R·M·WADE & CO·

SINCE 1865

PORTLAND. ORE.

Farm Equipment Catalog

No. 40

E. W. C. - Mar. 4 - 1931

E. W. Crichton
March 4 - 1931

WADE QUALITY HAS MEANT THE BEST IN
FARM EQUIPMENT FOR OVER
HALF A CENTURY

R·M·WADE & CO·
SINCE 1865
PORTLAND. ORE

INCORPORATED

322 to 336 Hawthorne Avenue
321 to 335 East Clay Street

PORTLAND, OREGON

FARM EQUIPMENT
CATALOGUE NO. FORTY

We embarked in the Farm Equipment Business sixty-six years ago and are at it yet with the best line carried in the Pacific Northwest

TO THE TRADE

It is with a great deal of pleasure and pride that we present to our customers this latest edition of our Farm Equipment Catalog. We want to call your attention to some important changes in the lines we distribute.

First, you will note that we have eliminated all duplicating lines and are carrying one line only of each article. This was done to enable us to carry a more complete stock and give better service, also to sell only the best.

Second, we want you to know the wonderful additions in lines that we have made this year. These are new lines of which we are justly proud, THE NEW IDEA SPREADER LINE, the largest in its field consisting of spreaders, transplanters, farm trucks, side delivery rakes and hay loaders, gasoline engines, corn shellers and corn pickers; the GOULDS LINE of pumps which enable us now to offer to you a complete line of pumps from hand to automatic and industrial pumps made by the largest factory in the world devoted exclusively to the manufacture of pumps; The WADE COAL BROODER which is made for us by one of the largest manufacturers of brooders and the GRAVES ELECTRIC BROODER; The WHITAKER LINE of cutting extras of which we have put in a large stock and can offer complete service; The KEYSTONE line of galvannealed fence which we believe has no equal on the market. Lastly we have added numerous small articles such as BULL DOG FANNING MILL, STEWART CLIPPERS, K & J WHEELBARROWS, STERLING TRACTOR HITCH and many others.

We know that these new lines will meet with your heartiest approval and of course we continue to carry the leading lines we sold in the past, namely RODERICK LEAN, VULCAN and PEORIA FARM IMPLEMENTS, EMPIRE MILKING MACHINES, LETZ FEED MILLS, WADE DRAG SAWS and associate lines.

We believe that we have grouped together a line from which every dealer can find many articles he will want to sell and a line that carries a good profit for full line dealers.

Our strongest claim for recommending our line is that it is not all made in one factory, therefore, we are able to pick the best article in the field. We believe that a man can make one article better than he can make 100 different products. We sincerely believe that the specialist can build better and know you will agree with us after you look over the features of the lines which we carry.

This concern, since it's foundation in 1865 by Mr. R. M. Wade has always had the same policy of old fashion honesty and fair dealings with its customers. Through three generation this company has stood the test of time.

We thank you for your patronage in the past and hope we will merit it in the future.

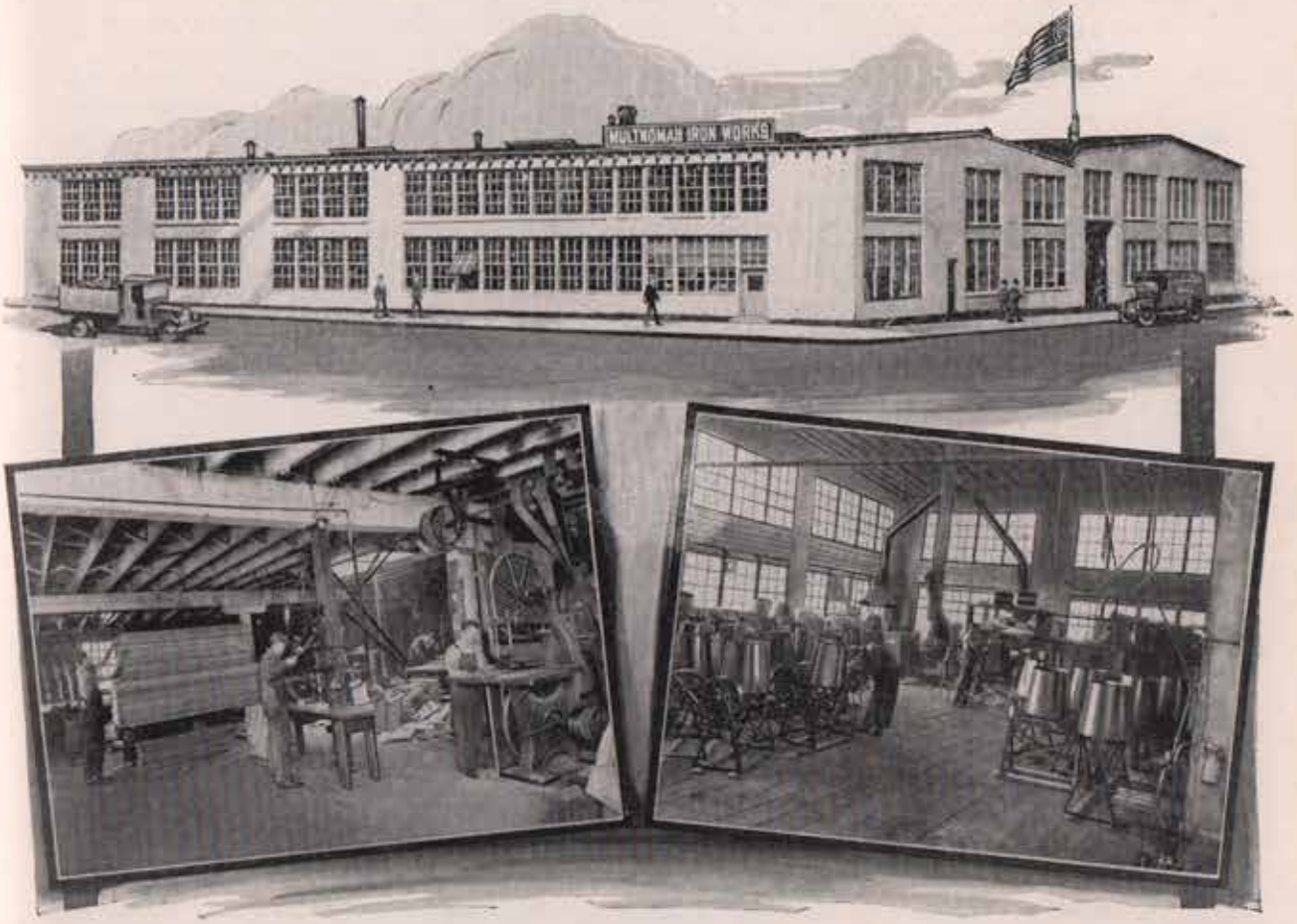
Yours truly,

R. M. WADE & COMPANY

Wade Newbegin

President

This is a view of our Office, Display Floor and Warehouse where we maintain a complete stock of all lines as shown in the catalog.



Exterior and Interior view of plant where Wade Products are manufactured: Top, shows the Plant located at 30th and Nicolai Streets; Above left, shows the Woodworking Department and Above right, shows the Concrete Mixer assembly Department.

Distributors of the Following Nationally Known Lines

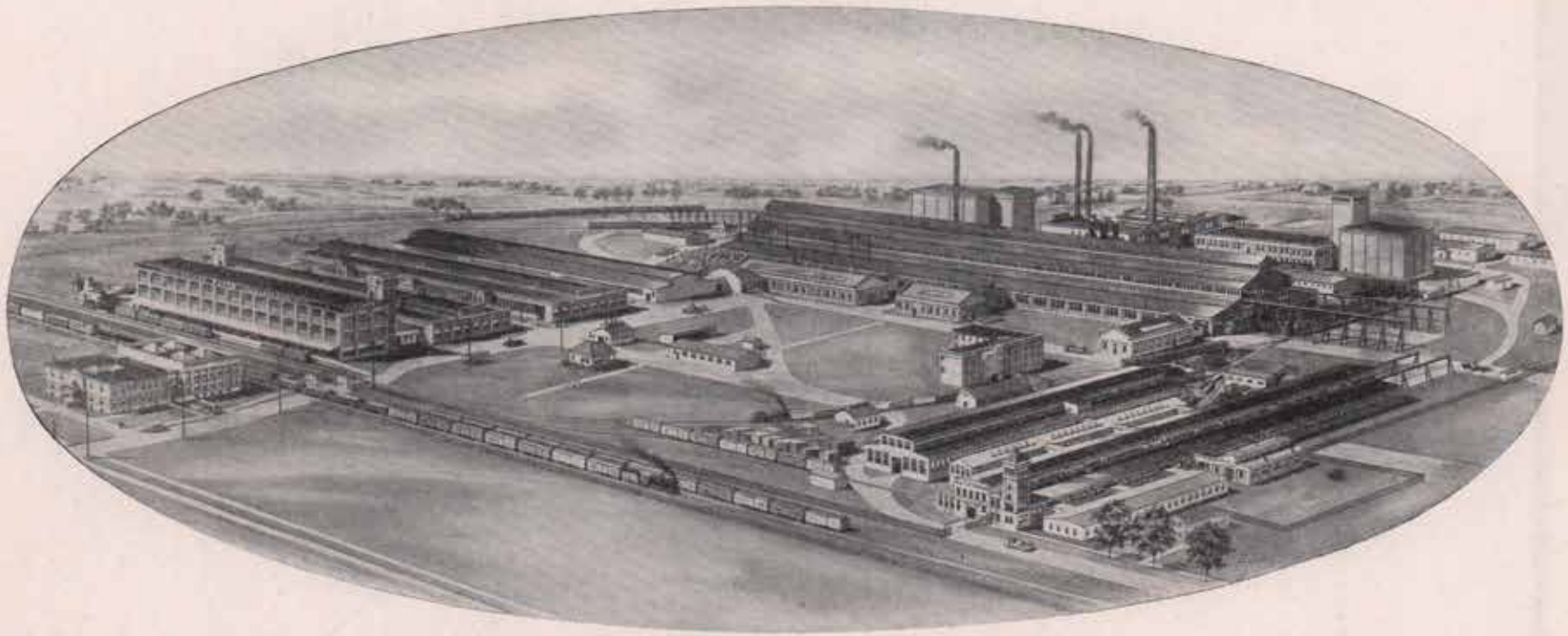
Acme Manufacturing Co.	Sprayers, Hand Planters
Ann Arbor Machine Co.	Hay Balers
Chicago Flexible Shaft Co.	Stewart Clippers
Cyclone Seeder Company	Seed Sowers
Curtis Manufacturing Co.	Circular and Drag Saw Blades
Donaldson Company	Tractor Seats
Case, Crane, Kilibourne & Jacobs Co.	Wheelbarrows
Emerson Mfg. Co.	Fanning Mills
Elgin Windmill Co.	Windmills and towers
Empire Milking Machine Co.	Milking Machines, cream separators, clippers
Empire Plow Company	Cultivators and garden plows
Freeman Manufacturing Co.	Feed Cutters
Gaterman Mfg. Co.	Windrowers, lifter guards
Graves Companies	Electric brooders
Goulds Pumps Inc.	Complete line pumps and water systems
Keystone Steel & Wire Co.	Fencing, barb wire, nails
Katelman Mfg. Co.	Land rollers
LeRoy Mfg. Co.	Evans Superior Potato Planter and Rollers
Roderick Lean Mfg. Co.	Disc, spring tooth and tractor harrows, milk carts
Letz Manufacturing Co.	Feed mills and ensilage cutters
Morgan Mfg. Co.	Grape Hoes
Multnomah Iron Works	Sulphur, land plaster and lime sowers, plaster mixers, concrete mixers, drag saws, steam saws, pole saws
New Idea Spreader Co.	Spreaders, transplanters, farm trucks, side delivery rakes, hay loaders, corn shellers, corn pickers, gasoline engines
A. H. Patch Co.	Corn shellers
Peoria Drill & Seeder Co.	Grain Drills, Grass Seeders
J. E. Porter Corp.	Barn equipment, hay tools
Sterling Tractor Co.	Tractor hitches
Smalley Corporation	Ensilage cutters
O. E. Thompson Co.	Root Cutters
United Engine Co.	Viking Separators
Vulcan Plow Co.	Horse drawn and tractor plows
Whitaker Mfg. Co.	Harvesting machinery, cutting parts and canvasses
Wiard Plow Co.	Chilled Plows
R. M. Wade & Co.	Drag Saws, concrete mixers, fertilizer sowers, brooders, farm trucks, bean threshers

We stock a complete line of repair parts for the above machines and in addition to the above we carry repairs for the following lines:

Adriance Mfg. Co.	Buckeye Mowers
Bateman Mfg. Company	Iron Age garden tools, potato planters and diggers
N. P. Bowsher Company	Feed Mills
Champion Corporation	Potato Diggers and Planters
LeRoy Plow Company	Land rollers and bean harvesters
Litchfield Mfg. Co.	Spreaders
Milwaukee	Chain Drive Mowers
Mast Foos Co.	Hand and power pumps
Ohio Rake Co.	Transplanters and Standard Diggers
Walter A. Wods	Tillage Tools
Wolverine Hay Balers	

As you will notice above, we carry the Whitaker line of cutting parts and can supply cutting parts for all makes of mowers and binders and some combine parts.

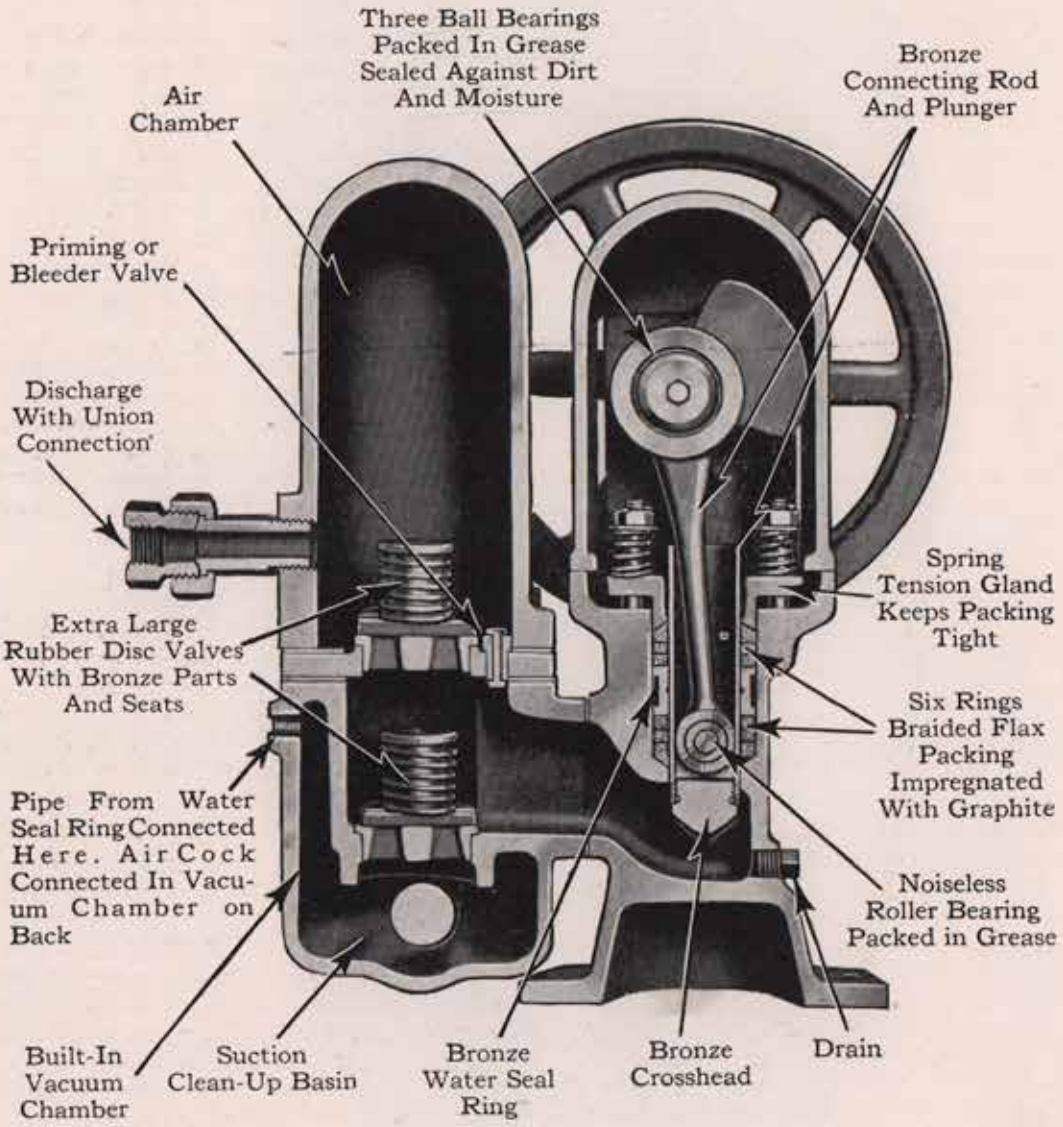
When in doubt as to where to obtain parts for machines if you will forward us your order we will turn same over to the Jobber who can serve you or, if the parts are not obtainable locally we will advise you promptly where they can be purchased.



BIRDSEYE VIEW OF THE GOULDS PLANT— WORLD'S LARGEST PLANT DEVOTED EXCLUSIVELY TO THE MANUFACTURE OF PUMPS

Since 1848 Goulds has helped to solve water supply problems for hundreds of thousands of farm and suburban homes, schools, hotels, factories, and municipalities. Its entire plant is devoted to the building of one product—pumps. Today, Goulds operates the world's largest pump plant—its steady growth the result of 82 years of leadership in the pump field.

The sectional view shown below illustrates the Goulds Ever-Oiled Shallow Well Pump which is one of their many types which we carry in stock. Notice the sturdy compact design. Goulds pumps are built to give real service. See the following pages for a complete description of their Shallow and Deep Well Systems.



Sectional View of EVER-OILED Pump

What You Should Know About Goulds Ever-Oiled Ball Bearing Pumps

SHALLOW WELL TYPE

With many vital improvements in its design, construction and working principles, Goulds EVER-OILED Pump is, today, the most outstanding pumping unit ever devised for water supply.

Like the automatic refrigerator, this new EVER-OILED Pump meets the modern demand for automatic home equipment that is attention-free and trouble-proof. It can be installed and forgotten—and it will run for years with the same ever-dependable, satisfactory service.

Let us take the EVER-OILED Pump apart and study the points of superiority which enable us to *guarantee this pump for two years.*

All Working Parts Enclosed

Over the pump cylinder is a protective hood to keep the crank arm, connecting rod, gland and plunger free from foreign matter which might injure the pump's working mechanism. Merely unscrew two bolts, and this hood comes off. The entire plunger assembly is readily accessible. With plenty of unhampered work room, the stuffing box can be repacked easily. No delicate complicated parts to handle and perhaps damage or misplace. All necessary tools are supplied in their handiest form with the pump.

Lubricated for Life

By unscrewing four cap nuts the bearing cap is removed, exposing to view the crankshaft and crankshaft and connecting rod ball bearings. At the factory these ball bearings are sealed in grease, protected from dirt and moisture. They are lubricated for the life of the pump.

Ball Bearing Construction

The two ball bearings on the crankshaft and the fully sealed connecting rod ball bearing not only add years to the life of the pump but insure smoother, quieter, trouble-free operation. Again we want to emphasize the fact that this ball bearing assembly, lubricated for life at the factory, never needs any further attention.

Leak-proof Construction

A certain amount of leakage is necessary in any pump, to act as a lubricant for the plunger. But in the EVER-OILED Pump none of this leakage gets outside the pump or around the floor. The water necessary for lubrication is carried back to the vacuum chamber and does not spill out. A water seal ring and a spring tension gland prevent this leakage from becoming excessive.

Bronze Water Seal Ring

As mentioned above, stuffing box leakage is controlled by the phosphor bronze water seal ring, where it is collected and carried back to the suction through the water seal piping. This water seal ring also acts as a guide for the plunger and thus lessens wear on the packing.

Spring Tension Gland

The EVER-OILED gland construction, a feature not found on any other water system pump, automatically tightens the packing and takes up any wear that may occur. This prevents leakage around the plunger or sucking in of air to air-bind the pump. Another advance in attention-free equipment. Most glands have to be tightened frequently by hand.

Large, Accessible Stuffing Box

Six quarter-inch square packing rings go in the stuffing box with the water seal ring in between. Made of soft flax impregnated with graphite to insure years of service with little appreciable wear, the rings stay soft, and prevent air coming in or water leaking out of the plunger case. Stuffing boxes are over two and one-quarter inches long.

No Small Leather Crimps

The reciprocating movement of the EVER-OILED Plunger is not dependent on small leather cups for satisfactory service. Leather cups dry out quickly—and since piston crimps must fit perfectly to pump water, small leather crimps need constant servicing. As described above, the EVER-OILED Pump has a liberal stuffing box with outside packed plunger and soft flax packing rings instead of leather crimps. Hence the long, continuous, attention-free service from this pump.

Valve Assembly

Loosening the four bolts on the air chamber exposes the valve assembly. The valves in Goulds EVER-OILED Pump are of more liberal design and more durable construction than those of any other pump. Their very simplicity is positive assurance against trouble. Only two valves, instead of four—extra large rubber disc valves with bronze packing plates, springs, stems and seats, identical in design and quality to those used on the best and largest engineering pumps. Easy to get at—should trouble by any chance develop or repairs become necessary—and no

difficulty experienced in renewing the valve discs.

Bronze Connecting Rod and Plunger

Compare the length of the new Goulds EVER-OILED plunger assembly and connecting rod with that of other pumps. The exceptional length of the stuffing box, connecting rod and plunger give a sure vertical movement to the plunger without side-play or side-pressure to cause wear. The bronze construction assures greater strength and longer wearing qualities. A noiseless roller bearing, hardened and ground, packed in grease—lubricated for life—joins the plunger to the connecting rod.

The Bleeder Valve

This priming or bleeder valve is one of the main reasons why Goulds EVER-OILED Pump is self-priming and can be depended upon to give constantly satisfactory service without losing its prime. It permits water that remains in the discharge chamber to flow back to the cylinder. It is not just a small hole in the valve seat, which can easily plug, as is the case with most water system pumps. It is self-cleaning, poppet type valve which oscillates in the valve seat with each plunger movement and thus cannot clog. All parts made of stainless non-corrosive alloy. It prevents air binding the pump by keeping the pump cylinder always primed. A more expensive construction but it contributes much to the EVER-OILED success.

Unit Construction

The use of small units bolted together in the Goulds EVER-OILED Pump makes it easy to replace worn or broken parts at an unusually low price—and without the necessity of buying practically a new pump.

All Working Parts Carefully Fitted

The engine of the finest automobile receives no better attention than the working mechanism of Goulds EVER-OILED Pump. All parts made of the highest grade metals, are machined to close working fits and so constructed that repairs or replaced parts will always fit the pump. The crankshaft is counterbalanced to eliminate vibration. The entire design and construction of the pump insure a smoothness of operation and a length of life unequalled today by any other water system pump.

Quiet Operation

For quietness, few pumps can compete with the new Goulds EVER-OILED. Ball bearings and the precision of its working mechanism assure this smooth, noiseless performance for the life of the pump.

Tested Three Times Before Shipment

Before it leaves our factory, every Goulds EVER-OILED Pump is rigidly tested under actual working conditions. First, all parts are given a hydrostatic test for leaks, before assembly.

Second, the assembled pump is given a running test to make sure that it handles more than its rated capacity and pressure, and picks up its suction properly. Bearings are checked to assure their meeting our standard of requirements and a general inspection of the pump is made for quiet operation.

Third, the complete unit is tested to see that all parts function properly.

GUARANTEE

Goulds Pump Co. guarantee to replace any Ever-Oiled Pump which has not given satisfactory service within two years from date of delivery to consumer. ¶ Gould's *Ever-Oiled* Pumps are guaranteed to be free from defects in material and workmanship during this two-year period.

The only restrictions we place on these two statements are:—

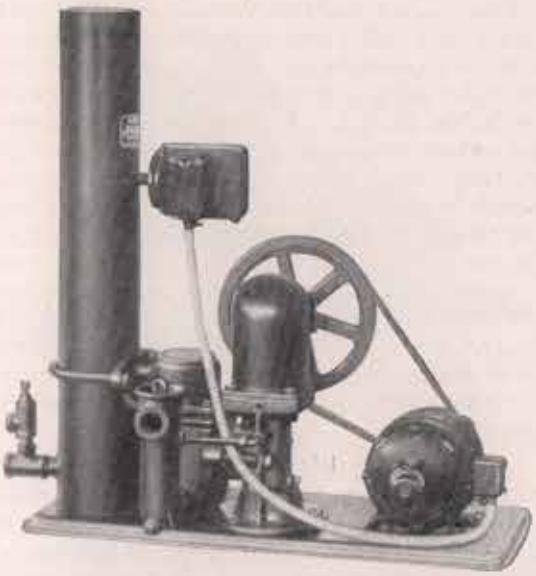
1. **Pumps must be installed and operated in accordance with our complete Instruction Book accompanying each pump.**
2. **Guaranteed Acceptance Postal Card must be returned to us (completely filled out) at the time the outfit is installed.**
3. **The guarantee is void if pump has been altered or repaired, subjected to misuse, accident or freeze-ups, or if it has been operated beyond factory ratings.**

This IS a liberal guarantee—one which no other manufacturer has cared to make. It is your protection. ¶ Think what it saves in service calls.

GOULDS EVER-OILED WATER SYSTEM W-40

"Fresh Water Jr."

Capacity 210 Gallons Per Hour—V-Belt Drive



Compared feature for feature with any other water system, the Goulds EVER-OILED Outfit W-40 proves itself to be the greatest water system value on the market today. It is a complete unit, ready to install—necessary only to connect pressure switch and water piping. It is self-starting and self-stopping.

It can be used for cistern water, cottages, rural or suburban homes, camps, filling stations, initial installations with plan for larger tank systems later. It is the best possible outfit for use with pressure tanks of large size, or for fresh water faucet, because pressure switch is already mounted on efficient air cushion. Also an ideal outfit to use with a storage tank where pump and tank are separated. Pressure switch is already mounted close to motor, and a pressure switch on the storage tank is not needed.

The Goulds EVER-OILED ball bearing pump, lubricated for life, requires no lubricating attention whatever. The non-leaking gland eliminates the possiblity of leakage around the pump or floor. The plunger packing is kept constantly tight by the spring tension gland. Instead of using the smallest motor possible, as is the practice of most water system manufacturers, this system is full powered with a ¼ horsepower motor to permit continuous satisfactory operation, such as for sprinkling, without danger to the motor. All of these improvements meet the modern demand for automatic, attention-free equipment and enable the system to operate month after month without care or worry. The superior construction and operation of the pump is so satisfactory that we are able to back it with a *two-year guarantee*.

This outfit complete can be installed in any convenient place where it will be protected from freezing. Floor space 13½x31x31 inches high.

EQUIPMENT

PUMP—Goulds EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years*. Capacity 210 gallons per hour. Suction lift 22 feet. Built-in vacuum chamber.

TANK OR CUSHIONING CHAMBER—Electrically welded steel. Acts as large cushioning chamber to give quiet, smooth operation. When faucet is opened, tank discharges less than ½ gallon before pump starts and fresh water flows from the faucet. Mounted on pressed steel base which carries pump and motor.

MOTOR—¼ horsepower repulsion-induction alternating current motor, or direct current as specified, General Electric.

SWITCH—Double-pole pressure switch, set to start at 25 lbs. and stop at 43 lbs. Motor and switch connected at factory.

BELT—Endless, non-slipping V-belt. Rubber and fabric. May be adjusted as needed by moving motor in slots provided.

RELIEF VALVE—To protect motor and pump from injury.

COMPLETE OUTFITS

Capacity 210 Gallons per hour

OUTFIT W-40—(*as illustrated*) Complete with EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years*; air cushioning chamber; vacuum chamber; air valve; electric pressure switch; relief valve; endless V-belt, and ¼ horsepower motor. Suction and discharge ¾ inch. Supplied only as complete unit, as illustrated. Motor and pressure switch connected for 60 cycle, 110 volts only, ready for installation.

Specify current used. If A. C. give phase, cycles and voltage. If D. C. give voltage.

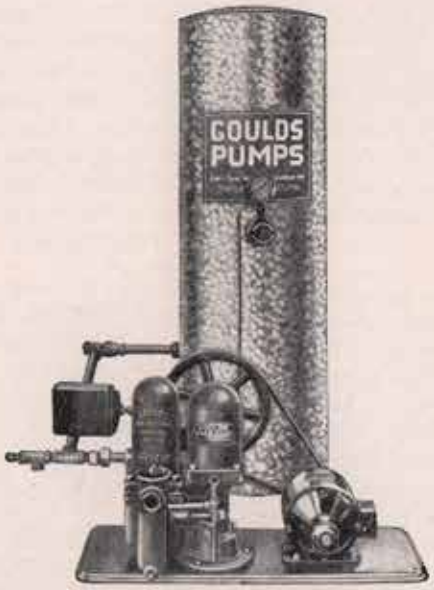
WEIGHT—150 lbs. Floor Space 13½"x31"x31" High.

EXTRA EQUIPMENT

Goulds Fig. 760, 1-inch Foot Valve and Strainer is recommended.

GOULDS EVER-OILED WATER SYSTEM W-48

Combination Fresh Water and Pressure Tank System
Capacity 210 Gallons Per Hour—V-Belt Drive



This is the most satisfactory combination water system on the market today, furnishing both fresh water and a storage supply from one pumping unit. Fresh cold water, direct from the well for drinking, and a storage supply adequate for all household requirements of hot and cold water are available.

This system uses our W-200 pumping outfit with a tank and a fresh water spring check valve to make a combination unit for fresh and storage water which cannot be equalled anywhere else on the market. A main feature is the pressure switch mounted on the air chamber to give the cushioning effect so desirable for long, trouble-free life. Most systems have the pressure switch mounted directly on the piping and attempt to overcome pump pulsations by using a "pulsation plug" in the diaphragm opening. But this plug often becomes clogged, with consequent damage to pump and motor. Goulds W-48 design overcomes these objections and offers a smoothly operating, long-lived combination system.

Lubricated for life at the factory, the EVER-OILED pump never requires lubricating attention.

A ¼ horsepower motor assures satisfactory operation without over-loading and consequent-danger to the motor, even on heavily loaded power lines where low voltage is liable to occur. It also permits the continuous operation, needed for sprinkling.

Smooth, noiseless, leak-proof, attention-free operation—and a pump backed with a two-year guarantee of satisfactory service. Here is a water system you can install and depend upon.

Floor space 38x36x50 inches high.

EQUIPMENT

PUMP—Goulds EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years.* Capacity 210 gallons per hour. Suction lift 22 feet. Mounted on pressed steel base with motor and air cushioning chamber. V-Belt Drive.

TANK—42-gallon, welded steel, galvanized inside and out, with galvanized pipe and fittings to connect pump and tank.

AIR VOLUME CONTROL—Completely automatic. Maintains the proper amount of air in tank, and prevents air-bound or water-logged condition. Supplied with fittings complete.

MOTOR—¼ horsepower repulsion-induction, alternating current or direct current as specified, General Electric.

SWITCH—Double pole pressure switch. Set to start at 23 lbs. and stop at 45 lbs. Motor and switch connected at factory.

BELT—Endless non-slipping V-belt. Rubber and fabric. May be tightened by motor adjustment.

FRESH WATER VALVE—Spring check valve, Marks type, for installation in the piping between pump and tank.

COMPLETE OUTFITS

Capacity 210 Gallons per Hour

OUTFIT W-48—Complete with EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years;* air cushioning chamber; vacuum chamber; a 42-gallon storage tank (See "Extra Equipment" below); Automatic Air Volume Control; galvanized pipe and fittings for connecting pump and tank; electric pressure switch; pressure gauge; air valve; relief valve; fresh water valve; endless V-belt; ¼ horsepower A. C. or D. C. motor. Suction and discharge ¾ inch. Supplied as complete system only as illustrated.

Specify current used. If A. C. give phase, cycles and voltage. If D. C. give voltage.

WEIGHT—230 lbs. Floor Space 38"x36"x50" high.

EXTRA EQUIPMENT

Goulds Fig. 760, 1-inch Foot Valve and Strainer is recommended. Storage tank is supplied only as listed. If a larger tank is wanted order W-200 Outfit, with size tank desired and necessary fittings.

GOULDS EVER-OILED PRESSURE TANK OUTFIT

Open Tank Outfit W-207

Capacity 210 Gallons Per Hour—V-Belt Drive

In buying a pumping unit only, whether for pressure tank, or general pumping service, no better value or more serviceable unit can be obtained than that represented in Goulds Outfits W-200 and W-207.

These are basic pumping units from which any desired water system may be built. Or they may be used, as listed, in a wide range of industrial and other applications where a reliable, trouble-free pump is demanded, such as for circulating water in dairies or creameries; filter service; fountains; handling light syrups, gasoline and other distillates; and for use in priming larger pumps.

Each of these outfits is equipped with the new Goulds EVER-OILED Ball Bearing Pump guaranteed for two years. No other water supply outfit on the market offers such a liberal pump guarantee.

No other outfit has the exclusive features which are an outstanding part of the EVER-OILED pump— a pump that never has to be lubricated, that is made positively leak-proof with its soft flax plunger packing, special bronze water seal ring and spring tension gland which keeps the packing tight at all times. The pump crankshaft and connecting rod assembly has three large ball bearings to assure smooth, noiseless operation and extra long wear— unit construction and accessibility of all working parts which make it easy and inexpensive to repair or replace parts.

Outfits W-200 and W-207 do not include a storage tank or tank fittings.

EQUIPMENT

W-200—For Pressure Tank Service

PUMP—Goulds EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years.* Capacity 210 gallons per hour. Large air chamber and built-in vacuum chamber. Suction lift 22 feet. Suction and discharge ¾ inch. Includes relief valve and air valve. Pump and motor mounted on pressed steel base. V-belt drive.

MOTOR—¼ horsepower repulsion-induction, alternating current or direct current as specified, General Electric.

SWITCH—Double-pole pressure switch. Set to start at 25 lbs. and stop at 45 lbs.

BELT—Endless, non-slipping V-belt. Rubber and fabric. May be tightened by simple motor adjustment.

W-207—For General or Open Tank Service

Same equipment as W-200 except that Pressure Switch is not included.

COMPLETE OUTFITS

Capacity 210 Gallons per Hour

OUTFIT W-200—Complete with EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years;* electric pressure switch; relief valve; air valve; endless V-belt, ¼ horsepower A. C. or D. C. motor. Suction and discharge ¾ inch. Specify current used. If A. C. give phase, cycles and voltage. If D. C. give voltage.

OUTFIT W-207—Same as Outfit W-200 but suplied without the pressure switch.

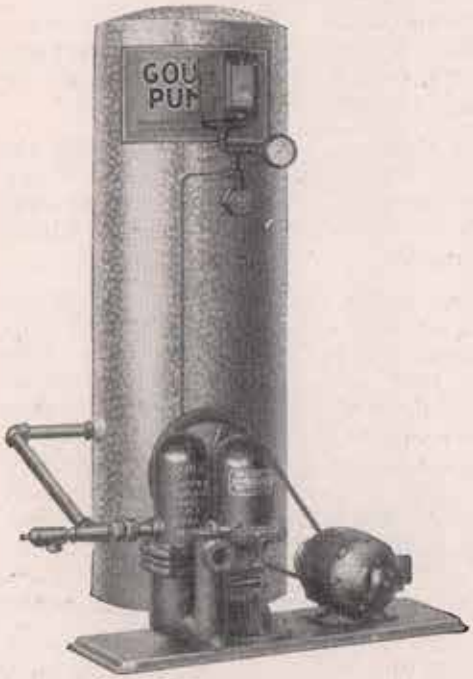
WEIGHT—W-200, 130 lbs.; W-207, 125 lbs. Floor Space 13½x29x17⅞ High.

EXTRA EQUIPMENT

Automatic Air Volume Control, with tubing and fittings. Float Switch including float, rod and stops. Pressure Gauge Water Gauge. Fig. 760 1-inch galvanized Foot Valve and Strainer. Pressure Switch.

GOULDS EVER-OILED COMPLETE PRESSURE SYSTEM W-205

Capacity 210 Gallons Per Hour—V-Belt Drive



Floor space 38x36x50 inches high.

Running water is no longer a luxury. Today, any convenient source of water supply can be brought into kitchen, bathroom, lavatory, cellar or barn, with the aid of a good pumping unit.

Such a pumping unit is found in EVER-OILED Pressure System W-205—a complete outfit for storage water supply, furnishing practically city water service to the farm, suburban home, wayside filling station, refreshment stand and similar places where the quantity of water used does not exceed 210 gallons per hour.

The W-205 pumping unit is the same as our W-200—made to assure perfect performance by the precision of its working parts—plunger packing kept tight by a spring tension take-up gland to make a leakless pump; two large bronze valves with rubber discs; a self-cleaning, poppet type priming valve, a ball bearing crankshaft assembly sealed in grease and which never requires lubricating attention; and many other vital features which enable us to guarantee this pump for two years.

EVER-OILED Outfit W-205 is a complete pressure system, ready to install and use merely by connecting suction and discharge pipes and wiring the pressure switch to the lighting circuit.

EQUIPMENT

PUMP—Goulds EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years.* Capacity 210 gallons per hour. Large air chamber and built-in vacuum chamber. Suction lift 22 feet. Includes relief valve and air valve. Pump and motor mounted on pressed steel base. V-belt drive.

MOTOR—¼ horsepower, repulsion-induction, alternating current or direct current as specified, General Electric.

TANK—42-gallon, welded steel, galvanized inside and out.

Galvanized pipe and fittings to connect pump discharge with tank.

AIR VOLUME CONTROL—Completely automatic. Keeps just the right amount of air in tank to prevent air-binding or water-logging. Requires no attention.

SWITCH—Double-pole pressure switch. Set to start at 23 lbs. and stop at 43 lbs.

BELT—Endless, non-slipping V-belt. Rubber and fabric. Simple motor adjustment for tightening.

COMPLETE SYSTEM

Capacity 210 Gallons per Hour

OUTFIT W-205—Complete with EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years;* 42-gallon storage tank (See "Extra Equipment" below); galvanized pipe and fittings for connecting pump and tank; Automatic Air Volume Control; pressure switch, relief valve and air valve; pressure gauge, endless V-belt, and ¼ horsepower A. C. or D. C. motor. Suction and discharge, ¾ inch.

Specify current used. If A. C. give phase, cycles and voltage. If D. C. give voltage.

WEIGHT—230 lbs.

EXTRA EQUIPMENT

Goulds Fig. 760, 1-inch Foot Valve and Strainer is recommended. Storage tank is supplied only as listed. If a larger tank is wanted, order Outfit W-200 with size tank desired and necessary fittings.

GOULDS EVER-OILED PRESSURE TANK OUTFIT W-400

OPEN TANK OUTFIT W-407

Capacity 420 Gallons Per Hour—V-Belt Drive

While an outfit with a capacity of 210 gallons per hour may serve the small home satisfactorily, where adequate fire protection is desired, a liberal amount of sprinkling is to be done, and livestock has to be watered, a larger capacity outfit such as this is necessary.

EVER-OILED Outfits W-400 and W407 are similiar to our W-200 and W-207 outfits but built to handle a capacity of 420 gallons per hour. It is, without doubt, the lowest priced 420-gallon unit on the market—and the best. An examination of its pumping unit will prove beyond a doubt the many superior points of this outfit, which enable us to back it and our other EVER-OILED pumps with a two-year guarantee of satisfactory service.

Every part is fully enclosed—protected from dust and other elements which might injure the pump.

Power is supplied by a 1/3 horsepower motor—ample size for long, continuous service without danger of overloading.

These outfits are capable of furnishing a dependable running water supply for medium and large suburban or farm homes, country clubs for house water supply, small rural schools, roadside lunch stands, service and gasoline stations, small dairies equipped with drinking bowls for cattle and small greenhouses for a limited amount of sprinkling. These units can also be used for many pumping services other than water supply; in industrial plants, oil refineries, private and public buildings for water circulation, handling distillates and similar purposes.

For pressure tank service, specify Outfit W-400; for general or open tank service, Outfit W-407.

EQUIPMENT

Outfit W-400—For Pressure Tanks

PUMP—Gould EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years.* Capacity 420 gallons per hour. Suction lift 22 feet. Large air chamber and built-in vacuum chamber. Includes relief valve and air valve. Mounted with motor on pressed steel base. V-belt drive.

MOTOR—⅓ horsepower repulsion-induction, alternating current or direct current as specified, General Electric.

SWITCH—Double-pole pressure swicth. Set to start at 23 lbs. and stop at 43 lbs.

BELT—Endless, non-slipping V-belt. Rubber and fabric. Simple motor adjustment for tightening.

Outfit W-407—For General or Open Tank Service

Same equipment as W-400 except that Pressure Switch is not included.

COMPLETE OUTFITS

Capacity 420 Gallons per Hour

OUTFIT W-400—Complete with EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years; electric* pressure switch, relief valve, air valve; endless V-belt; ⅓ horsepower A. C. or D. C. motor. Suction and discharge 1-inch. Specify current used. If A. C. give phase, cycles and voltage. If D. C. give voltage.

OUTFIT W-407—Same as Outfit W-400 but supplied without pressure switch.

WEIGHT—W400 165 lbs.
W407 160 lbs.

FLOOR SPACE—14½x29x24 inches high.

EXTRA EQUIPMENT

Automatic Air Volume Control, with tubing and fittings. Pressure Gauge. Water Gauge. Ball Check Air Valve. Fig. 760, 1-inch galvanized Foot Valve and Strainer. Float Switch, including float, rod and stops.

GOULDS EVER-OILED COMPLETE PRESSURE SYSTEM W-405

Capacity 420 Gallons Per Hour—V-Belt Drive

In homes, on farms, country estates, country clubs, summer cottages, rural schools and other places where the water requirements average more than 210 gallons per hour, Outfit W-405 offers real economic service. In fact, nowhere else can such value be found in a system of 420 gallons capacity. In the long run, this outfit will prove more economical than a smaller capacity outfit even if the proposed installation seems to indicates a quantity of water used amounting to about 210 gallons per hour.

Outfit W-405 is a complete unit, including storage tank with automatic air volume control, ready to install and use by connecting outfit to water supply and electric current.

Without hesitation we recommend the pumping unit—the new Goulds EVER-OILED Ball Bearing Pump—as the finest and most reliable in mechanical performance ever used on a water system. And we back this claim with a two-year guarantee of satisfactory service.

The ball bearing crankshaft and connecting rod, lubricated for life, the non-leaking spring tension gland, and the two large valves instead of the usual four small ones found in most pumps, assure a pump that is smooth, quiet, leakless and trouble-free in its operation. Other features which make this the finest of water system pumps are described on pages 7 and 8.

Goulds EVER-OILED Pressure System W-405 can be installed in basement or other convenient place where it will be protected from freezing. Floor space 38x37x50 inches.

EQUIPMENT

PUMP—Goulds EVER-OILED Ball Bearing Pump, *lubricated for life, guaranteed for two years.* Capacity 420 gallons per hour. Large air chamber and built-in vacuum chamber. Suction lift 22 feet. Includes relief valve and air valve. Pump and motor mounted on pressed steel base.

MOTOR—⅓ horsepower repulsion-induction, alternating current or direct current as specified, General Electric.

TANK—42-gallon, welded steel, galvanized inside and out.

Galvanized pipe and fittings to connect pump discharge with tank.

AIR VOLUME CONTROL—Completely automatic. Keeps just the right amount of air in tank to prevent tank from becoming air-bound or water-logged. Requires no attention.

SWITCH—Double-pole pressure switch. Set to start at 23 lbs. and stop at 43 lbs.

BELT—Endless non-slipping V-belt. Rubber and fabric. Simple motor adjustment for tightening.

COMPLETE SYSTEM

OUTFIT W-405—Complete with EVER-OILED Ball Bearing Pump; *lubricated for life, guaranteed for two years;* 42-gallon storage tank (see "Extra Equipment" below); galvanized pipe and fittings for connecting pump and tank; Automatic Air Volume Control; pressure switch; relief valve; air valve; pressure gauge; endless V-belt; and ⅓ horsepower A. C. or D. C. motor. Suction and discharge 1 inch. Specify current used. If A. C. give phase, cycles and voltage. If D. C. give voltage.

WEIGHT—265 lbs.

EXTRA EQUIPMENT

Goulds 1-inch Foot Valve and Strainer is recommended. Storage tank is supplied only as listed. If a larger tank is wanted order Outfit W-400, with size tank desired and necessary fittings.

GOULDS EVER-OILED SEPARATE PUMPS

Figure 1784

As a power pump with capacities of 210 and 420 gallons per hour, this new Fig. 1784 EVER-OILED Ball Bearing Pump is more than just a pumping unit for water systems.

It is suitable for a large variety of services, including general water supply in industrial plants; circulating water in dairies or creameries; circulating water for air or gas compressors and internal combustion engines; handling oil in oil purifying systems; distillates; filter service; process work; and many other purposes. It is also recommended for replacing other pumps now in service where a dependable EVER-OILED trouble-proof pump is wanted.

A study of the construction features of this pump, as mentioned below, offer convincing reasons why we can back this unit with a two-year guarantee of satisfactory performance.

Single Cylinder, Single-Acting. Outside Plunger-Packed Type, Simplest Construction

1. *Crankshaft*—Forged steel counter-balanced to eliminate vibration; accurately ground to close limits.
2. *Ball Bearings*—Three ball bearings on crankshaft and upper connecting rod are packed in grease and sealed against dirt and moisture—lubricated for life; smooth, silent, long wearing.
3. *Roller Bearing*—Noiseless roller bearing on lower connecting rod is sealed in grease—lubricated for life; no wear, no noise, long life.
4. *Packing Gland*—Spring tension type. Keeps packing always tight. Does away with frequent adjusting. Cotter pins prevents nuts from working loose. Leakless, trouble-free.
5. *Plunger and Connecting Rod*—All bronze. Will not rust or corrode. Connecting rod nearly twice as long as any other; no side thrust, long life.
6. *Protective Hood*—All working parts of pump fully enclosed and protected. Hood may be removed by loosening two cap screws. Keeps dust and dirt out; long life.
7. *Packing*—Six soft flax rings impregnated with graphite. They stay soft and resist wear.
8. *Water Seal Ring*—Phosphor bronze. Prevents leakage at gland by leading seepage back to pump vacuum chamber. Acts as a plunger guide and relieves packing of wear. Trouble-proof, lengthens pump life.
9. *Air Chamber*—Extra Large. Prevents undue water logging and assures an even flow of liquid. Insures quiet operation without pounding. Easily removed to reach valves quickly. Air valve standard equipment.
10. *Vacuum Chamber*—Built integral with pump. Only pump on market with vacuum chamber at its most effective point. Makes for quiet suction line by eliminating pounding.
11. *Bleeder Valve*—Oscillating poppet type. Keeps pump always primed. Stainless alloy, non-corrosive, will not stick. Oscillates with each movement of the plunger, which keeps it clean and prevents clogging.
12. *Valves*—Two, extra large, instead of the usual four small ones. Highest quality rubber discs backed by bronze plates, will not dry out or crack. All parts excepting disc are of bronze. Simply assembled. Readily accessible, long wearing, trouble-proof.
13. *Discharge Connection Union*—Improved type. All bronze, cannot corrode. Ground joint. Leak-proof. Standard equipment. Makes disconnecting extremely simple.
14. *All Working Parts Carefully Fitted*—Made of highest grade metals obtainable. Machined to close working fits. Repair or replacement parts will always fit the pump. Entire design and construction of the pump insure a smoothness and quietness of operation and a length of life unequalled by any other pump.

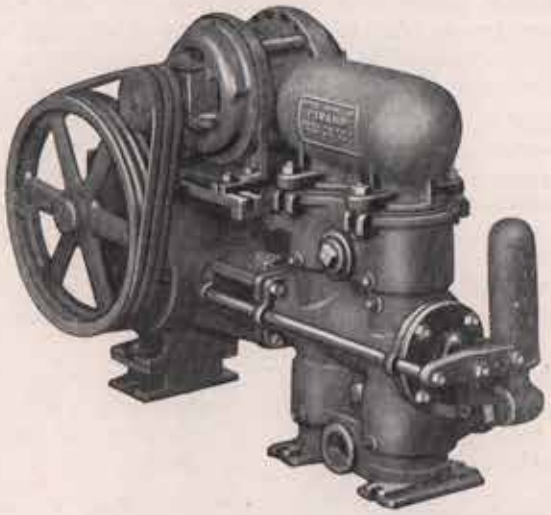
SPECIFICATIONS

Two pulleys available—Specify which is wanted

Capacity		Bronze Plunger		Speed Rev. per Min.	Suction Lift Feet	*Working Pressure Lbs.	For Elevation to Feet	Horsepower Required		Suction and Discharge Connection Inches	Overall Dimensions Inches	Pulley Sizes Inches		Hgt. Pulley Shaft	Ship. Wgt. Lbs.
Gals. per Hr.	Gals. per Min.	Diam. In.	Stroke In.					Elec. Motor	Gas Engine			Flat Pulley	"V" Pulley		
210	3.5	1¾	1¼	525	22	43	100	¾	½	¾	13¼ x 12¾ x 16¼ High	9½ x 1¾	9½	11½	68
420	7	2⅛	1¼	525	22	43	100	½	½	1	14 x 14 x 22½ High	9½ x 1½	9½	12¾	99

V-belt pulley groove dimensions—$21/32$" wide at top, $7/16$" deep, 32° angle.

GOULDS AUTOMATIC OILED, IMPROVED PYRAMID PUMPING UNIT DOUBLE ACTING



The Goulds Improved Pyramid is practically a new pump made by re-designing the famous Pyramid which was for years universally accepted as the finest pump for general water service.

The Improved Pyramid is a single cylinder double acting piston pump of the quiet, completely self-lubricating type and improved features typical of modern times which insure the utmost satisfaction to users.

Please note that the Pyramid pump shown here is only the electric type and of the smaller capacity, but we can furnish Pyramid pumps for practically all heads and capacities required. For information on larger capacity belt driven pumps write to us and we will prescribe the correct pump for your use. The belt driven pump is Figure 1741 not shown in our catalog but is priced in our price book. Write us for the correct size to use.

Improved Pyramid pump, double acting, V-belt driven. Capacity 600 and 750 gallons per hour, 50 lb. pressure.

This is the finest low-priced, large capacity pumping unit to be found. It has many uses on large dairy and produce farms, country estates, country clubs, in restaurants, creameries, factories, school houses or wherever capacities of 600 and 750 gallons per hour are required. Using this pumping unit as a basic unit, any required service may be met. It can be used for open or pressure tank service with any size tank to meet conditions as they exist.

The "Improved Pyramid" pump is driven by an ample size motor mounted over the pump and connected by a "V" type belt. The motor mounting is simple, strong and trouble-proof. There are no set screws to work loose causing motor misalignment. After years of thorough testing in many applications the V-belt has come to merit a permanent place as a drive of the highest type. It possesses qualities of smooth, flexible, quiet and trouble-free performance which make it the ideal pump drive. Adjustment of the belt is made by sliding the motor in slots provided in the motor bracket.

EQUIPMENT

NO. 7412 V—Consists of "Improved Pyramid" 2"x2" pumping unit, as illustrated, for open tank service, motor for 110-220 volts, 60 cycle, single phase, A. C. or 110-220 volts D. C. V-belt drive.

600 gallons per hour—½ H. P. Motor.
750 gallons per hour—¾ H. P. Motor.

NO. 7412 VA—Same as above but *for pressure tank service* and including relief valve and air valve.
Specify capacity and motor size required.

FOR SHALLOW WELLS—Suction lift 22 feet.
Suction and discharge openings—1¼ inch.

FLOOR SPACE—17x32¾x23 inches high.
Specify voltage, cycles, phase and whether A. C. or D. C.
There will be an extra charge for voltage or cycles other than listed. Can be supplied with motors for 25, 30, or 50 cycles.

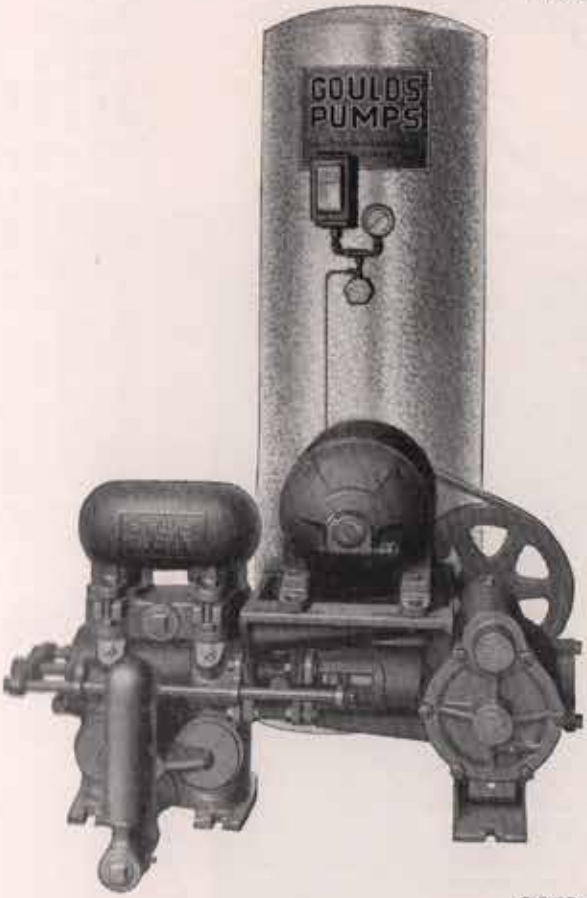
WEIGHT—½ H. P. Motor—228 lbs.
¾ H. P. Motor—248 lbs.

EXTRA EQUIPMENT

Automatic Air Volume Control complete with tubing and fittings—for pressure tank service. Automatic Float Switch complete with float, 5-ft. rod and stops. Pressure Switch. Water Gauge. Pressure Gauge. Relief Valve. Goulds Fig. 760, 1-inch Galvanized Foot Valve and Strainer.

GOULDS AUTOMATIC OILING "IMPROVED PYRAMID" COMPLETE SYSTEM

V-Belt Drive



Capacities 600 and 750 Gallons per Hour

In selecting a water system for your particular needs, be sure to get enough capacity. It is far better to over-estimate the quantity of water you will use, than to specify a system with a capacity which just meets your present requirements and which a year from now will prove altogether too small.

The outfit shown on the opposite page is a complete water system with capacities for large produce farms and dairies, factories, large camps, schools, apartments, etc.

The pumping unit is the new "Improved Pyramid". It is driven by an electric motor of sufficient size to meet capacity requirements without overloading. The motor, mounted over the pump on a sturdy, rigid base, is connected to the power end by a V-belt drive.

This is a silent, flexible, dependable drive which has proved through years of service its ability to give trouble-free performance. We always recommend a flexible pump drive and this is an excellent one at low cost—sure to give satisfaction.

OPERATION

An electric pressure switch automatically controls the operation of this system. Water will flow from the storage tank at the turn of a faucet. When pressure in tank lowers to 23 pounds, the pump starts. It stops when the pressure increases to 43 pounds. Water-logged and air-bound tanks are eliminated by the Automatic Air Volume Control which does not require attention and which automatically maintains the proper amount of air in the tank. The system is complete, with piping and control accessories, ready to install and use by wiring to electric circuit.

EQUIPMENT

NO. 7412 VAT—Consists of "Improved Pyramid" 2"x2" pumping unit, as illustrated, for pressure tank service; motor for 110-220 volts, 60 cycle, single phase, A. C. or 110 or 220 volts D. C.; V-belt drive; 42-gallon steel tank galvanized inside and out (see "Extra Equipment" below); Automatic Air Volume Control; pressure switch; pressure gauge, air valve, relief valve; galvanized piping and fittings for Automatic Air Volume Control, pump and tank.

600 gallons per hour—½ horsepower Motor.
750 gallons per hour—¾ horsepower Motor.

FOR SHALLOW WELLS—Suction lift 22 feet.
Suction and discharge openings—1¼ inches.

FLOOR SPACE—36x32¾x50 inches high.

Specify voltage, cycles, phase and whether A. C. or D. C. above. Can be supplied with motors for 25, 50 or 50 cycles.

There will be an extra charge for voltage other than listed

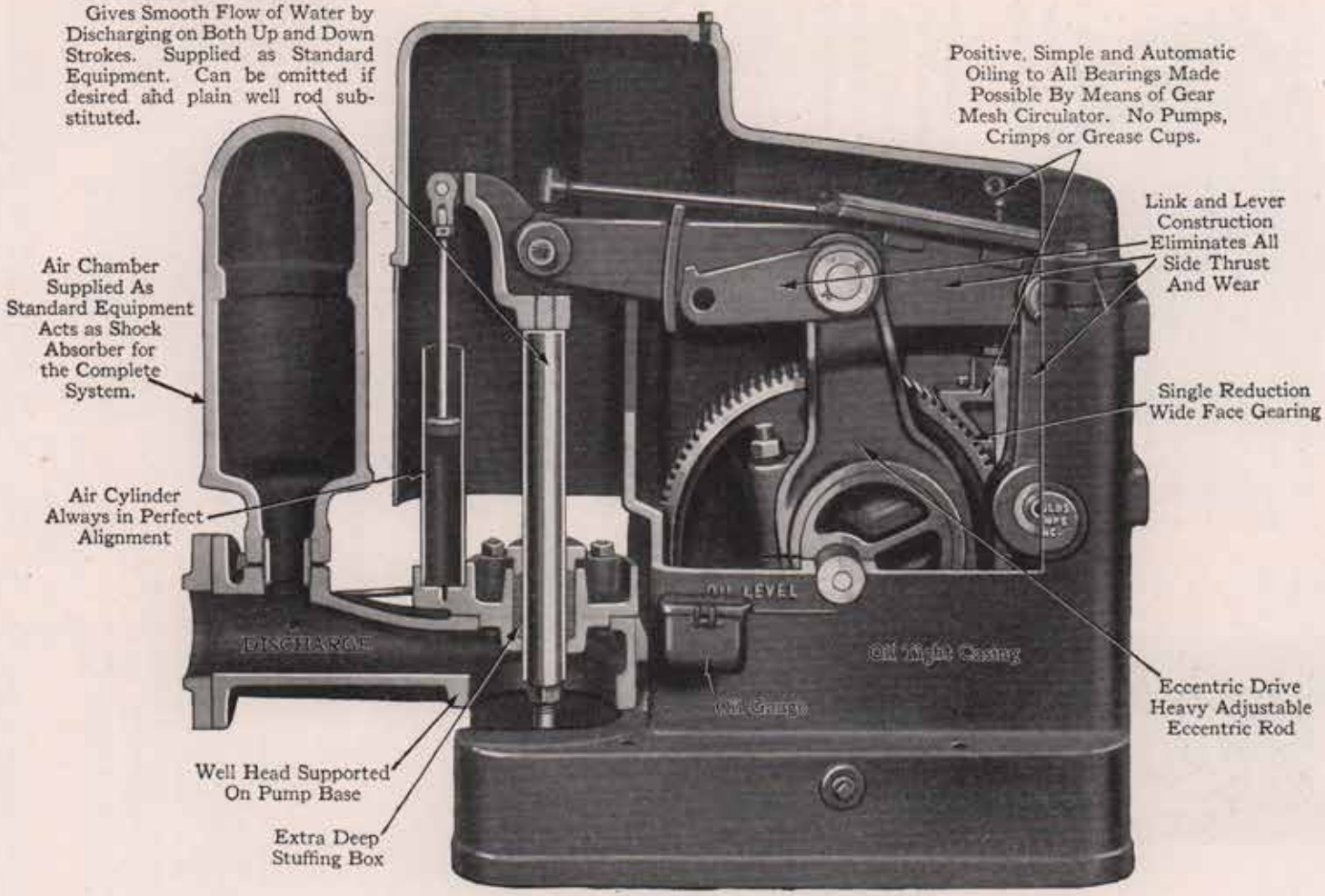
WEIGHT—½ H. P. Motor—255 lbs.
¾ H. P. Motor—275 lbs.

EXTRA EQUIPMENT

Goulds Fig. 760, 1-inch galvanized Foot Valve and strainer. Storage tank is supplied only as listed. If a larger tank is wanted, order No. 7412 VA, with size tank desired and necessary fittings.

GOULDS FIGURE 1782—8-INCH STROKE DEEP WELL HEAD

Typical Sectional View



Three Sizes—4, 6 and 8-inch Stroke

In addition to the features pointed out above, many other important changes have been made to improve the design and the working mechanism of Goulds new deep well working heads. All parts are sturdily constructed and fully enclosed; there are no openings to allow dirt to get into the case; the large oil reservoir with gear mesh oil circulator (Patent Pending) insures adequate lubrication and results in long life and trouble-free service. Every care has been taken to design a working head easy to install, easy to take care of and to give the most satisfactory service over a long period of time.

4 AND 6-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL PUMPING UNITS

For Open or Pressure Tank Service

Differential Plunger gives smooth, even flow of water.

Air Chamber acts as shock absorber for complete system.

Large single reduction gearing.

Gear Mesh Oil Circulator (Patent Pending)—Bathes all bearings in a continuous flood of oil.

For single or double-acting cylinders.

	4"Stk.	*6"Stk.*
Discharge Pipe	2 "	2 "
Suction Pipe	3½"	4 "
Plunger Rod Male Thd. U. S. Std.	½"	⅝"

Pumps can be supplied with suction bushing and rod coupling as per standard sizes, if specified. If not specified, pumps will be shipped as listed above.

Illustrated with Air Pump for Pressure Tank Service.

4-INCH STROKE

Condensed Ratings at 50 R. P. M. for Single-Acting Cylinders Using Wood Well Rod

Diam. of Cylinder	Gals. per Min.	PRESSURE TANK: Max. Depth (Ft.) to Water with 50 lbs. Tank Pressure				OPEN DISCHARGE: Depth (Ft.) to Water plus Disch. Hd. above Surface			
		¼ HP Motor	½ HP Motor	¾ HP Motor	1 HP Motor	¼ HP Motor	½ HP Motor	¾ HP Motor	1 HP Motor
1¼"	2.1	40	90	190	230	150	200	300	345
2¼"	3.45	—	—	70	170	95	130	190	290
2¾"	5.2	—	—	—	75	60	85	130	195
3¼"	7.2	—	—	—	25	—	60	90	140

4-INCH STROKE PUMPING UNITS

NO. 7824V—Goulds Fig. 1782 4-inch Stroke Automatic Oiling, deep well pumping unit complete with adjustable top motor mounting, V-belt drive, *for open tank service*, large air chamber, 1/3 H. P., 110-220 volts, 60 cycle, single phase repulsion-induction A. C. or 110 or 220 volts D. C. motor.

NO. 7824VA—Same as No. 7824V above but with air pump included, *for pressure tank service, as illustrated.*

NO. 7824VF—Same as No. 7824 but with anti-freeze attachment.

NO. 7824VAF—Same as No. 7824VA but with anti-freeze attachment.

Also furnished with ¼, ½ and ¾ H. P. motors and without motor but including single-groove pulley and belt.

6-INCH STROKE

Condensed Ratings at 45 R. P. M. for Single-Acting Cylinders Using Wood Well Rod

Diam. of Cylinder	Gals. per Min.	PRESSURE TANK: Max. Depth (Ft.) to Water with 50 lbs. Tank Pressure				OPEN DISCHARGE: Depth (Ft.) to Water plus Disch. Hd. above Surface			
		½ HP Motor	¾ HP Motor	1 HP Motor	1½ HP Motor	½ HP Motor	¾ HP Motor	1 HP Motor	1½ HP Motor
1¼"	2.8	115	230	230	—	230	345	345	—
2¼"	4.65	25	95	170	230	140	210	285	345
2¾"	6.95	—	30	75	170	95	145	190	285
3¼"	9.7	—	—	20	90	75	100	135	205
3½"	13.0	—	—	—	40	—	75	100	155

6-INCH STROKE PUMPING UNITS

NO. 7826V—Goulds Fig. 1782 6-inch Stroke Automatic Oiling, deep well pumping unit complete with adjustable top motor mounting, V-belt drive *for open tank service*, large air chamber, ½ H. P., 110-220 volts, 60 cycles, single phase repulsion-induction A. C. or 110 or 220 volts D. C. motor.

NO. 7826VA—Same as No. 7826V above but with air pump included, *for pressure tank service.*

NO. 7826VF—Same as No. 7826V but with anti-freeze attachment.

NO. 7826VAF—Same as No. 7826VA but with anti-freeze attachment.

Also furnished with ¾, 1 and 1½ H. P. motors and without motor but including single-groove pulley and belt for ½ and ¾ H. P. motors double-groove pulley and two belts for 1 and 1½ H. P. motor.

8-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL PUMPING UNITS

For Open or Pressure Tank Service

V-BELT DRIVE

Differential Plunger gives smooth, even flow of water.

Air Chamber acts as shock absorber for complete system.

Large single reduction gearing.

Gear Mesh Oil Circulator (Patent pending). Bathes all bearings in a continuous flood of oil.

For Single or Double-Acting cylinders.

Discharge Pipe Size 3".

Suction Pipe Size 5"

Plunger Rod Male Thread U. S. Std. ¾".

Pumps can be supplied with suction bushing and rod coupling as per standard sizes if specified. If not specified, pumps will be shipped as listed above.

Illustrated with Air Pump for Pressure Tank Service.

8-INCH STROKE

Condensed Ratings at 40 R. P. M. for Single-Acting Cylinders Using Wood Well Rod

Diam. of Cylinder	Gals. per Min.	PRESSURE TANK Max. Depth (Ft.) to Water with 50 lbs. Tank Pressure				OPEN DISCHARGE Depth (Ft.) to Water plus Disch. Hd. above Surface			
		1 HP Motor	1½ HP Motor	2 HP Motor	3 HP Motor	1 HP Motor	1½ HP Motor	2 HP Motor	3 HP Motor
1⅝"	3.4	230	230	—	—	345	345	—	—
2¼"	5.5	120	230	230	230	240	345	345	345
2⅝"	8.2	45	120	200	230	160	240	320	345
3¼"	11.5	—	55	115	220	115	170	230	340
3⅝"	15.3	—	—	60	140	85	130	175	250
4¼"	24.5	—	—	—	45	—	80	105	160

Outfits are exceptionally quiet in operation, require little floor space and are particularly suitable for installation in pits or where space is limited. Motor mounting allows use of any standard motor with ample adjustment and take-up. The V-belt driven units are lowest priced motor drive, yet are flexible and reliable. For use in building your own water system for open or pressure tank service.

8-Inch Stroke Pumping Units

NO. 7828V—Goulds Fig. 1782 8-inch Stroke Automatic-Oiling deep well pumping unit with adjustable top motor mounting, V-belt drive, *for open tank service,* complete with large air chamber, 1 H. P., 110-220 volts, 60 cycle, single phase repulsion-induction A. C. or 110 or 220 volts D. C. motor.

NO. 7828VA—Same as No. 7828V above but with air pump included, *for pressure tank service,* as illustrated.

NO. 7828VF—Same as No. 7828V but with anti-freeze attachment.

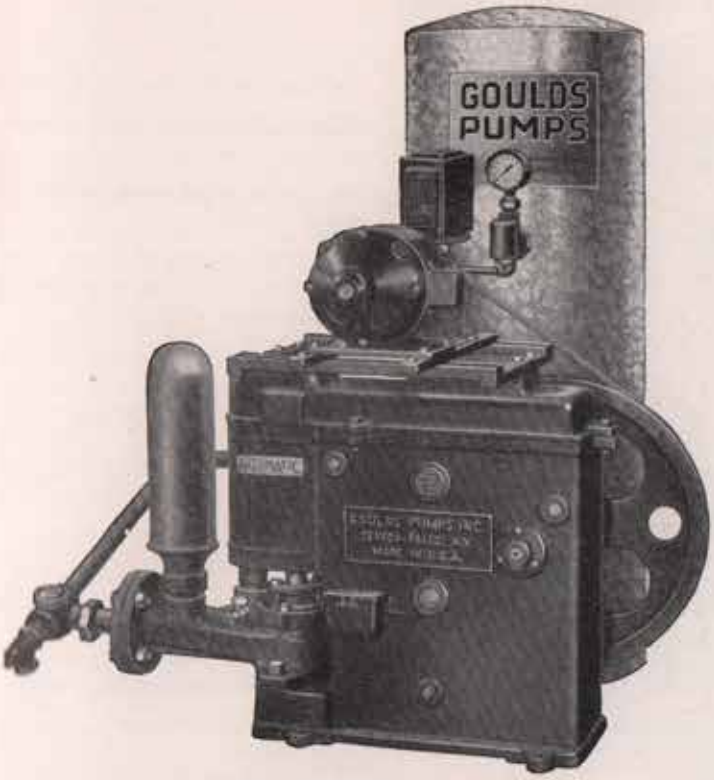
NO. 7828VAF—Same as No. 7828VA but with anti-freeze attachment.

Also furnished with 1½, 2 and 3 H. P. motors and without motor but including single-groove pulley and belt for 1 H. P. motors, double-groove pulley, two belts for 1½ and 2 H. P. motors, three-groove pulley, three belts for 3 H. P. motor.

4 AND 6-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL COMPLETE SYSTEMS

V-BELT DRIVE



Differential Plunger gives smooth, even flow of water.

Air Chamber acts as shock absorber for complete system.

Gear Mesh Oil Circulator (Patent Pending)—Bathes all bearings in a continuous flood of oil.

Automatic "Airite" control prevents waterlogged or air-bound tank.

For single or double-acting cylinders.

	4"Stk.	*6"Stk.*
Discharge Pipe Size	2 "	2 "
Suction Pipe Size	3½"	4 "
Plunger Rod Male Thread U. S. Std.	½"	⅝"

Pumps can be supplied with suction bushing and rod coupling as per standard sizes if specified. If not specified, pumps will be shipped as listed above.

Complete with Air Pump

4-INCH STROKE

Condensed Ratings at 50 R. P. M. for Single-Acting Cylinders Using Wood Well Rod

Diam. of Cylinder	Gals. per Min.	PRESSURE TANK Max. Depth (Ft.) to Water with 50 lbs. Tank Pressure				OPEN DISCHARGE Depth (Ft.) to Water plus Disch. Hd. above Surface			
		¼ HP Motor	½ HP Motor	¾ HP Motor	1 HP Motor	¼ HP Motor	½ HP Motor	¾ HP Motor	1 HP Motor
1¼"	2.1	40	90	190	230	150	200	300	345
2¼"	3.45	—	—	70	170	95	130	190	290
2¾"	5.2	—	—	—	75	60	85	130	195
3¼"	7.3	—	—	—	25	—	60	90	140

4-Inch Stroke Complete Systems

NO. 7824VAT—Goulds Fig. 1782 4-Inch Stroke Automatic Oiling, deep well complete system with adjustable top motor mounting, V-belt drive, 42-gallon galvanized tank, "Airite" automatic air control, pressure switch, pressure gauge, two-way check valve, relief valve and galvanized piping connecting pump and tank, air pump, large air chamber, ⅛ H. P. 110-220 volts, 60 cycle, single phase, A. C. or 110 or 220 volts, D. C. motor, as illustrated.

NO. 7824 VATF—Same as No. 7824VAT but with anti-freeze attachment.

Also furnished with ¼, ½ and ¾ H. P. motors and without motor but including single-groove pulley and belt.

6-INCH STROKE

Condensed Ratings at 45 R. P. M. for Single-Acting Cylinders Using Wood Well Rod

Diam. of Cylinder	Gals. per Min.	PRESSURE TANK Max. Depth (Ft.) to Water with 50 lbs. Tank Pressure				OPEN DISCHARGE Depth (Ft.) to Water plus Disch. Hd. above Surface			
		½ HP Motor	¾ HP Motor	1 HP Motor	1½ HP Motor	½ HP Motor	¾ HP Motor	1 HP Motor	1½ HP Motor
1¾"	2.8	115	230	230	—	230	345	345	—
2¼"	4.65	25	95	170	230	140	210	285	345
2¾"	6.95	—	30	75	170	95	145	190	285
3¼"	9.7	—	—	20	90	75	100	135	205
3¾"	13.0	—	—	—	40	—	75	100	155

6-Inch Stroke Complete Systems

NO. 7826VAT—Goulds Fig. 1782 6-Inch Stroke Automatic-Oiling deep well complete system with adjustable top motor mounting, V-belt drive, 42-gallon galvanized tank, "Airite" automatic air control, pressure switch, pressure gauge, two-way check valve, relief valve and galvanized piping connecting pump and tank, air pump, large air chamber, with ½ H. P. 110-220 volts, 60 cycle, single phase, repulsion-induction, A. C. or 110 or 220 volts, D. C. motor.

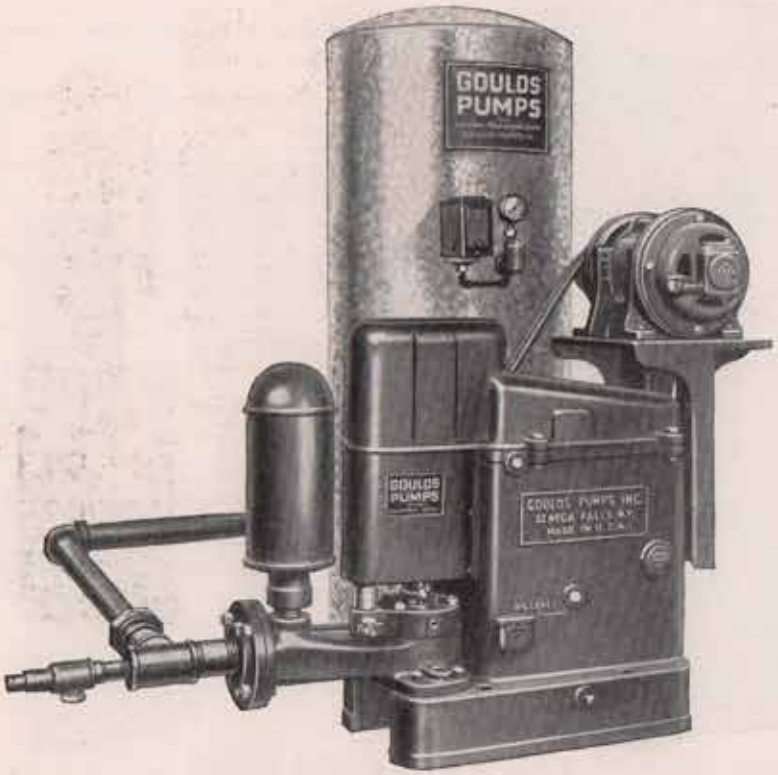
NO. 7826VATF—Same as No. 7826VAT but with anti-freeze attachment.

Also furnished with ¾, 1 and 1½ H. P. motors and without motor but including single-groove pulley and belt for ½ and ¾ H. P. motors; double-groove pulleys and two-belts for 1 and 1½ H. P. motor.

8-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL COMPLETE SYSTEM

V-BELT DRIVE



For single or double-acting cylinders.

Differential Plunger gives smooth, even flow of water.

Air chamber acts as shock absorber for complete system.

Gear mesh oil circulator (Patent pending)—bathes all bearings in a continuous flood of oil.

Two-way check valve not shown.

Automatic "Airite" control prevents water-logged or air-bound tank.

Discharge pipe size 3 inches.

Suction pipe size 5 inches.

Plunger rod male thread U. S. Std. three-fourth inches.

Pumps can be supplied with suction bushing and rod coupling as per standard sizes, if specified. If not specified, pumps will be shipped as listed above.

Complete with air pump.

8-INCH STROKE

Condensed Ratings at 40 R. P. M. for Single-Acting Cylinders Using Wood Well Rod

Diam. of Cylinder	Gals. per Min.	PRESSURE TANK Max. Depth (Ft.) to Water with 50 lbs. Tank Pressure				OPEN DISCHARGE Depth (Ft.) to Water plus Disch. Hd. above Surface			
		1 HP Motor	1½ HP Motor	2 HP Motor	3 HP Motor	1 HP Motor	1½ HP Motor	2 HP Motor	3 HP Motor
1¼"	3.4	230	230	—	—	345	345	—	—
2¼"	5.5	120	230	230	230	240	345	345	345
2¾"	8.2	45	120	200	230	160	240	320	345
3¼"	11.5	—	55	115	220	115	170	230	340
3¾"	15.3	—	—	60	140	85	130	175	250
4¼"	24.5	—	—	—	45	—	80	105	160

Thorough dependence can be placed in the performing ability of the complete deep well systems. The adjustable overhead motor mounting with V-belt makes an excellent drive for smooth, quiet operation. These systems are compact and can be installed in a heated building; or with Goulds anti-freeze attachments, with underground discharge and buried tank can be used in an unheated shelter. All necessary equipment is supplied except cylinder and well rod. Trouble-free operation and long life are assured by the superior construction features described. A good outfit for dealer to handle. Occupies but little floor space.

8-Inch Stroke Complete Systems

NO. 7828VAT—Goulds Fig. 1782 8-inch Stroke Automatic Oiling deep well complete system with adjustable top motor mounting, V-belt drive, 42-gallon galvanized tank. "Airite" automatic air control, pressure switch, pressure gauge, two-way check valve, relief valve and galvanized piping connecting pump and tank, air pump, large air chamber, 1 H. P., 110-220 volts, 60 cycle, single phase, repulsion-induction A. C. or 110 or 220 volts D. C. motor.

NO. 7828VATF—Same as No. 7828VAT but with anti-freeze attachment.

Also furnished with 1½, 2 and 3 H. P. motors and without motor but with single-groove pulley and belt for 1 H. P. motor; double-groove pulley, two belts for 1½ and 2 H. P. motors; three-groove pulley, three belts for 2 H. P. motor.

4, 6 AND 8-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL PUMPING HEADS

With Tight and Loose Pulleys for Engine or Line-Shaft Drive
For Open or Pressure Tank Service

Air chamber acts as shock absorber for complete system.

Large single reduction gearing.

Gear mesh oil circulator (Patent Pending)—Bathes all bearings in a continuous flood of oil.

Gear Ratio 7 to 1.

For single or double-acting cylinders.

Differential plunger gives smooth, even flow of water.

Illustrated with air pump for pressure tank service.

Fitted with tight and loose pulleys, these heads are particularly suited for engine or line-shaft drive for supplying water from deep wells to farms, market gardens, estates, large residences, mills, factories, filling stations, etc. It is for use with storage tanks of any desired size, whether of the open or pressure type. For pressure tank service, an air compressor is furnished as illustrated. This automatically pumps air into the tank at every stroke. An air valve permits by-passing of the air when sufficient air has been pumped into tank.

For building your own water system and adapting it to present available power from whatever source of supply, this makes an excellent pumping unit.

SPECIFICATIONS

	4" Stroke	*6" Stroke*	*8" Stroke*
Discharge Pipe Sizes	2"	2"	3"
Suction Pipe Sizes	3½"	4"	5"
Plunger Rod Male Thread U. S. Std.	½"	⅝"	¾"
Strokes per Minute	50	45	40
T. & L. Pulley Dimensions	10"x2½"	12"x2½"	12"x3½"

EQUIPMENT

4-Inch Stroke Pumping Units

NO. 7824—Goulds Fig. 1782 4-inch stroke automatic-oiling deep well pumping head, *for open tank service,* equipped with tight and loose pulleys and large air chamber.

NO. 7824A—Same as No. 7824 above, but with air pump included, *for pressure tank service.*

NO. 7824F—Same as No. 7824, but with anti-freeze attachment.

NO. 7824AF—Same as No. 7824A but with anti-freeze attachment.

6-Inch Stroke Pumping Units

NO. 7826—Goulds Fig. 1782 6-Inch Stroke Automatic-Oiling deep well pumping head, *for open tank service,* equipped with tight and loose pulleys and large air chamber.

NO. 7826A—Same as No. 7826 above, but with air pump included, *for pressure tank service.*

NO. 7826F—Same as No. 7826, but with anti-freeze attachment.

NO. 7826AF—Same as No. 7826A, but with anti-freeze attachment.

8-Inch Stroke Pumping Units

NO. 7828—Goulds Fig. 1782 8-Inch Stroke Automatic-Oiling deep well pumping head, *for open tank service,* equipped with tight and loose pulleys and large air chamber.

NO. 7828A—Same as No. 7828 above, but with air pump included, *for pressure tank service,* as illustrated.

NO. 7828F—Same as No. 7828, but with anti-freeze attachment.

NO. 7828AF—Same as No. 7828A, but with anti-freeze attachment.

4-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL PUMPS

COMPLETE TABLE OF RATINGS

Where total head will exceed 150 lbs. per sq. in. (364 ft.) or cylinder is to be placed at depth greater than 250 ft. inquiries should be referred to our Engineering Department for recommendations.

Pressure switches are set 23-43 pounds when shipped but can be adjusted for higher or lower pressures depending upon requirements. The above ratings with tanks are based on 50 pounds tank pressure which should not be exceeded.

The Fig. 1782 4" can be used with double-acting cylinder. Refer to us for ratings and recommendations.

Youngstown Air-tite steel pump rod can be substituted for solid steel rod or wood rod with single-acting cylinders in tables.

Single-Acting Cylinders—50 Strokes Per Minute

				STEEL WELL ROD RATINGS									WOOD WELL ROD RATINGS		
				Head in Feet above Surface of Ground for Various Cylinder Depths *Open Discharge*							Cylinder Depth Plus Tank Elev. above Surface (Feet)		Cylinder Depth Plus Tank Elev. above Surface (Feet)		
Displ. Gals. per Min.	Inside Diam. of Cyl.	Drop Pipe Ins.	Elec. Motor H.P.	40 Feet in Well	60 Feet in Well	80 Feet in Well	100 Feet in Well	125 Feet in Well	150 Feet in Well	200 Feet in Well	50 Lbs. Tank Pressure	Steel Well Rod Ins.	Open Disch.	50 Lbs. Tank Pressure	Wood Well Rod Ins.
2.1	1¾"	2	¾	95	70	40	10	—	—	—	30	⅞	150	40	1⅛
			⅓	150	120	90	60	25	—	—	60	⅞	200	90	
			½	250	215	185	150	110	70	—	120	⅞	300	190	
			⅔	305	285	265	245	220	170	70	175	⅞	345	230	
3.45	2¼"	2½	¾	45	20	—	—	—	—	—	—	⅞	95	—	1⅛
			½	75	50	24	—	—	—	—	—	⅞	130	—	
			⅔	140	110	80	55	20	—	—	55	⅞	190	70	
			¾	225	180	160	130	90	50	—	100	⅞	290	170	
5.15	2¾"	3	¾	15	—	—	—	—	—	—	—	1⅛	60	—	1⅜
			½	40	15	—	—	—	—	—	—	1⅛	85	—	
			½	80	55	30	5	—	—	—	—	1⅛	130	—	
			⅔	140	110	80	55	20	—	—	55	1⅛	195	75	
7.2	3¼"	3½	½	15	—	—	—	—	—	—	—	1⅛	60	—	1⅝
			⅔	45	20	—	—	—	—	—	—	1⅛	90	—	
			¾	85	60	35	—	—	—	—	20	1⅛	140	25	

In selecting equipment for any given well conditions use the column for the next greater cylinder depth. For example: If the cylinder is to be placed 90 ft. below the surface, use ratings in column "100 Feet in Well."

Pounds per Square Inch × 2.31 = Feet Head (Elevation). Feet Head × .433 = Pounds per Sq. In.

STANDARD SUCTION BUSHINGS

Heads will be shipped with suction connection fitted with any one of the following bushings, if specified; otherwise, they will be supplied unbushed as shown on catalog pages.

4" Stroke	*6" Stroke*	*8" Stroke*
3½"x3 "	4"x3½"	5"x4 "
3½"x2½"	4"x3 "	5"x3½"
3½"x2 "	4"x2½"	5"x3 "
	4"x2 "	5"x2½"
		5"x2 "

STANDARD PLUNGER ROD COUPLINGS

Heads will be shipped with plunger rod fitted for any one of the following rod connections, if specified; otherwise, they will be supplied without coupling, threaded as shown on catalog pages.

For Steel Rod Sizes Female U. S. Std. Thread	For Wood Rod Sizes Male Pin Thread	For Pipe Rod Sizes Female Pipe Thread
7/16"	5/8"	1 "
½"	⅞"	¾"
5/8"	1⅛"	1¼"
¾"	1½"	1½"

6-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL PUMPS

COMPLETE TABLE OF RATINGS

Fig. 1782 6" Stroke pump is designed for a total plunger load of 950 lbs. It is suitable for many ratings higher than shown in the following tables. For example: With 3¼" cylinder, 1½ H. P. motor and wood well rod, the maximum total head for Open Discharge (Cylinder Depth Plus Tank Elevation above surface) listed in the table is 345 feet. However, a rating of 425 feet can be used, if proper recommendations are made.

With 50 lbs. tank pressure, 1¾" cylinder, and 1 H. P. motor, using wood well rod, the table shows maximum cylinder depth of 230 feet. With proper recommendations, a maximum depth of 345 feet can be used. It is possible to use this head for cylinder depths down to 690 ft., but ratings higher than shown in the table require heavy pipe, special cylinders and fittings and should not be used without proper recommendations. The tables are prepared to meet most conditions where standard pipe and fittings can be used. For ratings beyond these tables, we will gladly make definite recommendations.

Single-Acting Cylinders—45 Strokes Per Minute

Displ. Gals. per Min.	Inside Diam. of Cyl.	Drop Pipe Ins.	Elec. Motor H.P.	STEEL WELL ROD RATINGS: Head in Feet above Surface of Ground for Various Cylinder Depths, *Open Discharge*: 40 Feet in Well	60 Feet in Well	80 Feet in Well	100 Feet in Well	125 Feet in Well	150 Feet in Well	200 Feet in Well	Cylinder Depth Plus Tank Elev. above Surface (Feet): 50 Lbs. Tank Pressure	Steel Well Rod Ins.	WOOD WELL ROD RATINGS: Cylinder Depth Plus Tank Elev. above Surface (Feet): Open Disch.	50 Lbs. Tank Pressure	Wood Well Rod Ins.
2.86	1¾"	2	½	170	140	110	80	45	5	—	75	⅞	230	115	1⅛
			¾	280	245	215	180	140	100	20	140	1⅛	345	230	
			1	305	285	265	245	210	160	60	170	1⅛	345	230	
4.63	2¼"	2½	½	90	60	35	5	—	—	—	20	⅞	140	25	1¼
			¾	155	125	100	70	35	5	—	70	1⅛	210	95	
			1	220	190	155	125	85	45	—	105	1⅛	285	170	
			1½	305	285	265	235	185	140	45	165	1⅛	345	230	
5.90	2¾"	3	½	45	25	—	—	—	—	—	—	⅞	95	—	1¼
			¾	95	70	45	—	—	—	—	25	1⅛	145	30	
			1	135	105	80	50	15	—	—	55	1⅛	190	75	
			1½	220	190	155	125	85	45	—	105	1⅛	285	170	
9.7	3¼"	3½	½	30	5	—	—	—	—	—	—	⅞	75	—	1¼
			¾	50	30	5	—	—	—	—	—	1⅛	100	—	
			1	85	55	30	5	—	—	—	15	1⅛	135	20	
			1½	150	120	95	65	30	—	—	65	1⅛	205	90	
12.9	3¼"	4	¾	30	5	—	—	—	—	—	—	1⅛	75	—	2¼
			1	50	25	5	—	—	—	—	—	1⅛	100	—	
			1½	105	75	50	25	—	—	—	30	1⅛	155	40	

Double-Acting Cylinders—45 Strokes Per Minute

Well Rod extra heavy pipe in 10-foot lengths and figure 4007 couplings

Displ. Gals. per Min.	Inside Diam. of Cyl.	Drop Pipe Ins.	Elec. Motor H. P.	Head in Feet above Surface of Ground for Various Cylinder Depths, *Open Discharge*: 40 Feet in Well	60 Feet in Well	80 Feet in Well	100 Feet in Well	125 Feet in Well	150 Feet in Well	200 Feet in Well	Cylinder Depth Plus Tank Elev. above Surface (Feet): 50 Lbs. Tank Pressure	Extra Heavy Pipe Rod
8.1	2¼"	2½	½	55	15	—	—	—	—	—	—	¾
			¾	125	85	45	5	—	—	—	45	
			1	190	150	110	70	20	—	—	75	
			1½	305*	285	245	205	155	105	5	140	
12.5	2¼"	3	½	20	—	—	—	—	—	—	—	¾
			¾	65	30	—	—	—	—	—	—	
			1	105	75	40	5	—	—	—	35	
			1½	195	160	125	95	50	10	—	85	
17.7	3¼"	3½	¾	25	—	—	—	—	—	—	—	1
			1	55	20	—	—	—	—	—	—	
			1½	115	85	50	15	—	—	—	40	
24.3	3¼"	4	1	20	—	—	—	—	—	—	—	1¼
			1½	65	30	—	—	—	—	—	—	

Where total head will exceed 150 lbs. per sq. in. (346 ft.) or cylinder is to be placed at depth greater than 250 ft. inquiries should be referred to our Engineering Department for recommendations.

8-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL PUMPS

COMPLETE TABLE OF RATINGS

Fig. 1782 8" Stroke pump is designed for a total plunger load of 1500 lbs. It is suitable for many ratings higher than shown in the following tables. For example: with 2¼" cylinder, 1½ H. P. motor and wood well rod, the maximum total head for Open Discharge (Cylinder Depth Plus Tank Elevation above surface) listed in the table is 345 feet. However, a rating of 560 feet can be used, with proper recommendations.

With 50 lbs. tank pressure, 2¼" cylinder and 3 H. P. motor, using wood well rod, the table shows maximum cylinder depth of 230 ft. With proper recommendations, a maximum depth of 600 feet can be used. It is possible to use this head for cylinder depths down to 1,000 ft., but these ratings require heavy pipe and special cylinders and fittings, and should not be used without proper recommendations. The tables are prepared to meet most conditions where standard pipe and fittings can be used. For ratings beyond these tables, we will gladly make definite recommendations.

Single-Acting Cylinders—40 Strokes Per Minute

Displ. Gals. per Min.	Inside Diam. of Cyl.	Drop Pipe Ins.	Elec. Motor H.P.	STEEL WELL ROD RATINGS: Head in Feet above Surface of Ground for Various Cylinder Depths, *Open Discharge*: 40 Feet in Well	60 Feet in Well	80 Feet in Well	100 Feet in Well	125 Feet in Well	150 Feet in Well	200 Feet in Well	Cylinder Depth Plus Tank Elev. above Surface (Feet): 50 Lbs. Tank Pressure	Steel Well Rod Ins.	WOOD WELL ROD RATINGS: Cylinder Depth Plus Tank Elev. above Surface (Feet): Open Disch.	50 Lbs. Tank Pressure	Wood Well Rod Ins.
3.4	1¾"	2	1	305	270	230	190	140	90	—	135	⅝	345	230	1⅛
			1½	305	285	265	245	220	195	145	230	⅝	345	230	
5.5	2¼"	2½	1	175	145	110	80	40	—	—	80	⅝	240	120	1⅛
			1½	290	265	230	200	160	120	40	150	⅝	345	230	
			2	305	285	265	245	220	195	100	190	⅝	345	230	
			3	305	285	265	245	220	195	145	230	⅝	345	230	
8.2	2¾"	3	1	105	75	50	20	—	—	—	35	⅝	160	45	1⅛
			1½	185	155	130	100	65	30	—	90	⅝	240	120	
			2	260	225	195	160	120	80	5	130	¾	320	200	
			3	305	285	265	245	220	195	145	230	⅝	345	230	
11.5	3¼"	3½	1	65	35	10	—	—	—	—	—	⅝	115	—	1⅛
			1½	120	95	70	40	10	—	—	45	¾	170	55	
			2	175	145	120	90	55	20	—	80	¾	230	115	
			3	285	260	230	205	170	135	65	165	¾	340	220	
15.3	3¾"	4	1	40	15	—	—	—	—	—	—	⅝	85	—	2¼
			1½	80	60	35	10	—	—	—	10	⅝	130	—	
			2	120	95	70	45	10	—	—	45	¾	175	60	
			3	205	180	150	125	95	60	—	110	⅝	250	140	
24.5	4¾"	5	1½	35	15	—	—	—	—	—	—	⅝	80	—	2¼
			2	60	35	10	—	—	—	—	—	¾	105	—	
			3	110	85	65	40	10	—	—	35	¾	160	45	

Double-Acting Cylinders—40 Strokes Per Minute

Well Rod Extra heavy pipe in 10-foot lengths and figure 4007 couplings.

Displ. Gals. per Min.	Inside Diam. of Cyl.	Drop Pipe Ins.	Elec. Motor H. P.	Head in Feet above Surface of Ground for Various Cylinder Depths, *Open Discharge*: 40 Feet in Well	60 Feet in Well	80 Feet in Well	100 Feet in Well	125 Feet in Well	150 Feet in Well	200 Feet in Well	Cylinder Depth Plus Tank Elev. above Surface (Feet): 50 Lbs. Tank Pressure	Extra Heavy Pipe Rod
9.8	2¼"	2½	1	150	110	70	30	—	—	—	55	⅝
			1½	265	225	185	145	95	45	—	115	
			2	—	—	—	—	205	155	55	170	
14.8	2¾"	3	1	80	45	15	—	—	—	—	20	⅝
			1½	155	120	85	50	10	—	—	65	
			2	225	195	160	125	85	40	—	105	
			3	—	—	—	—	—	190	100	195	
21.0	3¼"	3½	1	35	5	—	—	—	—	—	—	1
			1½	85	55	20	—	—	—	—	25	
			2	140	100	70	35	—	—	—	55	
			3	245	210	175	130	100	55	—	115	
28.8	3¾"	4	1	5	—	—	—	—	—	—	—	1¼
			1½	45	10	—	—	—	—	—	—	
			2	80	50	15	—	—	—	—	25	
			3	160	125	90	55	10	—	—	65	
46.0	4¾"	5	1½	5	—	—	—	—	—	—	—	1½
			2	30	—	—	—	—	—	—	—	
			3	45	15	—	—	—	—	—	20	

Where total head will exceed 150 lbs. per sq. in. (346 ft.) or cylinder is to be placed at depth greater than 250 ft. inquiries should be referred to our Engineering Department for recommendations.

Goulds Single and Double-Acting Deep Well Cylinders

Figure 1708
Single-Acting Cylinder

An inexpensive, well-built cylinder with body of seamless, drawn brass tubing. Upper and lower valves fitted with Formica fabric discs which insure longer life with fewer repairs. Plunger easily withdrawn for releathering without removing cylinder and connecting pipe. Upper cap, malleable iron; lower cap, galvanized iron. Lower valve not removable through connecting pipe.

Figure 904
All Brass, Ball Valve
Single-Acting Cylinder

Barrel of seamless, drawn brass tubing with cast bronze top and bottom attachments. Bronze ball plunger and suction valves can be withdrawn from well without disturbing connecting pipe. Plunger is fitted with pin conection as per table.

Figure 1800
All Brass, Spring Valve
Single-Acting Cylinder

An economical all-brass cylinder with spring-controlled valves, fitted with frictionless, water-proof leathers and tough, wear-resisting rubber. This type of valve works silently and smoothly with practically no vibration or trouble from water hammer and seat-cutting. A cylinder with a record for more water pumped at less power cost. Plunger and lower valve can be withdrawn without disturbing drop pipe.

Fig. 904

Fig. 1708

Fig. 4006

Figure 1801
Brass Lined, Spring Valve
Single-Acting Cylinder

Spring-controlled bronze poppet valves increase the efficiency of this cylinder 10 to 25 per cent. The barrel is double strength, wrought pipe lined with seamless brass tubing, swaged and tooled to prevent slipping. Pure gum rubber and water-proof, frictionless leathers used. Valves are easily withdrawn without disturbing cylinder.

Fig. 1801

Figure 4006
All Brass
Double-Acting Cylinder

Double-acting cylinders are used when more water is desired from small casings. Delivers approximately twice as much water as a single-acting cylinder with no material increase in power. Ball valves, cages, plunger and inside cylinder are all brass. Plunger may be withdrawn without disturbing column or discharge pipe.

CYLINDER RATINGS

Figure 1708

Inside Diam. Inches	Length Stroke, Inches	Length Cylinder, Inches	Top Connecting Pipe, Inches	Bottom Connecting Pipe, Inches	Can Be Used in Well Pipe, Diam. Inches	Wgt. Lbs.
1¾	6	10½	2	1	3	5
1¾	10	14½	2	1	3	6½
2¼	6	10½	2½	1	3½	7½
2¼	10	14½	2½	1	3½	9
2¾	6	10½	3	1¼	4	9
2¾	10	14½	3	1¼	4	10½

Plunger Tapped for ½ Inch U. S. Std. Well Rod.

Figure 904

Inside Diam. Inches	Length Stroke, Inches	Length Cyl., Inches	Connecting Pipe Top and Bottom, Inches	Can be Used in Well Pipe, Diam.	Plunger Thread, Male Pin Inches	Wgt. Lbs.
1¾	6	19	2	3"	⅝	10
1¾	10	22	2	3"	⅝	11
1¾	12	25	2	3"	⅝	12
2¼	6	20	2½	4"	⅝	13
2¼	10	23	2½	4"	⅝	14
2¼	12	26	2½	4"	⅝	15
2¾	6	21	3	4"	⅞	17
2¾	10	24	3	4"	⅞	19
2¾	12	27	3	4"	⅞	20
3¼	6	26	3½	5"	1¼	32
3¼	10	29	3½	5"	1¼	35
3¼	12	32	3½	5"	1¼	36
3¾	6	28	4	6"	1¼	48
3¾	10	31	4	6"	1¼	53
3¾	12	34	4	6"	1¼	57
4¾	6	31	5	8"	1½	126
4¾	10	34	5	8"	1½	125
4¾	12	37	5	8"	1½	126
5¾	6	35	6	8"	1½	160
5¾	10	38	6	8"	1½	170
5¾	12	41	6	8"	1½	175

We recommend extra strong galvanized pipe in 10 ft. lengths, using one less Fig. 4007 guide coupling than number of lengths of pipe rod.

For 4-inch stroke pumping units and complete systems use the 6-inch stroke cylinder; for 8-inch outfits use 10-inch stroke cylinder.

All cylinders are listed without rod coupling.

Figure 1800

Inside Diam. Inches	Length Stroke, Inches	Length Cyl., Inches	Connecting Pipe, Top and Bottom, Inches	Can be Used in Well Pipe, Diam.	Plunger Tapped for U. S. Std. Rod Inches	Wgt. Lbs.
1¾	6	14	2	3"	⅝	5½
1¾	10	18	2	3"	⅝	6
2¼	6	14	2½	3½"	⅝	8
2¼	10	18	2½	3½"	⅝	8¼
2¾	6	14	3	4"	⅝	11
2¾	10	18	3	4"	⅝	11¼

Figure 1801

Inside Diam. Inches	Length Stroke, Inches	Length Cyl., Inches	Connecting Pipe, Top and Bottom, Inches	Can be Used in Well Pipe, Diam.	Size Well Rod Plunger Tapped for, In.	Wgt. Lbs.
1¾	10	18	2	3"	¾ Rod	10
1¾	12	20	2	3"	¾ Rod	10½
2¼	10	20	2½	3½"	¾ Rod	15⅓
2¼	12	22	2½	3½"	¾ Rod	16⅓
2¾	10	21	3	5"	¾ Rod	25
2¾	12	23	3	5"	¾ Rod	26¼
3¼	10	22	3½	5"	⅞ Pin	30⅝
3¼	12	24	3½	5"	⅞ Pin	32¼
3¾	10	22	4	6"	⅞ Pin	38
3¾	12	24	4	6"	⅞ Pin	40
4¾	10	26	5	8"	1¼ Pin	81½
4¾	12	28	5	8"	1¼ Pin	85

Figure 4006

*This type cylinder requires Fig. 4007 Guide Coupling.

Inside Diam. Inches	Length Stroke, Inches	Length Cyl., Inches	Connecting Pipe, Top and Bottom, Inches	Can be Used in Well Pipe, Diam.	Plunger Tapped for Pipe Rod Inches	Wgt. Lbs.
2¼	8	32	2½	4"	¾	60
2¼	10	44	2½	4"	¾	65
2¾	8	43	3	5"	¾	90
2¾	10	45	3	5"	¾	94
3¼	8	44	3½	5"	1	128
3¼	10	46	3½	5"	1	130
3¾	8	44	4	6"	1¼	150
3¾	10	46	4	6"	1¼	155
4¾	10	52	5	8"	1½	258

8-INCH STROKE

GOULDS NEW AUTOMATIC-OILING DEEP WELL PUMPS

COMPLETE TABLE OF RATINGS

Fig. 1782 8" Stroke pump is designed for a total plunger load of 1500 lbs. It is suitable for many ratings higher than shown in the following tables. For example: with 2¼" cylinder, 1½ H. P. motor and wood well rod, the maximum total head for Open Discharge (Cylinder Depth Plus Tank Elevation above surface) listed in the table is 345 feet. However, a rating of 560 feet can be used, with proper recommendations.

With 50 lbs. tank pressure, 2¼" cylinder and 3 H. P. motor, using wood well rod, the table shows maximum cylinder depth of 230 ft. With proper recommendations, a maximum depth of 600 feet can be used. It is possible to use this head for cylinder depths down to 1,000 ft., but these ratings require heavy pipe and special cylinders and fittings, and should not be used without proper recommendations. The tables are prepared to meet most conditions where standard pipe and fittings can be used. For ratings beyond these tables, we will gladly make definite recommendations.

Single-Acting Cylinders—40 Strokes Per Minute

				STEEL WELL ROD RATINGS									WOOD WELL ROD RATINGS		
				Head in Feet above Surface of Ground for Various Cylinder Depths *Open Discharge*							Cylinder Depth Plus Tank Elev. above Surface (Feet)		Cylinder Depth Plus Tank Elev. above Surface (Feet)		
Displ. Gals. per Min.	Inside Diam. of Cyl.	Drop Pipe Ins.	Elec. Motor H.P.	40 Feet in Well	60 Feet in Well	80 Feet in Well	100 Feet in Well	125 Feet in Well	150 Feet in Well	200 Feet in Well	50 Lbs. Tank Pressure	Steel Well Rod Ins.	Open Disch.	50 Lbs. Tank Pressure	Wood Well Rod Ins.
3.4	1¾"	2	1	305	270	230	190	140	90	—	135	⅝	345	230	1½
			1½	305	285	265	245	220	195	145	230	⅝	345	230	
5.5	2¼"	2½	1	175	145	110	80	40	—	—	80	⅝	240	120	1⅝
			1½	290	265	230	200	160	120	40	150	⅝	345	230	
			2	305	285	265	245	220	195	100	190	⅝	345	230	
			3	305	285	265	245	220	195	145	230	⅝	345	230	
8.2	2¾"	3	1	105	75	50	20	—	—	—	35	⅝	160	45	1⅝
			1½	185	155	130	100	65	30	—	90	⅝	240	120	
			2	260	225	195	160	120	80	5	130	¾	320	200	
			3	305	285	265	245	220	195	145	230	⅝	345	230	
11.5	3¼"	3½	1	65	35	10	—	—	—	—	—	⅝	115	—	1¾
			1½	120	95	70	40	10	—	—	45	¾	170	55	
			2	175	145	120	90	55	20	—	80	⅝	230	115	
			3	285	260	230	205	170	135	65	165	¾	340	220	
15.3	3¾"	4	1	40	15	—	—	—	—	—	—	⅝	85	—	2¼
			1½	80	60	35	10	—	—	—	10	⅝	130	—	
			2	120	95	70	45	10	—	—	45	¾	175	60	
			3	205	180	150	125	95	60	—	110	⅝	250	140	
24.5	4¼"	5	1½	35	15	—	—	—	—	—	—	⅝	80	—	2¼
			2	60	35	10	—	—	—	—	—	¾	105	—	
			3	110	85	65	40	10	—	—	35	¾	160	45	

Double-Acting Cylinders—40 Strokes Per Minute

Well Rod Extra heavy pipe in 10-foot lengths and figure 4007 couplings.

Displ. Gals. per Min.	Inside Diam. of Cyl.	Drop Pipe Ins.	Elec. Motor H. P.	Head in Feet above Surface of Ground for Various Cylinder Depths *Open Discharge*							Cylinder Depth Plus Tank Elev. above Surface (Feet)	Extra Heavy Pipe Rod
				40 Feet in Well	60 Feet in Well	80 Feet in Well	100 Feet in Well	125 Feet in Well	150 Feet in Well	200 Feet in Well	50 Lbs. Tank Pressure	
9.6	2¼"	2½	1	150	110	70	30	—	—	—	55	¾
			1½	265	225	185	145	95	45	—	115	
			2	—	—	—	—	205	155	55	170	
14.8	2¾"	3	1	80	45	15	—	—	—	—	20	¾
			1½	155	120	85	50	10	—	—	65	
			2	225	195	160	125	85	40	—	105	
			3	—	—	—	—	—	190	100	195	
21.0	3¼"	3½	1	35	5	—	—	—	—	—	—	1
			1½	85	55	20	—	—	—	—	25	
			2	140	100	70	35	—	—	—	55	
			3	245	210	175	130	100	55	—	115	
28.8	3¾"	4	1	5	—	—	—	—	—	—	—	1¼
			1½	45	10	—	—	—	—	—	—	
			2	80	50	15	—	—	—	—	25	
			3	160	125	90	55	10	—	—	65	
40.0	4¼"	5	1½	5	—	—	—	—	—	—	—	1½
			2	30	—	—	—	—	—	—	—	
			3	45	15	—	—	—	—	—	20	

Where total head will exceed 150 lbs. per sq. in. (346 ft.) or cylinder is to be placed at depth greater than 250 ft. inquiries should be referred to our Engineering Department for recommendations.

Goulds Single and Double-Acting Deep Well Cylinders

Figure 1708
Single-Acting Cylinder

An inexpensive, well-built cylinder with body of seamless, drawn brass tubing. Upper and lower valves fitted with Formica fabric discs which insure longer life with fewer repairs. Plunger easily withdrawn for releathering without removing cylinder and connecting pipe. Upper cap, malleable iron; lower cap, galvanized iron. Lower valve not removable through connecting pipe.

Figure 904
All Brass, Ball Valve
Single-Acting Cylinder

Barrel of seamless, drawn brass tubing with cast bronze top and bottom attachments. Bronze ball plunger and suction valves can be withdrawn from well without disturbing connecting pipe. Plunger is fitted with pin conection as per table.

Figure 1800
All Brass, Spring Valve
Single-Acting Cylinder

An economical all-brass cylinder with spring-controlled valves, fitted with frictionless, water-proof leathers and tough, wear-resisting rubber. This type of valve works silently and smoothly with practically no vibration or trouble from water hammer and seat-cutting. A cylinder with a record for more water pumped at less power cost. Plunger and lower valve can be withdrawn without disturbing drop pipe.

Fig. 904

Fig. 1708

Fig. 4006

Figure 1801
Brass Lined, Spring Valve
Single-Acting Cylinder

Spring-controlled bronze poppet valves increase the efficiency of this cylinder 10 to 25 per cent. The barrel is double strength, wrought pipe lined with seamless brass tubing, swaged and tooled to prevent slipping. Pure gum rubber and water-proof, frictionless leathers used. Valves are easily withdrawn without disturbing cylinder.

Figure 4006
All Brass
Double-Acting Cylinder

Double-acting cylinders are used when more water is desired from small casings. Delivers approximately twice as much water as a single-acting cylinder with no material increase in power. Ball valves, cages, plunger and inside cylinder are all brass. Plunger may be withdrawn without disturbing column or discharge pipe.

Fig. 1801

CYLINDER RATINGS

Figure 1708

Inside Diam. Inches	Length Stroke, Inches	Length Cylinder, Inches	Top Connecting Pipe, Inches	Bottom Connecting Pipe, Inches	Can Be Used in Well Pipe, Diam. Inches	Wgt. Lbs.
1¼	6	10½	2	1	3	5
1¼	10	14½	2	1	3	6½
2¼	6	10½	2½	1	3½	7½
2¼	10	14½	2½	1	3½	9
2¾	6	10½	3	1¼	4	9
2¾	10	14½	3	1¼	4	10½

Plunger Tapped for ½ Inch U. S. Std. Well Rod.

Figure 904

Inside Diam. Inches	Length Stroke, Inches	Length Cyl., Inches	Connecting Pipe Top and Bottom, Inches	Can be Used in Well Pipe, Diam.	Plunger Thread, Male Pin Inches	Wgt. Lbs.
1¼	6	19	2	3"	¾	10
1¼	10	22	2	3"	¾	11
1¼	12	25	2	3"	¾	12
2¼	6	20	2½	4"	¾	13
2¼	10	23	2½	4"	¾	14
2¼	12	26	2½	4"	¾	15
2¾	6	21	3	4"	¾	17
2¾	10	24	3	4"	¾	19
2¾	12	27	3	4"	¾	20
3¼	6	26	3½	5"	1¼	32
3¼	10	29	3½	5"	1¼	35
3¼	12	32	3½	5"	1¼	36
3¼	6	28	4	6"	1¼	48
3¼	10	31	4	6"	1¼	52
3¼	12	34	4	6"	1¼	53
4¼	6	31	5	8"	1½	120
4¼	10	34	5	8"	1½	125
4¼	12	37	5	8"	1½	126
5¼	6	35	6	8"	1½	160
5¼	10	38	6	8"	1½	170
5¼	12	41	6	8"	1½	175

We recommend extra strong galvanized pipe in 10 ft. lengths, using one less Fig. 4007 guide coupling than number of lengths of pipe rod.

For 4-inch stroke pumping units and complete systems use the 6-inch stroke cylinder; for 8-inch outfits use 10-inch stroke cylinder.

All cylinders are listed without rod coupling.

Figure 1800

Inside Diam. Inches	Length Stroke, Inches	Length Cyl., Inches	Connecting Pipe, Top and Bottom, Inches	Can be Used in Well Pipe, Diam.	Plunger Tapped for U. S. Std. Rod Inches	Wgt. Lbs.
1¼	6	14	2	3"	⅝	5½
1¼	10	18	2	3"	⅝	6
2¼	6	14	2½	3½"	⅝	8
2¼	10	18	2½	3½"	⅝	8¼
2¾	6	14	3	4"	⅝	11
2¾	10	18	3	4"	⅝	11¾

Figure 1801

Inside Diam. Inches	Length Stroke, Inches	Length Cyl., Inches	Connecting Pipe, Top and Bottom, Inches	Can be Used in Well Pipe, Diam.	Size Well Rod Plunger Tapped for, In.	Wgt. Lbs.
1¼	10	18	2	3"	¾ Rod	10
1¼	12	20	2	3"	¾ Rod	10½
2¼	10	20	2½	3½"	¾ Rod	15½
2¼	12	22	2½	3½"	¾ Rod	16¾
2¾	10	21	3	4"	¾ Rod	25
2¾	12	23	3	5"	¾ Rod	26¾
3¼	10	22	3½	5"	¾ Pin	30¾
3¼	12	24	3½	5"	¾ Pin	32¾
3¾	10	22	4	6"	¾ Pin	38
3¾	12	24	4	6"	¾ Pin	40
4¾	10	26	5	8"	1¼ Pin	81½
4¾	12	28	5	8"	1¼ Pin	85

Figure 4006

*This type cylinder requires Fig. 4007 Guide Coupling.

Inside Diam. Inches	Length Stroke, Inches	Length Cyl., Inches	Connecting Pipe, Top and Bottom, Inches	Can be Used in Well Pipe, Diam.	Plunger Tapped for Pipe Rod Inches	Wgt. Lbs.
2¼	8	32	2½	4"	¾	60
2¼	10	44	2½	4"	¾	65
2¾	8	43	3	5"	¾	90
2¾	10	45	3	5"	¾	94
3¼	8	44	3½	5"	1	128
3¼	10	46	3½	5"	1	130
3¾	8	44	4	6"	1¼	150
3¾	10	46	4	6"	1¼	155
4¾	10	52	5	8"	1½	258

Accessories for Goulds Water Systems

Pressure Switch

Automatic Pressure Switches

Two-pole switch for automatically maintaining desired pressure in pneumatic tanks. Two settings available Tapped ¼" pipe.

No. 430—Setting 23-43 pounds.

No. 750—Setting 55-75 pounds. Can be adjusted up to 100 lbs. or down to 50, maintaining 20 lbs. differential.

Pressure switch No. 750 is only supplied separately and will not be substituted on any systems or units in this catalogue. It is listed as a convenience for those who are building their own systems to meet special conditions.

Float Switch

Automatic Float Switch

Two-pole switch for automatically maintaining desired level in open tanks. Two types—one arranged to open motor circuit and the other to short-circuit engine ignition, at high water level. Specify which type. Complete with float, 5 ft. rod and stops.

Gasoline Engine Cut-off Switch

For short-circuiting engine ignition and stopping engine when desired tank pressure is reached. Use only low tension lead of magneto ignition engines. Set to stop engine at 43 pounds tank pressure.

Pressure and Float Switches

Maximum Motor H.P. with Underwriters' Approval.

Volts	*D. C.*	1 *Phase*	2 *or* 3 *Phase*
110	½	1½	3
220	½	3	5
550	—	2	2

Suitable magnetic starter or contractor must be used whenever the motor size or rating is such that the pressure switch is not adequate for across the line starting. These switches may then be used as pilot switches. Consult your local electrician or power company.

We always recommend suitable motor protective devices such as Sentinel Breaker or protective cut-out.

Relief Valve

Relief Valves

Spring controlled valve used to safeguard the pump against damage caused by excessive pressure. Every pump must have a relief valve installed in discharge line close to the pump. Factory set to open at 75 lbs. Specify pump capacity and working pressure.

Pressure Gauge

Pressure Gauge

High quality 100 lb. pressure gauge for pneumatic tank service. Threaded ¼ inch male pipe.

"Airite" Control

"Airite" Control

A simple device to be screwed into tank tapping to automatically maintain the desired volume of air in the tank. The pump air attachment is set to pump a small amount of air all the time. The excess is released through the Airite control without manual attention. Eliminates watching air supply and prevents water-logged or air-bound tanks. Threaded ½ inch male pipe with ¼" pipe tap on top for pressure gauge and ¼" pipe tap in bottom for pressure switch connection.

Sentinel Breaker

Sentinel Breaker

The installation of a sentinel breaker is the best insurance against burned out motors, due to low voltage and other causes which fuses do not take care of in time to save the motor. Furnished for ¼, 1/3, ½ and ¾ H. P. motors. When ordering specify H. P. of motor and current characteristics.

Fig. 1791 Check Valve

760

1644. 659

Foot Valves and Strainers

Rod Couplings

Fig. 4007 Guide Coupling

Pin Connection

Fig. 1791 Discharge Check Valve

Two-way check valve designed especially for use with Goulds Automatic-Oiling deep well heads. This valve connects to pump discharge, one side outlet to discharge line, other side outlet for relief valve. Pump valve design with screwed brass seat, brass stem and spring and rubber valve disc. Regularly supplied with complete systems. Two sizes.

Pump Connection	*Side Outlets*	*Used On*
1¼"	1¼"	4" and 6"
2 "	2 "	8"

Fresh Water Valves

Fresh water valves can be furnished in ¾" and 1¼" sizes.

Fig. 760 Foot Valve with Bolted Strainer

Size Inches	*Approx. Wgt. Lbs.*	*Overall Diam. Ins.*	*Overall Lgth. Ins.*
1¼	2¼	4⅞	4⅛
1½	3½	5⅝	4⅞
2	6½	6½	5¼
2½	11	8½	8⅝
3	12	8½	8⅝
4	26	10⅝	9¾

Fig. 1644 Foot Valve and Strainer

Size Inches	*Outside Diam. Inches*	*Will go in Pipe Inches*	*Go in Well Casing*	*Approx. Wgt. Lbs.*
1¼	2-7/16	2½	2½	3
1½	2⅝	3	2¾	4
2	3	3	3¼	4
2½	3⅞	4	4	7
3	4⅝	5	4¾	11
4	5½	6	6¼	17

Fig. 659 Strainer with Female Pipe Thread

Size Inches	*Approx. Wgt. Ins.*	*Overall Diam. Ins.*	*Overall Lgth. Ins.*
1	⅞	1-13/16	5-13/16
1¼	1	2⅛	6 - 3/16
1½	1	2⅜	6 - 3/16
2	2	2⅞	7⅛

Steel Well Rod

Galvanized without couplings and not threaded.

Sizes—¾", 7/16", ½", ⅝", and ¾".

Sold by the foot in separate lengths of 20 feet each, or in bundle lots of 14 (20 ft. lengths) to the bundle.

Wood Well Rod and Couplings

Sizes—1⅛", 1⅝", 2" and 2¼"

Sold complete with couplings in lengths up to and including 18 feet

Rod Couplings

Both Female Threads U. S. Std.

Straight Couplings—

⅜", 7/16", ½", ⅝" and ¾"

Reducer Couplings

½"x⅜" ⅝"x½" ¾"x½"
½"x7/16" ⅝"x7/16 ¾"x⅝"
¾"x7/16"

Both Female Threads

One End—Pin Thd., One End—U. S. Std.

Pin Thred U. S. Std.		*Pin Thred U. S. Std.*	
⅜"	½"	½" to	⅝"
⅜" to	¾"	⅞" to	¾"
¾" to	⅞"	1⅛" to	¾"
⅞" to	½"		

Extra Strong Galvanized Pipe Rod

Used with Fig. 4006 Double-Acting Cylinder, in sizes—¾", 1", 1¼", and 1½".

Lengths approximately 10 feet threaded.

Fig. 4007 Guide Coupling

Used with Fig. 4006 Double-Acting Cylinder. Inside Cylinder Diameters—2¼", 2¾", 3¼", 3-3/4", and 4-3/4.

Pin Connections

Both Male Threads

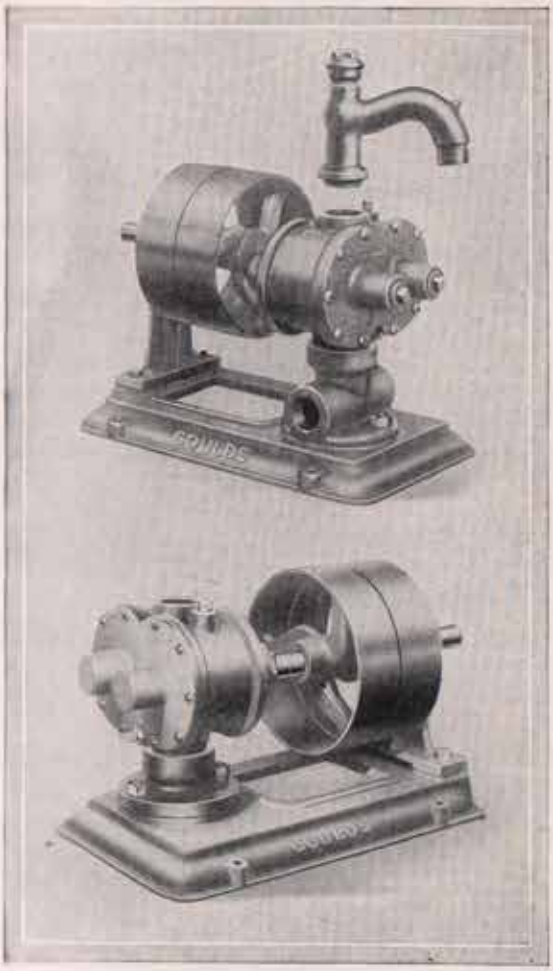
Two Thread Combinations

⅞" Pin to 7/8" Pin

1⅛" Pin to 1-1/8" Pin

GOULDS POWER ROTARY PUMPS

Discharge Head—100 Feet



Above: Fig. 1699
Below: Fig. 1281

Fig. 1281. This pump is fitted with tight and loose pulleys, which makes it particularly adaptable for line shaft drive.

Fig. 1185½. Same as Fig. 1281 but fitted with the spout piece illustrated. Top of the spout is threaded for iron pipe and capped. If discharge to overhead tank or upper floor is desired, remove this cap, connect up discharge piping and use the cap to blank off the spout discharge.

Figs. 1698 and 1699. These are the same as Figs. 1281 and 1185½, respectively, except that the suction can be taken from either of two sides or bottom. Furnished in iron construction only. Built only in No. 1 and No. 3 sizes.

Capacities and Speeds. Capacities given are at 100 r.p.m. for maximum heads of 100 feet. While we recommend speeds of 200 r. p. m., these pumps will give satisfactory service at speeds up to 300 r.p.m., but longer life can be expected when operated at low speeds, against low heads.

Case. Accurately machined to within limits of 1/1000 of an inch.

Cams. Accurately machined and bored to give perfect alignment of the cam shafts.

Gland. Screw type, easily accessible.

Priming and Drain Plugs. Conveniently located on each pump.

Valves. Iron pumps have leather valves. All bronze and bronze case and cams pumps have bronze valves.

Packings. All surface and gland packings are of special material to withstand the action of such oils as *kerosene, gasoline, fuel oil and distillate.*

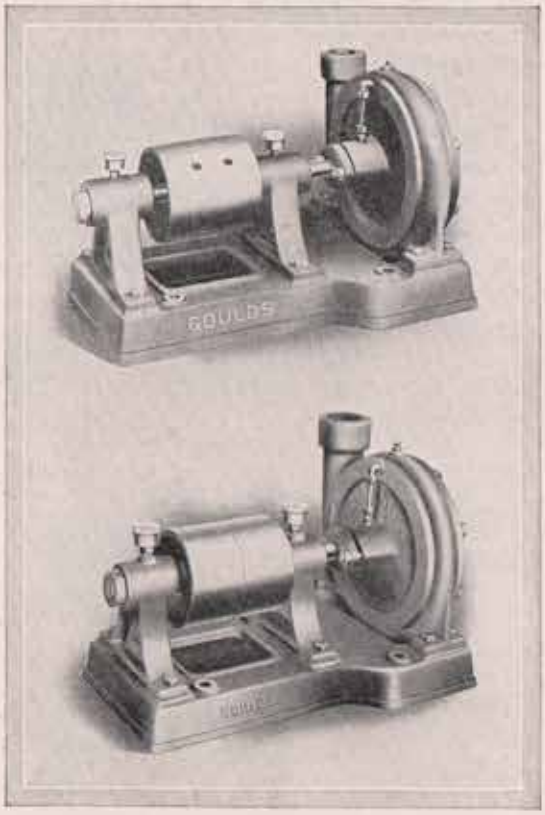
Three Constructions. Iron, Bronze Case and Cams, and All Bronze. Bronze pumps have all parts coming in contact with the liquid of Bronze.

Fig. 1281

No.	Gals. per Min. 100 Revs.	Suction Pipe Ins.	Discharge Pipe Ins.	Tight and Loose Pulleys Ins.	Discharge Head Ft.	Approx. Wgt. in Lbs.
1	10	1½	1¼	8 x 2½	100	66
2	12½	1½	1¼	8 x 2½	100	73
3	14	1½	1½	8 x 2½	100	78
4	25	2	2	12 x 3½	100	137
5	27½	2	2	12 x 3½	100	146
6	32½	2½	2½	24 x 4	100	300

Fig. 1185½

			Hose			
1	10	1½	1	8 x 2½	100	70
2	12½	1½	1	8 x 2½	100	75
3	14	1½	1¼	8 x 2½	100	84
4	25	2	1½	12 x 3½	100	145
5	27½	2	2	12 x 3½	100	154
6	32½	2½	2½	24 x 4	100	329



Above: Fig. 3010
Below: Fig. 3005

GOULDS CENTRIFUGAL PUMPS

For Belt Drive—Also Direct Drive

Capacities 900 to 63000 gallons per hour

For Heads up to 100 Feet

Because of its wide application this makes a profitable and quick moving pump for Mill Supply Houses and Machinery Jobbers to carry in stock at all times.

Suitable for a great many uses in mills, mines, on road and construction work, for booster service, irrigation, sewage pumping, handling gasoline, etc.

While low in price this pump must not be confused with the ordinary trade pump with which the market is flooded. Quantity production makes possible the moderate prices at which these high quality pumps are sold.

We invite a comparison point by point with any other pump of its price, class and size.

Fig. 3010. With single pulley.

Fig. 3005. With tight and loose pulleys.

Casing. Of close grained cast iron, designed to give highest efficiency.

Shaft. Open hearth high carbon steel, ample size.

Electric Direct Drive not shown but can be furnished in all sizes.

End Thrust is prevented by means of thrust collars which are securely fastened to the shaft and which bear against babbitted surfaces of the bearing.

Bearings. Babbitted. 1 and 1½ sizes have one pedestal bearing; larger sizes have two. 1 to 4 inch sizes inclusive have grease cup lubrication. 5, 6 and 8 inch sizes have ring oiled bearings.

Foot Valve. We recommend the use of our foot valves with these pumps.

Special Construction. Can be fitted for handling gasoline at slight additional charge. Prices on application.

Figs. 3005 and 3010 Centrifugal Pumps

Pump Size Inches	*Pump Nozzles*		*Normal Cap. in Gals. per Min.*	*Diam. and Face Pulley in Ins. Figs. 3005-3010*	*Domestic Ship'g. Weight Lbs. Fig. 3005*	*Domestic Ship'g. Weight Lbs. Fig. 3010*
	Dis. Ins.	*Suc. Ins.*				
*1	1	1	20	3x 2½	45	30
*1½	1½	1¼	30	4x 3	50	35
*2	2	2	70	5x 5	120	100
3S	3	3	120	6x 6	250	200
3L	3	3	200	6x 7	300	265
4	4	4	270	7x 7	450	375
5	5	5	470	10x10	700	650
6	6	6	750	12x12	975	850
8	8	8	1050	14x14		1200

*Fitted with screwed connections. Other sizes furnished with Companion Flanges.

GOULDS NEW MINUTE MAN CELLAR DRAINER

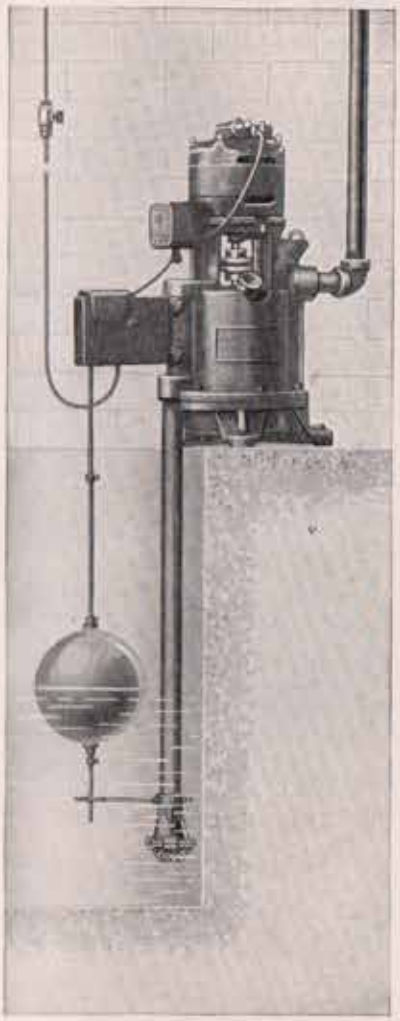


Fig. 1776

Here it is, ready for action against its allied foes, seepage and flood water. Like the Minute Man of history it stands on guard, prepared for instant, dependable service.

A leader in the field of low-priced high-grade cellar drainers.

Attractively finished in bronze and black.

Can be used for pits from 1½ to 5 ft. deep.

Pump is self-priming centrifugal with bronze impeller and stainless steel shaft.

Shaft is fully enclosed and packed in grease, requiring little or no attention.

Complete outfit includes ¼ H. P. motor; 8 ft. lamp cord with plug; sentinel breaker for motor protection; foot valve; 3 ft. suction pipe, which can be cut off for pits of less depth; float switch.

Float switch is of the double pole type with all parts enclosed.

Float is of copper with brass rod.

Capacity 5 to 25 G.P.M. against heads up to 23 feet.

Discharge, 1 Inch.
Shipping Weight, 107 Lbs.
Minimum Pit Diameter, 12 Inches.
With ¼ H. P. 110 Volt, 60 Cycle A. C. Motor.

Ratings

¼ H.P. 1750 R.P.M. Motor		¼ H.P. 1450 R.P.M. Motor	
5 G.P.M.	23 Ft.	5 G.P.M.	15 Ft.
10 G.P.M.	22 Ft.	10 G.P.M.	14 Ft.
15 G.P.M.	20 Ft.	15 G.P.M.	12 Ft.
20 G.P.M.	18 Ft.	20 G.P.M.	10 Ft.
25 G.P.M.	15 Ft.		

GOULDS CENTRIFUGAL PUMP

With Direct Connected Motor

Fig. 3028

Fig. 3028. A small, compact Centrifugal Pump with ½ inch suction and discharge. Built to meet the demand for a very small capacity pump for many different circulating services, such as handling water, brine, alcohol, etc.

The unit consists of Pump, one-sixth H. P., 110 volt, 60 cycle, 1750 R.P.M. motor, and flexible coupling, mounted on cast iron base, as illustrated.

Furnished either with or without motor as desired.

The Pump has an iron case, with bronze impeller and shaft.

Larger Direct Drive Pumps can be furnished in all sizes.

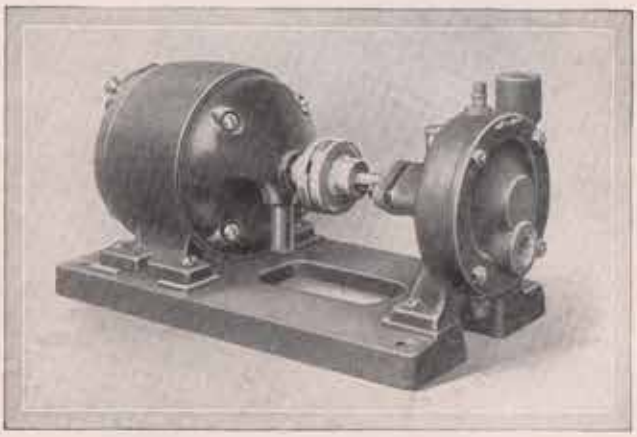


Fig. 3028

Pipe sizes suction and discharge, ½ Inch.
Motor required, ⅙ H. P.
Capacity Range, 4 to 10 G.P.M.
Head Range 3 to 10 Feet.
Shipping Weight, 45 Lbs.

Ratings—Fig. 3028—Based on Pumping Clear Cold Water

Motor—⅙ H.P.; 1750 R.P.M.				
Total Head in Feet	3	8	9	10
Capacity, G.P.M.	10	6	4	2

GOULDS "IMPROVED" HYDRAULIC RAMS

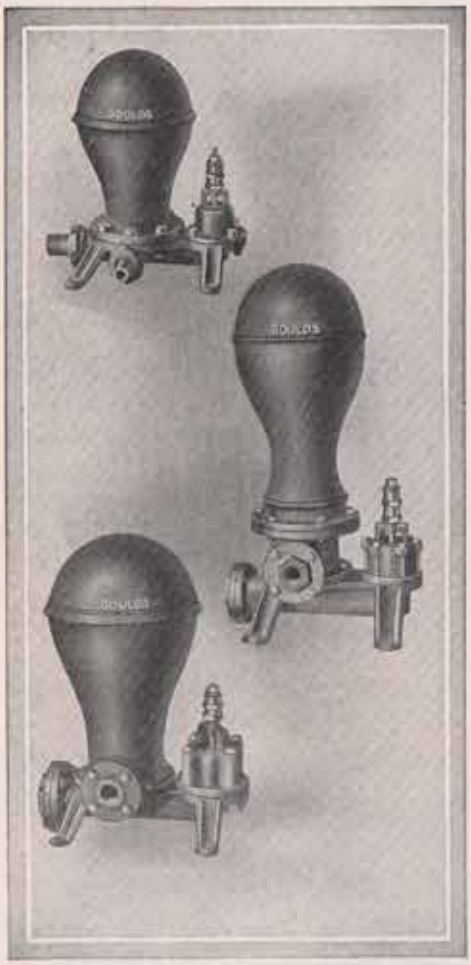


Fig. 1701
Fig. 1702

Fig. 1703

The hydraulic ram is a self-acting pump which utilizes the momentum of a slight fall of water to force a part of the water to an elevation many times as high as the fall used to operate the ram. The simplicity, effectiveness and durability of this machine make it one of the most useful as well as the most economical of the equipments available for forcing water to distant and elevated points.

The valves in all of these rams are of the rubber disc type on bronze grid seats, with spring, plate and stem of solid bronze. This valve is identical with that used on our large power pumps and is a decided improvement over any type of hinged or leather valve. Its use insures high efficiency, long life, and ease of repair.

In all Goulds rams, the impetus valve and case, the inlet and discharge tubes and snifting valve are of bronze.

Figures 1701, 1702 and 1703

Fig. No.	*Size No.*	*Supply per Minute to Operate Ram, Gals.*	*Pipes*		*Approximate Weight in Lbs.*
			**Drive Inches*	**Discharge Inches*	
	3	2 to 4	1	½	35
1701	4	3 to 7	1¼	¾	53
1702	5	6 to 12	2	1	94
1703	6	11 to 20	2½	1¼	165

*Figure 1701 fitted for either iron or lead pipe.

GOULDS PITCHER SPOUT PUMP

Fig. 205½
Insert: Fig. 205½ No. 2 mounted on Fig. 1647 Bracket

Fig. 205½. This is a lower priced cistern and shallow well pump than the closed mouth design, but is substantial and well built in every way. Special machines are used in polishing the cylinder to insure a smooth surface for the plunger leather.

Although this is the simplest and lowest priced pump which we build, the same careful attention is given to its manufacture as with our larger and more expensive types.

Cylinder—Iron.

Revolving Bearer Top—Enables the user to operate the lever from the most convenient position. The top is secured to the cylinder by a set screw.

Cut-Off Base—Note the cut-off base which allows a basin or other receptacle to be placed directly under the spout. Base is fitted with nut tapped for iron pipe.

Spout—Designed to eliminate slopping. Lip prevents water from dripping down the pump.

Suction Lift—25 feet. Horizontally the suction pipe may extend a short distance.

Anti-Freeze Feature—This pump can be drained by lifting the lever as high as it will go. This trips the suction valve, permitting the water to flow out of the cylinder.

Bracket for Pitcher Spout Pumps

Fig. 1647. This bracket makes an excellent shelf for supporting our No. 2 Pitcher Spout Pump or any Pitcher Pump with a base diameter of 7¼ to 8 inches. A piece of leather or rubber placed beneath the bracket where it grips the rim of the sink will prevent any damage to the sink, and at the same time insure quiet operation. The bracket is clamped to the sink by means of two set screws. Two other set screws allow the bracket to be adjusted to the proper angle at the time the pump is connected up.

Eliminates Moisture. Where this support is used, there will be no dampness nor moisture, as is often the case where wooden shelves are used.

Figure 205½

No.	*Diameter Cylinder Inches*	*Stroke, Inches*	*Capacity Per Stroke, Gals.*	*Suction Pipe Inches*	*Approx. Weight in Lbs.*
2	3	4	.12	1¼	24
3	3½	4	.17	1¼	26
4	4	4	.22	1½	30
5	4½	5	.34	2	42

Figure 1647

Pump Bracket for No. 2 Pitcher Spout Pumps

GOULDS "THRESHER" DOUBLE-ACTING FORCE PUMP

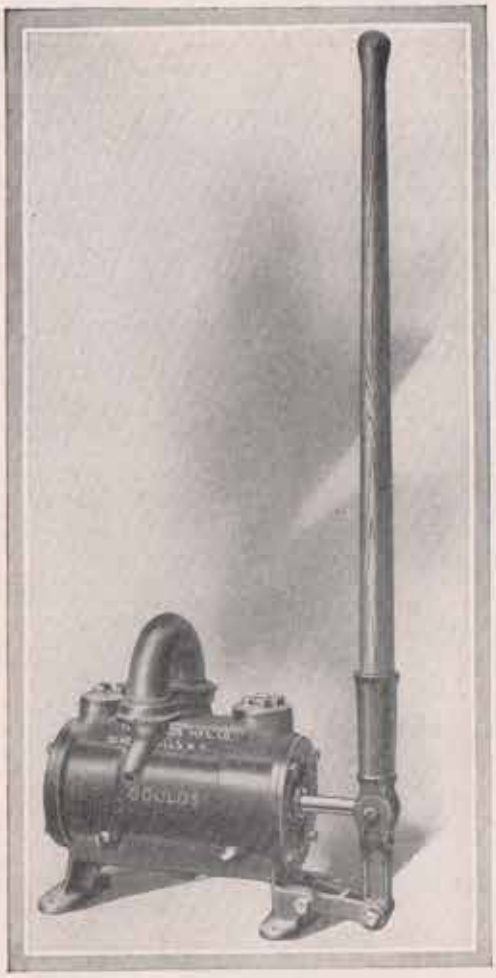


Fig. 1465

Fig. 1465. Here is an excellent pump of moderate price suitable for many services such as filling thresher tank wagons, spray tanks, and cold boilers; also for use in pumping out excavations, manure pits, etc. This pump is of simple construction and has no complicated parts.

Valves and Piston. The valves and piston are easily removable. The caps over the discharge valves can be unscrewed with a rod or flat bar, no wrench being necessary. Valves are all metal with leather face.

Suction Piece and Gooseneck. The suction piece and the "Goose Neck" are furnished for hose connection but when iron pipe is used these fittings can be discarded, as both suction and discharge openings are tapped for standard 2-inch iron pipe.

Piston and Piston Rod. The piston is fitted with two cup leathers. The polished steel rod operates through a brass packing gland of ample size to insure against leakage.

Lever. A long wood handle is furnished as illustrated.

Drain Plugs. Pump can be drained to prevent freezing by removing two conveniently placed drain plugs.

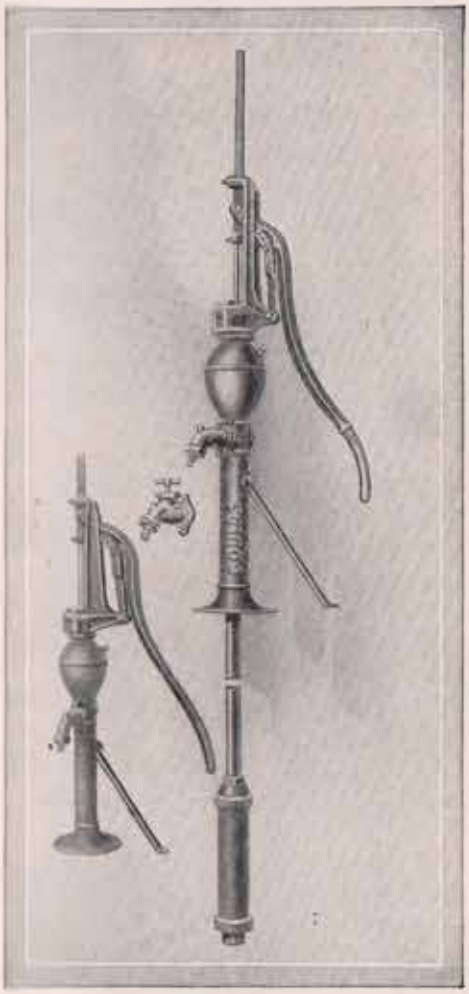
Suction Lift. 25 feet. Horizontally, the suction pipe may extend a short distance.

Pump With Strainer, Hose Couplings and Clamps

Figure 1465

Diameter Cylinder, 5 Inches.
Stroke, 5 Inches.
Capacity per Rev., .85 Gals.
Suction, 2-in. hose and 2-in. pipe.
Discharge, 1-in. hose and 2-in. pipe.
*Lift and Force, 50 feet.
Approximate Weight, 86 lbs.

*Total Lift and Force from supply to point of delivery.



Standard *Set Length*

Goulds Anti-Freezing Force Pump Standard and Set Length

STANDARD

With Plain Spout—Fig. 1653. With Cock Spout—Fig. 1654

Some of your customers will want a low-priced Force Pump Standard of this type for engine drive, with the idea of operating it by hand for the present. Our Fig. 1653 or 1654 is just the pump for this service. The guided top adapts it for engine drive. Lift and Force up to 190 feet.

Furnished with either plain or cock spout.

Revolving Bearer Top—Guided type bearer top causes the rod to move up and down in a straight line without side motion. The bushing which takes the wear is renewable.

The top can be turned so that the lever can be operated from the most convenient position.

Crosshead and Windmill Rod—Improved one-piece forge steel windmill rod and crosshead.

Four Leverages—Handle is drilled with four holes to give four different leverages by merely changing one pin.

Stock—Best grade cast iron with air chamber to insure a steady flow of water. Back is tapped for 1¼-inch iron discharge pipe.

Pipe Sizes—Stock is regularly tapped near the spout for 2-inch pipe, but can be bushed for 1½-inch or 1¼-inch pipe, when so ordered.

Rod Sizes—Well rod furnished with standard is threaded ⅝-inch U. S. Standard. On Standards bushed for 1¼-inch pipe, this rod is fitted for ⅜-inch steel well rod; Standards bushed for 1½-inch and those tapped for 2-inch pipe are fitted for 7/16-inch steel well rod.

Cylinders—Order our iron cylinders for use with this standard.

Drip Hole—To prevent freezing, a ⅛-inch drip hole should be drilled in the connecting pipe just below the frost line.

SET LENGTH

With Plain Spout—Fig. 1663. With Cock Spout—Fig. 1664

The set length includes pipe and cylinder and is shipped complete as illustrated and measures 4 feet from base to bottom of cylinder, which makes it suitable for wells about 30 feet in depth. If desired for use in wells of greater depth, add sufficient pipe and rod to place the cylinder in the water if possible. If this can not be done, the cylinder should be placed within at least 15 feet of the water.

Spout—Both cock and plain spouts are interchangeable and are fitted with nut and hose tube for ¾-inch garden hose; spout is fastened to the stock by two stud bolts.

Cylinder—Furnished in iron or brass-lined construction.

Valve Seat—Made of White Bronze, raised construction. *Will not chip, crack, rust or corrode.*

Foot Valve and Strainer—We recommend the use of foot valve and strainer with these pumps.

Figs. 1653 and 1654 Standards

Figure	Stroke, Inches	Drop Pipe, Inches	Discharges	Steel Well Rod, Inches	Approximate Weight in Pounds	Height Base to Spout, Inches
1653	Adjustable 6, 8, 9 and 10 inch	2	1¼ inch pipe and ¾ inch hose	⅝	88	17½
1654	Adjustable 6, 8, 9 and 10 inch	2	1¼ inch pipe and ¾ inch hose	⅝	90	17½

Figs. 1663 and 1664 Set Lengths

Figure	Number	Cylinder, Inches	Stroke, Inches	Cap. per 10 Inch Stroke, Gals.	Suction Pipe, Inches	Discharges		*Lift and Force, Feet	Approx. Weight in Pounds	Height Base to Spout, Inches
						Pipe, Inches	Hose, Inches			
1663	4	3 x 14	6, 8, 9	.30	1¼	1¼	¾	60	106	17½
1663	6	3½ x 14	and	.41	1½	1¼	¾	50	109	17½
1664	4	3 x 14	10 inch	.30	1¼	1¼	¾	60	108	17½
1664	6	3½ x 14	Adjustable	.41	1½	1¼	¾	50	111	17½

* Depth of wells to which pumps may be adapted by lowering cylinders to within 15 feet of water or total lift and force from supply to point of delivery.

GOULDS
HAND ROTARY FORCE PUMP
FOR PUMPING FROM BARRELS

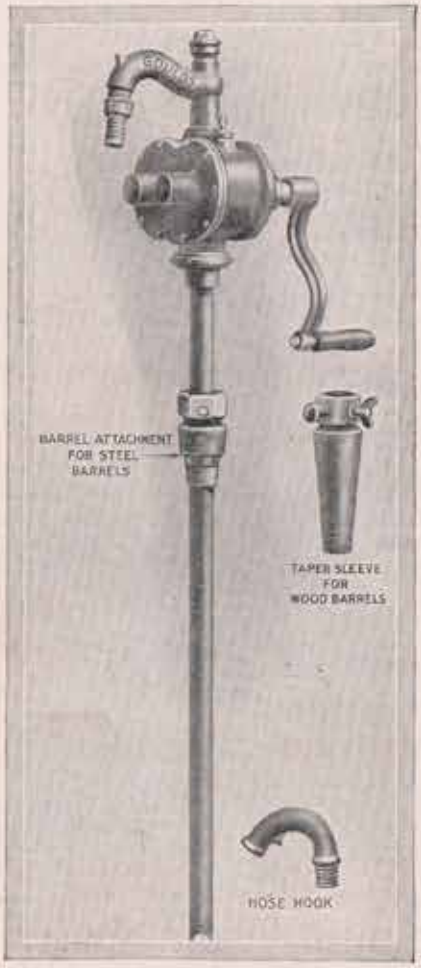


Fig. 464. Every public garage, oil station, oil wholesaler and many private garages can use this design of rotary pump made especially for pumping from barrels. The taper sleeve is adjustable so that it can be moved up or down on the suction pipe and is threaded so that it can be used in steel barrels. In wood barrels the pump can be further secured by forcing the sharp ends of the suction pipe into the bottom of the barrel. Spout is fitted for hose coupling.

Case. Accurately machined to 1/1000 of an inch.

Cams. Accurately machined, and bored to give perfect alignment of the cam shafts.

Gland. Screw type, easily accessible.

Spout. Fitted with female hose coupling. Top of spout is threaded for iron pipe and capped.

Hose Hook. As illustrated, furnished only when ordered. No extra charge.

Adjustable Barrel Attachment (For Steel Barrels). Furnished regularly, as illustrated. Attachment on Nos. 1 and 2 Pumps have two threads, one to fit 1½ in. and the other to fit 2 in. gas pipe thread. No. 3 size will fit only 2 in. Attachment is adjustable and can be moved to any position on the suction pipe.

Taper Sleeve, (For Wooden Barrels). Furnished only when especially ordered.

Priming and Drain Plugs. Conveniently located on each pump.

Valves. None.

Packings. All surface and gland packings are of special material to withstand the action of such oils as *kerosene, gasoline, fuel oil and distillate.*

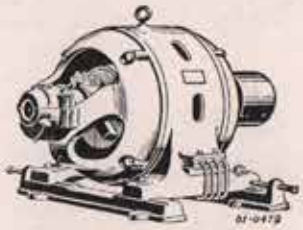
Two Constructions. Iron and All Bronze. Bronze pumps have all parts coming in contact with the liquid bronze.

Figure 464

No.	Gals. per Minute 100 Revs.	Suction Pipe Ins.	Discharges: Top of Spout Hose Ins.	Discharges: End of Spout Hose Ins.	Discharge Head Ft.	Approx. Wgt. in Lbs.
1	10	1	1	1	60	41
2	13	1	1	1	60	46
3	17	1¼	1¼	1¼	60	53

ELECTRIC MOTORS

We can supply electric motors in all sizes and styles in any of the following makes. Century, General Electric, Westinghouse, and Wagner. See price book for prices and weight. When ordering motors, give line service, single or three phase, voltage, direct or alternating current. Bare motors are listed in price book. If you desire base or pulleys they are extra and must be specified when ordering. Note—only standard size and speeds listed in price book; other motor prices on request. We recommend motor protection for every motor. See price book for extra charges.



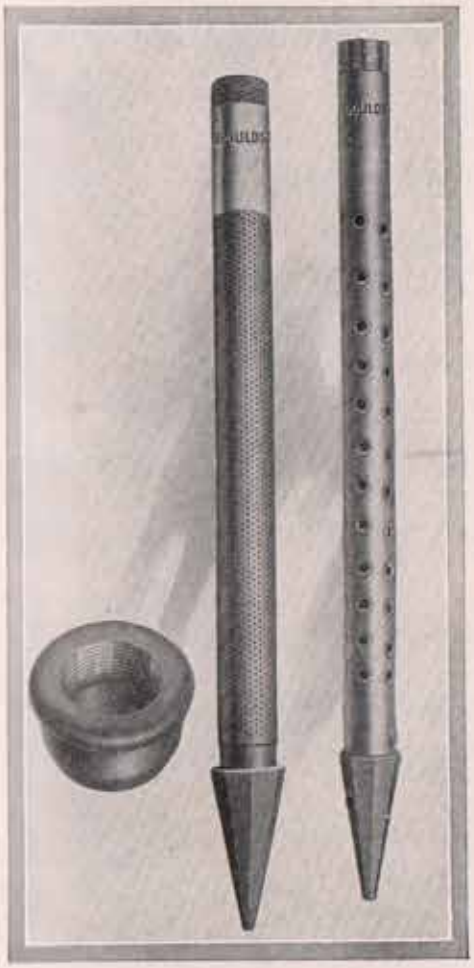


Fig. 510 Fig. 524 Fig. 661

DRIVE CAP

For Well Points

Fig. 510. Malleable iron drive cap for screwing over the end of drive pipe when driving a well.

Figure 510

Size of Pipe, 1¼ Inches. Approximate Weight 1¼ Lbs.
Size of Pipe, 1½ Inches. Approximate Weight, 1½ Lbs.
Size of Pipe, 2 Inches. Approximate Weight, 3¼ Lbs.

GOULDS BRASS JACKET DRIVE WELL POINTS

Fig. 524. These well points are made of galvanized iron pipe with elliptical holes of uniform size punched an equal distance apart. They contain the greatest number of holes possible to punch in a pipe and retain sufficient strength for driving. They are covered with a brass wire cloth, which is protected by a heavy perforated brass jacket. The drive point is iron, swaged into the pipe and riveted. See price book for sizes.

WASHER DRIVE WELL POINTS

Fig. 661. These well points are made of galvanized iron pipe. The holes are bored and countersunk. Each hole is covered with brass wire gauze held in place by a brass washer.

Trade No.	*Diameter Pipe Inches*	*Length of Pipe Inches*	*No. of Holes*	*Approx. Weight in Lbs.*
301	1¼	24	60	5
302	1¼	30	80	6
303	1¼	36	100	7

NOTE—This is a condensed list of the sizes most frequently used. Prices on other sizes will be given on application.

PIPE AND FITTINGS

We can supply all sizes black and galvanized pipe, also plugged and reamed. We can supply all types of standard or special fittings. Prices are standard as governed by plumbing supply houses.

BELTING

We can supply all sizes of rubber and leather belts, endless and V belts in any standard make. Prices governed by manufacturer of belt.

GENERAL INFORMATION

POWER TO DRIVE PUMPS

The following supposed conditions will illustrate the use of the friction tables on the following pages:

EXISTING CONDITIONS

Water desired to be pumped, 80 gallons per minute; well, 12 feet deep; pump situated 50 feet from the well; tank situated 400 feet from the pump and at 80 feet elevation.

Suction pipe, 3-inch diameter, and from existing conditions is 12 feet in well and 50 feet from well pump, and has two 3-inch elbows.

Discharge pipe is 2½-inch diameter, and from existing conditions is 400 feet from pump to tank foundations and 80 feet from foundations to tank, and has three 2½-inch elbows.

Therefore, power must be provided (A) to raise the water 12 feet + 80 feet = 92 feet; (B) to overcome the friction of water in pipes and elbows; (C) to overcome the friction in pump and connections to the engine.

WHAT SIZE ENGINE IS SUITABLE FOR THIS WORK?

The calculations are simplified by finding the "friction heads" equivalent to the losses in pipes and pumps and taking the actual head, which is 12 feet + 80 feet = 92 feet. Therefore we have:

(A)	12 feet in well and 80 feet from ground to tank = Actual Head		= 92	ft.
(B)	3-inch pipe friction = 12 ft. + 50 ft. = 62 ft. and by pipe friction table	$^{62}/_{100}\times 2$	= 1.24	ft.
	Two 3-inch elbows = by elbow friction table	2×0.184	= 0.368	ft.
	400 ft. + 80 ft., 2½-in. pipe = 480 ft. = from pipe friction table	$^{480}/_{100}\times 4.6$	= 22.08	ft.
	Three 2½-in. elbows = by elbow friction table	3×0.4508	= 1.3524	ft.
	Total of (B) or friction actual head pump has to work against		=117.0404	ft.
(C)	Pump friction. This varies greatly with different pumps and conditions, but must not be taken for less than ⅓ to ½ of (A) + (B). Taking it at ½ it is		117.04 / 2	=58.52

Grand Total = (A) 92.00 ft. + (B) 25.04 ft. + (C) 58.52 ft. = 175.56 ft.

Therefore, the engine must be able to drive pump to lift 80 gallons 175.56 feet high in 1 minute, or, expressed in H. P.:

$$\text{H. P.} = \frac{80\times 8\tfrac{1}{3}\times 175.56}{33{,}000} = 3.56 \text{ H.P.}$$

8⅓ pounds = weight of gallon of water.

33,000=number of foot pounds per minute in one horsepower.

No close estimate of power required can be made, as slight variations in roughness of pipe and in condition of pump may mean a large variation in amount of power required.

General Information

Continued

USEFUL INFORMATION AND FORMULA FOR CALCULATING PUMP PROBLEMS

A gallon of water weight 8⅓ pounds and contains 231 cubic inches. A cubic foot of water weight 62½ pounds and contains 1,728 cubic inches, or 7½ gallons; 31½ gallons of water constitute a barrel; 1½ gallons fill an ordinary lavatory; 30 gallons fill the average bath tub. It requires about 7 to 10 gallons to flush a closet.

Horses drink 5 to 10 gallons per day. Cattle drink 7 to 12 gallons per day. Hogs drink 2 to 2½ gallons per day. Sheep drink 1 to 2 gallons per day. With 40 to 50 pounds pressure per square inch, an ordinary ¾-inch garden hose nozzle requires about 6 gallons per minute, when throwing a solid stream, or about 4 gallons when spraying. It requires about 8 gallons to sprinkle 100 square feet of lawn; 16 to 20 gallons will soak it thoroughly.

A cubic foot per second equals 450 gallons per minute. An acre-foot is 325,829 gallons. The term "miner's inch" of water is more or less indefinite, but is approximately equal to a flow of 11¼ gallons per minute. This varies in different states from about 9 to 13 gallons per minute.

Diameter multiplied by 3.1416 = circumference. Circumference multiplied by .3183 = diameter. The square of the diameter multiplied by .7854 = area.

To find the diameter of a pump cylinder required to move a given quantity of water per minute, the piston travel being 100 feet per minute, divide the number of gallons by four, then extract the square root, and the result will be the diameter in inches.

To find the area of required pipe, the volume of water being known, multiply the number of cubic feet of water by 144 and divide the product by the velocity in feet per minute. This gives the area of pipe, from which is it easy to determine the diameter.

To find the velocity in feet per minute necessary to discharge a given volume of water in a given time, multiply the number of cubic feet of water by 144 and divide the product by the area of the pipe in inches.

In figuring the actual horsepower required to operate a pump, the "friction head" should be added to the "actual head," or elevation. This is given in the table on the following page.

Using the above formula and including the "friction head" will give the theoretical horsepower. To figure the actual horsepower required it is necessary to know the efficiency of the pump. To illustrate:

If the efficiency of a small pump is 33⅓ per cent, the actual horsepower required is three times the theoretical.

If the efficiency is 50 per cent, the actual horspower is double the theoretical.

If the efficiency is 66⅔ per cent, the actual horsepower is 1½ times the theoretical, etc.

TABLE CAPACITY OF PUMPS

The figures at the extreme right and left of the table are piston, or plunger, diameters; the line of figures across the top are piston, or plunger, strokes; the figures in the body of the table are the capacity, or displacement, in gallons, corresponding to a single stroke. To find the capacity for one revolution, multiply the capacity for a single stroke by one, two, three or four for single, duplex, triplex, or quadruplex, single acting, and by two, four or six for double acting pumps.

Diameter of Cylinder, Ins.	Area Circle, Square In.	Length of Stroke in Inches, and Capacity of Stroke in Gallons of Pump Cylinder with Given Diameter												Diameter of Cylinder, Ins.
		4	5	6	8	10	12	14	15	16	18	20	24	
1¼	1.23	.0212	.0266	.0319	.0425	.0531	.0637	.0743	.0797	.0848	.0955	.1062	.1274	1¼
1⅜	1.48	.0256	.0321	.0385	.0513	.0642	.077	.089	.0963	.1027	.1156	.1280	.1541	1⅜
1½	1.77	.0306	.0382	.0459	.0612	.0765	.0918	.1071	.1147	.1224	.1377	.1530	.1836	1½
1¾	2.41	.0416	.0521	.0625	.0833	.1041	.1249	.1457	.1562	.1666	.1874	.2082	.2499	1¾
2	3.14	.0544	.068	.0816	.1088	.136	.1632	.1904	.204	.2176	.2448	.2720	.3264	2
2¼	3.98	.0688	.086	.1033	.1377	.1721	.2063	.241	.258	.2754	.3096	.3442	.4128	2¼
2½	4.91	.085	.1062	.1275	.17	.2125	.255	.2975	.3187	.34	.3825	.425	.51	2½
2¾	5.94	.1028	.1285	.1543	.2057	.2571	.3085	.3598	.3855	.4114	.4626	.5142	.617	2¾
3	7.07	.1224	.1530	.1836	.2448	.306	.3672	.4284	.459	.4896	.5508	.612	.7344	3
3¼	.830	.1436	.1795	.2154	.2872	.3594	.4312	.503	.5385	.5748	.6466	.7182	.8624	3¼
3½	9.62	.1666	.2082	.2499	.3332	.4165	.4998	.5831	.6247	.6664	.7497	.833	.9996	3½
3¾	11.05	.1912	.239	.2868	.3824	.478	.5736	.6692	.687	.7648	.8605	.9561	1.147	3¾
4	12.57	.2176	.272	.3264	.4352	.544	.6528	.7616	.816	.8704	.9792	1.088	1.3056	4
4¼	14.19	.2456	.307	.3684	.4912	.6141	.7368	.8596	.921	.9824	1.105	1.228	1.473	4¼
4½	15.90	.2754	.3442	.4131	.5508	.6885	.8262	.9639	1.0327	1.1016	1.2333	1.377	1.6524	4½
4¾	17.73	.3068	.3835	.4062	.6136	.7671	.9204	1.073	1.15	1.2227	1.380	1.534	1.84	4¾
5	19.64	.34	.425	.51	.68	.85	1.02	1.19	1.272	1.36	1.53	1.7	2.04	5
5¼	21.65	.3748	.4685	.5622	.7496	.9371	.124	1.311	1.405	1.499	1.686	1.874	2.228	5¼
5½	23.76	.4114	.5142	.6171	.8228	1.0285	1.2342	1.4399	1.5425	1.6456	1.8513	2.057	2.4684	5½
5¾	25.97	.4496	.562	.6744	.8992	1.124	1.348	1.573	1.686	1.789	2.022	2.248	2.696	5¾
6	28.27	.4896	.612	.7344	.9792	1.2240	1.4688	1.7136	1.8362	1.9584	2.2032	2.448	2.9376	6

General Information

Continued

FRICTION OF WATER IN ELBOWS

Feet Head to be added for each Elbow

Table based on Weisback's Formula for very short bends

Gallons per Minute Del.	PIPE SIZE—INSIDE DIAMETER										
	¾ In.	1 In.	1¼ In.	1½ In.	2 In.	2½ In.	3 In.	3½ In.	4 In.	5 In.	6 In.
5	.161	.0621	.0184	.0115	.0046	.....	.....	.....	.....	.....	.....
10	.644	.2162	.0713	.0414	.0138	.0069	.....	.....	.....	.....	.....
15	1.449	.4876	.1587	.092	.0322	.0115	.....	.....	.....	.....	.....
20	2.576	.8648	.2829	.1587	.0575	.0276	.0115	.....	.....	.....	.....
25	4.002	1.3455	.4462	.2484	.0874	.046	.0184	.....	.....	.....	.....
30	.....	1.9435	.6394	.3611	.1265	.0644	.0253	.....	.....	.....	.....
35	.....	2.645	.8740	.4935	.1748	.0851	.0345	.0207	.....	.....	.....
40	.....	3.450	1.1385	.6394	.2254	.1127	.046	.0253	.016	.....	.....
45	.....	4.370	1.4389	.8096	.2875	.1426	.0598	.0345	.0207	.....	.....
50	.....	.....	1.771	.989	.3519	.184	.0736	.0391	.023	.....	.....
60	.....	7.774	2.553	1.426	.506	.2576	.1012	.0598	.0345	.0138	.0069
70	.....	10.580	3.496	1.978	.6992	.3404	.138	.0805	.0483	.0207	.0092
75	.....	12.190	4.002	2.254	.805	.3956	.1656	.092	.0552	.023	.0115
80	.....	13.800	4.554	2.553	.9016	.4508	.184	.1012	.0621	.0276	.0115
90	.....	17.480	5.750	3.243	1.150	.5704	.2392	.138	.0805	.0322	.0161
100	.....	.....	7.084	3.956	1.3076	.736	.2944	.1564	.0989	.0391	.0184
125	.....	.....	.....	6.256	2.231	1.104	.460	.2576	.1541	.0621	.0299
150	.....	.....	.....	9.016	3.197	1.5755	.5578	.368	.2208	.0897	.0437
175	.....	.....	.....	12.236	4.370	2.1505	.8970	.5014	.3036	.1219	.0598
200	.....	.....	.....	15.824	5.612	2.944	1.1776	.6266	.3956	.1564	.0736
250	.....	.....	.....	.....	8.878	4.393	1.8401	.0258	.6164	.2507	.1196
300	.....	.....	.....	.....	12.788	6.302	2.622	1.472	.8832	.3588	.1748

Table for Converting Pressure Per Square Inch into Feet Head of Water.

Feet Head	Pounds per Square Inch	Feet Head	Pounds per Square Inch	Feet Head	Pounds per Square Inch
1	2.31	55	126.99	180	415.61
2	4.62	60	138.54	190	438.90
3	6.93	65	150.08	200	461.78
4	9.24	70	161.63	225	519.51
5	11.54	75	173.17	250	577.24
6	13.85	80	184.72.	275	643.03
7	16.16	85	196.26	300	692.69
8	18.47	90	207.81	325	750.41
9	20.78	95	219.35	350	808.13
10	23.09	100	230.90	375	865.89
15	34.63	110	253.98	400	922.58
20	46.18	120	277.07	500	1154.48
25	57.72	125	288.62	.....	.....
30	69.27	130	300.16	.....	.....
35	80.81	140	323.25	.....	.....
40	92.36	150	346.34	.....	.....
45	103.90	160	369.43	.....	.....
50	115.45	170	392.52	.....	.....

FRICTION OF WATER IN CLEAN IRON PIPES

Feet Head to be added to each 100 feet of Pipe

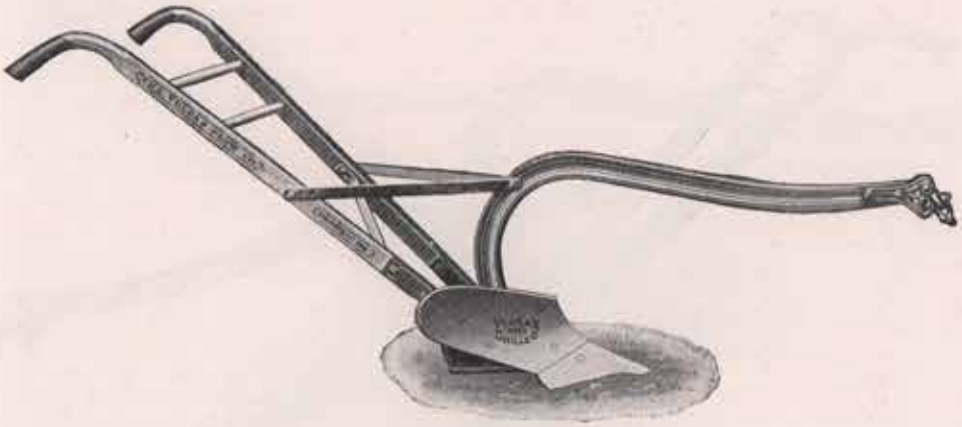
Ellis & Howland's Experiments

Gallons per Minute Del.	¾ In.	1 In.	1¼ In.	1½ In.	2 In.	2½ In.	3 In.	3½ In	4 In	5 In.	6 In.
5	7.6	1.9	.71	.27	.09	.05	.01	.....	.....	.....	.....
10	29.9	7.3	1.4	1.0	.28	.09	.05	.01	.....	.....	.....
15	66.	16.1	5.5	2.2	.57	.18	.09	.05	.02	.....	.....
20	115.	28.0	9.5	4.8	.96	.32	.13	.07	.03	.01	.....
25	179.	43.7	14.7	6.0	1.7	.48	.23	.09	.05	.02	.01
30	264.	63.2	21.0	8.6	2.1	.69	.30	.14	.07	.03	.01
35	372.	85.1	28.9	11.6	2.7	.92	.39	.20	.11	.04	.02
40	461.	110.	37.0	14.9	3.7	1.2	.53	.25	.14	.05	.02
45	594.	145.	46.5	18.7	4.6	1.5	.64	.32	.16	.07	.02
50	.....	185.	57.3	23.0	5.6	1.9	.80	.39	.20	.09	.03
60	.....	253.	82.8	32.2	8.0	2.7	1.2	.55	.30	.11	.05
70	.....	340.	116.	46.0	11.0	3.5	1.4	.87	.44	.16	.06
75	.....	393.	129.	51.4	12.2	4.1	1.7	.90	.48	.17	.07
80	.....	442.	147.	57.5	14.5	4.6	2.0	.93	.53	.18	.07
90	.....	580.	184.	73.6	17.9	5.9	2.5	1.1	.60	.21	.09
100	.....	.....	228.	89.7	21.7	7.3	2.9	1.5	.74	.27	.11
125	.....	.....	367.	150.	34.3	10.0	4.6	2.1	1.2	.39	.16
150	.....	.....	516.	207.	48.8	16.1	6.5	3.1	1.6	.57	.23
175	.....	.....	.....	294.	64.6	21.7	8.6	4.2	2.1	.78	.30
200	.....	.....	.....	359.	86.2	28.6	11.5	5.4	2.8	.96	.39
250	.....	.....	.....	600.	137.	41.7	17.7	8.5	4.3	1.5	.60
300	.....	.....	.....	.....	195.	64.4	25.7	11.5	6.2	2.1	.85
350	.....	.....	.....	.....	258.	86.8	34.9	16.3	8.4	2.9	1.1
400	.....	.....	.....	.....	345.	114.	44.9	21.3	10.9	3.7	1.5

Table for Converting Feet Head of Water into Pressure Per Square Inch.

Feet Head	Pounds per Square Inch	Feet Head	Pounds per Square Inch	Feet Head	Pounds per Sq. In.
1	.43	55	23.82	190	82.20
2	.87	60	25.99	200	86.62
3	1.30	65	28.15	225	97.45
4	1.73	70	30.32	250	108.27
5	2.17	75	32.48	275	119.10
6	2.60	80	34.65	300	129.93
7	3.03	85	36.81	325	140.75
8	3.40	90	38.98	350	151.58
9	3.90	95	41.14	375	162.41
10	4.33	100	43.31	400	173.24
15	6.50	110	47.64	500	216.55
20	8.66	120	51.97	600	259.85
25	10.83	130	56.30	700	303.16
30	12.99	140	60.63	800	346.47
35	15.16	150	64.96	900	389.78
40	17.32	160	69.29	1000	433.09
45	19.49	170	73.63	.....	.....
50	21.65	180	77.96	.....	.....

NO. 10N VULCAN CHILLED PLOW, STEEL BEAM



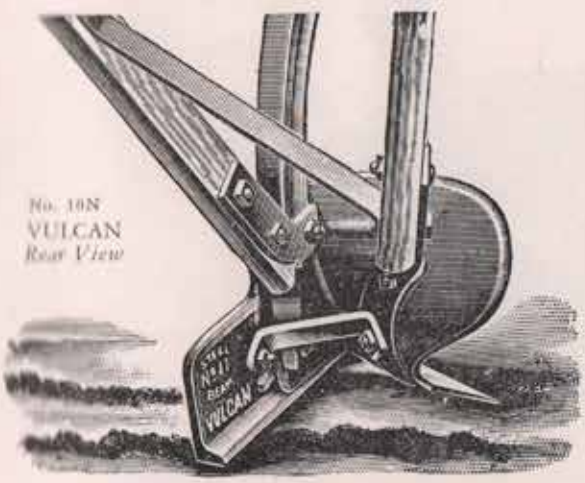
The No. 10N and larger sizes of Vulcan Steel Beam Plows have handles bolted to heavy wrought steel connecting brackets, and these handles are adjustable to suit length of the operator.

These plows are well balanced and will run steadily with the least amount of labor to the operator and the team.

Carefully chilled Moldboards, Landsides and Points insure long and satisfactory service in rocky and gritty soil. The moldboards are correctly curved to secure even pressure over the entire surface, which insures good scouring, and proper pulverizing of the soil.

The No. 10N and larger sizes of Vulcan Plows are intended for heavy work where a sharp cutting front edge is required, therefore, are made with separate special hardened chilled shin piece.

Capacity, 6x10 inches; Weight, 105 lbs.



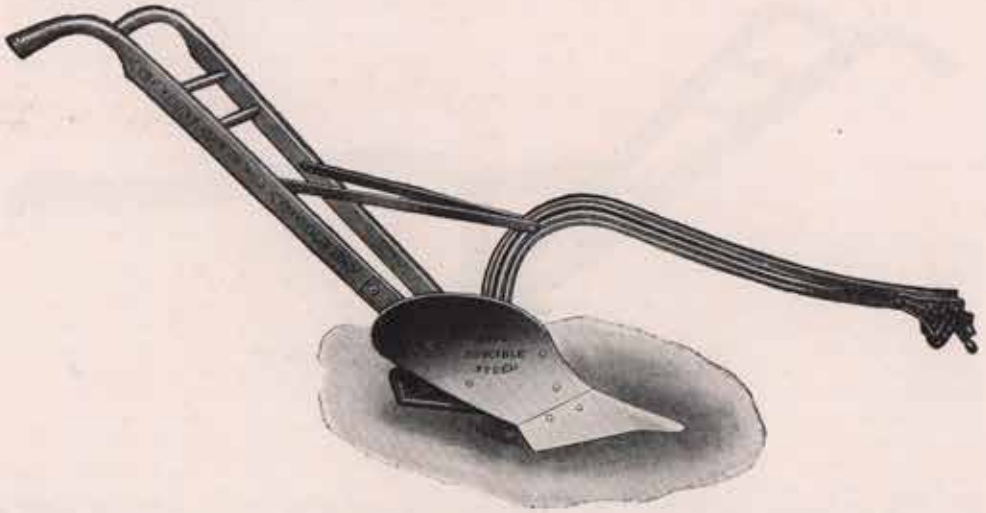
No. 10N
VULCAN
Rear View

VINEYARD HITCH

We can furnish an offset vineyard hitch at a small extra charge that will convert our one horse plow into a very efficient vineyard plow.

Notice the heavy Wrought Steel Handle Connections, the one connection reinforcing the mold-board; and also note the low Spreader Brace and Diagonal Handle brace, all helping to give a very rigid construction.

NO. 12N VULCAN ROSE CLIPPER PLOW

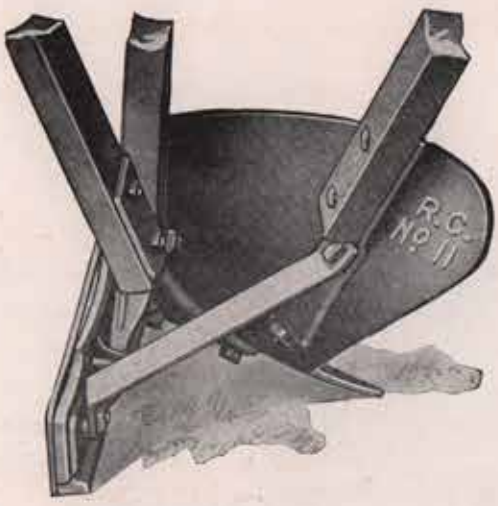


A few distinctive features of the Rose Clipper Plows:

The combined Saddle and Landside in one piece, is of Charcoal Iron, properly modeled for strength. It has a replaceable Chilled Heel easily and cheaply renewed when worn. A Crucible Steel Plate is attached to the Landside. The Moldboard and Point are of High Carbon Crucible Steel, very durable, and will scour well in all but the very difficult or sticky soils, and for these soils we supply Black Land Plows.

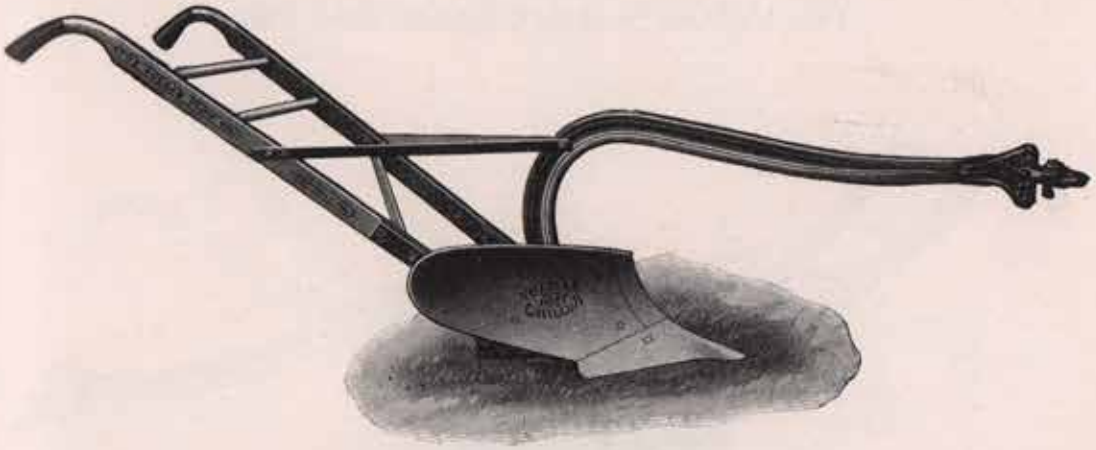
Each plow is equipped with extra point and wrench.

Capacity 8x12; Weight 120 lbs.



Rear View

No. 12N VULCAN CHILLED PLOW, STEEL BEAM



The No. 12N Vulcan is the best plow for an average two-horse team and can be recommended for a wide range of work.

The No. 14N is adapted for medium and heavy three-horse teams, and the work of these plows will satisfy the most exacting plow man.

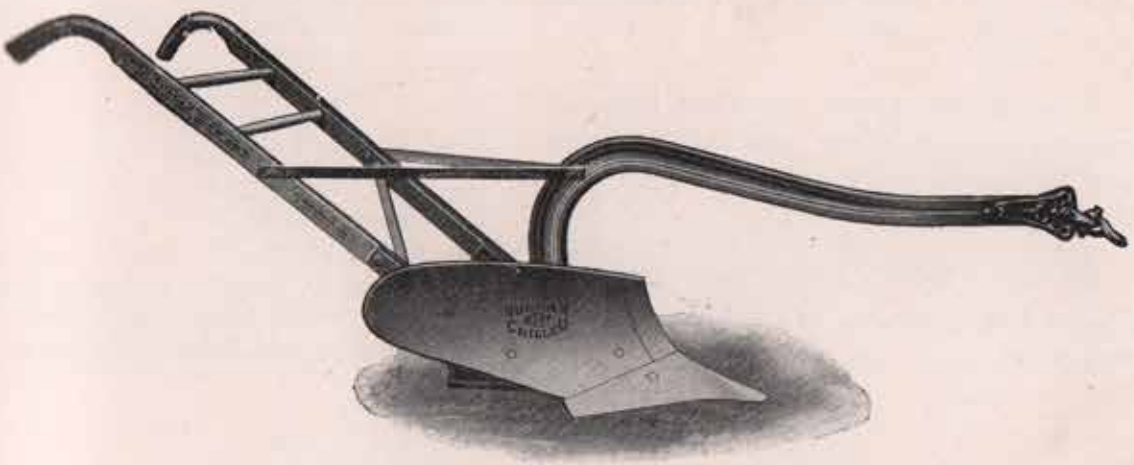
Moldboards are of the right shape to do good work and they are carefully chilled so as to give long service and to scour properly. The Heavy Grey Iron, standards cannot be bent, which insures the plows will retain the correct shape.

Especially upon these larger plows, which are subjected to very severe strain, the interlocking construction of Saddle, Landside and Point is of great value as it results in more strength and less breakage.

Strength, Durability, Light Draft and Steady Running are oustanding features in these plows, and they insure long service to the user and satisfied customers to the dealers who sell the Vulcan Implements.

Number 12N. Capacity 7x12; Weight, 125 lbs.
Number 14N. Capacity 8x14; Weight 155 lbs.

No. 14N Vulcan Chilled Plow, Steel Beam



The Vulcan Scotch Clipper Steel Plow

The Vulcan Scotch Clipper is one of our most popular plows. Construction throughout is of the very best.

The Moldboard has a long, gradual curve, so that it will scour well even in sticky soil. It properly crumbles the furrow slice, and completely covers heavy vegetation and trash. The Vulcan Scotch Clipper is, therefore, ideally suited for plowing under a heavy cover crop or stand of stalks and weeds.

As illustration shows, this plow has good clearance under the beam and it is well balanced so that it will run steadily with light draft.

We furnish Heavy Crucible Steel Points Chilled Iron Points can be furnished for these plows.

The Moldboard is of highest quality steel, carefully tempered, and Landside is fitted with a separate Chilled Heel, which not only protects the steel landplate from excessive wear, but also helps to steady the plow.

The Saddle is of grey iron, properly molded for strength.

Made in one size only, No. 14, Right and Left Hand.

Steel Beam: 14 inch cut.

Weight: 145 lbs.

Vulcan Scotch Clippers are regularly equipped with Steel Point on the plow.

highest quality
and Landside is
lled Heel, which
l landplate from
lps to steady the

iron, properly

, No. 14, Right

t.

rs are regularly
on the plow.

WIARD CHILLED PLOW

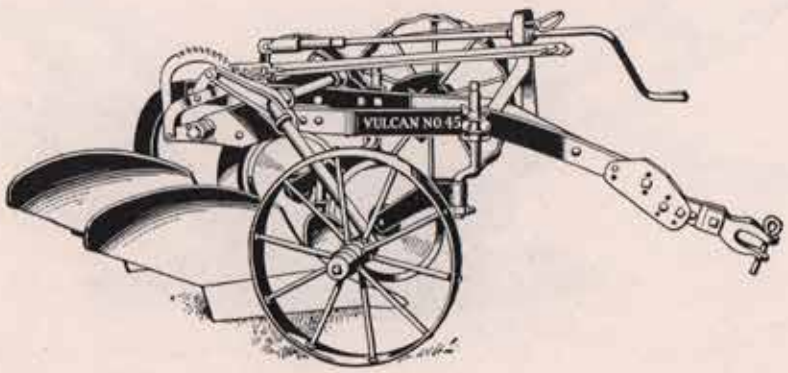
Wood Beam

WIARD CHILLED PLOW, OLIVER PATTERN

The No. 144 Wiard is a general purpose chilled plow for use in soils where steel will not scour. Also used in stony, sandy or gravelly soil.

		Weights
No. 144	14-inch Wiard Chilled Plow	
No. 144	Points or Share, 14-inch	
No. 144	Jointers complete	
No. 144	Gauge Wheel complete	

VULCAN NO. 45 TRACTOR PLOWS



The No. 45 Plow has a flexible hitch drawbar. The tractor traveling into gulleys or over ridges does not change depth of plowing.

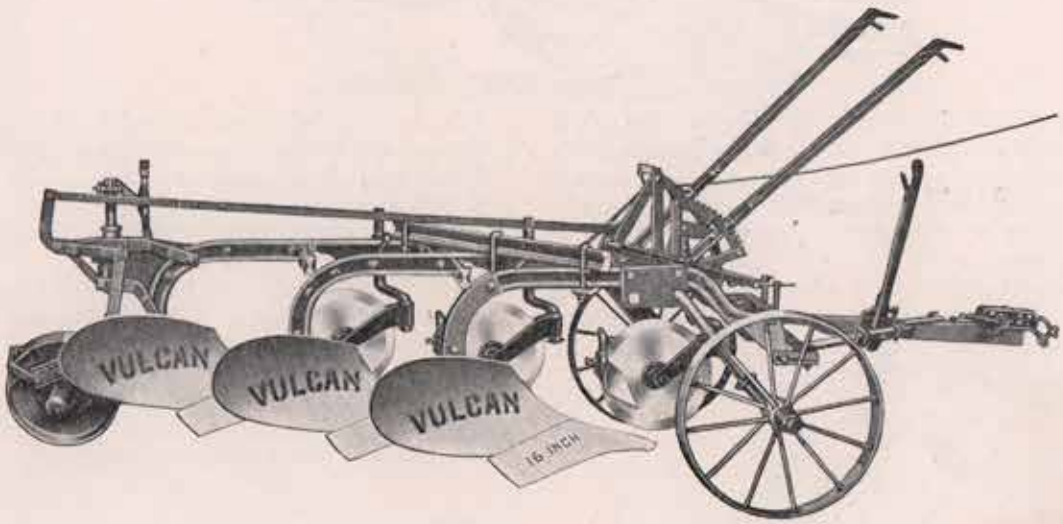
The No. 45 Plow is so built that no effort is required to couple or uncouple from the tractor. With the furrow wheel in line with the front bottom and with the land wheel set well back to the rear of the second bottom, maximum plowing efficiency is experienced on uneven fields. This also makes for easy adjustment of bottoms when the plow is in motion.

A special power lift, possessing an eccentric movement, slowly starts the plow upward from under a heavy load, then after the start, a rapid movement is secured bringing them to the full transporting height in a short space of travel. All parts of the power lift are made of drop forgings, heavier than are ordinarily used. The connecting link works directly on full sized axle instead of working on a small bolt, which again reduces wear and strain.

SPECIFICATIONS

		Wgt., Lbs.
No. 45	2 bottom plow 14-in. steel	591
No. 45	2 bottom plow 16-in. steel	596
No. 45	2 bottom plow 14-16-in. Adj.	604

VULCAN NO. 41 TRACTOR PLOWS



In the Vulcan Tractor Plows you find a quality of workmanship backed by fifty years of plow building, combined with a design that leads in improvements and keeps pace with the development of power farming.

Important features of these plows are:

Adjustable Frame which permits cutting 12, 14 or 16-inch furrows.

Rigid Rear Wheel Control which permits backing of plow in furrow or when out of the ground.

Wide clearance between bottoms and under beams which prevents choking of trash.

Automatic Release Attachment and Diagonal Hitch Shifter furnished as regular equipment.

The Three-Bottom No. 41 Plow can be supplied with Heavy Top Beam Reinforcement, when it is desired to use this gang for exceedingly heavy work.

All Vulcan No. 41 Tractor Plows may be fitted with 12, 14 or 16-inch bottoms.

On Vulcan Tractor Plows, one beam and bottom can be removed from the Three and Two-Bottom Plows when so desired, or they can be added to the One and Two-Bottom sizes.

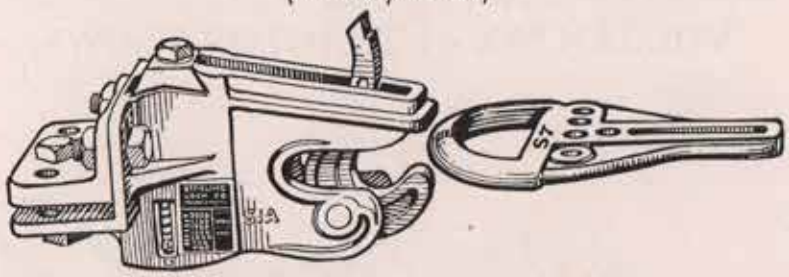
These tractor plows are convenient and easy to handle, enter readily and hold their depth in hard ground. We furnish bottoms suitable for varying soil conditions, viz:

General purpose, stubble, prairie breaker, solid or rod, steel slat.

3-Bottom Plow weighs 1120 lbs.

Sterling Automatic Coupler and Tractor Hitch

(A Safety Device)



Automatically releases the instant the plow strikes an obstruction, eliminating broken plow points and the springing of beams. Can be adjusted to release at from 500 to 5,000 pounds. Indicator on side shows pressure at which it will release.

Couples automatically by backing the tractor in from any angle and permits backing the plow.

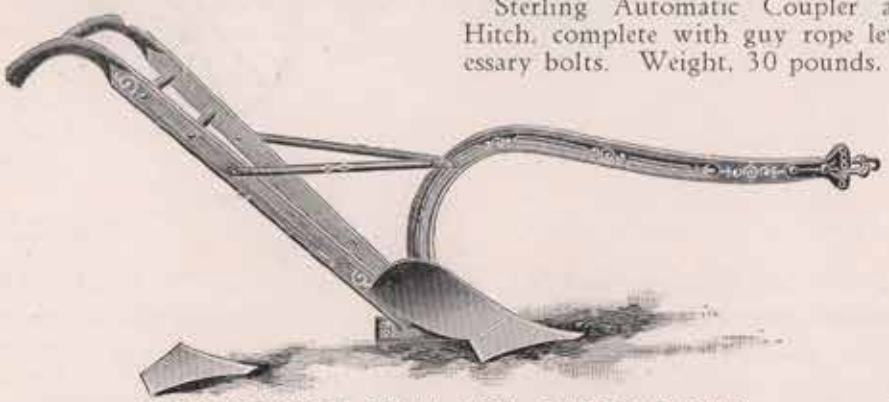
Can be converted into a positive hitch by turning an adjusting block.

May be uncoupled or detached from the plow if desired without the operator leaving his seat.

Made entirely of malleable iron except hook and adjusting block which are special steel. Will withstand the hardest usage. Weighs 30 pounds.

Suitable for all makes of tractors and for two and three wheel plows. Can also be used as a positive hitch and coupler on trucks and road machinery.

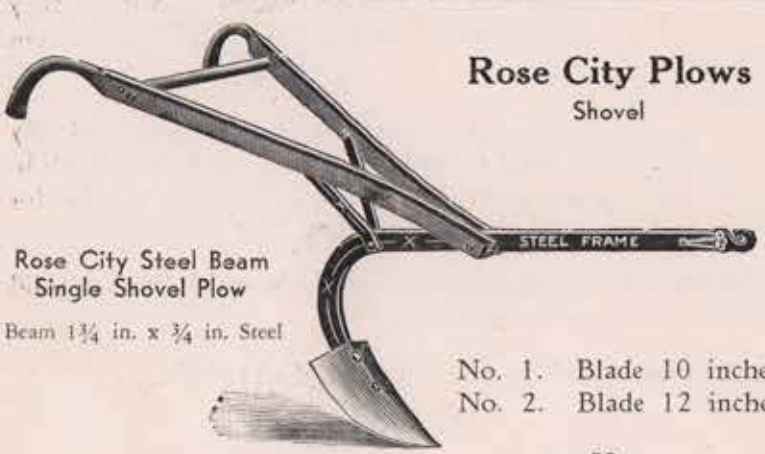
Sterling Automatic Coupler and Tractor Hitch, complete with guy rope lever and necessary bolts. Weight, 30 pounds.



ROSE CITY STEEL BEAM, STEEL GARDEN PLOWS	Weight, Lbs.
Pony Plow, one-horse, 7-inch	60
A. O. Plow, one-horse, 8-inch	63
B. O. Plow, one-horse, 9-inch	68
C. O. Plow, two-horse, 10-inch	84
D. O. Plow, two-horse, 11-inch	87

Rose City Plows

Shovel



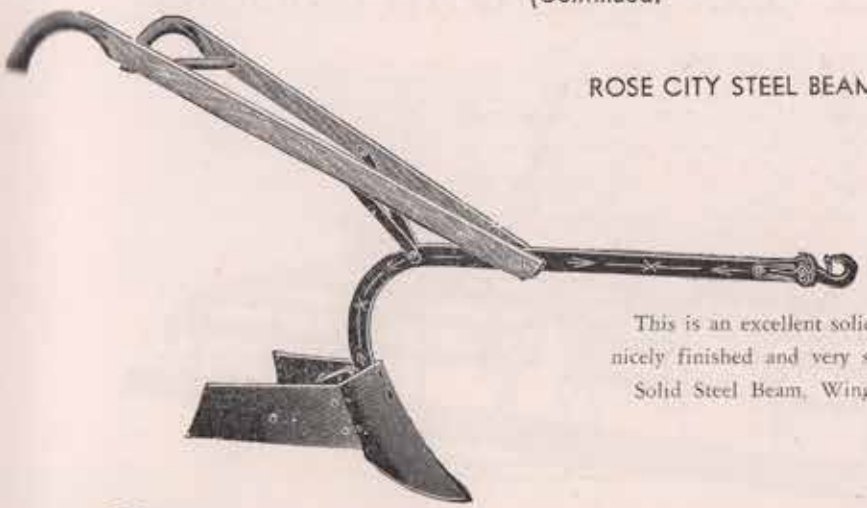
Rose City Steel Beam Single Shovel Plow

Beam 1¾ in. x ¾ in. Steel

	Weight, Lbs.
No. 1. Blade 10 inches wide, 12 inches long	30
No. 2. Blade 12 inches wide, 12 inches long	31

ROSE CITY PLOWS

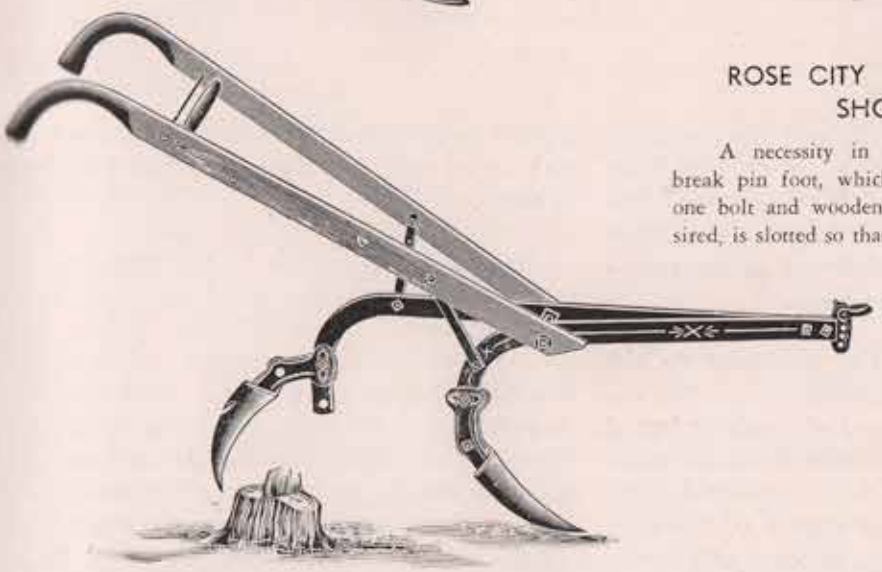
(Continued)



ROSE CITY STEEL BEAM, WING SHOVEL PLOW

This is an excellent solid Steel Beam, Wing Shovel Plow, nicely finished and very serviceable.

Solid Steel Beam, Wing Shovel, Plow, weight, 38 lbs.



ROSE CITY BREAK PIN DOUBLE SHOVEL PLOW

A necessity in rocky or stumpy land. The break pin foot, which it attached to standard with one bolt and wooden pin, or with two bolts if desired, is slotted so that any style blade can be attached by means of a heel bolt. The foot is adjustable and blades can be given any slant desired.

Break Pin Double Shovel Plow, 6x11 inch blades.

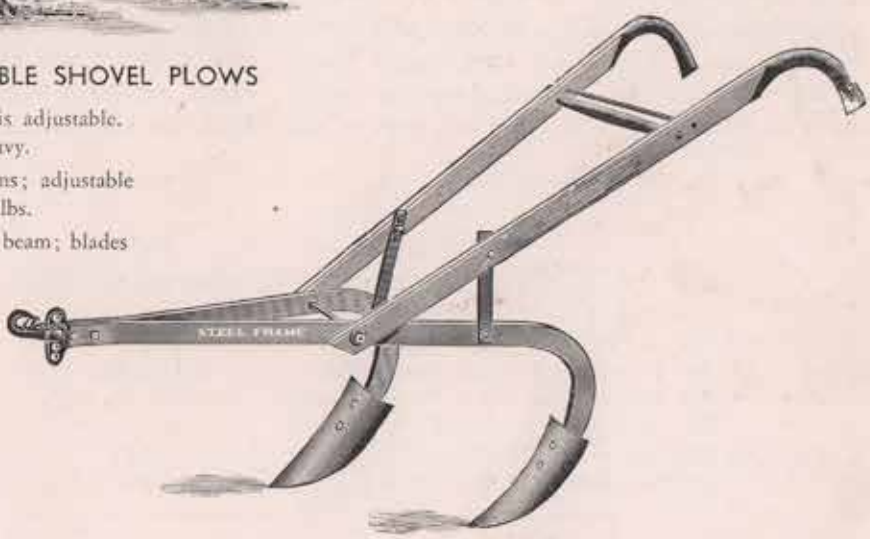
Beams 1¾x¾ inch steel; weight 48 lbs.

ROSE CITY MALTA DOUBLE SHOVEL PLOWS

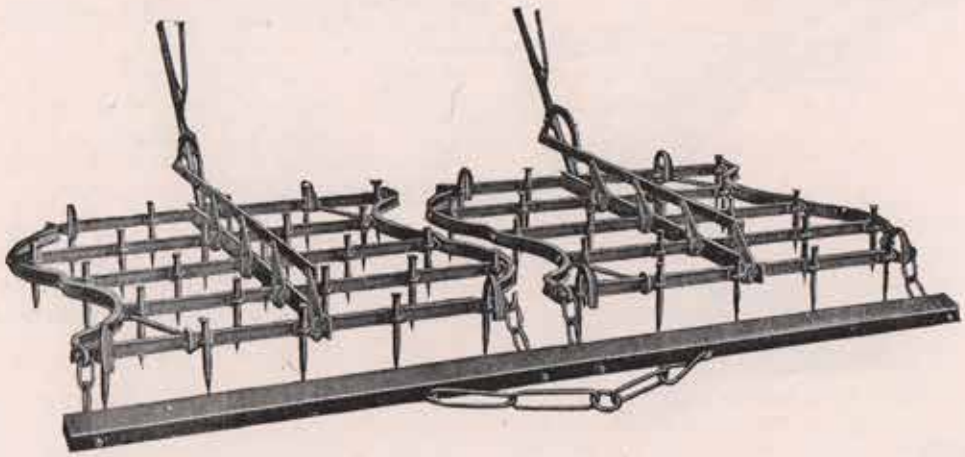
Blades have two holes. Clevis is adjustable. Malta Shovels are extra heavy.

No. 1 Steel Beam, 1½x⅝ beams; adjustable blade 6x11 in.; weight, 34 lbs.

No. 2 Steel Beam Plow, 1¾x¾ beam; blades 6x11 in.; weight, 46 lbs.



RODERICK LEAN SPIKE TOOTH HARROWS



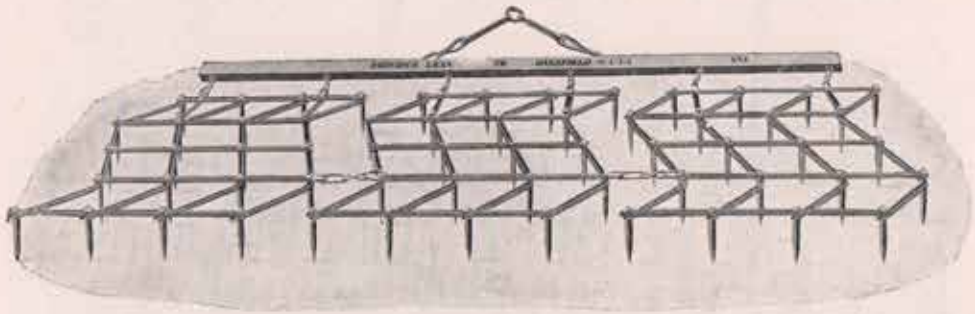
One of the highest grade and most satisfactory harrows on the market. Combines great durability and long wear. Built of special materials made expressly for the purpose. Steel Forgings used wherever practical to the exclusion of castings, rivets and bolts.

Instead of fastening the toothbars to the sidebars with malleable clamps, as on the ordinary harrow, the toothbars are carefully forged and rounded to rotate in the sidebars, being held by retaining nuts, which cannot loosen. This does away with the chance of breakage and provides a much stiffer, stronger and longer lasting frame. The heavy steel corner braces are adjustable to take up wear, insuring a rigid frame at all times. The hitch is a part of the sidebar forged to shape and will outwear any number of malleable hooks attached with bolts or rivets.

Making harrow teeth is a science that requires trained and experienced workmen to get the best results. Roderick Lean Harrow teeth are made of special steel, forged and shaped on automatic hammers by skilled workmen who do this class of work from one year to another. On the "O.S." Series Harrow the teeth are long, diamond shaped, providing the best cutting and pulverizing powers, as well as the longest wear. Teeth are fastened by patented drop forged steel eyebolts and special steel clamps that securely hold the teeth in place. Four runner teeth for each section.

No.	*Description*	*Width*	*Weight*
No. 14-O. S.	50 Teeth 2 Sec.	7½ ft.	173
No. 15-O. S.	60 Teeth 2 Sec.	9 ft.	195
No. 18-O. S.	75 Teeth 3 Sec.	11¼ ft.	260
No. 17-O. S.	90 Teeth 3 Sec.	13½ ft.	308
No. 19-O. S.	100 Teeth 4 Sec.	15 ft.	374
No. 20-O. S.	120 Teeth 4 Sec.	18 ft.	413
25 Tooth Section, No Bar		3½ ft.	79
30 Tooth Section, No Bar		4½ ft.	87

RODERICK LEAN SPIKE TOOTH HARROWS



"ZIG ZAG"

Also one of the originals of the Roderick Lean line of Harrows. The narrow independent sections agitate and pulverize the ground and work out trash. We know of hundreds of instances where these harrows have been in continuous use for 25 years, some of them without a repair.

Frame is channel steel of special grade, and teeth are carefully forged and so fitted in the toothbars that they cannot turn. May be reversed when worn, affording uniformity of wear.

Made in Regular and Heavy styles with twenty teeth to the section, any number of sections constituting a harrow.

Runners—equipped with runners when required to facilitate the transportation of the harrow to and from the field. Ordinarily placed on one section of the tool which section is turned with the teeth upwards, the other sections are placed on top of it, and the runners allow the whole to be easily drawn over the road or field.

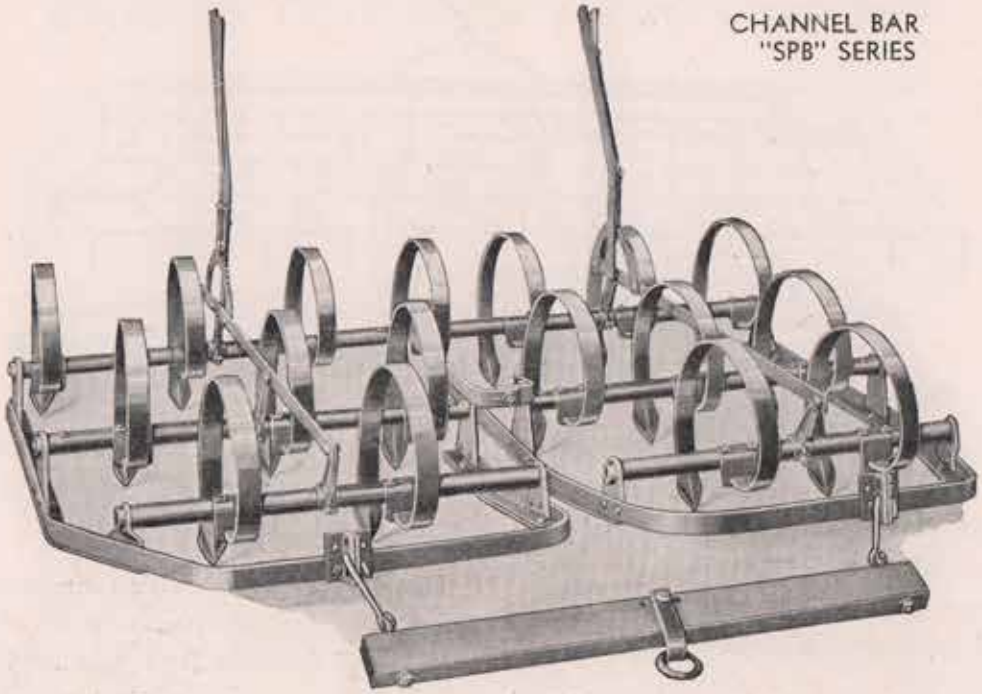
ZIGZAG HARROWS (Regular, 20 Teeth to the Section)

		Net Weight	*Width*
4	40 Teeth, 2-Section	95 lbs.	6¼ ft.
5	60 Teeth, 3-Section	144 lbs.	9½ ft.
6	80 Teeth, 4-Section	194 lbs.	12½ ft.
6½	100 Teeth, 5-Section	248 lbs.	15¾ ft.
7	120 Teeth, 6-Section	291 lbs.	19 ft.
8	160 Teeth, 8-Section	392 lbs.	25 ft.
20	Tooth Section only	40 lbs.	3 ft.

ZIGZAG HARROWS (Heavy, 20 Teeth to the Section)

4H	40 Teeth, 2-Section	127 lbs.	6½ ft.
5H	60 Teeth, 3-Section	192 lbs.	9½ ft.
6H	80 Teeth, 4-Section	258 lbs.	12½ ft.
6½H	100 Teeth, 5-Section	328 lbs.	16 ft.
7H	120 Teeth, 6-Section	388 lbs.	19 ft.
8H	160 Teeth, 8-Section	519 lbs.	25 ft.
20H	Tooth Section only	59 lbs.	3 ft.

RODERICK LEAN SPRING TOOTH HARROWS



CHANNEL BAR
"SPB" SERIES

Unquestionably one of the strongest and most durable all steel spring tooth harrows built, and will do a thorough job of pulverizing where less substantial harrows could not stand the strain.

Like all Roderick Lean Spring Tooth Harrows, this all steel Harrow has a one-piece, angle steel frame, equipped with extra steel runner plates, which, when worn, are cheaply and easily replaced, saving the cost of new frames.

The tooth bars are exceptionally stiff and strong, made of high grade steel. They rotate easily in the end standards, making it easy to clear the harrow of trash.

Note the exceptionally high clearance of this harrow—one of its big features. One long and one short center runner as provided on this harrow enable the trash to be more readily cleared out than on harrows with two long center runners. At the same time, this arrangement does not allow the frame to sag as where both center runners are short.

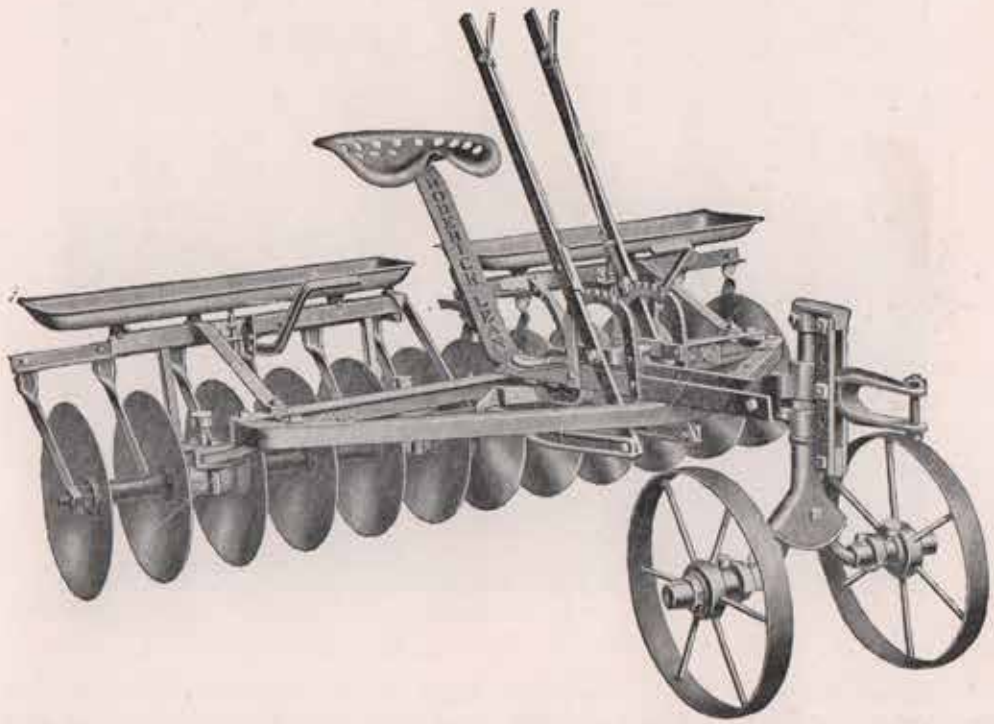
High couplings between sections also assist in clearing the harrow of trash.

SIZES AND WEIGHTS

No.	*Description*	*Weight*	*Width*
No. 2	9 Tooth, 1-Section with handle	130	
No. 5SCB	15 Tooth, 2-Section	226	5 Feet
No. 7SCB	17 Tooth, 2-Section	244	6 Feet
No. 23SCB	23 Tooth, 3-Section	349	8 Feet
No. 25SCB	25 Tooth, 3-Section	367	9 Feet
	8 Tooth, Center Section with 23 or 24 T Bar	132	3 Feet
	2-8 Tooth, Center Section with 23 or 24 T Bar	251	6 Feet
	Reversible Pointed Teeth, extra per tooth		
	Alfalfa Teeth, extra, per tooth		

Roderick Lean "New Century" Disc Harrow

"H" SERIES



Frame is extra heavy, one-piece angle steel, rigidly braced through the center by the steel stub pole.

Center foot lever permits instant adjustment for working dead furrows, ridges or uneven ground. Even depth of cultivation at all times. No delay or bother to make adjustment with wrench. No pressure springs to weaken or break. Pressure release by foot lever lock. Means better work and easier handling, is easier to adjust than hand lever. Conveniently placed and not in operator's way. The strongest and best arrangement of its kind.

Provided with angle steel stub pole. No wood pole to rot and break. Fore-truck can also be attached without extra wood stub. One pole serves all purposes. When harrow is used with foretruck, pole is bolted between the angles of the steel stub, or equipped with proper irons can be attached to frame and used as setover pole for three-horse hitch. Same pole can be used with foretruck for two or four-horse hitch, or three-horse setover hitch.

Scraper frame is strongly braced to main frame, and supported by steel standards at each bearing. Scrapers are flexible spring steel. Operate by foot lever conveniently placed, and keep the discs clean from the center to the outer edge. When not required, scrapers may be set away from discs by means of small hand lever attached to the scraper pressure springs.

Roderick Lean "New Century" Disc Harrow "H" Series

(Continued)

End draft bars very heavy. Pass under the frame rather than through a slot, preserving full strength at the points subject to the greatest strain. Lever draft bars are high, so that they will not catch trash. Curved to keep gangs level at any angle.

Scraper Frame double angle steel rigidly held in place by double standards and strongly braced to frame. The scraper arrangement is a special feature. Scrapers operate by a steel foot lever conveniently placed. May be set away from discs when not required. Scrapers spring steel and very flexible. Bearings extra heavy, dust-proof, provided with oil-soaked hardwood bearings, and large compression grease cups. Long steel levers work in forged steel ratchets, insuring good strength and easy shifting of gangs.

Pressed steel weight pans are not regularly furnished, but can be equipped on all sizes when required. Neckyoke furnished extra when required. Tractor hitch in place of foretruck also supplied when ordered.

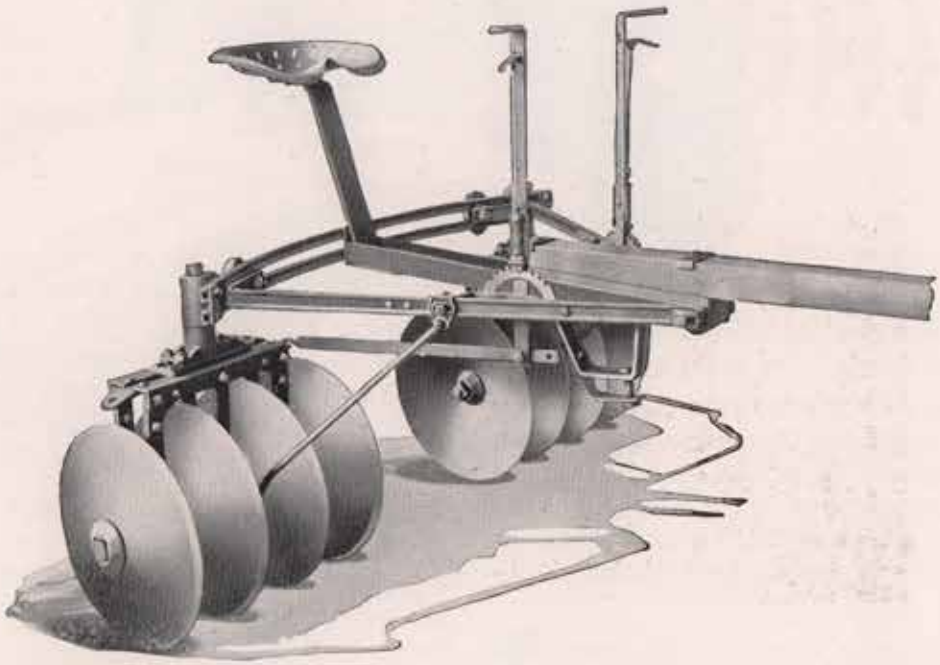
SIZES AND WEIGHTS

No.	*Description*		*Width*	*Equipment*	*Weight With Pole*	*Weight With Foretruck*
516H	10 disc	16 in.	5 feet	2 Horse	370	405
616H	12 disc	16 in.	6 feet	3 Horse	417	453
518H	10 disc	18 in.	5 feet	2 Horse	390	425
618H	12 disc	18 in.	6 feet	3 Horse	438	473

Roderick Lean Reversible and Extension Disc Harrow

HIGH FRAME "J" SERIES

Also furnished with special high frame foretruck when desired.



This harrow can be used with equally good results in field, orchard and vineyard, and is especially adapted for ridging, the gangs being adjustable as to width, may be tilted and are reversible for in-throw or out-throw.

The rear side of the frame consists of two pieces of stiff channel steel, to which the gang couplings clamp. Merely by loosening the bolts of the coupling and lever clamps, the gangs may be shifted in or out to any point desired, adjustment being thus provided to the fraction of an inch; a very important feature in cotton bedding and cotton cultivation, and in cultivating any crops planted in rows. A quicker and simpler arrangement could not be devised.

Note the construction of the gangs. Three bearing boxes to each gang equipped with large solid oil-soaked hardwood bearings. Experience has proven these to be the strongest and most durable bearings made. This is one of the strong features of this disc. Each gang equipped with large oil tubes conveniently placed.

By merely removing the gang brace and loosening the lever draft bar, the gangs can be turned, and thus reversed for in-throw or out-throw. This change is accomplished in almost a moment, because of the simplicity of the lever arrangement.

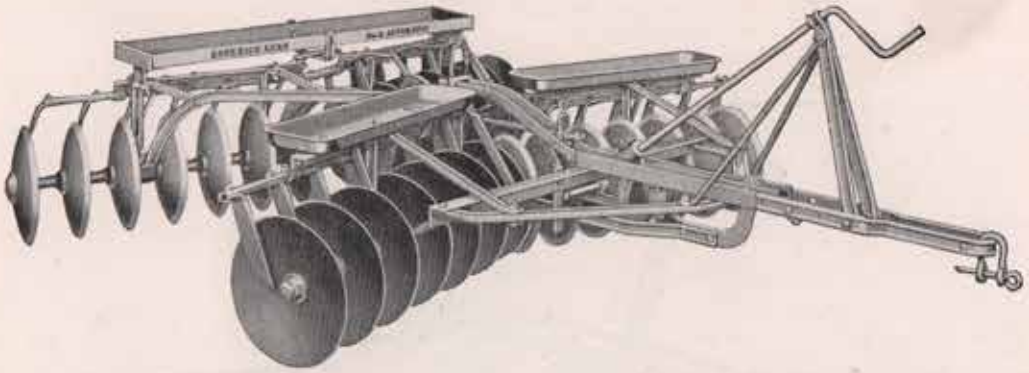
The gangs may be tilted by means of the adjustable sleeve on coupling, making the disc especially adapted for hilling purposes when desired.

Forged steel ratchets and levers with direct leverage, make shifting of gangs easy. Levers shift in or out on frame when the gangs are extended or narrowed.

SIZES AND WEIGHTS

No.	*Description*	*Weight with Pole*	*Weight with Foretruck*
99J	6 Discs, 16 inches diameter	261	295
100J	8 Discs, 16 inches diameter	303	337
105J	6 Discs, 18 inches diameter	271	305
106J	8 Disc, 18 inches diameter	317	351

Roderick Lean "Powershift" Automatic Tractor Disc



The Roderick Lean "Powershift" Automatic Tractor Disc is made in 5, 6, 7 & 8 ft. sizes, for use with any standard two or three-plow tractor.

This harrow is handled from the tractor seat like a tractor plow. There is no need of stopping the tractor and getting off to adjust the gangs. The harrow is instantly adjustable under draft to prevent stalling or overloading when working in wet or extraordinary conditions.

The adjustment of a regulating clevis connecting the harrow to the tractor determines the degree of working angle for both front and rear harrows. Full or less than full angle of gangs obtained as desired. Adjustments are QUICKLY AND EASILY MADE FROM THE TRACTOR SEAT.

It is not necessary to back the tractor to adjust the gangs. The hand lever, easy to reach from the tractor seat, and easy to turn, moves the clevis forward or back, the gangs taking the desired angle under forward draft of the tractor. If desired, when attaching the tractor to the harrow in the field, the tractor may be backed to set the clevis in the desired position, or the clevis may be slid back by hand, the gangs then taking their angle under forward draft.

For wheeling through a wet spot, over a covered stump, etc., or for transporting, merely releasing the trip on the lever enables the tractor to pull the clevis out, the gangs straightening instantly. The gangs may then be angled again by means of the lever, as explained above, without stopping, backing tractor, or dismounting.

The Roderick Lean idea of double draft bars connecting the rear harrow with the front has revolutionized tractor disc harrow construction, and makes possible more thorough work than can be obtained with any other method of trailer attachment.

Double draft bars converging from the outer ends of the gangs hold the rear section strictly to its work under the worst condition making the rear disc blades cut midway between front disc blades at all times.

Rear section cannot track with front or slide down hill on sloping ground. Draft bars curve downward at the rear to connect with the bearings, thus giving direct draft to the axles. Draft at this low point holds the rear section in the soil, making it cut equally as thoroughly as the front harrow.

The double draft bars on the Powershaft are equipped at all four points with flexible connections, permitting short turning without digging holes or piling soil, and making lightest possible draft and even depth of cultivation. This harrow turns short like a wagon and works as close in field corners as it is possible to work with the tractor.

SPECIFICATIONS

No. Discs	*Diam.*	*Width*		*Weight*
24	16-inch	6 ft.	Adjust. Scrapers	749
24	18-inch	6 ft.	Adjust. Scrapers	797
28	16-inch	7 ft.	Adjust. Scrapers	795
28	18-inch	7 ft.	Adjust. Scrapers	866

KATELMAN (OVERLAND) PACKER

There are many uses for our machine, notably the breaking of the crust and mulching for winter wheat, mulching spring seeded grain, planting corn, caring for sandy soil, saving seed, rolling listed corn, rolling planted corn and wheat.

The Overland will work behind any plow. It will not clog up.

The Overland will save your alfalfa after a hard or dry winter. When the ground is bulging from freezing and thawing and the March winds are blowing the soil away from the roots, put the Overland Packer and Sprocket Mulcher on your field. It will press the roots down in the soil and mulch the surface and save your crop.

The Overland will pay for itself in a little time in raising potatoes, fruit and vegetable farming, sugar beets, etc.

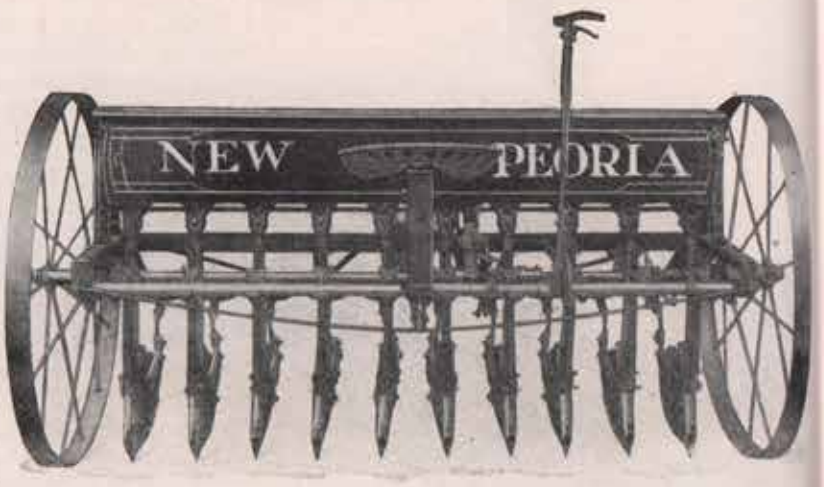
8 ft. Straight Shaft	1050 lbs.
10 ft. Straight Shaft	1240 lbs.
10 ft. Flexible Shaft	1260 lbs.

The Overland Packer and Sprocket Mulcher is an invention produced by necessity to help the modern scientific farmer build up his soil, increase his crops and get profitable returns from his high-priced land. It has been commended by most of the leading agricultural colleges and schools in the country.

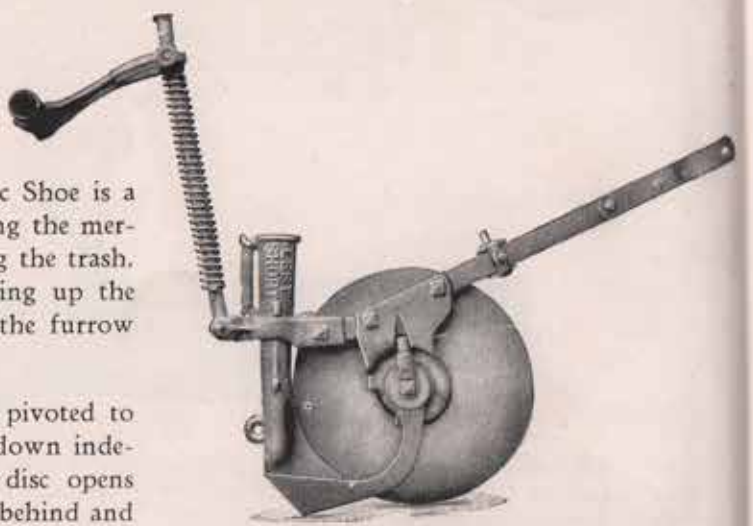
The Overland Packer and Sprocket Mulcher is made of a series of loosely mounted wheels with a three-inch face and an "A" shaped center, on the inside of which are the loosely mounted rim with cogged or toothed edges. The "A" shaped wheel, which does the pulverizing and packing, is mounted loosely on the shaft and turns on the same. The shaft also turns in the boxing so that all wheels may turn at one time or each individual wheel may turn by itself, carrying with it the cogged rim which does the mulching. The cogged rim being carried on the "A" shaped wheel has sufficient play to make it work like an eccentric and allows it to press out beyond the face of the smooth wheel at the rear, continuously, which serves as a self-cleaner to the roller. This eccentric mounting of the cog rim inside of the rim of the smooth wheel allows the rim to fall behind the smooth wheel in its revolutions with the same, just far enough to tear up the surface of the packed ground after the smooth wheel has passed over it, making a loose mulch of from half an inch to an inch deep on top of the soil. This prevents crusting and thereby eliminates evaporation of the moisture by capillary attraction.

12 ft. 3-Section Roller	1575 lbs.
15 ft. 3-Section Roller	1930 lbs.

PEORIA DRILLS



We invite the most careful comparison with other makes. Simplicity in construction, durability and ease of operation have been the aim of the builders and money cannot buy a better made drill, as they are not made. The framework of the various styles of New Peoria Drills is the same, enabling the owner to change his drill from a disc shoe to a double disc or hoe drill, or vice versa, as he may desire. Before entering into a detailed description of each of these drills, we wish to point out a few of the advantages in general construction applying to all Peoria Drills. These features as found on the Peoria are guaranteed to be the most modern and up-to-date construction. We desire to call special attention to the drop frame (no extra castings to break here), which permits the use of a short draw bar, thereby insuring greater strength.



New Peoria Disc Shoe—The Disc Shoe is a combination disc and shoe embodying the merits of both the single disc for cutting the trash, penetrating the hard soil and opening up the furrow. The shoe is for forming the furrow and depositing the seed.

The forward end of the shoe is pivoted to the disc bearing and works up and down independently of the disc. After the disc opens the furrow the shoe follows directly behind and deposits the seed on a packed seed bed and none of which can, at any time, come in contact with the revolving disc. This assures for the seed the three essential requirements to make grain grow—heat, air and moisture.

The shoe travels the same depth as the disc. No loose dirt can fall into the furrow until after the seed is deposited. The seed is always deposited at the bottom of the furrow on a packed seed bed.

SIZES AND WEIGHTS

Size	*No. of Poles*	*No. of Horses and Style Hitch*	*Width Tires*	*Disc Shoe Weight, Lbs.*	*Double Disc Weight, Lbs.*	*Hoe Drills Weight, Lbs.*	*Grass Seed Attachment Weight, Lbs.*
10-6	1	2, with neckyoke	3 inches	815	830	690	32
20-6	2	6, with equalizer	4 inches	1635	1590	1250	65
20-6		Tractor drill, with power lift.		1700	1645	1400	65

Other sizes can be secured from factory in 10 days on special order.

PEORIA FERTILIZER DRILLS

PEORIA UNION COMBINED FERTILIZER AND GRAIN DRILLS

It is built very similar to the New Peoria, but has a two-compartment hopper, one for grain and one for fertilizer.

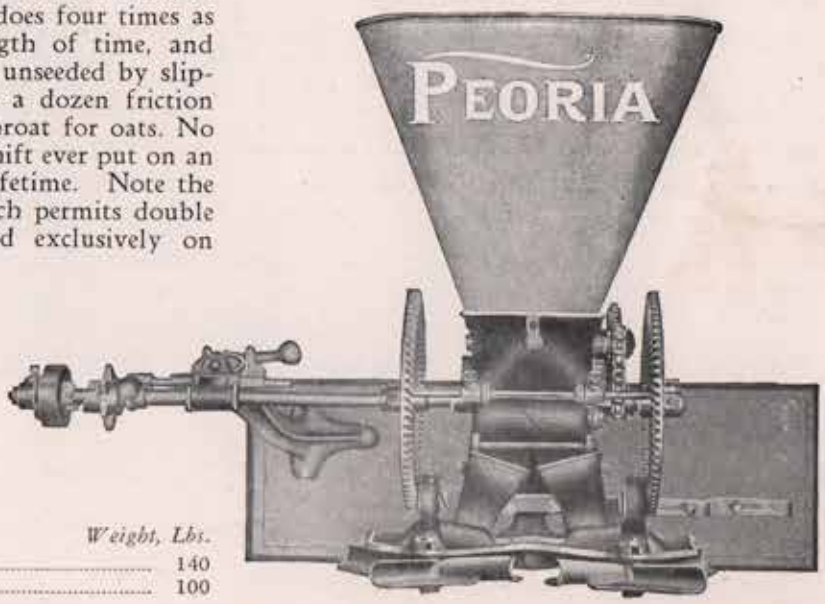
You do not have to use both grain and fertilizer parts at the same time, if you do not desire to. You can sow fertilizer without the grain part running, or vice versa. By this means, it is possible to fertilize ground on which planted crops will be grown, such as potatoes, corn, etc., or sow grain at any time while the fertilizer part of your drill is not running and wearing out. You really have two separate drills in one.

It is regularly equipped with the Disc Shoe, the Double Run Grain Feed and Improved Star Fertilizer Feed and makes a combination which has proven itself the best and most economical combined drill made. The Peoria Union is the last word in drill perfection. Think of it! With this drill and without an additional part, 70 different gradually increasing quantities of fertilizer can be sown.

Factory Shipment only. Weights and Special on Request.

PEORIA ENDGATE SEEDERS

Will cast oats 45 to 50 feet, costs less than an 11-foot wheel seeder and does four times as much work in the same length of time, and does it better. No space left unseeded by slipping of gear. Will outwear a dozen friction drives. Force feed. Large throat for oats. No choking. Simplest winding shift ever put on an endgate seeder. Will last a lifetime. Note the helical gear construction, which permits double possible. Noiseless gear used exclusively on Peoria endgate seeders.

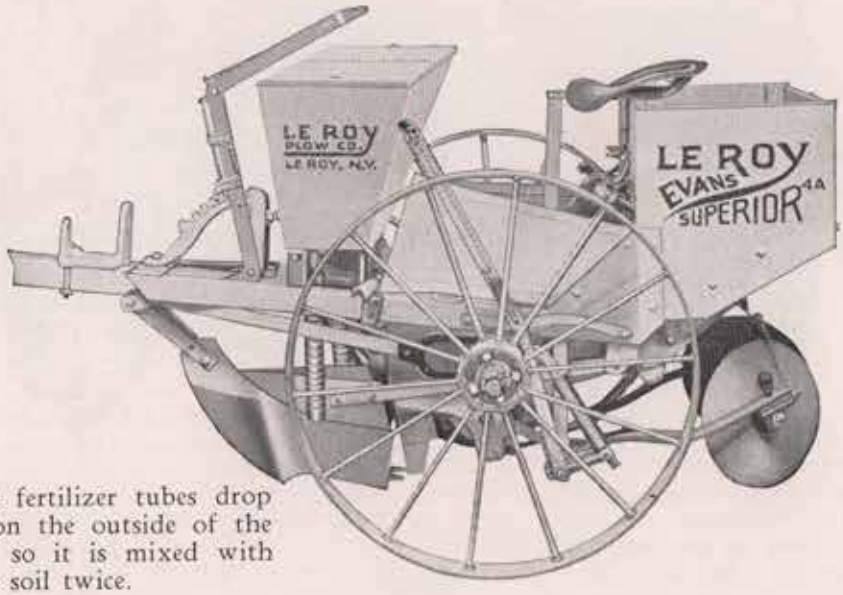


CASTS

	Ft. Wide
Timothy	30
Clover	45
Oats	45
Alfalfa	45
Rye	60
Barley	65
Wheat	65

	Weight, Lbs.
Peoria Double Fan Endgate Seeder	140
Peoria Single Fan Endgate Seeder	100

LE ROY (EVANS-SUPERIOR) POTATO PLANTER



Note that the fertilizer tubes drop the fertilizer on the outside of the opening plow so it is mixed with the soil twice.

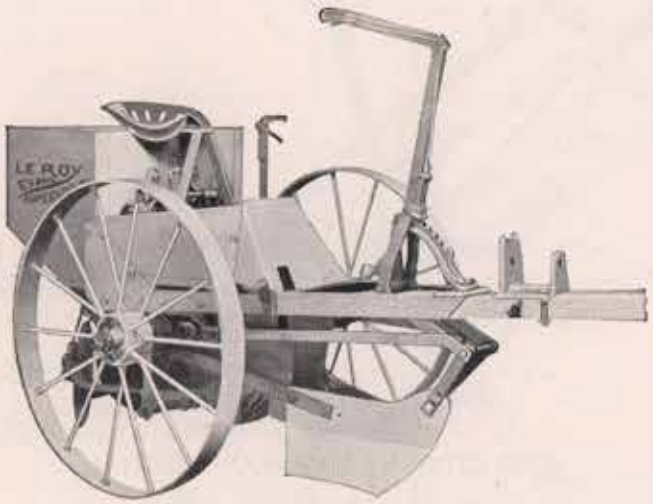
ONE ROW PLANTER WITH FETILIZER DISTRIBUTOR

This is the original well known Evans Potato Planter, now made under the name of LeRoy. It is lighter draft than others: the main bearings are Hyatt Rollers. Uniform Planting—by two rows of pickers, dropping the seed almost directly under the axle at even depth, and in plain sight of the operator. Large Seed Hopper with vibrating bottom and adjustable feed gate. Three bushel capacity. Fertilizer Hopper, when furnished, is also three bushel capacity, with positive adjustable force feed. Strong Main Wheels, 36x4 inches. Both wheels drive. Works perfectly on hillsides. Adjustable spacing—Plants 10, 12, 14, 18, 28, or 36 inches apart in the row. Two Levers—One regulates opening plow and planting clutch, the other controls covering discs so they cover clear to end of row. Disks are adjustable to any width and height of ridge desired. Adjustable Disc Row Marker. All working parts carefully shielded. The entire planter is painted a handsome dark green.

	Weight
Regular One Row Planter, plain	630 lbs.
Fertilizer Attachment, extra	75 lbs.

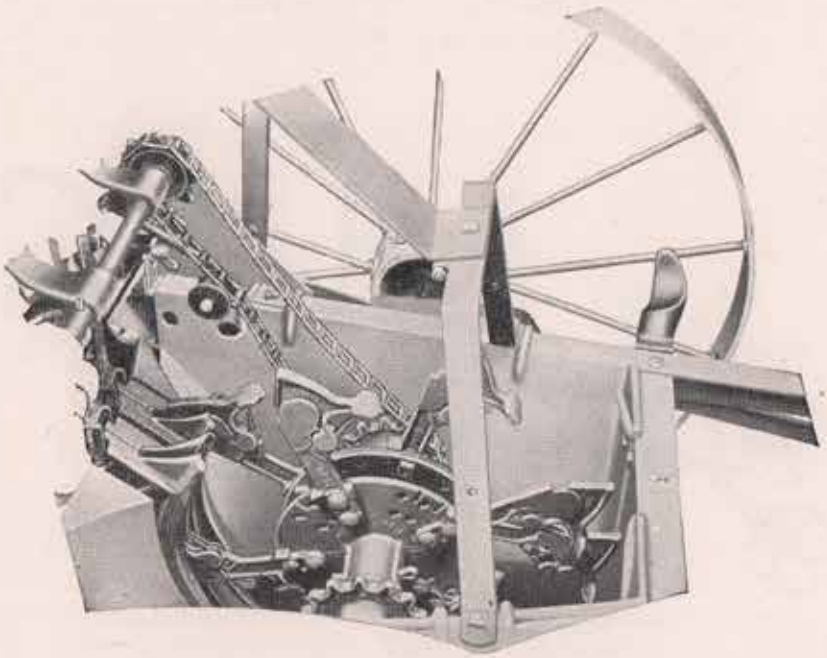
Le Roy (Evans-Superior) Potato Planter

Continued



Regular One Row Planter

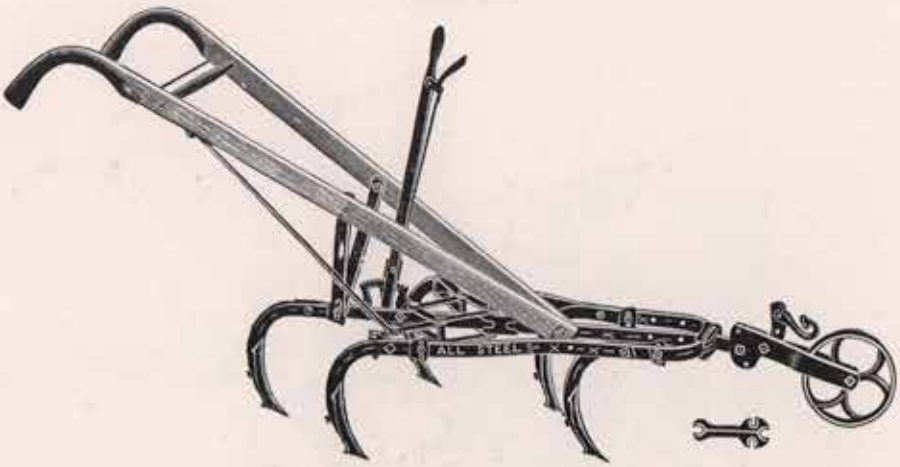
A good row marker is regular equipment. Iron on pole shows where it is attached.



Detail View of Working Parts

All working parts are shielded, yet in plain view of the driver.

ROSE CITY CULTIVATORS

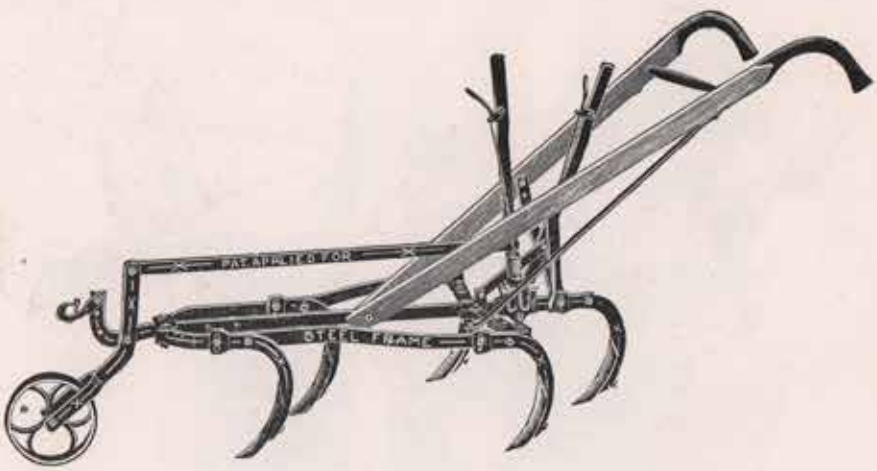


ROSE CITY FIVE-TOOTH CULTIVATORS

No. 1

The above cut represents the Rose City Five-Tooth Cultivator in its most popular form—with expanding lever, plain gauge wheel.

Will cultivate most any crop—potatoes, corn, beans, peas, tomatoes, melons, blackberries, etc. Can be furnished with Horse Hoe Attachment. See next page.



No. 2

The No. 2 Rose City Cultivator is identical with the No. 1, except that it has a lever wheel instead of a plain wheel. The steel lever is attached to forward part, but the handle is in easy reach—with it you can regulate the working depth while the tool is in motion—a good time-saver in the busy season. Can be furnished with Horse Hoe Attachment. See next page.

ROSE CITY CULTIVATORS

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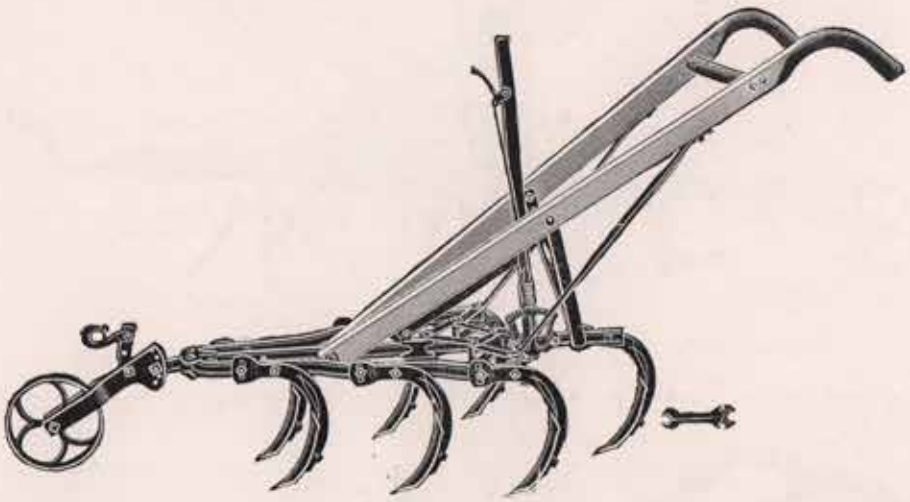
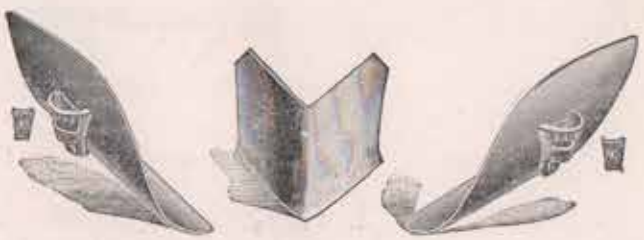


No. 3—7 Tooth

The Rose City Seven-Tooth Cultivator is of the same general construction as the No. 1 five-tooth as previously described, excepting that it has two extra teeth. These two teeth may be removed if desired, making a five-tooth cultivator.

PLAIN FRONT GAUGE WHEEL

ONE SET HORSE HOE ATTACHMENTS



	Weight
No. 1. Rose City 5-Tooth Cultivator with Plain Gauge Wheel	58
No. 2. Rose City 5-Tooth Cultivator with Lever Gauge Wheel	63
No. 3. Rose City 7-Tooth Cultivator with Plain Gauge Wheel	65
For one set of Horse Hoe Attachments add	
For Gauge Wheel not taken, deduct	5
Plain Gauge Wheel only, as extra, add	5
Lever Gauge Wheel only, as extra, add	10
Horse Hoe Attachments, as extra, add	7½

ROSE CITY SPRING-TOOTH CULTIVATORS

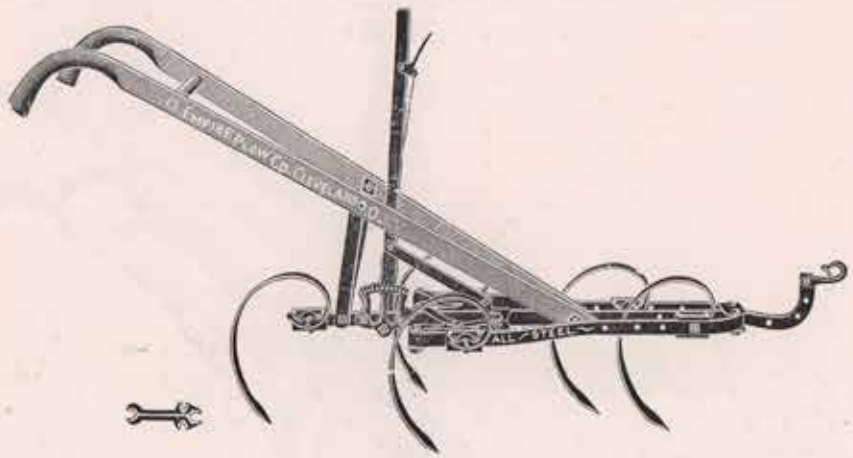


Fig. 10

With 5 spring teeth. By the use of the lever the spring teeth may be set at any angle.

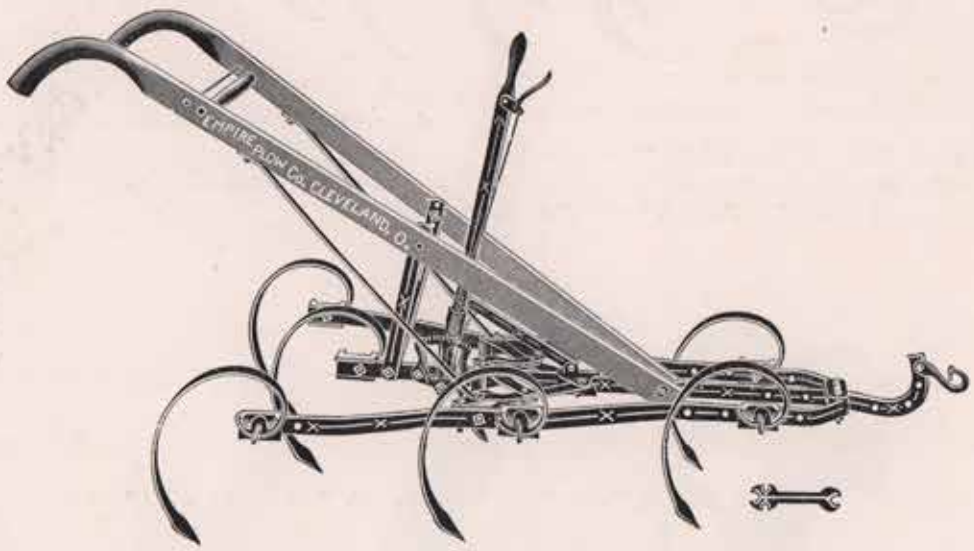


Fig. 11

Fig. 11 is similar to the cultivators shown above, but has 7 spring teeth. Both styles can be equipped with gauge wheel, such as is used on the Rose City Cultivator.

These spring-tooth cultivators are very suitable for deep cultivation between rows. The spring teeth loosen up the soil nicely and will bring all foul weeds and roots to the surface.

ROSE CITY SPRING-TOOTH CULTIVATORS

	Weight, Lbs.
Fig. 10 With 5 spring teeth	51
Fig. 11 With 7 spring teeth	65
Add for plain gauge wheel	7

ROSE CITY CULTIVATORS

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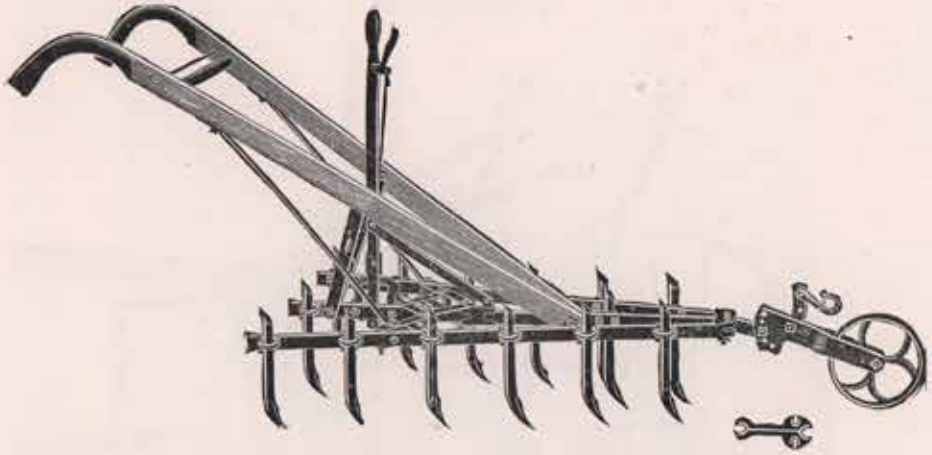
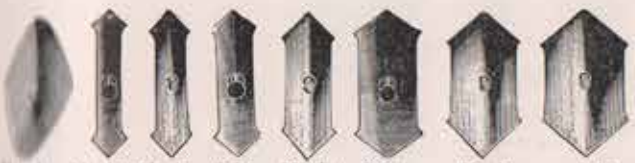


NO. 4 ROSE CITY COMBINED HARROW AND CULTIVATOR

No. 4 represents our Rose City Combined Harrow and cultivator, a tool that has, since its introduction, seemed to go "right to the spot" among farmers over the Northwest. As plainly shown in cut, the teeth are diamond shape, with a small cultivator tooth forged on one end—steel, of course. For very close work, every other tooth can be quickly removed.

Rose City Cultivator Teeth. "Thistle" Sweeps and Furrows



No. 1 Oval | 1¼ in. wide | 1½ in. wide | 2 in. wide | 2½ in. wide | 3 in. wide | 3½ in. wide | 4 in. wide

Sweeps

Furrowers

	Weight, Lbs.
No. 4. Rose City Combined Harrow and Cultivator with Plain Gauge Wheel	58
Add for Lever Gauge Wheel in Place of Plain Gauge Wheel	5
Deduct for Plain Gauge Wheel	5

CULTIVATOR POINTS, THISTLE SWEEPS AND FURROWERS

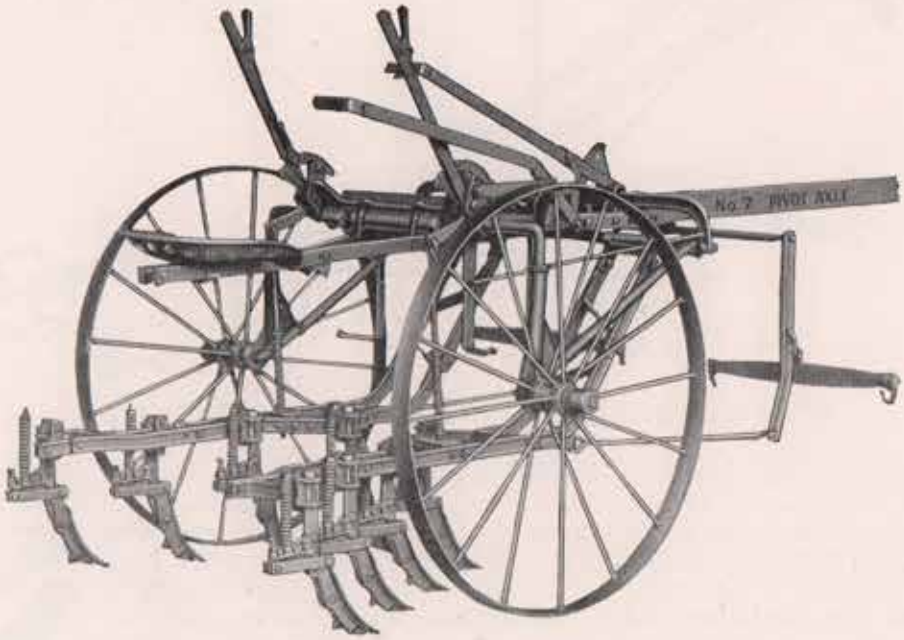
	Weight, Lbs.
No. 1 Oval with Bolts, per 100	96
1¼-inch, with Bolts, per 100	61
1½-inch, with Bolts, per 100	66
2-inch, with Bolts, per 100	72
2½-inch, with Bolts, per 100	73
3-inch, with Bolts, per 100	76
3½-inch, with Bolts, per 100	96
4-inch, with Bolts, per 100	106

	Weight, Lbs.
6-inch Sweeps with Bolts, per 100	100
8-inch Sweeps with Bolts, per 100	124
10-inch Sweeps with Bolts, per 100	137
12-inch Sweeps with Bolts, per 100	150
14-inch Sweeps with Bolts, per 100	200
15-inch Sweeps with Bolts, per 100	210
10-inch Furrowers, per 100	325
12-inch Furrowers, per 100	450
15-inch Furrowers, per 100	525

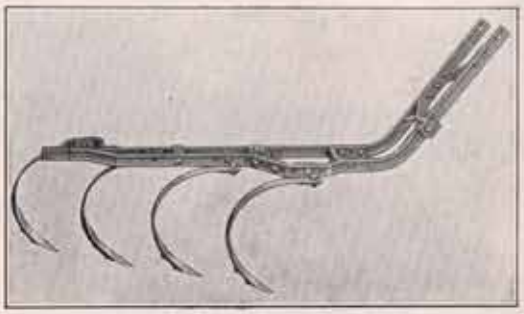
RIGHT AND LEFT HAND SWEEPS FOR CULTIVATORS

	Weight, Lbs.
No. 23. 6 inches, R. or L.	124
No. 23. 7 inches, R. or L.	130
No. 23. 8 inches, R. or L.	137
No. 23. 9 inches, R. or L.	145

RODERICK LEAN No. 7 PIVOT AXLE CULTIVATOR



The latest, most advanced ideas of cultivator building have been embodied in this new cultivator. For corn, beets, and all row crops, the user will find the No. 7 exceptionally easy to operate, thorough in its work, and a machine of unusual strength and long life.



No. 7 Pivot Axle Cultivator Gang Equipped With Spring Teeth

In building the No. 7, special attention has been given to arch and axle construction. The method used of telescoping the axles into a heavy one-piece frame arch provides a rigid frame and arch of great strength that assures thorough, accurate work at all times. This construction also means that axles are always vertical, whether gangs are up or down.

Quick and easy shifting of gangs and pivoting of axles is a most desirable feature on any pivot axle cultivator. On the No. 7, foot pedals are directly connected to gang drag bar support, which shifts on steel rollers. There are no chains, pulleys, etc., and friction is reduced to a minimum, action on gangs and axles is quick and positive. One of the best shifting arrangements on any cultivator.

RODERICK LEAN No. 7 PIVOT AXLE CULTIVATOR

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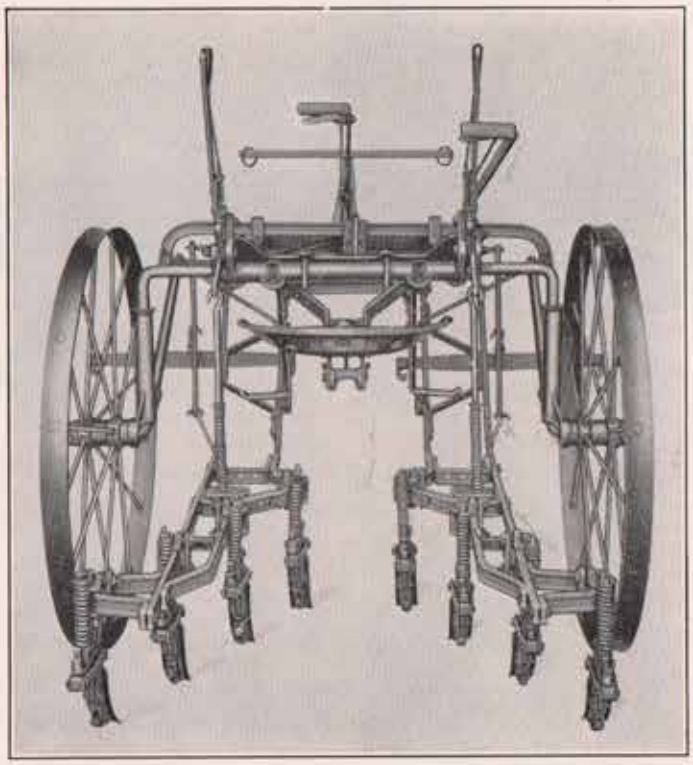


The No. 7 has every feature necessary for thorough work, and for all conditions. Widths of the arch is changed by simply moving axles in and out of frame arch. Axles are held rigidly in place by two dowel pins.

For adjusting width between the gangs and bringing them toward or away from the row, a small hand lever is located directly in front of the driver.

A conveniently reached lever at the rear of the pole levels the gangs at any depth, also sets the rear shovels to cut deeper than the front, or vice versa.

Independent levers for each gang, permit the user to quickly clear the gangs of trash, while the master lever raises the gangs for turning, transporting, etc.

SIZES AND WEIGHTS

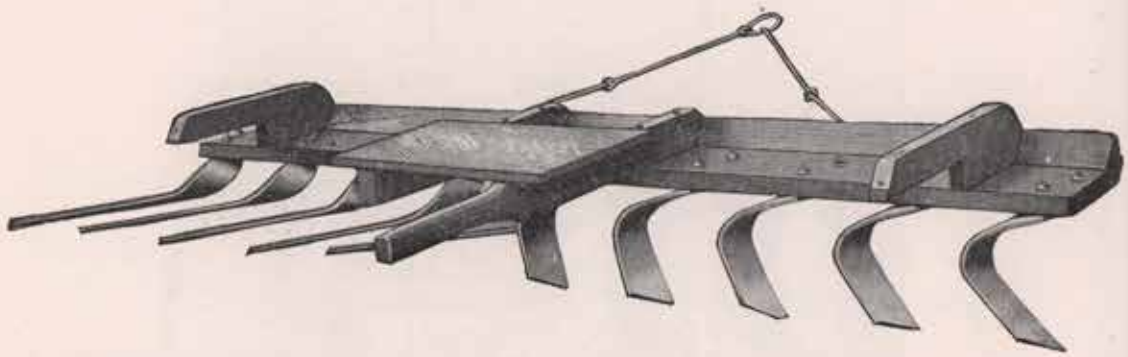
Cult. No.	*Description*	*Gang Nos.*	*Wt.*
7	6 Shovel Pin Break	706P	443
7	6 Shovel Spg. Trip	706S	467

All Posts Round. Boots—Round, with Clamp Back Shovels, or Slotted, with Double-Pointed Backless Shovels.

The seat is removable on the frame, adjustable to leg length, and can also be folded upward to give access to fenders.

The Disc Hiller is mounted on DUST-PROOF MACHINED STEEL BEARINGS. Fits in the same clamp as Round Post on No. 7 Cultivator.

WADE WEEDERS



Showing Weeder with the teeth set for general field work.

The Wade Weeder is a very efficient tool for the extermination of weeds.

The blades are made of high carbon steel and have sharp cutting edges and have a cutting surface of 24 inches. They are solidly bolted to frame, are 3 inches wide and 3/8-inch thick, which give them ample strength to withstand the strain to which a tool of this kind is subjected. Teeth may be set in for orchard work. The frame is made of No. 1 Douglas Fir and the entire machine is fully guaranteed against defects in material and workmanship.

The Wade Weeder is a western product built especially to meet conditions of the Northwest.

They are also used extensively in the semi-arid sections for mulching and assist greatly in retaining the moisture.

SPECIFICATIONS

Size	*Description*	*Weight, Lbs.*
6 ft.	Wade Weeder	156
8 ft.	Wade Weeder	187
10 ft.	Wade Weeder	220
12 ft.	Wade Weeder	240

MORGAN GRAPE HOE

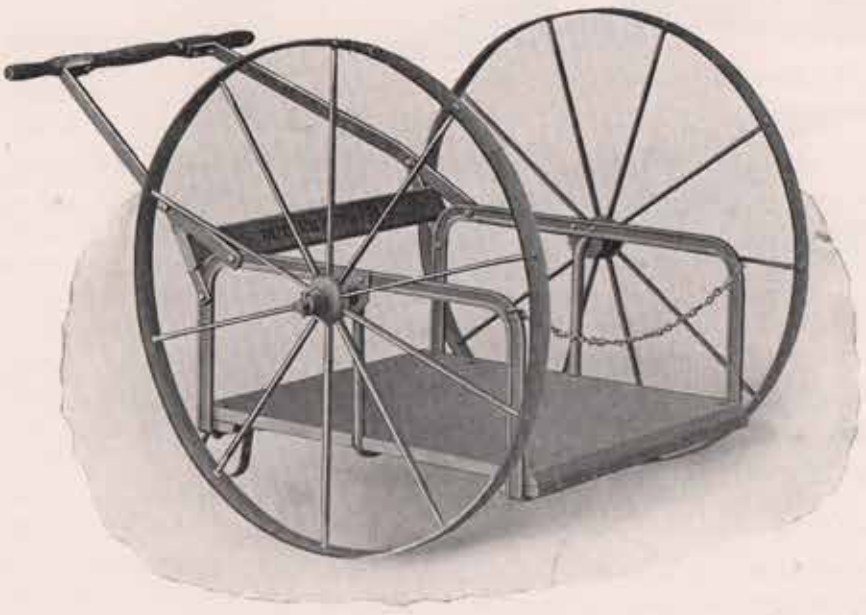
The original Morgan Grape Hoe has been known for years as a wonderful labor saver in the cultivation of grapes and berries and is especially adapted to vineyard work. It not only does the work more quickly but, in many instances, better than can possibly be done by hand.

One horse is used and the tool is adjustable to any width of row. Without any especial attention being paid to the driving, the hoe is accurately guided in and out around the vines or stakes by the disc castor wheel, to which a handle is attached. The horse is hitched to one side of the pole, with ample room for the hoe to work under the vines without any danger of injury to them from the horse or the hitch.

The saving of time and labor in the use of this tool will pay for its cost several times over in one season.

Morgan Grape Hoe, Weight, 100 lbs.

LOW PLATFORM MILK CART

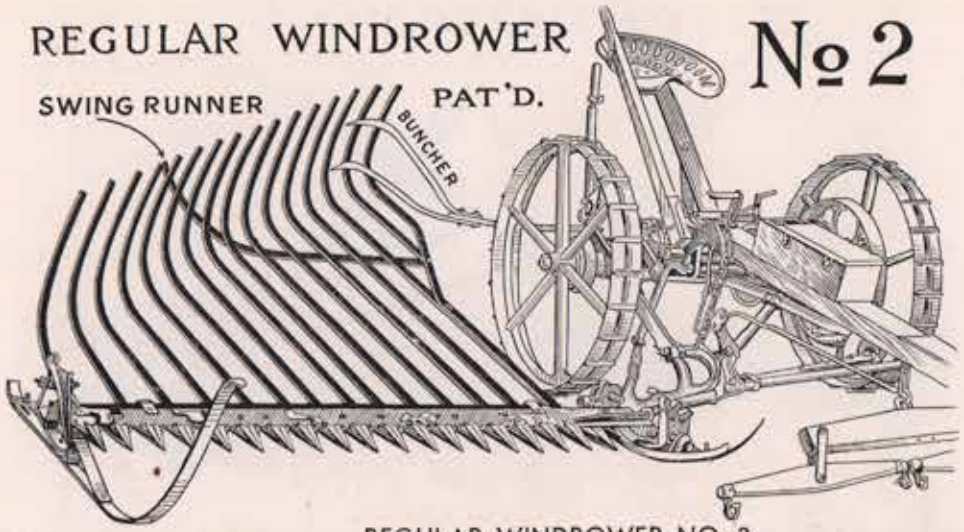


Wheels 36 inches high, tire 2 inches wide; axle 7/8 inch round. Frame of cart made of steel, carrying a low platform 27x32 inches. Capacity 500 to 600 pounds.

Very sturdily built; not a light constructed cart. This cart is specially designed for carrying milk cans.

Low Platform Milk Cart, Weight 100 lbs.

REGULAR WINDROWER No 2



REGULAR WINDROWER NO. 2

Windrows and Bunches Clover, Alfalfa, Flax, Vetch, Green and Ripe Peas

GATERMAN WINDROWER AND BUNCHER

No. 5 Lifter Guard Binder or Mower

No. 2 B Lifter Guard—Pea Guard for Mowers

No. 4 B Lifter Guard for Champion

Farmers have found that this is the ideal way to gather clover for seed and that the Gaterman is the ideal windrower.

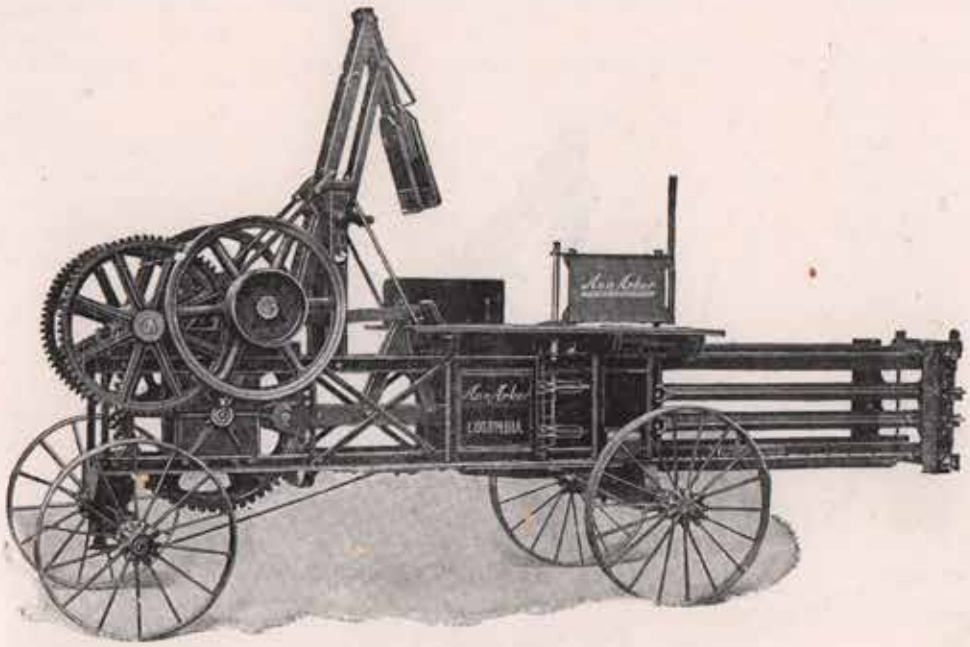
It windrows perfectly, gathering everything whether short or tall, and deposits it at the rear, behind the mower, leaving a clear track for the next round. It will save its cost in a few days' work.

It comes regularly without the buncher shown above. This buncher is attached to the seat spring and holds the load on the fingers and is tripped by a foot lever, depositing the load in neat bunches instead of windrows.

A Swing Runner is riveted onto the offset bar which swings under the windrower bars, and lifts them from the ground to prevent the slat bars from catching and bending in turning corners.

	Weight, Lbs.
Gaterman Windrower for 4½-foot mower	60
Gaterman Windrower for 5- foot mower	65
Gaterman Windrower for 6- foot mower	75
Gaterman Windrower for 7 and 8 foot mower	—
Gaterman Buncher Attachment for above	15

ANN ARBOR HAY BALERS



ANN ARBOR "COLUMBIA"

THE PIONEER STILL AT THE FRONT FOR HEAVY SERVICE—The Ann Arbor "Columbia is the original of the Ann Arbor line. It is the machine that established their reputation years ago. It has successfully withstood more use and abuse than any other hay press on the market. The Ann Arbor "Columbia" is a double-geared press. Its capacity is from 125 to 175 pounds to the bale, and it bales from 30 to 70 tons of hay a day, according to the power used. The Ann Arbor "Columbia" is known for making a clean bale which is due to their self-cleaning folder or tucker which absolutely over-comes the "mangy" or bristly appearance of bales from ordinary machines. It is an all steel machine. We confidentially believe that no hay press was ever built that could produce more work at the same cost or give longer service than the Ann Arbor "Columbia." Hundreds of letters received from users support that conclusion.

HEAVY DUTY WITH GREAT CAPACITY—The Ann Arbor "Columbia" should be selected by those who are making a business of baling the year through and who must have a machine which will do business all the time and under all conditions of weather, crop and crew.

See Page 75 for specification and further information.

ANN ARBOR HAY BALERS

THE ANN ARBOR "40"

Single or Double Gear

The Ann Arbor "40" possesses practically all of the desirable features implanted in the "Columbia". It is double-geared throughout therefore affording the same perfect balance and distribution of power. This machine can also be furnished in single gearing. Being somewhat lighter in weight than the "Columbia" it can be easily transported from one job to the other by any team or tractor. Bales from 125 to 150 lbs. can be made with this baler and from 25 to 30 tons of hay a day can be baled easily.

For further specifications see the following page.

ANN ARBOR HAY BALERS

SPECIFICATIONS ON ANN ARBOR HAY PRESSES

	COLUMBIA	NO. 40
Capacity, tons per hour	30-70	25-50
Horse power required	10 to 20	8 to 12
Revolutions per minute	515	625
Size of pulley	14" dia., 8" face	14" dia., 8" face
Tying space	67"	67"
Weight	6475 lbs.	5060 lbs.
Size of feed opening	25"	21¾"
Length of stroke	32"	28"
Beats per minute	22"	22"
Length of baler over all	17' 9"	15' 11"
Width of baler over all	70"	70"
Height of machine with feeder-head up	10' 3"	9' 4"
Height of machine with feeder-head down	7' 7"	6' 6"

The above specifications give you the information on the capacity of the Ann Arbor machine and we are listing below some of the many fine Ann Arbor features. If you desire any more information on the Ann Arbor Baler write to us and we will be very pleased to send you circulars or any other information.

Whichever Ann Arbor you buy, it is the result of our honest, painstaking effort to give it:

Strength and Durability—

Simplicity—Absolutely no complicated parts.

Ease of Running—All the power furnished is used to bale hay. No power wasted in the mechanism.

Ability to Do Quality Work—No better bales could be made than the Ann Arbor produces.

Large Capacity—The day's work tells. So does the bank account.

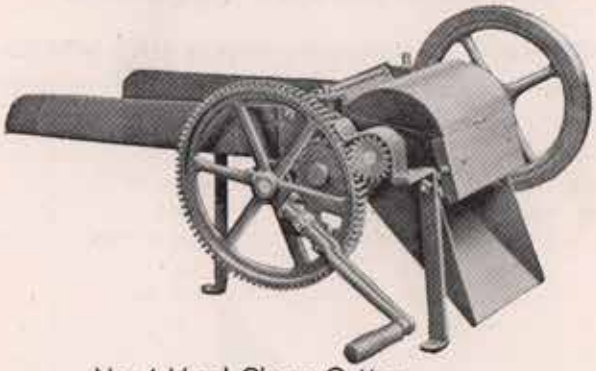
SOME DISTINCTIVE FEATURES

1. Patented Quick-Return Feeder—Positive, but gentle in action. Saves alfalfa stems.
2. The Ann Arbor Feed Opening—The largest on any press. Also a mighty saver of alfalfa food values.
3. Belt Power Transmission—The "elastic drive."
4. Even-Load Fly Wheel Mechanism—A great equalizer of engine pull.
5. Gears Revolving on True Centers—No jerks; can speed up safely to any desired point.
6. Ann Arbor Block-Dropping Device—Works easily when you want it, not before. Out of the way at side of opening.
7. Ann Arbor Folder—Absolutely perfect bales from the Ann Arbor.
8. Low-Down Construction—Measure height of opening from ground. No complicated, trouble-giving carrier necessary.
9. Long Tying Chamber—Gives the man tying every possible chance.
10. Ann Arbor Durability.
11. Low Upkeep—Average upkeep on Ann Arbor presses last year—many of them over 20 years old—$3.17.

CROSS-HEAD BALE TIES

Per bundle of 250 ties, length 9½, No. 15 wire, weight per bundle about 36 lbs.

HAND FEED CUTTERS



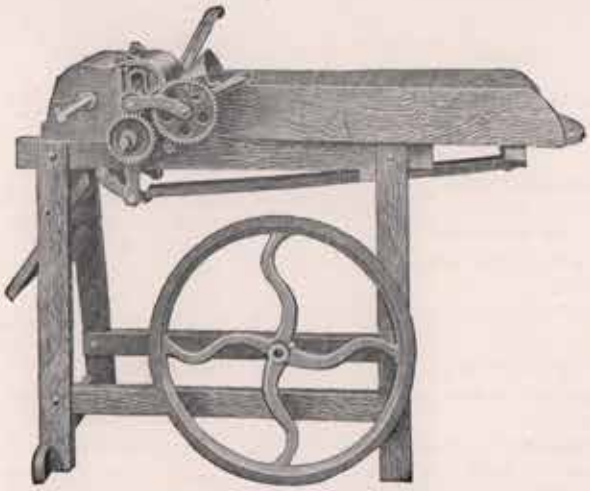
No. 4 Hand Clover Cutter

The No. 4 Hand Clover Cutter—a good substantial machine that will do the work for which it was intended in a highly satisfactory manner.

It cuts either green or dry clover, alfalfa, vegetable tops, etc., into the ⅛-inch lengths most suitable for poultry.

The cylinder head, similar in construction to our large feed cutter, consists of two malleable iron heads to which four knives 7 inches long are bolted. These steel knives work against a hardened iron adjustable cutting bar, and are easily removed for sharpening.

The machine has two corrugated feed rolls. The upper one governed by two tension springs, raises and lowers as the machine is fed. Machine can be mounted on a bench or box.



No. 7 Hand Feed Cutter

This is the smallest of our uniform cutters. It contains all the important features of the larger sizes, such as the change in the length of cut without changing gears, safety stop lever, etc. The frame is made of hardwood with mortise and tenon joints and is exceptionally well braced. The feed table is broad and deep and of good length. Feed rolls are governed by an equalizer bar and spring so that both ends of feed rolls are raised equally and there is no binding in the boxes. This machine has the adjustable cone feed gearing by which length of cut is changed, and is furnished with two 8 inch knives. These knives are made of tempered steel and are secured to the knife heads by knife bolts and have adjusting screws for setting and holding knives in the proper position.

Length of cut—⅛-inch, 5/16-inch, or ½-inch.

Capacity per hour—Dry fodder, 150 to 200 lbs. Green fodder, 300 to 400 lbs.

No. 4 Hand Cutter, Weight, 70 lbs.
No. 7 Hand Cutter, Weight, 150 lbs.

THOMPSON'S BANNER ROOT CUTTERS

For beets, mangels, turnips, carrots, pumpkins, etc. Banner Cutters have small scoop-shaped knives which cut the roots into long, narrow thin strips, like shavings. These pieces are easily eaten and digested by all livestock, even by young lambs. Roots prepared for poultry by a Banner Cutter largely increase the number of eggs obtained during winter months.

NO. 20 BANNER CUTTER

Is the most popular size machine for general use. Shaker grate in bottom of hopper sifts out dirt and feeds roots to the knives with certainty. Operates with a hand crank, as shown, and will easily cut from 30 to 50 bushels of roots per hour. Used for cutting feed for cattle and hogs, not for poultry feed. The cutting wheel has 20 hardened steel knives, which are easily removed for sharpening or replacement. Weight 120 lbs.

NO. 15 BANNER CUTTER

Is the same machine as the No. 20, but is equipped with a pulley for hand or power operation. Weight 130 lbs.

NO. 7 BANNER CUTTER

Is made exclusively for cutting poultry feed. It is a hand operated machine, light running and of good capacity. Cuts the feed into fine ribbon-like strips, in fact shreds it; thus providing green food, in easily digested form, the year round. Result, abundant egg laying during the winter months, which all poultrymen want. Two to five minutes' operation will cut enough feed for a large flock of chickens. Weight, 35 lbs.

NO. 28 SHREDDER OR SLICER

Cuts roots and vegetables such as potatoes, onions, apples, turnips, cabbage, etc. Shreds into ribbons. A wonderful machine for large poultry flocks, sheep or lambs. Eight wide steel knives fitted to 28 inch platter plate gives great cutting capacity. Knives may be easily removed for sharpening. Hopper is shaped for self-feeding. A bottom grate sifts dust and dirt away from roots before cutting. Capacity of hopper 2½ bushels. This model is designed more particularly for power operation, but can be operated by hand. Knives are reversible to cut in flat pieces if desired. Weight, 180 lbs.

NO. 10 SMALLEY ROOT CUTTER

The No. 10 Root Cutter is provided with combination knives, one edge being straight for slicing and the other grooved for pulping. The slotted hole in the knife permits of its adjustment for fine or coarse cutting, also compensates for wear on the blade. Roots can be pulped so fine that even calves or fowl may be fed on them without danger of choking.

Cut shows the combination knives, heavy fly wheel and shaft used on the No. 10 Pulper and Slicer. The knives can be adjusted for fine or coarse cutting. They are guaranteed to do more and better work with the same power than any other root cutter or pulper, regardless of price.

Capacity per hour—Hand, 20 bushels; power, 60 bushels.

Root Cutter No. 10, for hand only	205 lbs.
Root Cutter No. 10, for hand and power	218 lbs.

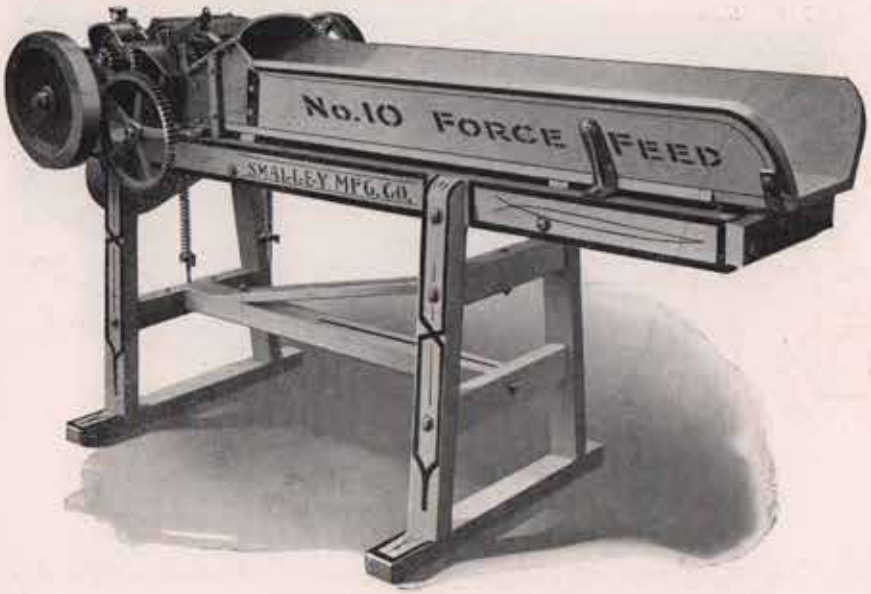
NO. 11½ SMALLEY FEED CUTTERS

	Weight, Lbs.
No. 11½, 2 knives, 2 length cut, hand only	215
No. 11½, 4 knives, 2 length cut, hand only	215
For Power Pulley, add	15

Many farmers who own large power cutters find the Smalley a good investment because it is a machine of such wonderful capacity that it can be used for cutting feed for a large-sized herd of stock, thus saving the necessity of "steaming up" a power cutter or getting out teams in bad weather to operate the big machine. This machine is of the latest improved style, and fills the requirements for a complete form cutter. It has an extra heavy hardwood frame and box equipped with 2 or 4 steel knives 11½ inches long, and cuts ¼, ½, and ¾-inch lengths. Its capacity is, per hour, green fodder, 600 to 800 pounds; dry fodder, 300 to 400 pounds. While this is a "hand only" machine, and is so recommended, we can, when desired, furnish a fly wheel pulley, and the cutter can be driven by power. Do not overlook the famous Smalley Patent Safety Fly Wheel. This cutter has it and it is warranted the best and most rapid hand power feed cutter on earth.

Floor space needed to operate, 2 feet 8 inches by 4 feet 4 inches.

SMALLEY ENSILAGE CUTTERS



No. 10 Force Feed Cutter

NO. 10 SMALLEY FORCE FEED ENSILAGE CUTTER

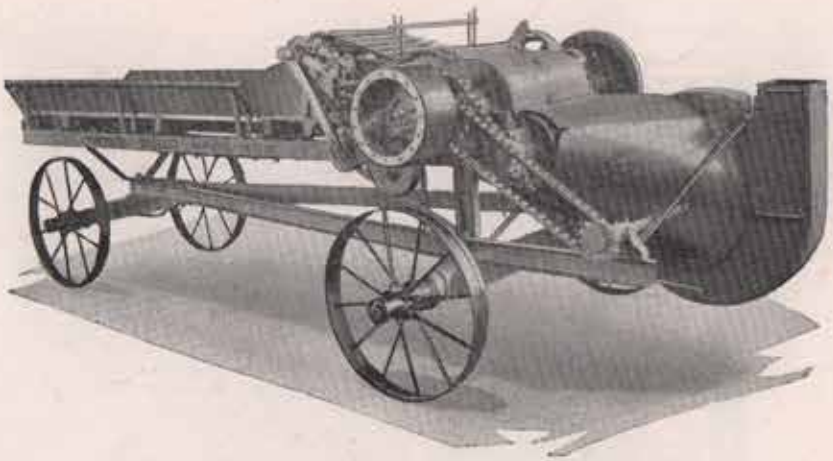
The No. 10 Force Feed Cutter is the smallest size of the force feed type manufactured. It was built to fill the want of farmers having small herds and for silos from 20 to 30 feet high.

The No. 10 Force Feed Cutter is built with hardwood frames, flaring feed table and has two traveling Grip Hook Force Feed Chains. Has lever for starting and stopping, but does not have the reverse. In case of emergency the patented chain drive works the same way it does on larger outfits. The sprocket on the knife shaft will run loose on the tapered end of the shaft and the knives and rollers stop. The machine is made with two feed rollers, but without the paddle roller, which is unnecessary in a machine of this size. It will cut ensilage, hay and straw or such other material as the other sizes, but, of course, does not have the capacity of the larger machines. Its capacity is from 2 to 4 tons of ensilage an hour. Horse power required, 4 to 6 gasoline. Can be used with or without blower or carrier. The blower is furnished with 6-inch galvanized pipe, and a small distributor can be furnished when specified.

	Weight, Lbs.
No. 10 Force Feed Cutter (no blower or carrier)	385
No. 10 Force Feed Cutter with blower and pipe for 30-ft. silo	815

For description of blower or carrier, see following pages.

SMALLEY BLOWER AND MOUNTING



NEW ALL-STEEL SMALLEY

The Smalley Cutter can now be furnished in either steel or wood frame in four large sizes of No. 20, 26, 36 and 40. Specifications and various equipment given on the following pages.

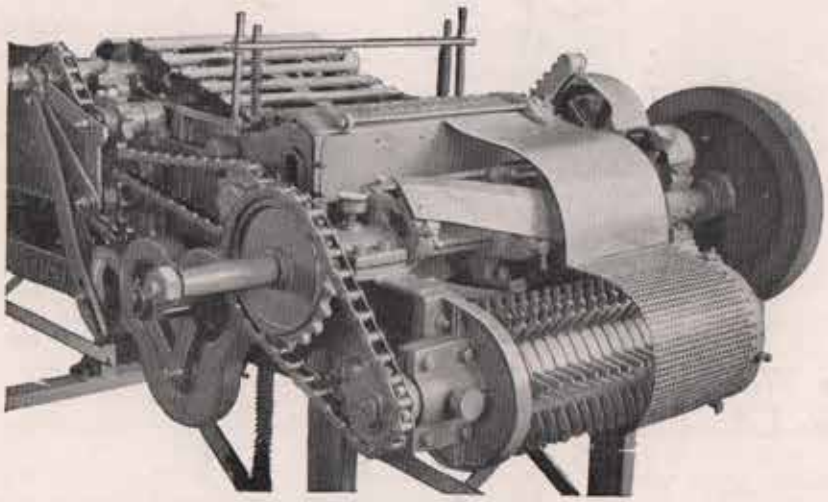
GRIP-HOOK FORCE FEED AND CHANNEL IRON TOP APRON

The traveling grip hook feed table and the channel iron top apron used on the Smalley heavy duty alfalfa cutters as per illustration above is the most efficient and self-feeding mechanism known for big capacity alfalfa cutters. There is no slippage or bent slats as with the the traveling apron and no lost time by being obliged to shut down for hours because of one of the only two chains breaking. Less of the fine chaff falls through because there is a smaller open area at the returning point of the chains than where the traveling carriage extends across the entire feed table. And on the machines equipped with a blower the little which may fall through is drawn in by the suction of the blower fan over an extension table which extends back beyond this point below the machine. It was only after much discrimination that Smalley has invented and adopted this Grip Hook in preference to all other types and now have used it exclusively for over 30 years. Farmers consider the Grip Hook as much in advance of all other traveling types of machines as the other traveling types are over the old hand feed type.

In addition to the Grip Hook the heavy duty alfalfa cutters are equipped with the Smalley patented channel iron top apron which replaces the paddle or third roller used on other machines. There is a channel iron slat riveted on every other link of a new heavy duty pintle chain on the new All Steel Alfalfa cutters. This apron is specially adopted for work on loose hay. It compresses the fodder gradually as it passes to the rollers and knives giving out greater capacity to the machine.

SMALLEY RECUTTERS

Double Cut—No Grinding—No Heating



It is the Smalley Recutter which saves that 35% protein and 20% fat contained in the coarse stock of the alfalfa plant, and likewise of other roughage plants.

The feed after being cut by the spiral knives is recut by the patented recutter knives in the recutter chamber until it is fine enough to pass through the screen which surrounds the recutter knives. The fineness of the meal is governed by the size of the perforation in the screen.

The Smalley recutter is famous because of its gate-free simple construction, easy running and big capacity despite its low R. P. M. speed which means lower power requirement.

The Smalley recutter gets this biggest capacity because of its greater screen area and specially perforated screen giving the screen the greatest number of holes to the square inch.

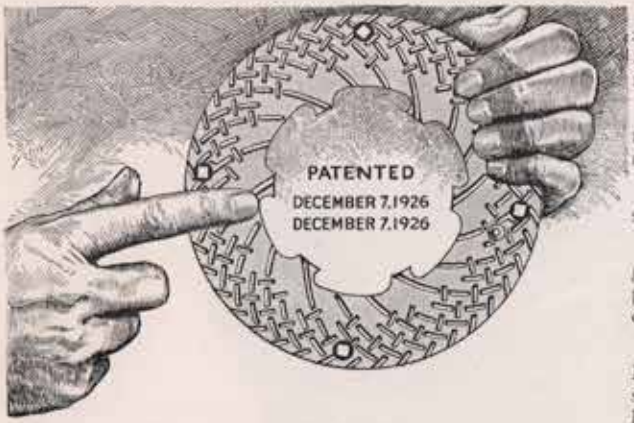
By recutting your alfalfa hay, kaffir corn, soy bean vines, and other roughage with a Smalley Recutter you save that coarse part of the plant by making it palatable to the animal, whereas, otherwise they take pleasure in nosing it aside.

Smalleys furnished with the following equipment: No. 20, 26, 36, and 40 inch sizes; cutter with mounting, cutter with blower, cutter with mounting and blower, cutter with recutter, cutter with recutter and mounting, cutter with recutter and blower, cutter with elevator, cutter with recutter, pipe and fittings.

Specifications for Smalley Alfalfa Cutters and Recutters

All Steel & Iron Construction sizes	20	26	36	40
Number of Knives	4	4	4	8
Length of Knives	20"	26"	36"	20"
Length of cut—¼", ⅜", ½", ¾"	All size machines			
Diameter of Rockwood pulley	Depends on power used			
Pulley face	8"	8"	8"	8"
Length of feed table	10'6" on all machines			
Height of table on mounted machine	38" on all machines			
Height of table on unmounted machine	34" on all machines			
Knife shaft speed on all machines	500 to 550 R. P. M.			
Number of blower fans	6	6	6	6
Diameter of blower	38"	38"	38"	38"
Blower speed on all machines	550 to 600 R. P. M.			
Recutter speed on all machines	900 to 990 R. P. M.			
Capacity tons per hour cutting dry timothy or alfalfa hay				
Cutter less recutter	3½	5	7	8
Cutter with recutter ⅜" screen	2200	2860	3960	4400 lbs.
Power requirement when cutter is equipped with blower and recutter	16-20	20-25	30-35	35-40

LETZ GRINDERS



In All the World No Grinding Plates Like the Letz

10 REASONS WHY

1. LETZ PLATES GRIND WET, DRY OR OILY materials without clogging. No other plates will do this.

2. LETZ PLATES GRIND FINE AND UNIFORMLY caused by the "zigzag alternate shear" action in the patented design of Letz Plates.

3. LETZ PLATES USE LESS POWER because "zigzag alternate shear" design allows flour to escape, retaining coarse material only for regrinding. That's why Letz plates require 25% to 50% less power.

4. LETZ PLATES HAVE LONG LIFE, because material is the toughest and hardest known. This means money saved.

5. LETZ PLATES ARE SELF-SHARPENING because shearing edges are flat and at right angles to surface.

6. LETZ PLATES HAVE MATCHLESS CAPACITY grinding from 50% to 300% more feed than ordinary plates because "zigzag alternate shear" can rapidly discharge all ground material.

7. LETZ PLATES ARE UNIFORM IN QUALITY Made of the best known material, finished on automatic special machinery, ground "dead true", eliminating the human element entirely. No "bad" sets.

8. LETZ PLATES ARE DURABLE. Not easily broken by stones, nails, small bolts or nuts. They are correctly designed, made of the toughest, hardest known materials scientifically mixed.

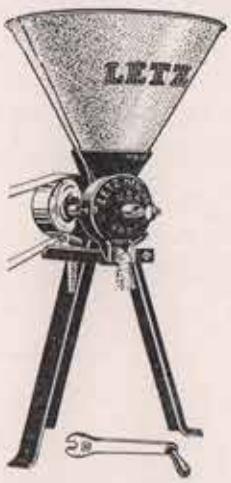
9. NO OTHER LINE OF PLATES IS SO COMPLETE When selecting proper Letz plates, cotton seed, linseed, millet, beans, peas or any of the most difficult seeds are ground at big capacity to the desired fineness.

10. OVERNIGHT SERVICE. There is a big warehouse stock of Letz plates in most all states in the Union. Thousands of local dealers carry them in stock. A telephone call brings Letz plates to your door the following day.

No. 4—Hand Power

Size of Plates	4"
Diameter of Flywheel	16"
Height, over all	18"
Weight, crated	30 lbs.
Capacity per hour	1 to 5 bu.

While the No. 4 grinder is a hand power only, the No. 04 is equipped with both hand crank and pulley, for use with power, making it the ideal combination for the small pumping engine or lighting plant motor.

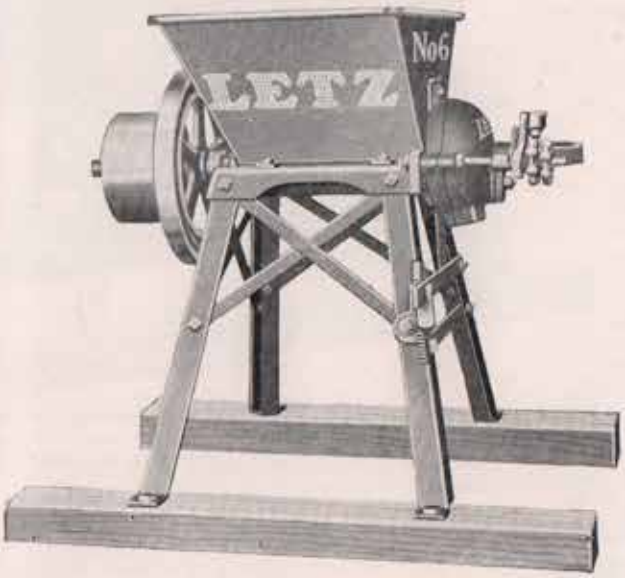


No. 04—Hand and Belt Power

Size of Plates	4"
Power required	½ to 1½ H. P.
Pulley, diameter	5"
Weight, crated	38 lbs.
Capacity per hour	2 to 6 bu.

For the poultry fancier or the farmer feeding only a few animal, either of the above grinders offers a cheap but most efficient way of preparing feed.

NO. 6 LETZ JUNIOR



The Letz Junior is a sturdy, substantially built machine and makes a fine combination with 2 to 6 H. P. engines. It has all of the general good features of the Letz Self-Sharpening, Silent-Running, Steel Plate Grinders. It grinds as fast and fine comparatively, as the larger sizes of Letz Grinders.

It will crush corn on the cob at big capacity without any assistance on the part of the operator.

SPECIFICATIONS

Plates .....6" in diameter
Drive Shaft .....1¼" in diameter
Pulleys..from 6-14" in diam., 4" face
Weight complete .....200 lbs.

Letz No. 6 mills are usually built with A-187-188 coarse plate in the mill, and medium plate A-167-168 attached as extra plates to crate.

CAPACITY PER HOUR

Bushels per hour, grinding ear corn medium fine, at 70 pounds to the bushel.

H. P.	*R. P. M.*	*Capacity*
2	500	6 to 9 bu.
3	700	10 to 15 bu.
4	750	14 to 18 bu.
5	800	16 to 20 bu.
6	850	18 to 25 bu.

NO. 109X LETZ GRINDER

A most suitable mill for engines from 4 to 15 H. P. Tractor owners will also find the No. 109X a most desirable mill when capacity as shown is sufficient to meet requirements.

SPECIFICATIONS

Plates ..... 8" diameter
Drive Shaft .....1-7/16" diameter
Pulleys...8, 10, 12, 14 and 16 inches diameter
Flywheel.....24 inches, weight 55 lbs.
Complete weight .....350 lbs.

Letz No. 109X mills are usually built with A-126 coarse plates in the mill, and fine plates A-225 attached as extra plate to crate.

CAPACITY PER HOUR

Bushels per hour, grinding ear corn medium fine at 70 pounds to the bushel.

H. P.	*R. P. M.*	*Capacity*
3	400	12 to 16 bu.
4	600	20 to 25 bu.
10	750	30 to 40 bu.
15	850	35 to 50 bu.

Letz Patented No. 210 Shuck Mill

SPECIFICATIONS

Grinding plates .....10" in diameter
Drive Shaft .....1-7/16 in diameter
Pulleys.....8, 10, 12, 14, 16, 18" in dia., 6" face
Flywheel.....24 in dia., weight 55 lbs.
Gross weight .....380 lbs.

Letz No. 210 Shuck Mills are regularly built with A-234 coarse shuck plate in mill, and fine plate A-231 attached as extra plate to crate.

CAPACITY PER HOUR BY WEIGHT

	15 H. P.	20 H. P.
Snapped corn	3000 to 4500	4500 to 7000
*Kafir corn heads	2500 to 3500	3500 to 5000
All small grains	1500 to 2500	2000 to 3000

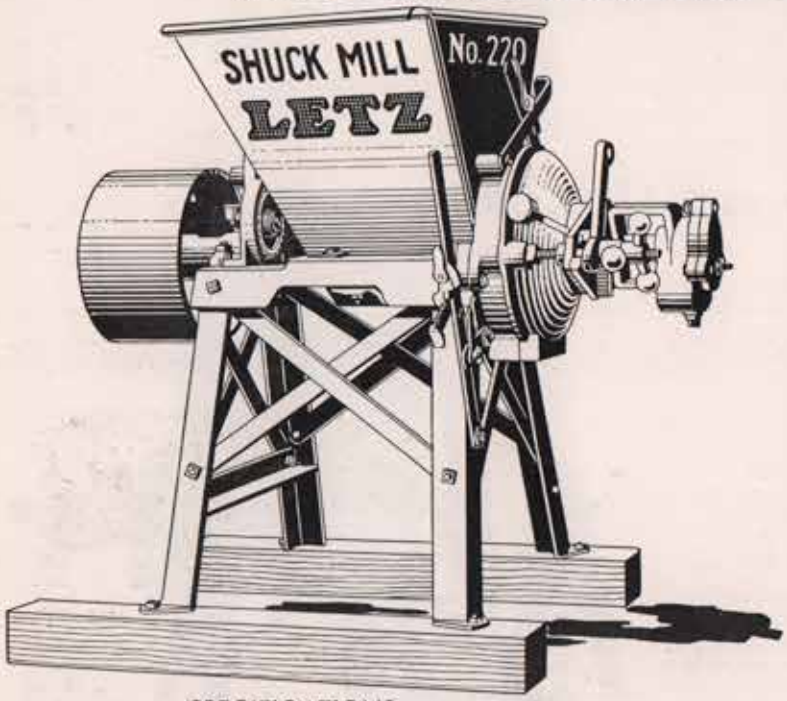
*Kafir corn must be headed closely, with not more than 4" of stem. Not for machine headed kafir corn.

The amazing capacity at which this mill grinds corn with shuck, kafir corn heads with 4 to 6" of stems attached, has made this mill a big seller.

Just the right size mill for 8-16 or Fordson tractors. Will grind 60 to 100 bushels of snapped corn. Many customers report 100 to 125 bushels of snapped corn per hour. All wearing parts are easily renewed at small expense. No parts need resharpening.

This mill is built substantially throughout. Every working part is properly designed for constant and dependable service. All bearings are provided with oil cups within convenient reach. 4x4" maple skids furnished on all Letz grinders.

No. 110 and 220 Heavy Duty Shuck Mills



10" and 10½" Grinder Plates

These mills have big capacity combined with great strength, designed especially for large dairymen, stockmen or country custom mill, where speed and sturdy construction means much.

The No. 110 and 220 mills are the same specifications other than the 110 takes the 10" burrs instead of the 10½" which the No. 220 uses. The capacity of the No. 110 Letz Mills is about one-third less than the capacity as given below for the No. 220.

The No. 220 is built over-size throughout, purposely to stand up under big capacity, using 15-35 H. P. Main drive shaft, 1-11/16" in diameter, with 8" face drive pulley. Grinder frame, buhr housing, plate holders and steel frame work, all built to give unfailing service for years.

Heavy duty, automatic oiling end thrust bearing makes possible for the mill to grind fast and fine without end bearing trouble. Hopper is provided with separate compartment and separate slide gate to regulate flow of small grains to the larger compartment. Agitator keeps contents of hopper alive. Double face plates described on Page 86.

SPECIFICATIONS

Grinding plate, double face .....10½" diameter
Drive shaft .....1-11/16" diameter
Pulleys, all 8-inch face....8, 10, 12, 14, 16 and 18" diameter
Speed recommended, (depending upon the amount of power available) .....750 to 1200 R.P.M.
Gross weight, knocked down, crated, including skids 460 lbs.

Letz No. 220 Shuck Mills are regularly built with B-31 coarse plates in mill, and fine plate B-34 attached as extra plate to crate

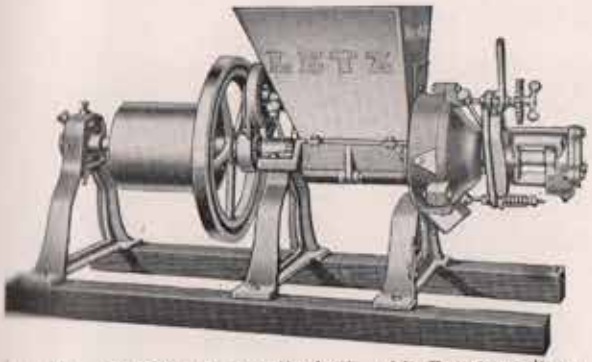
CAPACITY PER HOUR BY WEIGHT

Materials	15-20 H.P. Speed of Mill 700-750 R.P.M.	25-30 H.P. Speed of Mill 850-1000 R.P.M.
Snaped corn	4500 to 7000	6000 to 10000
*Kafir corn heads	3500 to 5000	4000 to 7000
All small grain	2000 to 3000	2500 to 4000

*Kafir corn must be headed closely, with not more than 4" of stem. Not for machine headed kafir corn.

No. 40 Letz Heavy Duty Grinder

With Automatic Oiling End Bearing



Letz No. 40 mills are usually built with D-212 medium plates in the mill, and fine plate D-211 attached as extra plates to crate.

Capacity, Bushels per Hour

(*Medium Grinding*)

	18 H. P.	25 H. P.
Oats	60 to 80 bu.	75 to 125 bu.
Ear Corn	60 to 75 bu.	75 to 100 bu.
Shelled Corn	70 to 80 bu.	75 to 150 bu.
Mixed Corn and Oats	70 to 80 bu.	75 to 125 bu.
Speed in R. P. M.	550-600 R.P.M.	800-850 R.P.M.

For the grain elevator, custom miller, or big feeder with large tractor, where heavy duty, continuous service, with big capacity, are first considerations, No. 40 Letz with new automatic oiling end bearing is recommended. More than 900 pounds of properly distributed metal to withstand the strain and stress of continuous operation.

Will grind fast, fine, uniform and at wonderfully large capacity. Handles anything from screenings to wet, soggy ear corn—it will not only keep your customers satisfied, it will bring new customers to you.

Specifications

- Height from floor to top of hopper, 40 inches.
- Regular skid furnished, 4" high.
- Length of shaft, 4 feet 11 inches.
- Length of skids, 64 inches.
- Hopper measures 23x24x14" deep.
- Width of the base, 28".
- Buhrs 12" diameter. Extra set free of charge.
- Weight, 904 pounds.
- Weight of flywheel 107 lbs.
- Diam. of drive shaft, 2".
- Hard grease cups on main bearings.

HEAVY DUTY AUTOMATIC OILING END THRUST BEARING FOR NO. 220 AND NO. 40 LETZ GRINDERS

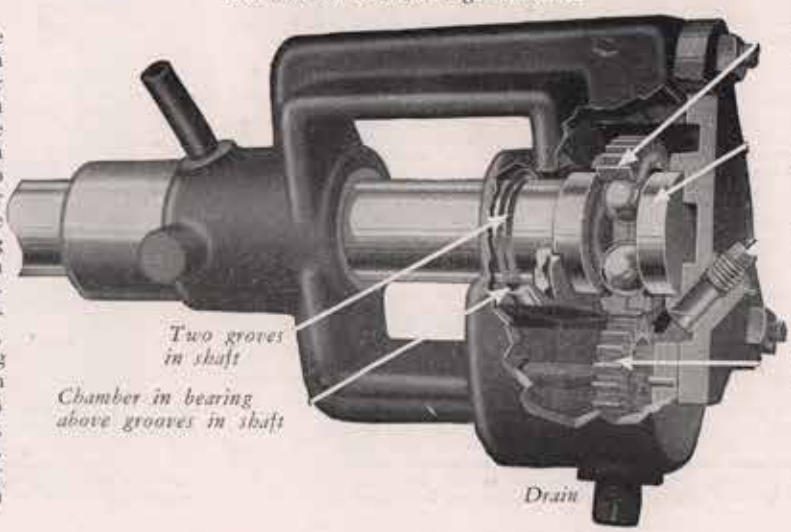
On account of the large capacity, and the unusually fine grinding, Nos. 40 and 220 Letz Shuck Mill is recommended to do, it is necessary to provide an end thrust bearing that will stand up against the most trying, severe conditions, running continuously for 24 hours, and still remaining perfectly cool.

This bearing is of the finest construction. Requires practically no attention. It is self-oiling. It requires refilling the oil chamber only once a month under continual usage. The ball race consists of four nickel chromium steel balls, revolving between two heat-treated, heavy cromium steel discs, having ground race ways.

The container cage that spaces the balls, and holds the discs, also is in itself a gear, the cogs on its perimeter mesh into a gear immersed in a bath of oil in a chamber below, thus the whole end thrust is operating in a bath of oil. The main drive shaft has two oil grooves in the right end of chamber casting. The casting that fits over the two grooves in the shaft has a ring chamber sufficiently wide to cover both grooves of the shaft. This ring chamber has an outlet at the bottom, therefore, the oil coming from the end thrust, working its way toward the grinding plates, is stopped by the two grooves in the shaft, as centrifugal force throws the oil from the two groves in shaft, into the ring chamber above the grooves. Oil then runs down the ring chamber and through the outlet at the bottom of ring chamber, back into the large oil chamber below.

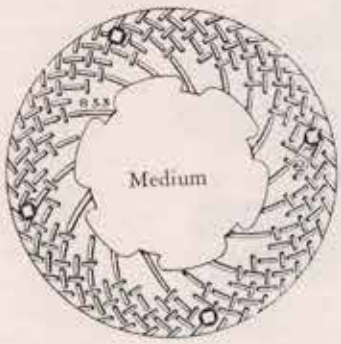
This bearing can be drained and filled quickly, as the oil chamber is provided with a pipe plug at the bottom. For refilling, another pipe plug is found in the center of end plate. Under continual use this bearing should be drained and refilled once a month.

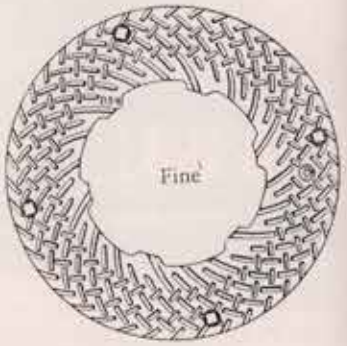
This end thrust bearing is fully covered by United States and Foreign patent letters. It is the last word in end thrust bearings. It runs cold. In design, workmanship and material it sets a high standard.



LETZ

ALTERNATE SHEAR, DOUBLE FACED, GRINDING PLATES, FOR NO. 220 AND NO. 110 MILLS





Speed, durability and economy, are the "watch words" of every successful business, whether it be farming or manufacturing. The development of the Letz alternate shear, double-faced grinding plates, keeps Letz Feed Mills abreast with the times, and in a class beyond competition.

The most economical way to grind grains and ear corn into feed is to crush and grind them with grinding plates. Shearing grain by sharp cutting edges requires far less power than to pulverize grains by pounding them with hammers. Furthermore, shearing grains through grinding plates assures a uniform, granular feed, containing 90% less objectionable flour. Shearing grain through grinding plates furthermore means a lower cost for grinder, a lower cost for grinding a bushel, a lower cost for repairs, and a positive assurance that damp, wet, oily feed will not clog or gum up your grinder.

LARGE CAPACITY

The Letz alternate shear, double-faced grinding plates, allow all feed to flow through the plates rapidly, no packing or clogging occurring at any point, admitting only enough material to enter the cutting channels to allow for free cutting and shearing of material flowing through channels. Owners say that these Letz alternate shear grinding plate turn out ground feed at the capacity of a small threshing machine.

Light Running

The Letz patented, alternate shear grinding plate, shears and grinds the grain in an entirely different fashion from any grinding plate ever before put on the market. By alternate shear, we mean as a kernel of grain passes through the cutting channels, it is alternately cut from right to left, and from left to right, as it passes through the cutting channels on its way through the plate, the flow of the grain taking a "zig-zag" path. That is why this plate is called an alternate shear plate. The alternate shear action is a great power saver, produces extremely fine grinding and gives the grinding plate long life.

Long Life

The patented, alternate shear, double faced Letz grinding plate have long life, on account of the large number of shearing edges arranged with wide, open channels, through which the material must pass during process of shearing. The large number of flat angular cutting edges always shear the grain, in scissor-like fashion. After dulling one side, plate may be reversed, exposing a new, sharp face to the work, therefore, having at least double the life of a single-faced grinding plate.

Letz Plates Finest Quality

In addition to the scientific design of Letz Grinding Plates, we call attention to the skill exercised in the manufacture of Letz plates. The materials in Letz plates are the toughest and hardest known mixtures of nickel-chromium and crucible-steel, giving the plate a cutting edge that will stay sharp a long time, and also giving sufficient strength so that small nuts, nails or bolts will not ruin the plates.

After the plates have been formed from these tough materials they are properly machined on automatic machinery, grinding the plates "dead true" on both sides so that when two plates are laid together, every cutting edge will shear like a pair of scissors. As these plates are ground automatically no "bad or untrue" plates can come through the Letz factory.

After plates have been made of proper materials and accurately machined, the final rigid test for strength and toughness is made. Plates are broken to determine their strength, plates are placed under instruments to determine the hardness of materials, and broken sections are observed under a strong microscope. Letz Grinding Plates are truly the finest quality grinding plates in the world.

Three Patterns—Coarse, Fine, Medium

Letz double face, alternate shear grinding plates are made in three different patterns, known as coarse, medium and fine plates. Each of these three patterns have a double face, each face being unlike the other of the same plate. Two coarse plates, when bolted in mill, should grind with two unlike sides together, for by bolting plates in mill so that two unlike sides rub together, the intersecting cross cutting edge on one plate will lie directly between the intersecting cross cutting edge on the oposite plate, thus making the plates operate on the alternate shear principle.

Wrong Way

When bolting two plates in grinder so that two like sides rub together, then the cross cutting sections of both plates will revolve directly over one another, thus eliminating the alternate shear action of plate, which will mean less capacity, more power, and less uniformness in grinding. Therefore, always bolt Letz alternate shear plates so that the two unlike sides rub together when grinding.

COARSE PLATE. The coarse grinding plate is recommended for coarse, rapid grinding. This plate is especially recommended for grinding ear corn, corn with the shuck, kafir corn heads, as well as all grain coarse. At a speed of 1000 R. P. M. it will grind up to 120 bushels of ear corn per hour, into a coarse meal with 20 H. P.

MEDIUM PLATE. For medium grinding of ear corn, corn with shuck, and all small grains, we recommend using the medium grinding plate. This plate is constructed just right for medium work, has big capacity and is very light running. Don't try to grind to flour fineness with this plate.

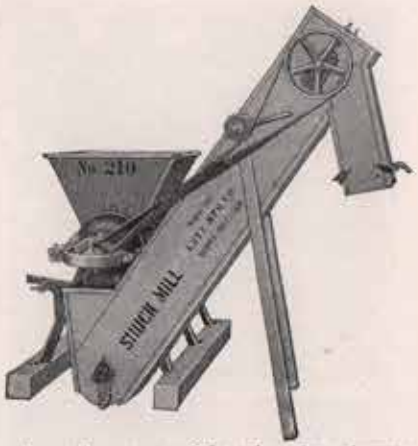
FINE PLATE. This plate is recommended for grinding small grains only, into a very fine meal. It should not be used for grinding ear corn. This plate is especially adapted for grinding oats, wheat, rye or barley to that fineness where hulls are cut up fine. This plate will especially suit the hog grower, poultryman or dairyman who believes in exceedingly fine grinding.

BAGGING ELEVATORS
WAGON BOX ELEVATORS

Letz Elevators are made of seasoned 1" lumber. They have amply wide box to elevate all the ground grain the Letz mill turns out. They elevate without clogging.

The Wagon Box Elevators are equipped with a swinging spout which will swivel to either side of elevator, or will point straight forward. In ordering elevator, always state for which size Letz Grinder it is intended, as the elevators for the larger Letz Grinders are wider and have greater capacity, and also the receiving spouts on some of these elevators vary for different sizes of Letz Grinders.

Every elevator is furnished with a 10-inch pulley and sufficient 1½-inch wide belting to drive the elevator.

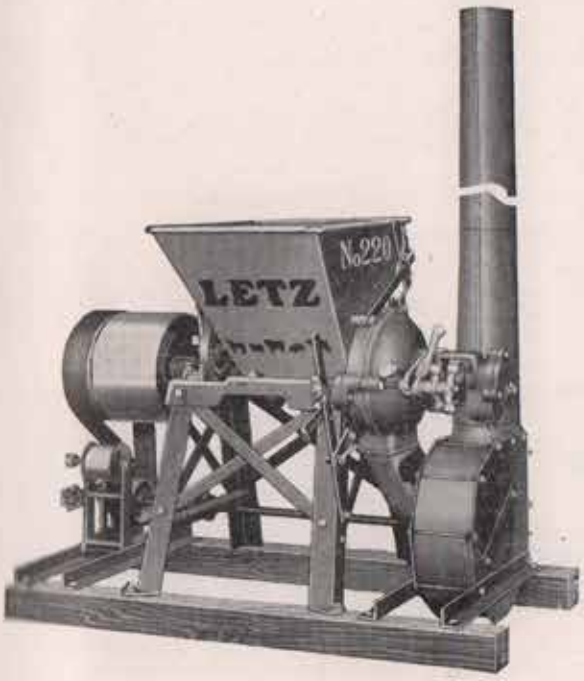


Letz Elevators—6 foot bagging elevator, and the regular wagon box elevator measures 10 ft. long.

All elevators are constructed with No. 55 malleable chain belting, to which are riveted sheet metal strips that carry ground feed up over top of elevator and discharge it into the double "Y" shaped Bagging Spout, which is made to accommodate two bags having a gate by means of which the flow of ground feed can be shifted from one bag to the other, enabling one man to operate the grinder and take care of the ground feed.

Elevators furnished for all grinders.

NO. 220 LETZ GRINDER WITH EXHAUST FAN



Exhaust fans may be attached to Letz hopper mills Nos. 109X, 111X, 210, 110 and 220. This exhaust fan measures 16" in diameter, 5" wide. Fan wheel has a heavy cast iron hub with steel arms cast solid into hub, steel fan blades ⅛" thick. The fan housing is made of 14 gauge steel, with a clean-out door at bottom. Bearings are all of high grade babbitt, with oil cups conveniently located. The drive pulley on grinder measures 12" diameter, 3" face, drive pulley on exhaust fan 5" diameter, 3" face.

To attach this exhaust fan to the Letz hopper mills above mentioned, a shaft with a 3" extension is necessary, so as to accommodate the drive pulley. Elevating and conveying ground feed with an exhaust fan is rapidly becoming popular. The exhaust fan will deliver ground feed up to 50 ft. high, or it will deliver feed at a distance of 100 ft. horizontally, conveying feed around corners, reaching any point in your barn or granary. Exhaust fan pipes are 5" diameter, elbows, valves, dust collector and other equipment are furnished at very reasonable prices.

LETZ COMBINATION MILLS

Prepares All Classes of Farm Feeds

CLASS 1
SMALL GRAINS, SHELLED CORN, OATS, ETC.

CLASS 2
EAR CORN OR SNAPPED CORN

CLASS 3
ROUGHAGES, FODDERS, HAYS, ETC.

By first considering all farm feeds, and dividing these feeds into three general classes, the almost unlimited ability of a Letz roughage grinder is better understood.

Farm feeds may be grouped, as follows:

Class 1—Small grains, (such as oats, barley, shelled corn, rye, etc.)

Class 2—Ear corn or snapped corn.

Class 3—Roughages, (such as bundle fodders, sheaf grain bundles, legume hays like alfalfa, soya-bean hay, sweet clover, clover, etc.)

The modern, successful grinder of today must handle *all* these classes of feeds *equally* well, with high capacity, with little work, with convenience of operation at low cost and with the the ability to turn out quality work.—whether preparing any class of feeds individually, or in combination.

The Letz is not just a small grain grinder. It is not another corn and cob mill. It is, in fact, an all purpose feed mill that prepares all classes of feeds, with high efficiency. Beyond any previous performance standards, it prepares these feeds, as you want them, coarse, medium or fine.

It is built to do the work a farm feed grinder should do. It is no longer necessary for you to allow limited feed preparation to reduce your livestock profits, because of a feed mill that is only part way efficient.

Not only will the Letz handle all classes of feeds. It will handle them in any condition they are brought to the grinder,—so long as they are fit for feed. It will handle your frozen shocked fodder, your soft corn, your theshed soy beans, without clogging,—and to big capacity.

It will do this kind of work twelve months in a year and in any kind of a season.

A Letz roughage grinder challenges the world in this ability.

Bundle Fodder Soaking Wet

Through Cutter Head

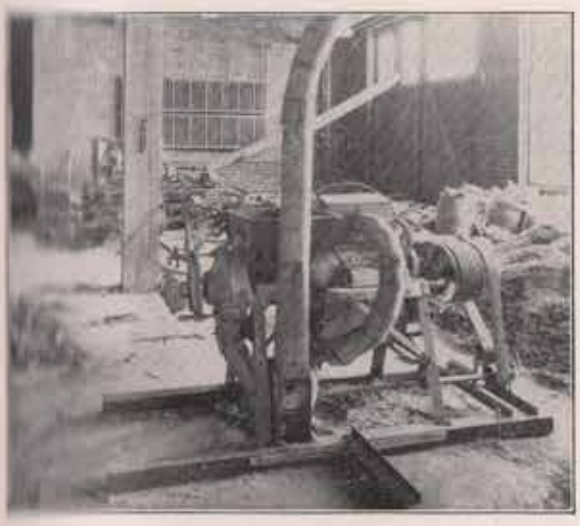
Through Mill Soaking Wet

Through Exhauster Fan

LETZ COMBINATION MILLS

BIG CAPACITY—LOW GRINDING COSTS

Official tests, by the Agricultural Engineering Departments, at different State Experiment Stations, prove the big capacity of the Letz Roughage Grinder on all classes of feed. Prove also, the low cost of grinding these different classes of feeds.



The No. 347 Letz, on Official Test, Laboratory of Ohio Agricultural Experiment Station, Establishing New High Capacity Records

Both tractor and electric motors have been used for power. In all these tests, the costs for grinding roughage feeds have been so low, that they prove beyond doubt, the profits that can be made from grinding roughages for livestock.

The Official report of the Ohio Agricultural Experiment Station shows a record capacity of 180 bushels of ear corn per hour, uniform, coarse grinding for beef cattle or sheep, this is threshing machine capacity. In another test, the No. 344 Letz also ground 2895 pounds of alfalfa, medium fine, with an average power requirement of only 14 horsepower!

OFFICIAL TESTS

FOR

BEST PERFORMANCE

PROVE LETZ LEADERSHIP

AT THE HAYS BRANCH OF THE KANSAS EXPERIMENT STATION

Cost of Grinding Kafir Fodder
Using Electric Motor

	Cost Per Ton
Labor and Power	$ .44

Cost of Grinding Kafir Stover
Using Electric Motor

	Cost Per Ton
Labor and Power	$ .51

Cost of Grinding Kafir Hay
Using Electric Motor

	Cost Per Ton
Labor and Power	$ .60

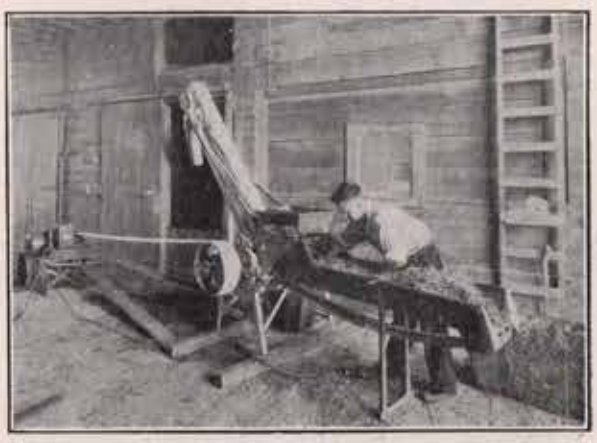
AT THE NEBRASKA STATE EXPERIMENT STATION

Cost of Grinding Corn Fodder
Using 10-20 Tractor

Labor (Capacity 2000 lbs. per hour, one man)	$ .35 per ton
Power (Kerosene at 15c per gallon)	.25 per ton
Interest, Depreciation, and Repairs on Grinder	.21 per ton
Interest, Depreciation, Housing, Repairs, etc., on Tractor	.53 per ton
TOTAL COST	$1.34 per ton

Using 7½ Horsepower Motor

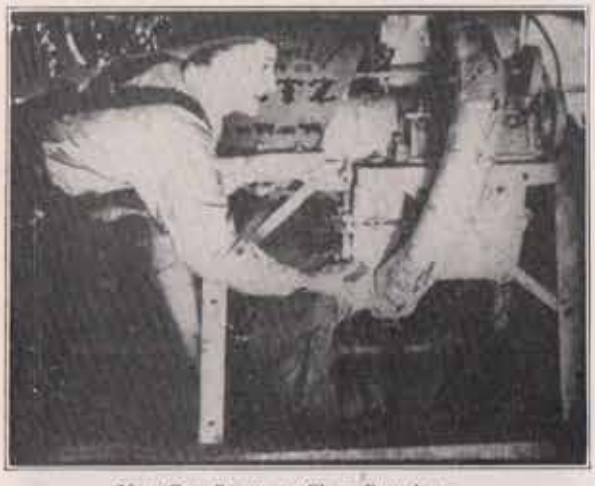
Labor (Capacity 1200 lbs. per hour, one man	$ .58 per ton
Power (Five cents per Kw. hour)	.32 per ton
Interest, Depreciation, and Repairs on Grinder	.35 per ton
Interest Depreciation, Housing, Repairs, etc., on Motor	.08 per ton
TOTAL COST	$1.33 per ton



The No. 130 Letz on Oficial Test, Nebraska Agricultural Experiment Station, Establishing New Low Cost Records on Grinding Roughage

LETZ COMBINATION MILL

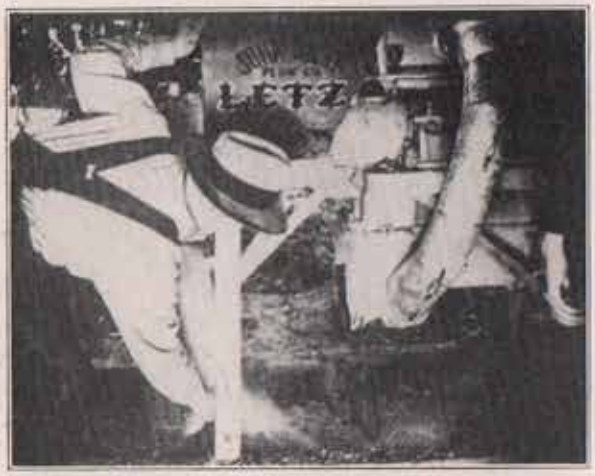
DOES A WIDE VARIETY OF WORK



You Can Recut or Chop Roughage

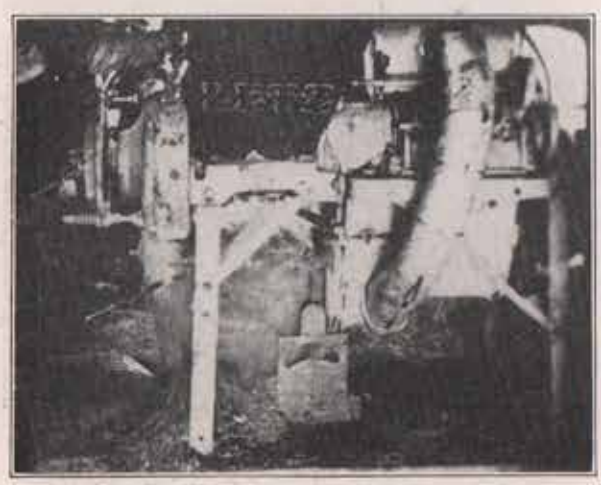
You can coarsely "chop" or recut any rough age. For example, take good quality alfalfa hay You might not want to grind it fine for dairy cattle, but you might be interested in chopping it coarse. This you can do with a Letz.

Not only that—you can recut or 'chop" any roughage to different degrees of coarseness. You can select any one of three speeds for the Letz feed table. The Letz will handle twice as much roughage on the long cut as it will on the short cut. You can also use different sizes of screens below the cutter head. With these adjustments you can turn out several different grades of re cut or "chopped" roughage.



You Can Grind Ear Corn and Grain Only

You can grind ear corn and grain only. Be cause it is a true, general purpose grinder, the Letz will operate just as efficiently on ear corn and grains as it will on roughage. It will grind ear corn or grain, coarse, medium or fine as de sired. To reduce ear corn at large, economical capacity, a crusher hook built on a cutting prin ciple is required. To turn out uniform work grinding plates built on a cutting principle are necessary. You have them both in a Letz roughage grinder.



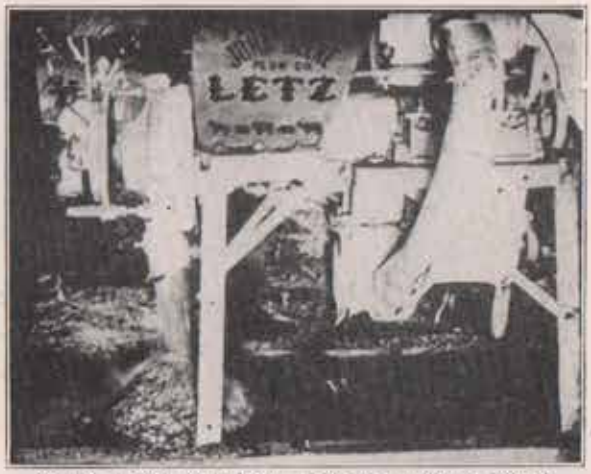
You Can Recut the Roughage Only and Grind the Grain Fine in One Operation

You can recut the roughage coarse—only and grind the grain, fine or medium, all in one swift, cheap operation. For example, while you are just coarsely chopping legume hay or bundle fodder through the cutter head in the same op eration, you may grind ear corn and grain fine medium or coarse, through the grinding plates then mix with the chopped roughage. In this set-up, all recut roughage flows from the cutter head into the exhauster fan or elevator, none of it through the grinding plates. It is often de sirable to just coarsely chop certain roughages and also grind the ear corn or grain, fine or medium, all in the one operation.

LETZ COMBINATION MILL

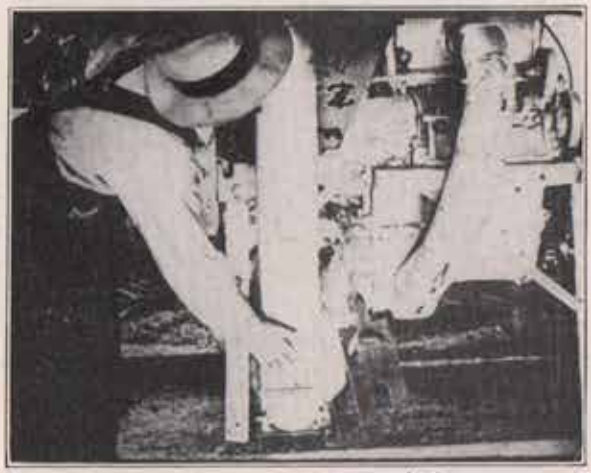
DOES A WIDE VARIETY OF WORK

You can also grind roughage separately or mixed in one operation. You may want to grind mixtures of legume hay and grains. For example, alfalfa and oats, fine or medium in one operation, for swine. With a quick, simple slide gate change, shown by the next page, the Letz puts both the grain and the roughage through the grinding plates to be ground together to the desired fineness and in predetermined proportions.



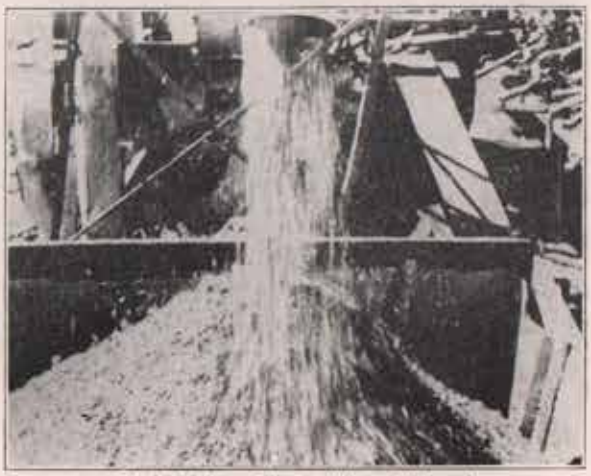
You Can Also Grind Roughage Separately or Mixed All in One Operation

Proper feed preparation is one thing. Of growing importance also, is the work saved and feed handling convenience added by mixing the ground grain with the ground or chopped roughage. And elevating and delivering the grain-roughage mixtures to several different storage bins or convenient feed distribution points. Important also is the overhead suction at the feeding throat of the machine, especially when running dry, dusty roughages through the cutter head to draw away the dust.



Then This Exhauster Fan Mixes and Elevates the Feeds

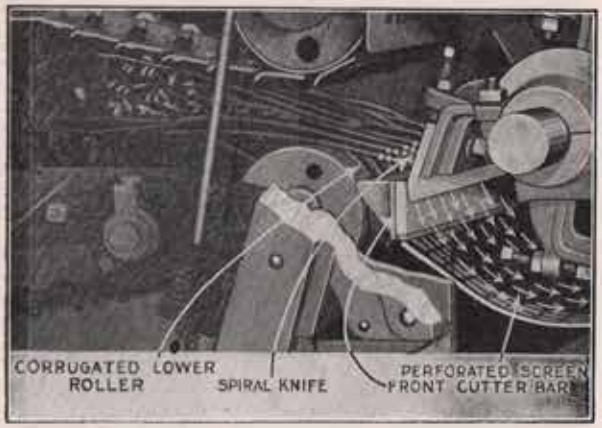
By means of branch lines and valves, prepared feeds may be discharged at half a dozen different points. The ball bearing exhauster fan will elevate to the heighth of any farm building. It will also blow feeds horizontally within a radius of 75 feet from the grinder. This smooth running ball bearing exhauster fan brings many important advantages to an already modern Letz roughage grinder. At feed preparation time, hundreds of happy users say that the ball bearing exhauster fan saves the time and work of one man.



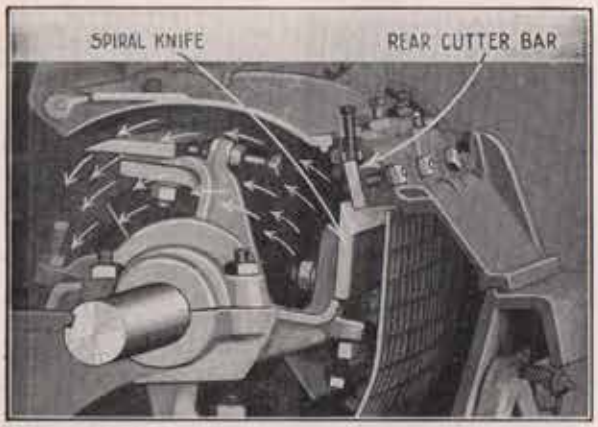
And Delivers Them Where Wanted

HOW LETZ COMBINATION MILL

DOES IT



FIRST OPERATION ON ROUGHAGE
Cutting at Front Cutter Bar



SECOND OPERATION ON ROUGHAGE
More Cutting at Rear, Recutter Bar

THIRD OPERATION ON ROUGHAGE
Here the Preparation May End by Discharging the Chopped Roughage From Lower Conveyor Case, Or Continued, if Desired, By———

Roughage is largely fiber—alfalfa stems are 55% fiber. Therefore, Letz works with roughage on a cutting principle—throughout.

Roughage is often bulky—light in weight—therefore, Letz works with roughage on a force-feed principle throughout.

Here you see the first operation. Roughage is first force-fed—as a tightly compressed mass—by a wonderful feed table—into the cutter head. Then, this roughage is cut at the front cutting bar.

With the cutter head running 850 R.P.M. *there are 56 cutting operations per second, at this front cutter bar.*

The second operation further reduces roughage at the rear, recutter bar.

Any cuttings—retained in the cutter head—are now cut and recut fine enough to be forced by the wide spiral knives through the square perforations in the screen. This is another part of the Letz plan of continuous force feed. *Feed cannot stand still inside a Letz roughage grinder.*

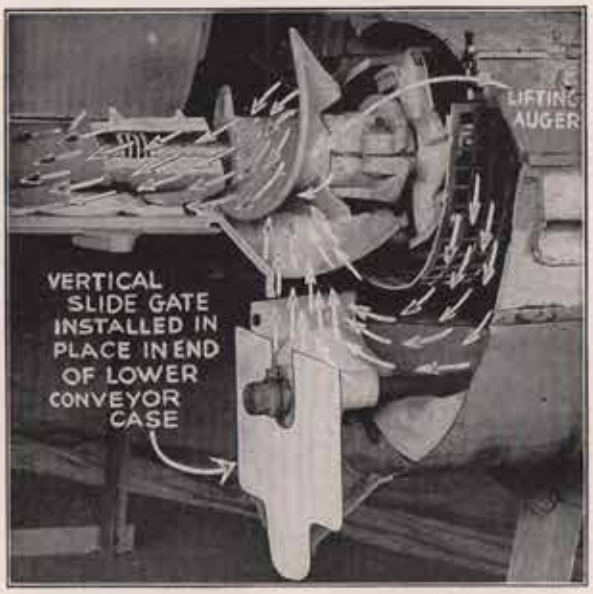
After the chopped roughage leaves the screen, it flows into the lower conveyor case. Here it is force-fed by the conveyor auger, to the discharge end of conveyor case. This conveyor case discharge end is provided with both vertical and horizontal slide gates. If you just want to chop the roughage only, the horizontal slide gate is installed in place. The roughage then flows into the exhauster fan or elevator with no further preparation.

LETZ COMBINATION MILLS

DOES IT

Ear corn or grain may be ground through the grinding plates in the same operation, and the ground grain discharged from the buhr end of machine into the exhauster fan or elevator, to be mixed, elevated and delivered with the chopped roughage.

If you want to grind the roughage, a quick change removes the horizontal and installs the vertical conveyor case slide gate. With the vertical gate in place, the chopped roughage is then thrown upwards, up into the lifting auger.

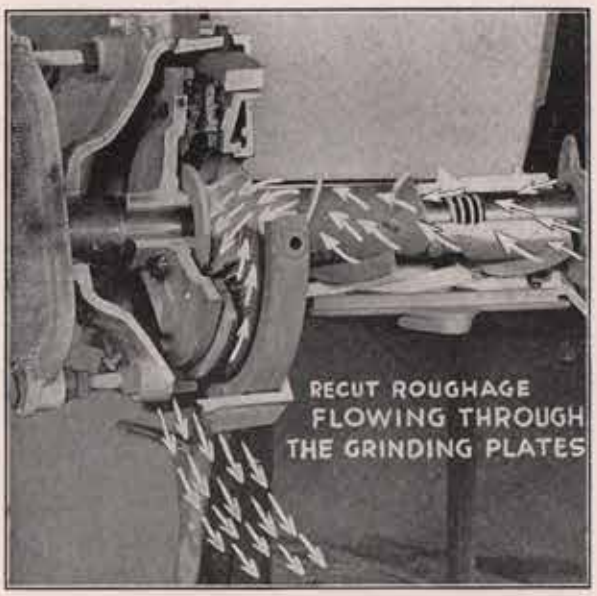


FOURTH OPERATION ON ROUGHAGE
Running It Into Hopper—Ear Corn or Grain May Be Ground Along—or Alone

The lifting auger then catches the recut roughage and augers it into the hopper. This is still one more patented part of the Letz plan of continuous force feed. The recut roughage is then ground either alone or along with ear corn or small grain.

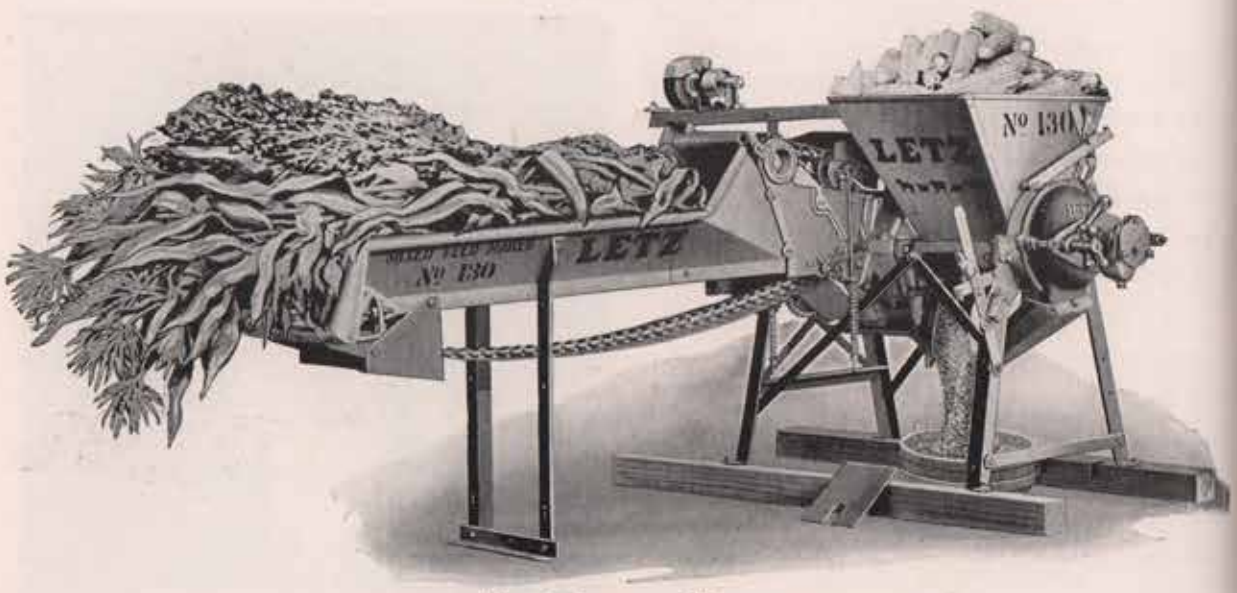
The fifth and final operation is that of grinding. The new patented Letz alternate shear plates operate on a force feed, non-clogging principle, also on a cutting principle. Therefore, they still further reduce the chopped roughage through another cutting operation. After the roughage is ground, it is then forced out of the buhr case into the exhauster fan or elevator.

By maintaining suction throughout the machine, through the lower conveyor case, and through the buhr case, the exhauster fan may be said to supplement the principle of forcing feeds throughout the machine.



FIFTH OPERATION ON ROUGHAGE
Through the Grinding Plates, Separately or Mixed With Grain, to be Ground Fine, Medium or Coarse

The No. 130 Letz Mixed Feed Maker



No. 130 Letz, on Skids

This is the small size. Bands on fodder bundles or sheaf grain bundles must first be cut and bundles staggered before feeding through cutter head.

This size is recommended for the dairy herd of 4 to 15 cows. For the cattleman feeding 20 steers or less. For the sheep grower with 700 head or less. For the hog raiser with 150 head or less.

SPECIFICATIONS

For explanation of various equipped combinations of No. 130, see page 97, 98 or 99.

Specifications of Nos. 130, 131, 132 and 133 Mixed Feed Makers

Power required	5 to 20 h. p.
Speed recommended	600 to 850 r.p.m.
Size of grinding plates	9¾ inches
Size of drive shaft in cutter head	1-11/16 inches
Size of bearing at pulley	1-11/16x7 inches
Size of cutter head	9 in. dia., 9 in. wide
Lengths of cuts with 4 knives	⅛, 3/16, ¼ inch
Regular size of pulley	12x6 inches

Table of Shipping Weights, Nos. 130, 131, 132 and 133 Letz

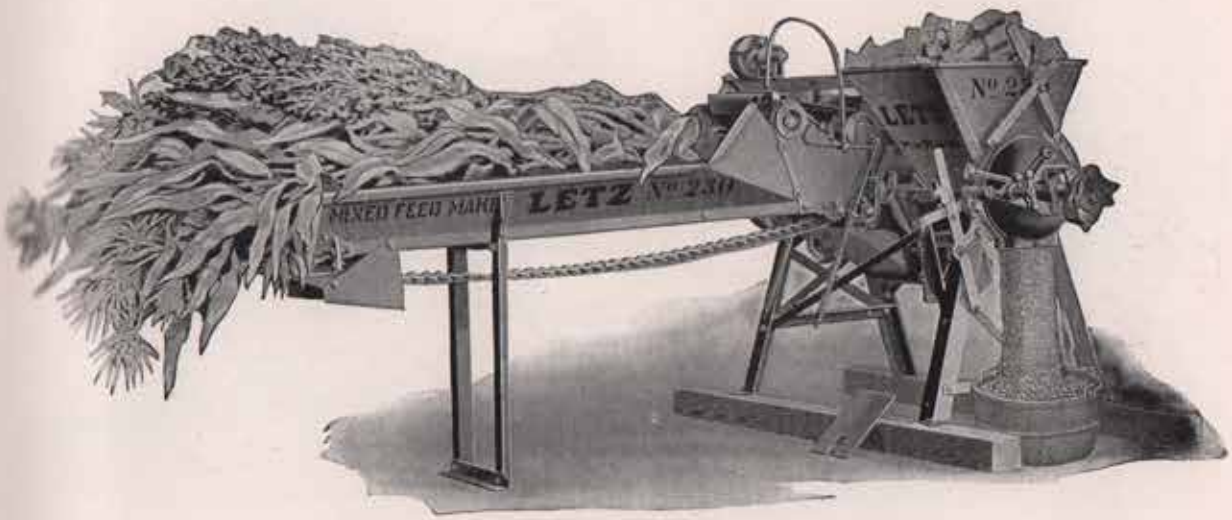
No. 130 Letz on skids	920 lbs.
No. 131 Letz, on Skids	1404 lbs.
No. 131 Letz, on Trucks	1727 lbs.
No. 130 Letz, and 12-ft. Elevator, on Skids	1112 lbs.
No. 130 Letz and 12-ft. Elevator, on Trucks	1435 lbs.
No. 132 Letz, on Skids	1380 lbs.
No. 130 Letz, and 6-ft. Elevator, on Skids	1035 lbs.
No. 130 Letz and 6-ft. Elevator, on Trucks	1358 lbs.
No. 133 Letz, on skids	1245 lbs.

Table of Capacity*—Nos. 130, 131, 132 and 133 Letz, in Pounds per Hour—Either Recutting Only or Cutting and Grinding

FEEDSTUFF	Cap. Thru Grinding Plates Med. Grind'g	Cap. Thru Cutter Hd. Thru a ¾" Screen
Corn Fodder with Ears	1200 to 2000	1500 to 3500
Bundle Fodder, Kafir, Milo, Feterita, Dorso, Maize	1200 to 2000	1500 to 3500
Legume Hay, Alfalfa, Red Clover, Sweet Clover	900 to 1800	1200 to 2500
Sheaf Grain Bundles, Oats, Rye, or Barley with Straw	900 to 1800	1500 to 3000
Johnson Grass, Sudan Grass, Hygeria	900 to 1800	1500 to 3000
Soybean Hay, Cow Pea Hay, Pea Vine Hay	900 to 1800	1500 to 3000
Ear Corn, Husked	2000 to 4500	2500 to 6000
Earn Corn with Shuck (Snapped Corn)	1500 to 3000	2500 to 5000
Oats	1100 to 2200	....
Rye or Barley	1200 to 2600	....

*All capacities are approximate and depend upon power, speed, plates used, belt drive, uniform feeding, then upon the material itself. Dry, brittle grain or roughage grinds more readily, may be ground finer and with less power. Heavy feeds are ground at greater capacity than light feeds.

No. 230 LETZ MIXED FEED MAKER



No. 230 Letz, on Skids

This is the medium size. Takes whole bundles of fodder or sheaf grain, without cutting bands, if bundles are not too large.

This size is recommended for the dairy herd of 15 to 20 cows. For the cattleman feeding 20 to 40 head. For the sheep grower with 100 to 200 head. For the hog raiser preparing feed for 150 to 300 head.

SPECIFICATIONS

For explanation of various equipped combinations see No. 230 mill on pages 97, 98 or 99.

Specifications for Nos. 230, 231, 232 and 233 Mixed Feed Makers

Power required	10 to 25 h. p.
Speed recommended	600 to 850 r.p.m.
Size of grinding plates	10½ inches
Size of drive shaft	1-11/16 inches
Size of bearing at pulley	1-11/16x7 inches
Size of cutterhead	10½ in. dia., 10½ in. wide
Lengths of cuts with 4 knives	⅛, 3/16, ¼ inch
Regular size of pulley	12x8 inches

Table of Shipping Weights, Nos. 230, 231, 232 and 233 Letz

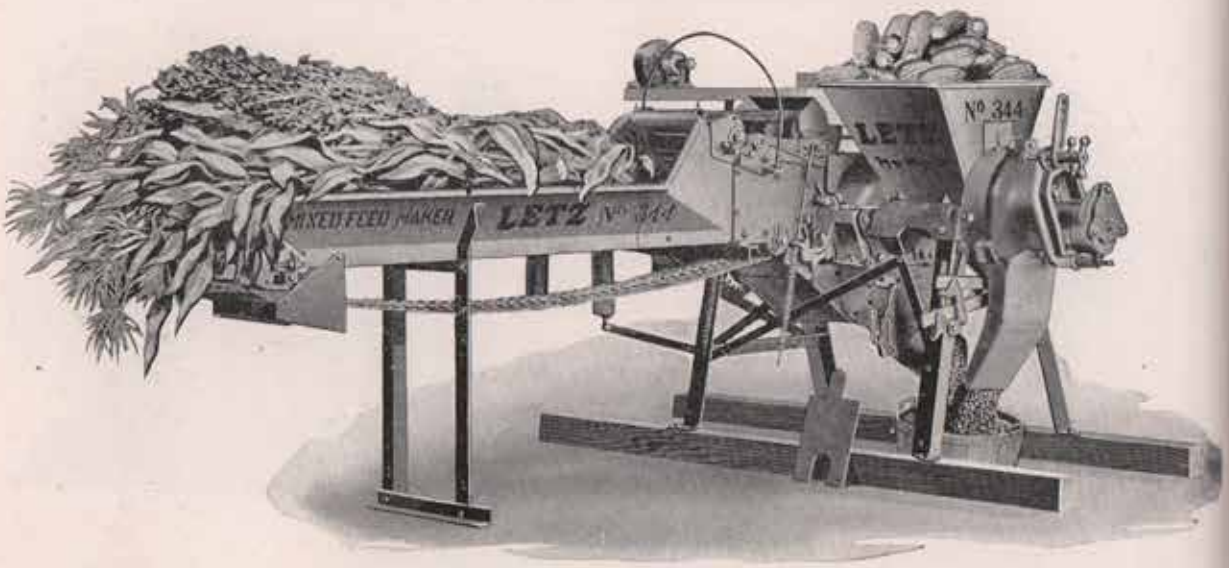
No. 230 Letz, on Skids	1177 lbs.
No. 231 Letz, on Skids	1658 lbs.
No. 231 Letz, on Trucks	1981 lbs.
No. 230 Letz and 12-ft. Elevator, on Skids	1381 lbs.
No. 230 Letz and 12-ft. Elevator, on Trucks	1704 lbs.
No. 232 Letz, on Skids	1620 lbs.
No. 230 Letz and 6-ft. Elevator, on Skids	1301 lbs.
No. 230 Letz and 6-ft. Elevator, on Trucks	1624 lbs.
No. 233 Letz on Skids	1502 lbs.

Table of Capacity*, Nos. 230, 231, 232 and 233 Letz in Pounds per Hour—Either Recutting Only or Cutting and Grinding

FEEDSTUFF	Cap. Thru Grinding Plates Med. Grind'g	Cap. Thru Cutter Hd. Thru a ⅝" Screen
Corn Fodder, with Ears	1500 to 3500	2000 to 4500
Bundle Fodder, Kafir, Milo, Feterita, Dorso, Maize	1500 to 3000	2000 to 4000
Legume Hay, Alfalfa, Red Clover, Sweet Clover	1500 to 3000	2000 to 4500
Sheaf Grain Bundles, Oats, Rye, or Barley with Straw	1500 to 3000	2000 to 4000
Johnson Grass, Sundan Grass, Hygeria	1500 to 3000	2000 to 4000
Soybean Hay, Cow Pea Hay, Pea Vine Hay	1500 to 3000	2000 to 4000
Ear Corn, Husked	2500 to 5000	3000 to 6500
Ear Corn with Shuck (Snapped Corn)	2000 to 5000	3000 to 6000
Oats	1200 to 2500	....
Rye or Barley	1600 to 3200	....

*All capacities are approximate and depend upon power, speed, plates used, belt drive, uniform feeding, then upon the material itself. Dry, brittle grain or roughage grinds more readily, may be ground finer and with less power. Heavy feeds are ground at greater capacity than light feeds.

No. 344 LETZ MIXED FEED MAKER



No. 344 Letz on Skids

This is the large size for big capacity. Built for bundle feed. Takes good size fodder or sheaf grain bundles without cutting the bands.

This size is recommended for the dairy herd of 20 or more cows. For the cattleman feeding 40 head or more. For the sheep grower with 200 head or more. For the hog raiser preparing feed for 300 head or more.

SPECIFICATIONS

For explanation of various equipped No. 344 mills see pages No. 97, 98 or 99.

Specifications for No. 344, 345, 346 and 347 and 347 Letz

Size of grinding plates	12 inches
Speed recommended	600 to 850 r.p.m.
Power required	15 to 30 h. p.
Size of drive shaft	2 inches
Size of main bearing, at pulley	2x7 inches
Size of cutter head	12 in. dia., 12 in. wide
Lengths of cuts with 4 knives	⅛, 3/16, ¼ inch
Regular size of pulley	12x8 inches

Table of Shipping Weights, Nos. 344, 345, 346 and 347 Letz

No. 344 Letz, on Skids	1525 lbs.
No. 345 Letz, on Skids	2010 lbs.
No. 345 Letz, on Trucks	2333 lbs.
No. 347 Letz and 12 ft. Elevator on Skids	1760 lbs.
No. 344 Letz and 12 ft. Elevator, on Trucks	2083 lbs.
No. 344 Letz and 6 ft. Elevator, on Skids	1665 lbs.
No. 346 Letz, on Skids	1982 lbs.
No. 344 Letz and 6 ft. Elevator, on Trucks	1988 lbs.
No. 347 Letz, on Skids	1850 lbs.

Table of Capacity*—Nos. 344, 345, 346 and 347 Letz, in Pounds per Hour—Either Recutting Only or Cutting and Grinding

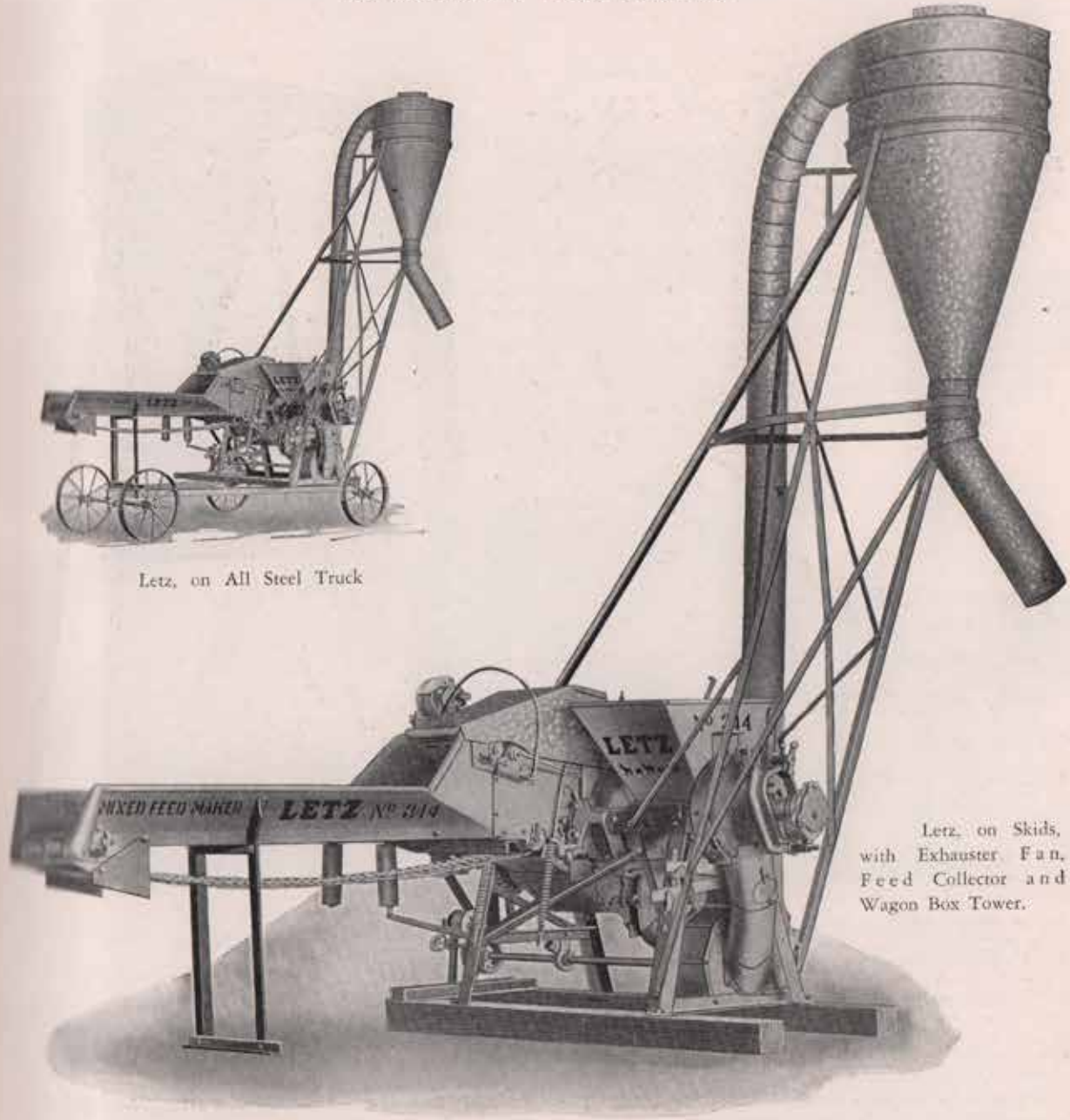
FEEDSTUFF	Cap. Thru Grinding Plates Med. Grind'g	Cap. Thru Cutter Hd. Thru a ¾" Screen
Corn Fodder with Ears	2000 to 5000	2500 to 6000
Bundle Fodder, Kafir, Milo, Feterita, Dorso, Maize	2000 to 4500	2000 to 5000
Legume Hay—Alfalfa, Red Clover, Sweet Clover	1800 to 4000	2400 to 6000
Sheaf Grain Bundles—Oats, Rye, or Barley with Straw	2000 to 4000	2500 to 5000
Johnson Grass, Sudan Grass, Hygeria	1800 to 4000	2400 to 6000
Soybean Hay, Cow Pea Hay, Pea Vine Hay	1800 to 4000	2400 to 6000
Ear Corn Husked	3500 to 7000	4000 to 9000
Ear Corn with Shuck (Snapped Corn)	3000 to 6000	3500 to 7500
Oats	1500 to 3000	——— ———
Rye or Barley	2000 to 4000	——— ———

*All capacities are approximate and depend upon power, speed, plates used, belt drive, uniform feeding, then upon the material itself. Dry, brittle grain or roughage grinds more readily, may be ground finer and with less power. Heavy feeds are ground at greater capacity than light feeds.

No. 345, 231 or 131 Letz with Ball Bearing Exhauster Fan

For Elevating Into Wagon Box or Bins

Letz, on All Steel Truck



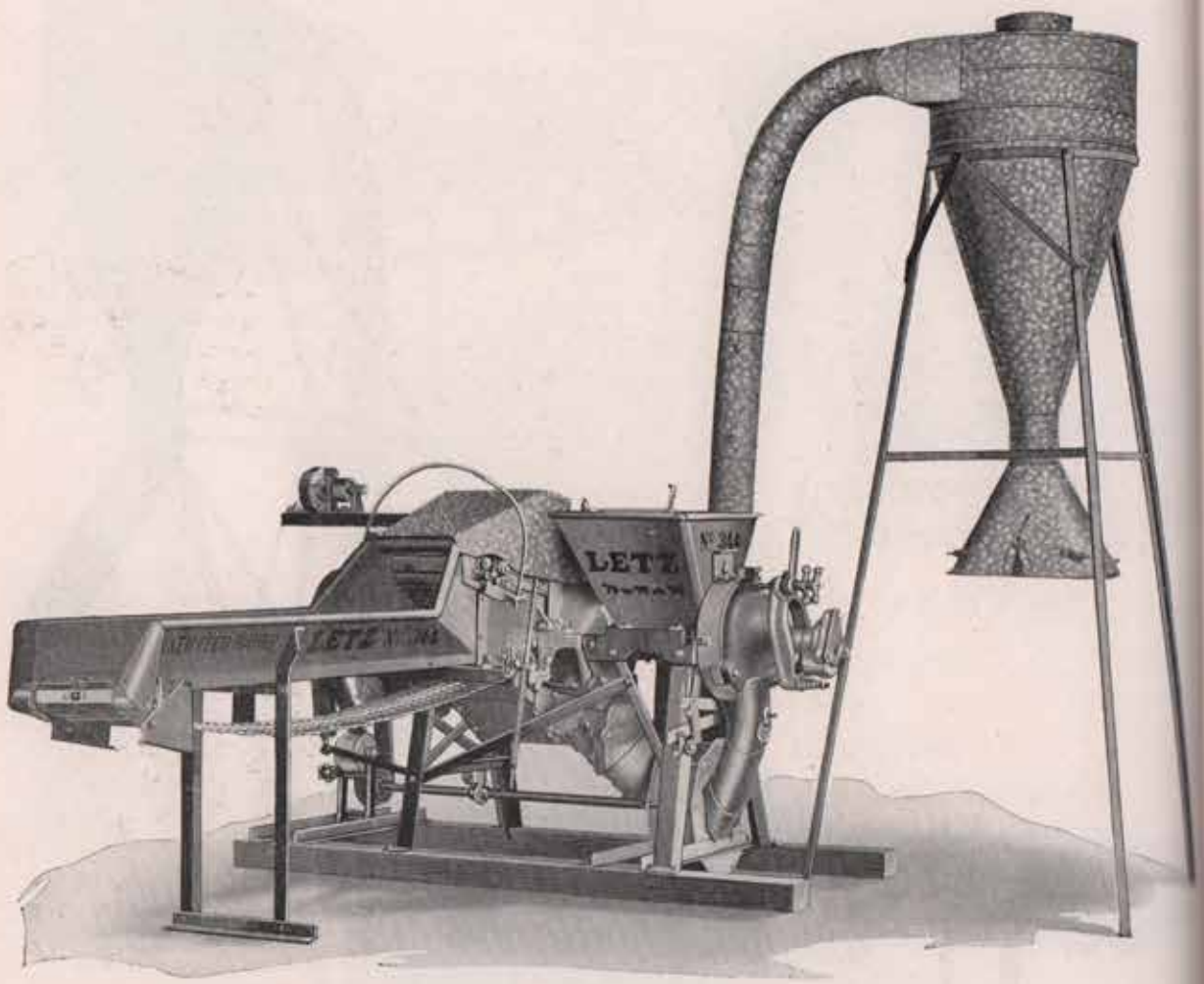
Letz, on Skids, with Exhauster Fan, Feed Collector and Wagon Box Tower.

The No. 345, 231 or 131 Letz is a complete outfit for elevating feed into wagon box, or bins, consisting of:

1—No. 344, 230 or 130 Letz Mixed Feed Maker on skids as shown on pages 94, 95, and 96.
1—Ball Bearing Exhauster Fan attachment.
1—12-ft. Steel Wagon Box Tower to support feed collector.
1—Galvanized Feed Collector for keeping feed uniformly mixed and separating feed from air.
1—6-inch Galvanized Swivel Spout for bottom of feed collector. 6½-ft. of Vertical, Galvanized Discharge Pipe. 1-ft. Horizontal, Galvanized Discharge Pipe.
1—6-inch Long Sweep Elbow.

This makes up a complete cutting and grinding outfit for elevating feed into wagon box or bins.

No. 346, 232 or 132 Letz with Ball Bearing Exhauster Fan



Letz on Skids with Exhauster Fan, Feed Collector and Sacking Tower

For Sacking Feed

Here is a complete outfit for sacking feed, consisting of:

1—No. 344, 230 or 130 Letz Mixed Feed Maker, on skids, as shown on page 94, 95 and 96.

1—Ball Bearing Exhauster Fan attachment.

1—6 ft. Steel Sacking Tower.

1—Galvanized Feed Collector for keeping feed uniformly mixed and separating feed from air.

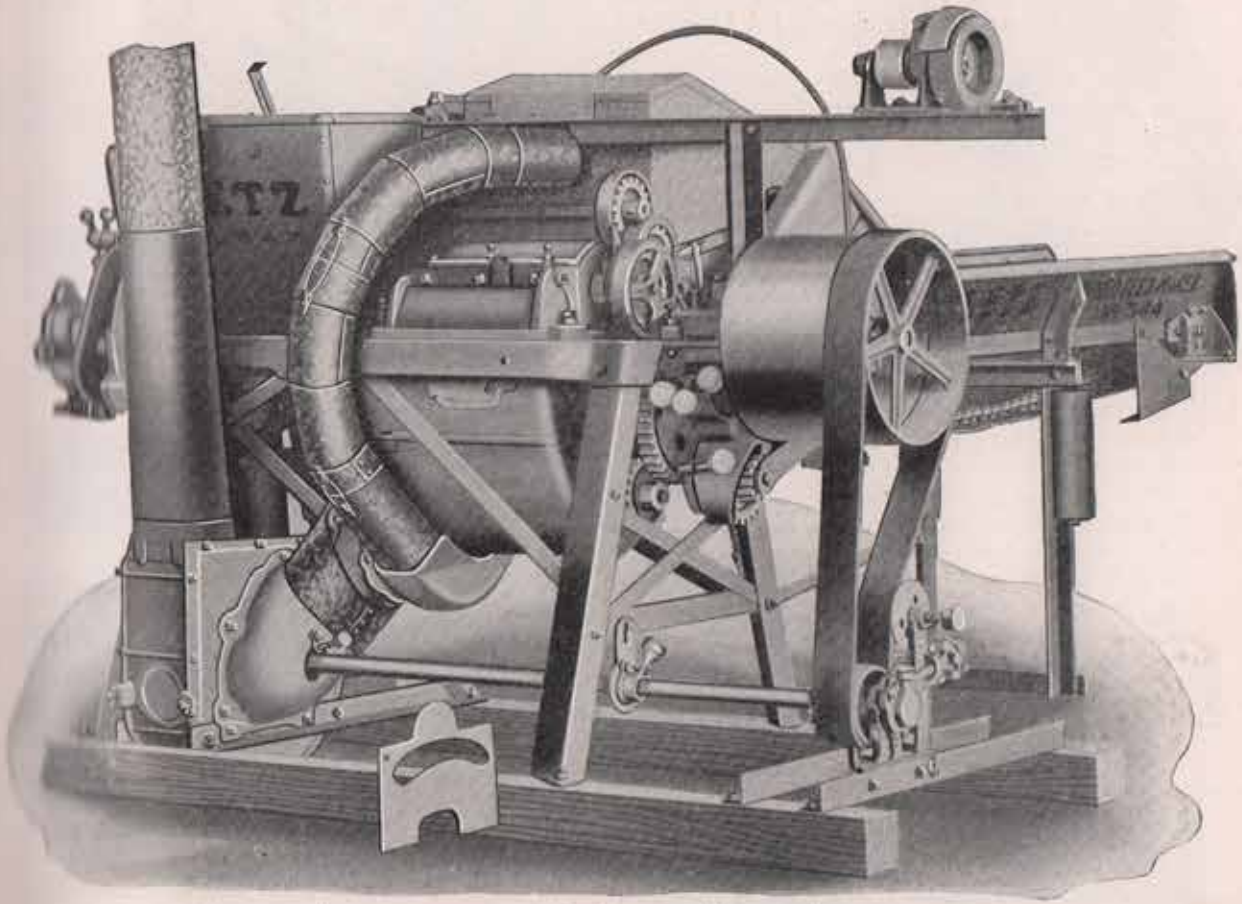
1—Double Bagging Spout for bottom of Feed Collector. 1-ft. of 6-inch. Galvanized Discharge Pipe.

1—6-inch Long Sweep Elbow.

This makes up a complete cutting and grinding outfit for sacking feed.

The steel sacking tower stand independently of the grinder and may be located where most convenient. The grinder may also be set at the most convenient location and connection made between the exhauster fan and feed collector by additional pipe and elbows where necessary.

No. 347, 233 or 133 Letz with Ball Bearing Exhauster Fan



No. 347 Letz, on Skids, with Exhauster Fan

A blower outfit to blow feed into places of storage. This outfit consists of:

1 No. 344, 230 or 130 Letz Mixed Feed Maker, on skids, as shown on Pages 94, 95 and 96.

1 Ball Bearing Exhauster Fan attachment.

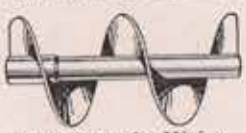
1 8-inch Long Sweep Galvanized Elbow.

8 ft. of 6-inch Galvanized Discharge Pipe.

Additional pipe and fittings, such as elbows, valves, etc., to make up a complete outfit for each individual installation extra.

Sharp Knives for Cutting

Sharp Buhrs for Grinding



Screw Auger for Mixing

WHAT THE LETZ DOES ALL IN ONE MACHINE

In one operation, the Letz does four distinct things:

1. It cuts and re-cuts any bundle fodder, hay, sheaf grain or other roughage or forage.

2. It crushes and grinds ear corn and all small grains, fine, medium or coarse.

3. Depending upon how the machine is set, it will then either:

(a) Mix the ground ear corn and grain with the recut roughage, or

(b) Grind the re-cut roughage and then mix the ground grain and ground roughage together and then

4. Elevate and deliver the finished mixed feed to where it is desired.

ROUGHAGE MILL ALSO FILLS THE SILO

Many owners are using their Letz roughage mills with ball bearing exhauster fan attachment, to fill the silo.

For silo filling, the ball bearing exhauster fan is not intended or recommended to replace the custom type silo filler.

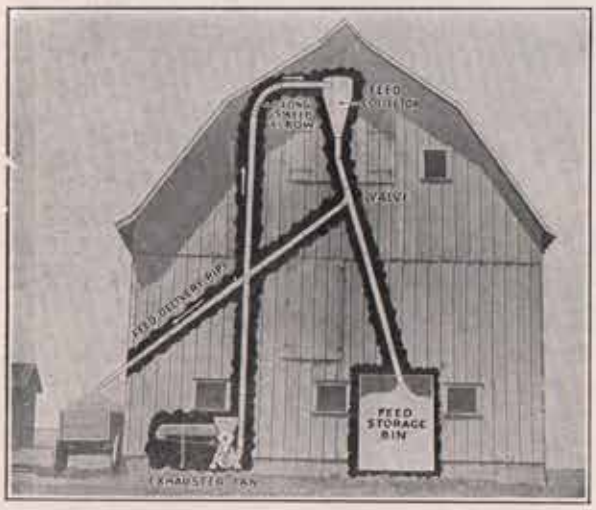
However, in the larger sizes Nos. 344 and 230 Letz with ball bearing exhauster fan, average size bundles can be fed into the machine, cut and elevated. Feeding whole bundles, the capacity of the No. 344 Letz is approximately 8 to 12 tons per hour with feed table working on fast speed, two knives removed to furnish ½" cut and screen below cutterhead as well as rear, recutter bar removed. An extra, larger size exhauster fan drive pulley, 18" is used, to give the fan more elevating power and the air intake casing at bottom of lower conveyor case is also removed, so that the exhauster fan can directly take the larger volume of air required for elevating green silage.

For the farmer, who desires to do his own silo filling and who will be satisfied with a moderate capacity, the Letz ball bearing exhauster fan will prove very satisfactory.

Approximate Capacities of Letz Roughage Mills, with ball bearing exhauster fans for silo filling on ½" cut, are as follows:

No. 347 Letz—8 to 12 tons per hour
No. 233 Letz—6 to 8 tons per hour
No. 133 Letz—4 to 6 tons per hour

An Exhaust Fan Saves Work and Time



Installation of No. 344 Letz Mixed Feed Maker, with Exhauster Fan on Holtex Farms, Dallas, Texas. Holtex Farms do considerable custom grinding. Note the ease with which wagons or trucks may be unloaded of long feed, then reloaded with ground feed.

If you distribute ground mixed feeds from a wagon or truck, an exhauster fan installation such as shown here, saves considerable work, time and personal inconvenience.

As the different feeds are ground and mixed, they are elevated at the same time into a feed collector located high in mow.

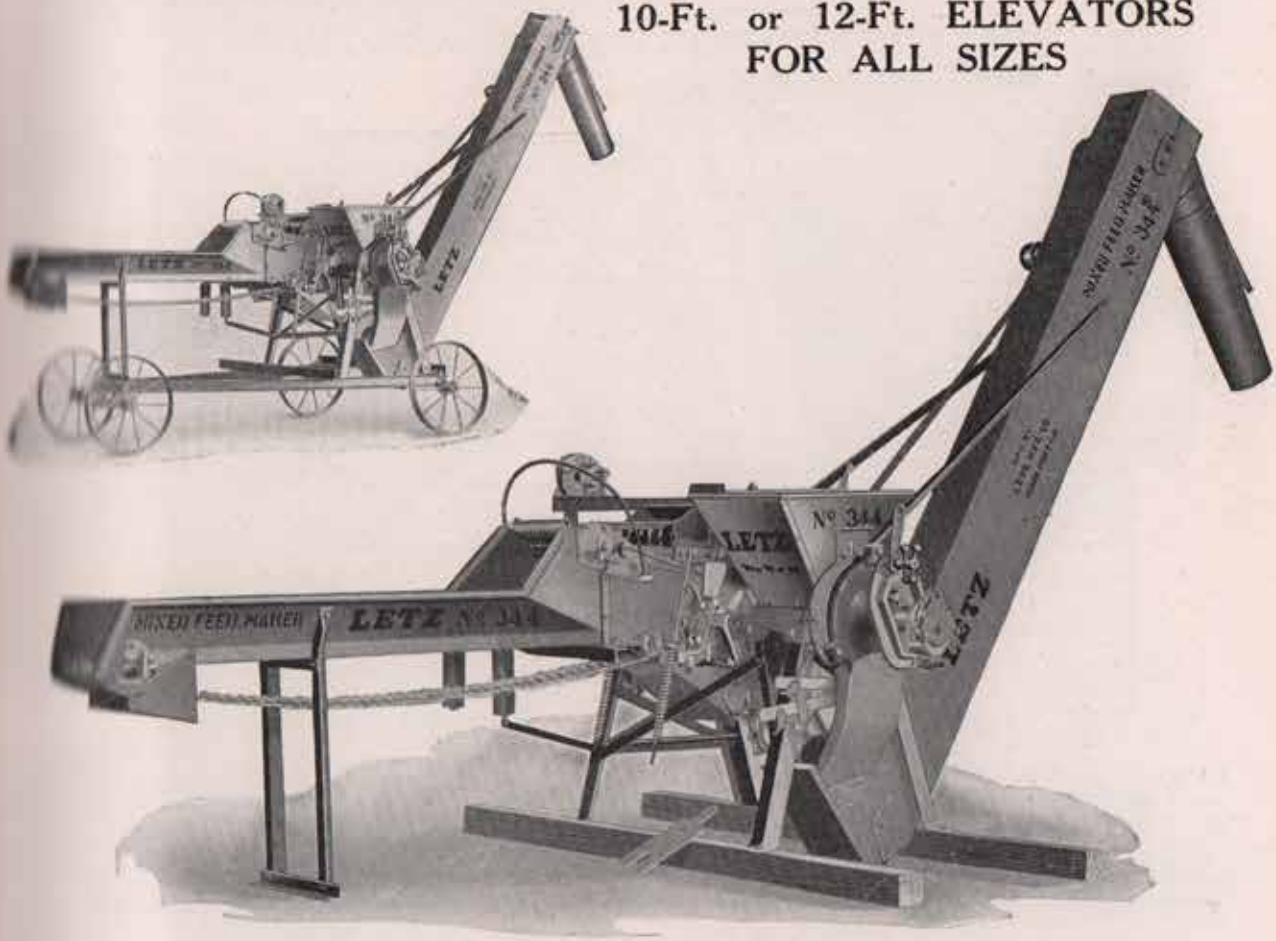
Different small grains, such as oats, barley, etc., may be stored overhead and fed by gravity directly into the feed mill hopper, with flow of grain regulated, making this part of the operation practically automatic.

A valve below the feed collector is used to discharge the feed into a wagon or truck as shown, or when desired, into an inside feed bin.

Where feeds are ground for neighbors, such an installation is most convenient, saving the lifting, shoveling and re-handling of feed.

THE ONLY FEED HANDLING YOU DO IS INTO THE MILL AND INTO THE MANGER—THE LETZ DOES THE REST

10-Ft. or 12-Ft. ELEVATORS FOR ALL SIZES



Wagon box elevators are manufactured in standard lengths of 10 ft. or 12 ft. They are built individually for the Nos. 344, 230 and 130 series and must be ordered accordingly. Illustration shows the No. 344 Letz with wagon box elevators. The wagon box elevators for Nos. 230 and 130 are similar in appearance, differing only in size, to fit the different machines.

Upper end of elevator is equipped with a swivel spout. This spout may be regulated when changing wagons or changing flow of ground feed from one bin into another.

Elevators are driven by jack shaft on grinder, jack shaft being driven by No. 55 malleable chain. A high grade rubber belt transmits the power to belt used on upper end of elevator. Slack in belt is taken up by an automatic belt tightener.

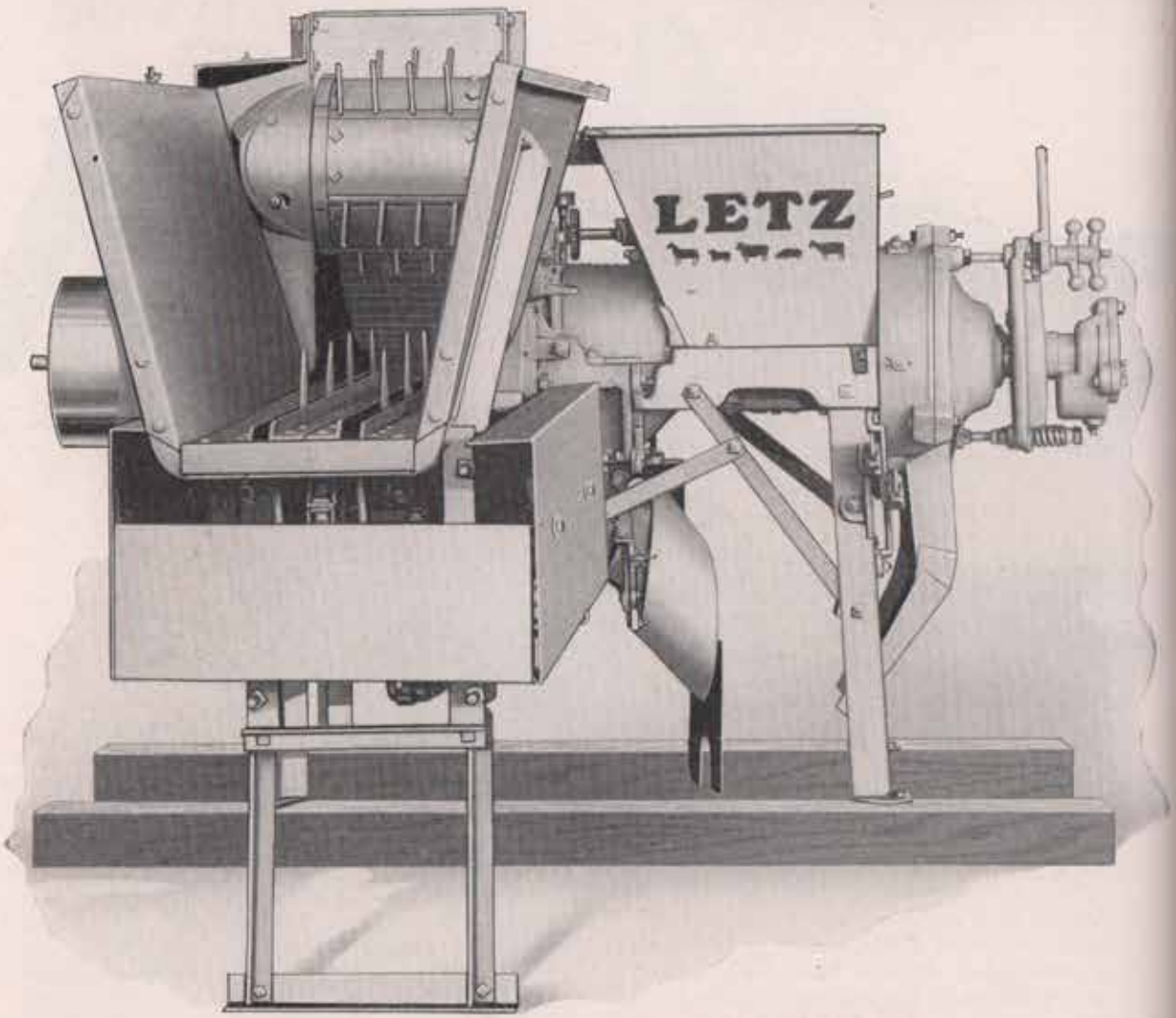
Heavy steel flights with reinforced ribs are riveted to No. 55 link belt, flights spaced 6½" apart. The carrier flights on the No. 344 elevator are 7" wide by 2½" high, on the Nos. 230 and 130 elevators 5" wide by 2½" high. The outside measurements of No. 344 elevators are 9" wide by 12⅝" high, and on Nos. 230 and 130 elevators 7" wide by 12" high, indicating their roominess.

Where desired, any Letz roughage grinder with wagon box elevators, may be mounted on all steel trucks, as illustrated above.

EXHAUST FAN HAS MANY ADVANTAGES OVER ELEVATOR

The first cost of the Letz exhauster fan attachment is little more than the price of an elevator. The advantages, however, with the exhauster fan are as follows:

1. Exhauster fan eliminates dust at the feed table when cutting and grinding powder dry roughage.
2. Exhaust fan has great elevating or conveying capacity. It will deliver feed within a radius of 50 to 75 ft. from the mill, into bins, into an overhead mow, into self-feeders, wagon box or other places of feed storage or feed distribution.
3. Exhaust fan increases capacity of cutter head because of the vacuum created by fan in the cylindrical chamber of the cutter head as well as in the lower conveyor case, thus drawing the feed away from the cutter head and lower conveyor more rapidly, keeping screen around cutter head clean.
4. With exhauster fan, feed can be discharged anywhere, and with less floor space, whereas elevator may be used only on rear end of grinder.



End View, No. 344 Letz, with Automatic Hay Feeding Table

This end view of the Letz hay feeding table better shows the construction and the force feed operation.

The lower feed mechanism consists of two traveling rows of pointed feeding fingers, mounted on endless chain belts.

The overhead feeding mechanism consists, first, of an upper revolving drum 11" in diameter by 11" wide.

Back of this drum is the standard, endless Letz upper feed belt. This feeds the hay under compression to the cutter head.

The revolving drum is equipped with six rows of pointed feeding fingers. These fingers are actuated by a crank inside the drum. As the drum revolves, the fingers extend from the drum, at front, to grab the hay.

Grabbing the hay with these pointed feeding fingers, both from above and below, makes a true, positive self-feed.

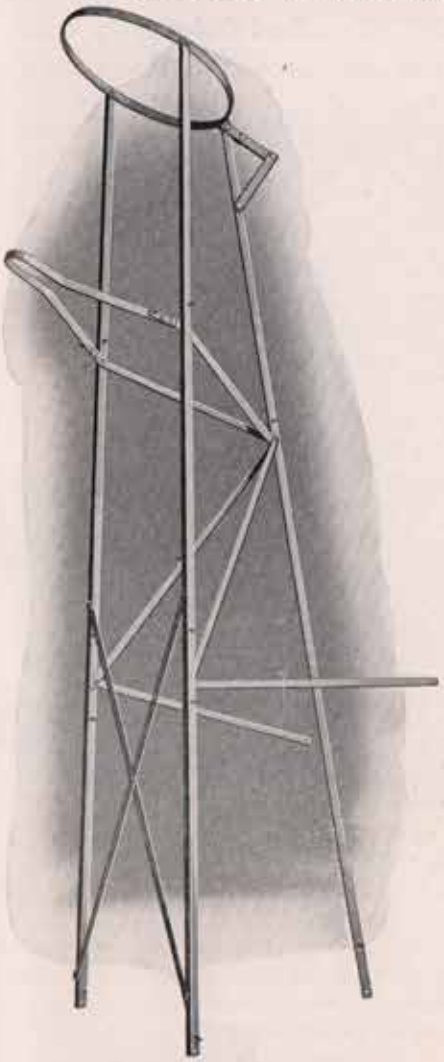
At the back of the drum, as it revolves, the fingers recede into the drum, releasing the hay, after delivering it, positively, to the upper feed belt, where it is compressed and fed into the cutter head.

Livestock farmers, desiring to either chop or grind large quantities of hay each season, will find this hay feeding table what they have been looking for.

And where it is desired to prepare hays for farm livestock, either choped or ground, the Letz will turn out the uniform grade wanted.

Letz Automatic Hay Table is furnished at extra cost.

STEEL TOWERS FOR FEED COLLECTORS



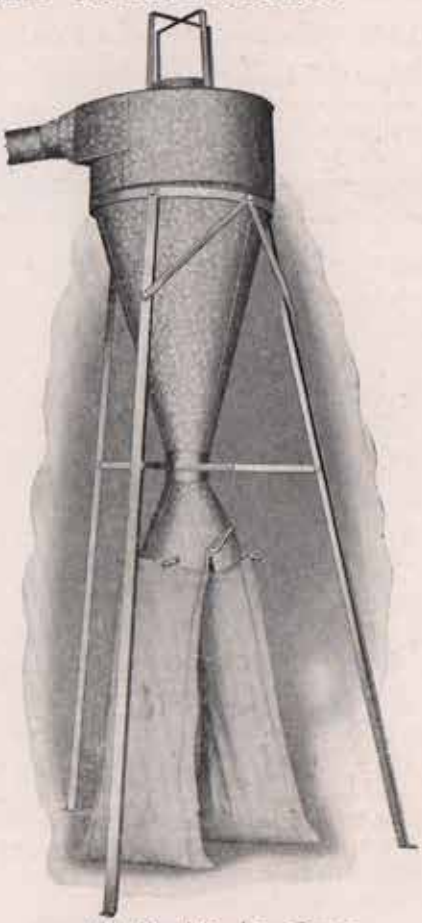
12-ft. Steel Wagon Box Tower
For Feed Collector

This steel wagon box tower is attached directly to the No. 344, 230 or 130 roughage grinders. It is not interchangeable on the different machines, and therefore, the model number of grinder must be mentioned at time of order.

This steel tower may be attached to the plate end of the grinder or to the rear of the grinder, (opposite feed table).

This steel tower supports the feed collector when discharging ground feed into wagon box or open bins. The 12-ft. steel tower is suitable for triple wagon box work.

Where wagon box tower is used, order swivel spout for bottom of feed collector.



6-ft. Steel Sacking Tower
For Feed Collector

This 6-ft. steel sacking tower stands independently of all sizes of mills.

It is interchangeable on all sizes, the same steel sacking tower being used with Nos. 344, 230 or 130 machines.

This steel sacking tower may be located where it is most convenient. It is used to support the feed collector where feed is sacked.

Where a 6-ft. steel sacking tower is used, order double bagging spout for bottom of feed collector. Where roughage mills with exhauster fans are installed with the main object of discharging feed overhead into mow, into bins, etc., but where it also is desired to sack some feed, this can be easily arranged by installing a valve in discharge line and leading a branch line to feed collector, supported by steel tower above.

Such an installation permits you to sack feed, as well as blow it into bins, all in one operation.

Fittings for Exhauster Fan Installations

6-in. Galvanized Discharge Pipe

Furnished in 1, 2, 4 and 6 foot sections. Large end of each section stenciled to assure easy installation.

Wiring clips provided so joints may be securely held together.

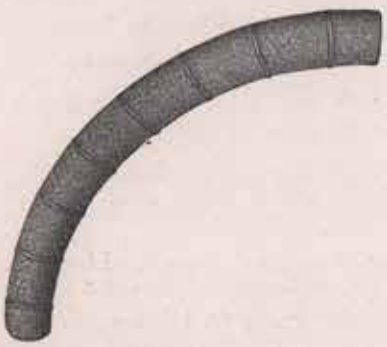
"Two-Way" Valve

By means of these valves, ground mixed feeds may be discharged at numerous places in any installation.

These valves have rubber lined inside gate, making them air-tight. Valves are easily and quickly adjusted.

Long Sweep Elbow

6-in. Galvanized, long sweep elbow, 36-in. inside radius. We recommend long sweep elbow wherever possible, due to decreased friction. Where feed is blown more than 15 ft.



above grinder or 20 ft. or more away from grinder, long sweep elbow must always be used to join the vertical discharge pipe line with horizontal discharge pipe line.

Short Sweep Elbow

Short sweep galvanized elbows may be used at discharge points to help break the air current and guide the feed in bins.

Feed Collector

A feed collector does two things at point of discharge. First, it prevents a cloud of dust at the end of discharge line. Secondly, the most important, it keeps the light and heavy, or the small and large pieces of ground feed evenly mixed.

Without a feed collector, there is a cloud of dust at discharge, also separation of feed particles takes place, heavy pieces of ground feed being blown some distance away and light pieces settling near discharge.

Bagging Spout

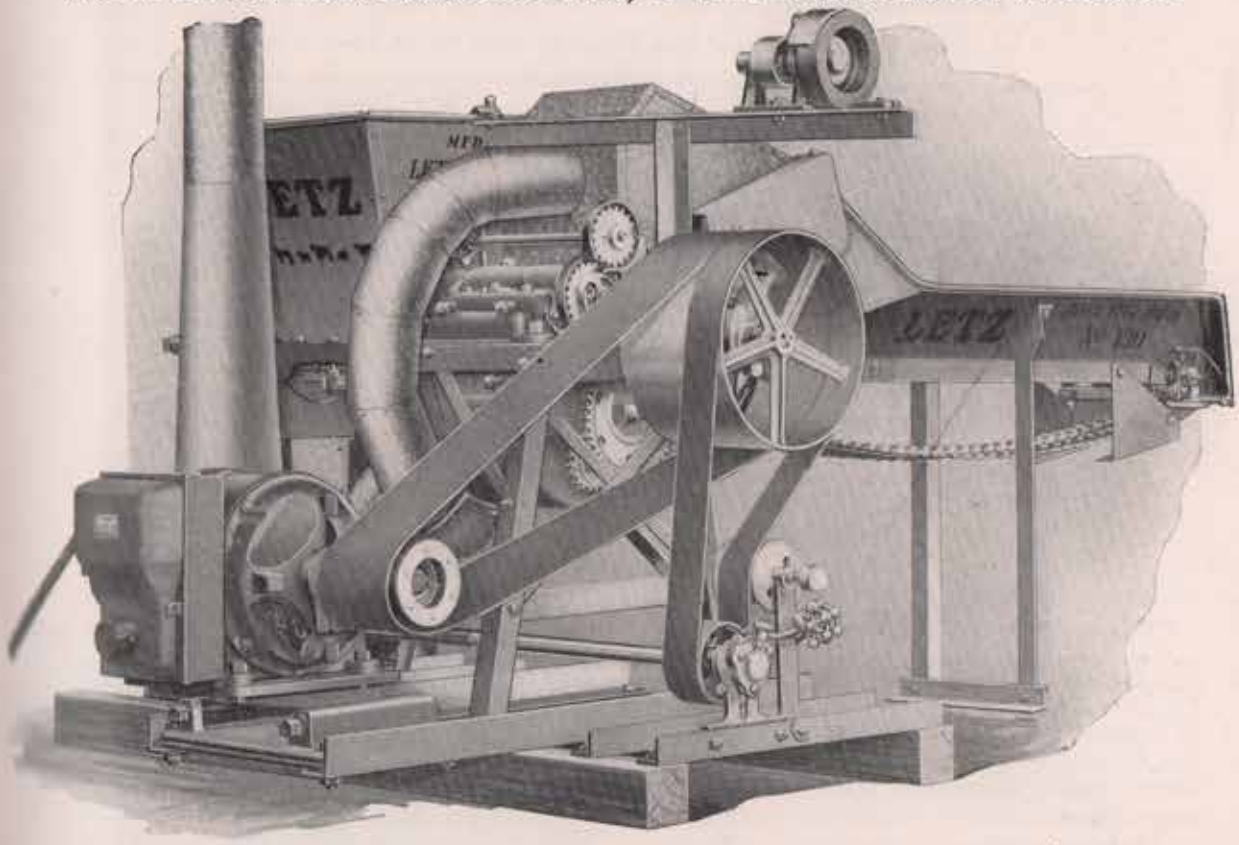
Galvanized, double bagging spout used at bottom of feed collector when feed is discharged into bags.

This spout is provided with quick-acting, efficient bag holders for rapid, easy changing of bags.

Swivel Spout

Galvanized, 6-in. swivel spout. Used at bottom of feed collector where feed is discharged into wagon box, truck, or open bins.

No. 133 Letz with Exhauster Fan, 5 H. P. Farm Motor Attached



Where a 5 or 7½ horsepower single phase, farm type motor may be installed, good capacity and an excellent grade of work can be turned out with a No. 130 Letz, with or without the exhauster fan or elevator.

Engineering tests indicate that as much as one ton per hour of fodder or legume hay may be coarsely chopped with 5 horsepower motor for power.

Engineering tests also indicate that when coarse grinding these same roughages, a capacity of 1,000 to 1,200 pounds per hour may be obtained.

As much as 25 to 30 bushels per hour or ear corn or oats may be coarsely ground through 8" plates with 5 horsepower single phase motor for power.

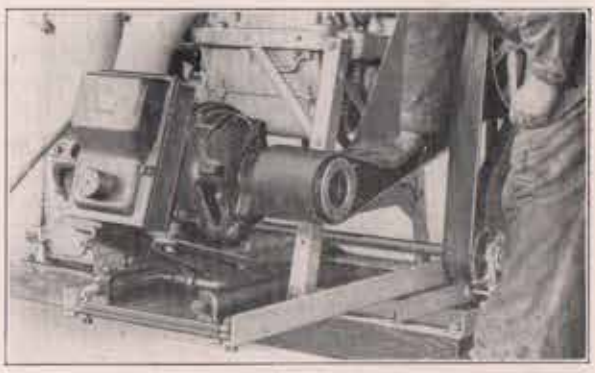
Ten to fifteen bushels per hour of oats or barley may be ground fine.

With a 7½ horsepower single phase motor, a corresponding increase in the above capacities may be obtained, also a desirable power surplus, using 8" plates in the grinder instead of the 10" standard size plates.

The illustration above shows a new 5 horsepower farm type, single phase motor bolted directly to a tilting base. This short center drive is most efficient. The weight of the motor acts automatically as a belt tightener, maintaining a uniform flow of power.

Where three phase service is available, any size Letz roughage grinder may be operated by electric motor, as shown by table.

Efficient short center drives may be likewise arranged for the Nos. 344 and 230 series Letz roughage grinders.



With 5 or 7½ Horsepower Farm Type Motor Bolted to this Tilting Base, the Weight of Motor Acts as An Automatic Belt Tightener, Making a Most Efficient Short-center Drive.

Electric Motor Drive for Letz Roughage Mills

Table Showing Correct Size Motor for Letz Mixed Feed Makers*

Model No.	Size Grinding Plates, Inches	Grinder Speed in R.P.M.	Size Motor
130 Letz	8	600	5
130 Letz	8	700	7½
130 Letz	10	850	10
230 Letz	10	600	7½
230 Letz	10½	700	10-12
230 Letz	10½	850	15
344 Letz	10½	700	10
344 Letz	12	700	15
344 Letz	12	850	20

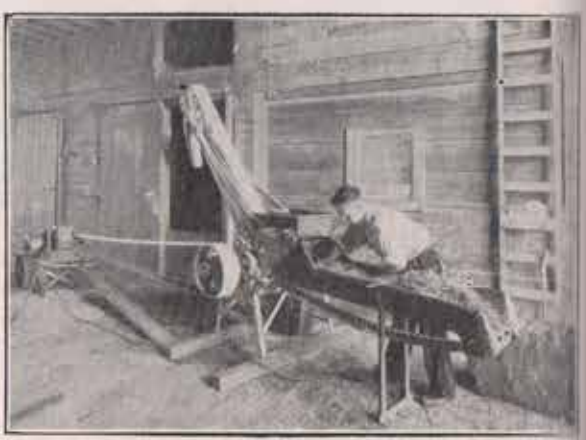
*Be sure that power service is such that motor delivers full rated horsepower during all working hours of the days and all working days of the year. It sometimes happens motors only deliver a fraction of their rated horsepower, due to high line being occasionally or continuously overloaded, or transformer too small in size, or transformer located too far from motor, etc., etc. Power Company Engineers can measure energy input and output with instruments to prove proper installation and service. This is most important.

Reports of Official Tests

Engineering Deparmtents of different State Experiment Stations, as well as field engineers of large power companies, are finding the modern Letz roughage grinder most practical, and efficient for operation by 5 or 7½ horsepower single phase motor.

An exhauster fan attachment may be added to the No. 133 Letz as it consumes less than one horsepower, when running empty and very little added power in operation. The Letz exhauster fan works like a centrifugal pump, requiring little power.

After official tests with different types of machines, the Engineering Department, University of Nebraska, found the No. 130 Letz most efficient.

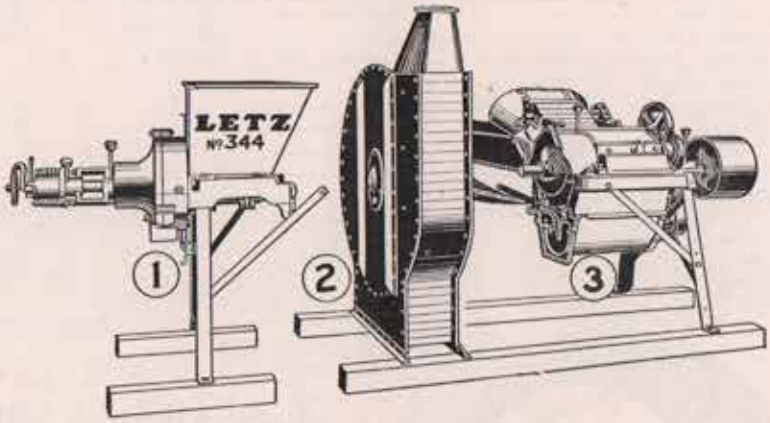


The No. 130 Letz, with 5 h. p. Motor, on Test at Nebraska State Experiment Station

Results of Official Tests, Agricultural Engineering Department, Nebraska State Experiment Station, Lincoln, Nebraska, No. 130 Letz, Sacking Elevato and Five Horsepower Farm Type Motor.

Feeds Prepared	Grade of Work	Lbs. Per Hour	Energy Consumed Per Ton Of Feed In K. W. Hours	Power Cost Per Ton at Rate Per K. W. Hour of 3c	4c	5c	6c
Alfalfa	Medium	1064	5.26	15.8	21.0	26.3	31.5
Snapped corn	Coarse	1200	7.66	22.9	30.6	38.3	45.9
Ear corn	Coarse	1200	7.50	22.5	30.0	37.5	45.0
Ear corn	Medium	1033	6.77	20.3	27.0	33.8	40.6
Oats	Coarse	767	6.77	20.3	27.0	33.8	40.6
Barley	Coarse	999	5.80	17.4	23.2	29.4	34.8
Shelled corn	Medium	2280	3.85	11.6	15.4	19.2	23.1

LETZ SILO FILLING EQUIPMENT



Showing How Silo Blower Replaces Grinder Head

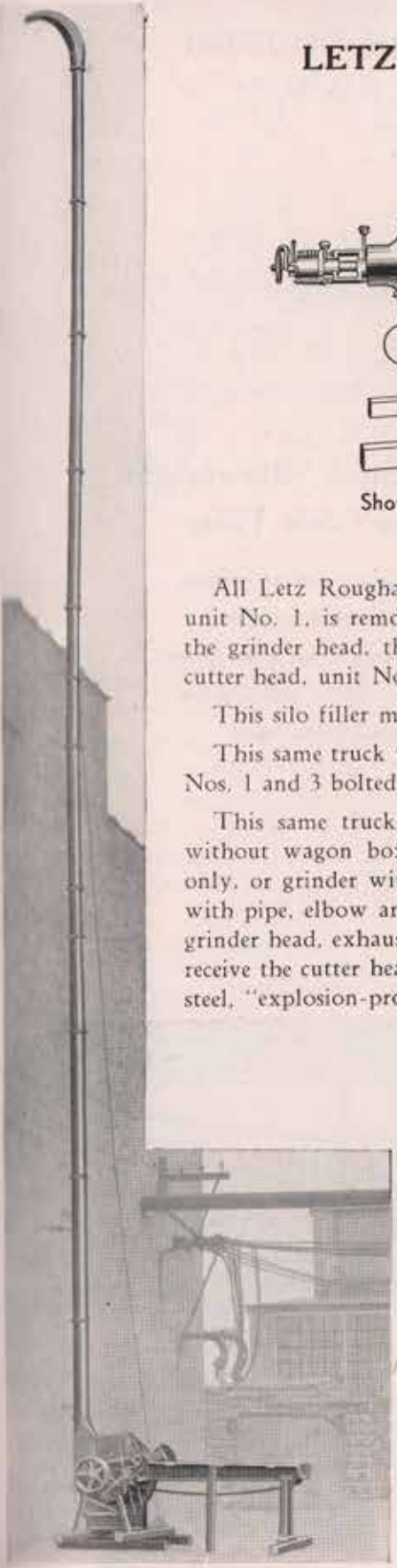
All Letz Roughage Mills are built on the unit plan. The grinder head, unit No. 1, is removable from the cutter head, unit No. 3. After removing the grinder head, the all-steel silo blower, unit No. 2, is then bolted to the cutter head, unit No. 3, making a modern, efficient silo filler.

This silo filler may be mounted on all-steel trucks, making it portable.

This same truck will receive the mixed feed maker or roughage mill or units Nos. 1 and 3 bolted together, with or without elevator.

This same truck will also receive the exhauster fan attachment, with or without wagon box tower. In fact, the one truck will receive the grinder only, or grinder with elevator, or grinder with exhauster fan, and steel tower with pipe, elbow and feed collector, or removing grinder head and elevator or grinder head, exhauster fan, tower and feed collector, this same truck will then receive the cutter head unit, and silo blower unit No. 2. Letz blowers are all-steel, "explosion-proof" construction with automatic safety drive. Letz blowers "throw" more than "blow". They will fill any height silo, with ease, small power and at surprisingly slow speed. Heavy flanged pipe, deflector, ensilage hopper, and inside distributor sections may be supplied.

The big advantages of having an individual silo filler are well known. By purchasing this silo blower attachment, a man has a two-in-one machine that is thoroughly practical and that will enable him to fill his silo when his corn gets to the proper stage and to do it with the utmost convenience and at the lowest cost.



A Letz Silo Filler will fill the tallest silo. Illustration shows the Letz elevating 75-ft. at a speed of only 600 r.p.m.

Specifications for Letz All-Steel Silo Fillers

Model No. LETZ SILO FILLER	344	230	130
Horsepower required	10 to 20	10 to 18	6 to 15
Speed recommended in r.p.m.	500 to 850	500 to 850	500 to 850
Diameter of blower housing, inches	40	40	40
Width of blower housing, inches	6	6	6
Diameter of blower shaft, inches	2	$1^{11}/_{16}$	$1^{11}/_{16}$
Diameter and width of cutter head, inches	12x12	$10\frac{1}{2}$x$10\frac{1}{2}$	9x9
Number of knives	4	4	4
Length of cut, in inches	$\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$
Throat capacity, in square inches	84	55	40
Capacity at $\frac{1}{4}$-inch cut, tons per hour	10 to 15	8 to 12	5 to 10
Diameter of wheels on truck	24x3	24x3	24x3
Gross weight with truck, lbs.	1687	1500	1265
Weight on skids, no truck, lbs.	1364	1178	941

Letz All-Steel "Blower and Thrower" Silo Filler

Explosion proof blower housing

Explosion proof fan wheel

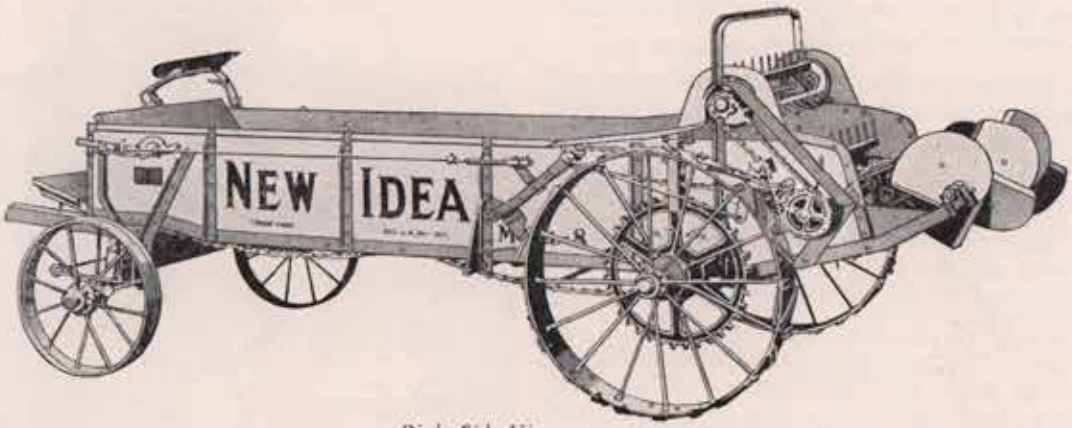
Automatic safety fan wheel drive

Automatic safety pulley drive

All-steel cutter head

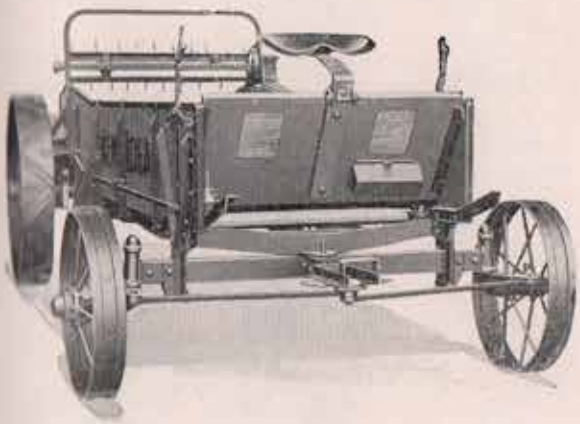
No. 344 Letz Silo Filler, on All Steel Trucks
(Any No. 344, 230 or 130 Silo Filler May
Be Furnished on Trucks or on Skids)

Model 8
NEW IDEA MANURE SPREADER



Right Side View

The Model 8 New Idea Spreader is a machine of the most modern design and quality built throughout. The following features are outstanding in the New Idea Spreader: light draft, maximum traction power, freedom from choking, five changes of speed (they are accurate, not hit and miss), high clearance, long drive chain engaging eleven teeth, double lift on chain, non-cramping front axles, roller bearings throughout, low down for easy loading. Then there are hundreds of "unseen" quality features such as copper bearing steel, high carbon steel, semi-steel castings, hardened steel chain, extra clear lumber, closely machined sprockets and cylinder heads, wheels bored to run true.



Showing New Idea Front Axle Construction

SPECIFICATIONS

Inside length of bed	10 Feet
Inside width of bed, front	38½ Inches
Inside width of bed, rear	40 Inches
Inside height of sides	17½ Inches
Height from ground to top of side	40½ Inches
Clearance under Conveyor	16 Inches
Clearance under Front Axle	8 Inches
Turning radius of outside front wheen	10 Feet 8 Inches
Height of load under rear arch	37 Inches
Capacity when loaded level	50 Bushels
Capacity when fully loaded	70-75 Bushels
Feed Range	4, 8, 12, 16 and 20 loads per acre
Length of Rear Axle	73 Inches
Rear Wheel	40" Diameter; 6½" Face; 9/32" Thickness
Front Wheel	27" Diameter; 4" Face; 9/32" Thickness
Shipping Weight	1550 Lbs.

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA SPREADER

Model 8 New Idea Spreader

(Continued)

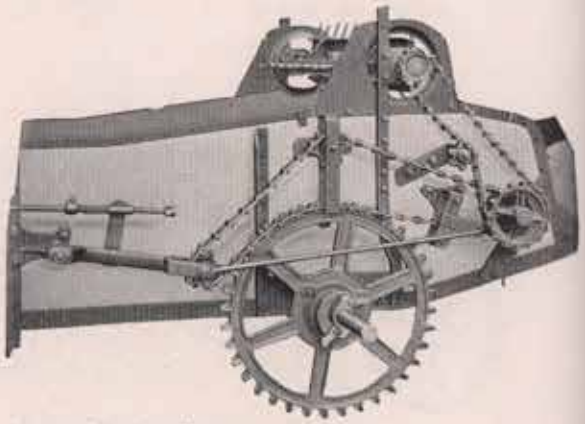
THE NEW IDEA DRIVE

The easy-running qualities of the Model 8 are due in great measure to the simple and powerful New Idea Positive Drive.

Cylinders and distributer are driven by individual chains of heat-treated steel links that remain flexible and free running even in the coldest weather.

The main cylinder is operated directly from the large drive sprocket. A separate chain operates the upper cylinder, while another at the opposite end of the main cylinder shaft, drives the distributer.

When in gear, eleven consecutive teeth of the chain mesh with the teeth of the sprocket and are held in place by a spring tension tightener. When out of gear, the chain is lifted free from the sprocket, but is not raised above the side of the machine, where it would interfere with loading.



Simplicity, sturdiness and power are combined in this easy running, distinctly New Idea Feature.

THE NEW IDEA DIRECT AXLE FEED

The noiseless, vibrationless motion of the New Idea Direct Axle Feed is responsible for the characteristic uniformity and evenness of the spreading done by the Model 8.

The smooth, steady movement of the conveyor is controlled by a sturdy, distinctive, 4 point cam. This cam is set directly on the axle, forced on under hydraulic pressure and fixed with key and set screw.

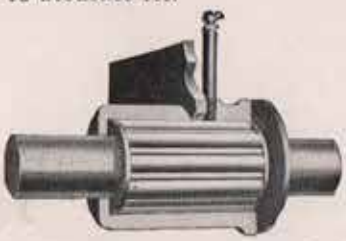
The edges of the cam form a continuous curve over which the roller of the feed arm glides without shock or hammering. There is no noisy pounding in the New Idea Feed. The conveyor moves back evenly and without jerking. The spread is uniform and smooth. There are no thin streaks or ridges. The easy, effortless operation of the New Idea Feed is one of the prime reasons for the long life and steady service of the Model 8.

A handy control lever at the driver's right enables him to adjust the feed to apply positively and uniformly 4, 8, 12, 16 and 20 loads per acre.

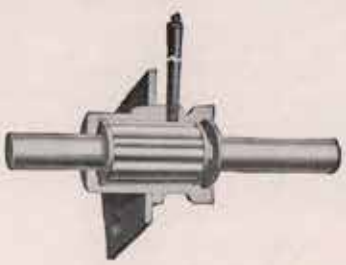
NEW IDEA BEARINGS

The bearings used on the Model 8 New Idea are correctly designed and carefully bored and machined to accurate fit.

All New Idea bearings are lubricated at the center so that the oil or grease is equally distributed over their entire length and surface.



All New Idea bearings are selft-aligning in the truest sense of the word. Each bearing is balanced so that the weight is equally divided at the exact center; neither end can drag or wear against the shaft.



Extra long and sturdy Roller Bearings are used on the rear axye, front axle and on the drive end of the main cylinder.

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA SPREADER

Model 8 New Idea Spreader

(Continued)

THE NEW IDEA DISTRIBUTOR

The distributer is a patented and exclusive New Idea feature. It is the modern development of the famous "Wide Spread" which was invented by the founder of this company and which gave the New Idea its name.

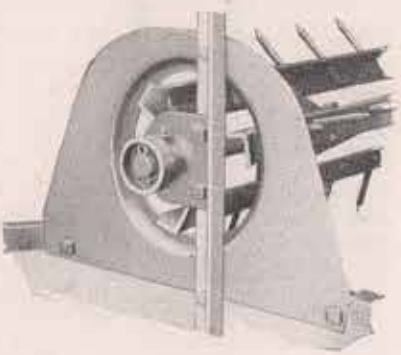
The shape of the blades, their arrangement on the shaft and their relation to each other, all combine to produce the uniform wide spread of finely pulverized manure that characterizes the work of all New Idea Spreaders.

The blades, like all other flat steel parts of the Model 8 are made from heavy gauge, copper bearing, rust and acid resisting steel, and are held in place on the shaft by specially designed castings that add stiffness to the blades and prevent them from slipping or turning.

THE NEW IDEA BEATER

New Idea cylinders are all steel and of the most rigid construction. They operate with the greatest of efficiency, reducing draft, finely pulverizing the manure and enabling the operator to handle a maximum load.

Note that the end of the beater bars extend through the cupped shield and provide for self cleaning.



The accompanying cut shows the New Idea cylinder teeth. They are diamond pointed and are made from high grade steel. Note the rigid way in which they are assembled to the beater frame—they are inserted through one leg of the angle steel bar and firmly riveted to the other leg. The teeth may be quickly and easily replaced.

THE NEW IDEA CHAIN AND CONVEYOR

New Idea conveyor chains are made of specially designed, heat-treated steel links with reinforced bars, and are not the ordinary links usually found on spreaders. The reinforced part of the bar (C) on the New Idea chain links gives extra strength and prevents crystallization and consequent breaking at (xx). Chains on other spreaders have the bars of the links cut off at (BB). The additional metal (C) provides a large factor of safety.

The barrel of the New Idea links is closed tighter than in ordinary chain—this construction keeps the chain from slipping apart and causing breakage when in operation—yet the chain links can be easily and quickly replaced.

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA SPREADER

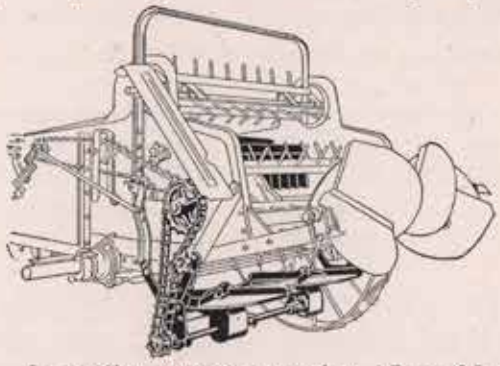
Model 8 New Idea Spreader

(Continued)

SPECIAL ATTACHMENTS FOR THE NEW IDEA SPREADER

LIME SPREADING ATTACHMENT

The New Idea lime spreading attachment provides the easiest, quickest and most efficient way of spreading lime, marl, rock phosphate,



etc. It applies an even covering 15 to 20 feet wide and the spreading rate can be regulated from ½ ton to 5½ tons per acre. This attachment can be installed or removed in just a few minutes time.

TAILBOARD ATTACHMENT

The New Idea Tail Board Attachment is used where no bedding or where sawdust, shavings and other similar substances have been used for bedding, making the manure difficult to handle.

BRAKE

The New Idea Brake is for use on extremely rolling or hilly land.

ONE WAY DISTRIBUTOR

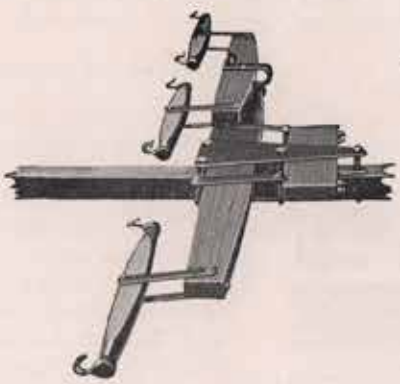
For use in orchards and places where manure is to be spread in one direction, the New Idea One-Way Right hand Distributor is recommended.

ANTI-WRAP CYLINDER

The New Idea Anti-Wrap Cylinder is for use where unusually tough long straw manure is to be handled and where considerable difficulty is experienced in keeping the upper cylinder from wrapping or choking.

TRACTOR HITCH

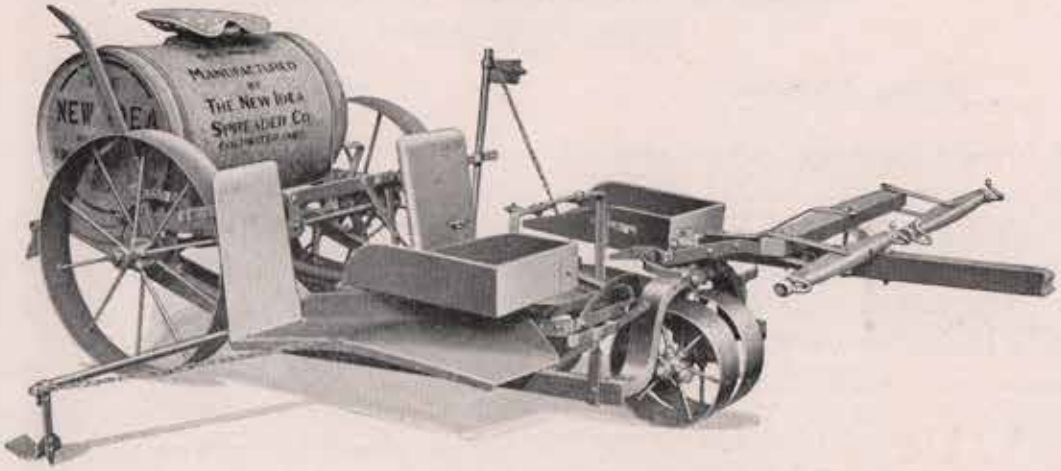
For use where the New Idea spreader is to be pulled by a tractor.



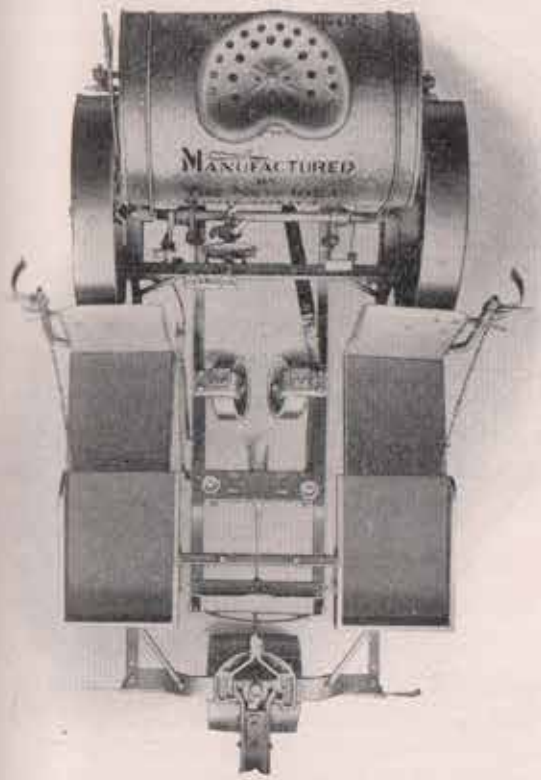
THREE HORSE HITCH

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA SPREADER

NEW IDEA TRANSPLANTER



Any plants that can be transplanted can be set with the New Idea. With this machine plants are set at the correct distance apart, at the proper depth, sufficiently watered and the soil firmly packed around them. The New Idea Transplanter materially reduces setting costs and insures strong, healthy plants, which result in increased profits at harvest time.



The New IDEA Transplanter is simple in construction and efficient in performance. It is durably and strongly built, the main frame being of steel, firmly braced and riveted together.

Two large wheels support the rear of the main frame, upon which the 60 gallon galvanized steel water tank is mounted. This tank is low—fully 8 inches lower than the tank of any other transplanting machine. The driver's seat is mounted on the opening of the tank and tips forward so that the tank may be filled conveniently from the rear.

The plant setters are located in front of the ground wheels on comfortable seats which are provided with backs and adjustable foot rests. They are out of dust and danger, and directly under the supervision of the driver, who can watch their work and regulate the speed of the machine according to their ability and skill.

The planting mechanism of the NEW IDEA Transplanter consists of a steel Shoe or Furrow Opener, a Water Valve and Pack Wheels or Press Plates for closing the furrow and packing the soil about the roots of the plants. The Planting Mechanism is mounted on a subframe which is operated by a lever at the right of the machine. This enables the driver to adjust the standard Furrow opener to cut a trench of any desired depth from 2 to 5 inches.

Weight of machine, without fertilizer attachment, 650 pounds. Length of machine, without pole, 7 feet 8½ inches. Width over all, 4 feet.

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA TRANSPLANTER

New Idea Transplanter

SPECIAL ATTACHMENTS

Fertilizer Attachment

The fertilizer attachment consists of a galvanized steel tank with a capacity of approximately 33 pounds—it is so constructed that different quantities of fertilizer, as desired, can be fed. The fertilizer is carried to the ground through a flexible tube and is deposited in a continuous stream directly in front of the furrow opener.

Pivot Axle Attachment

The Pivot Axle Attachment separates the wheels of the front truck, making it possible for the machine to be used in setting such crops as sweet potatoes, onions, etc., that are planted on ridges more than 8 inches in height. The front wheels are held in perfect alignment with the rear wheels and the tongue is automatically locked when the machine is in operation, so that straight rows are assured.

Tractor Hitch

The New Idea Tractor Hitch is for use where a tractor will be used for pulling the transplanter. It is strongly built and is easily attached in place of the regular horse hitch.

Foot Trip Attachment

The Foot Trip Attachment is for use where plants are to be set so that they may be cross cultivated. By means of this attachment, the plant setter releases the application of water with a foot controlled lever. To set plants in this manner the field is marked one way and the team driven crosswise and plants set and water released as the machine crosses the marking.

Deep Furrow Opener

The Deep Furrow Opener is for use where exceptionally deep planting is desired. The heel of the shoe is exceptionally wide giving large planting space—it will open a furrow to a depth of 8 inches.

Long Axle Attachment

The Long Axle Attachment is an extra length axle that permits the rear wheels to be shifted in or out, so that the transplanter may be used to plant in rows 27 inches or less apart.

Mint Shoe

A special attachment for properly setting mint roots. It can be easily and quickly attached or removed.

Sand or Clod Pushers

A simple attachment that is placed ahead of the furrow opener for keeping clods or excess soil away from planting row.

Irrigation Attachment

The Irrigation Attachment consists of a set of large discs which are attached at the rear of the transplanter, one operating on each side of the plant row, for the purpose of cutting a liberal sized furrow through which water may pass.

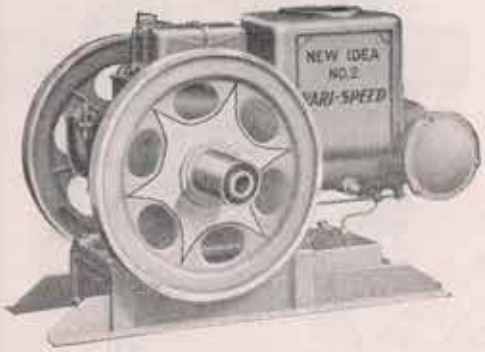
Potato Planting Attachment

The Potato Planting Attachment is a simple device that can be quickly installed on the transplanter and provides for the efficient planting of potatoes.

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA TRANSPLANTER

NEW IDEA GASOLINE ENGINES

"VARI-SPEED" ENGINE



New Idea No. 2

"Vari-Speed" Engine 1½ H. P. to 2½ H. P.

The New Idea No. 2

Into the New Idea No. 2 "Vari-Speed" Engine has been built every desirable feature for producing steady, economical and flexible power, plus years of satisfactory service.

It is Variable Speed, All Enclosed, Self-Oiling and Roller Bearing Equipped Engine.

It has an exceptionally wide range of efficient power making. Any job requiring between 1½ and 2½ H.P. is handled with equal adaptability. It provides the same steadiness and economy for the light tasks as it does when called upon to furnish its maximum power output.

The outward appearance of the New Idea No. 2 "Vari-Speed" Engine bespeaks its safe, simple, compact and sturdy construction. All important operating parts, such as the piston, connecting rod, main and connecting rod bearings, timing gears, magneto, cam shaft and governor, are completely enclosed.

All working parts on the engine are lubricated by the splash system from the crank case, except the two bearings of the rocker arm for the exhaust valve, which are provided with spring top oil cups. There is no oil pump to get out of order or oil lines to clog up, but instead, you have a simple automatic and most efficient oiling system.

SPECIFICATIONS

CYLINDER—Highly polished wall assuring maximum compression. Bore 3½". Stroke 5".

GOVERNOR—Throttle type, gear-driven, running in oil.

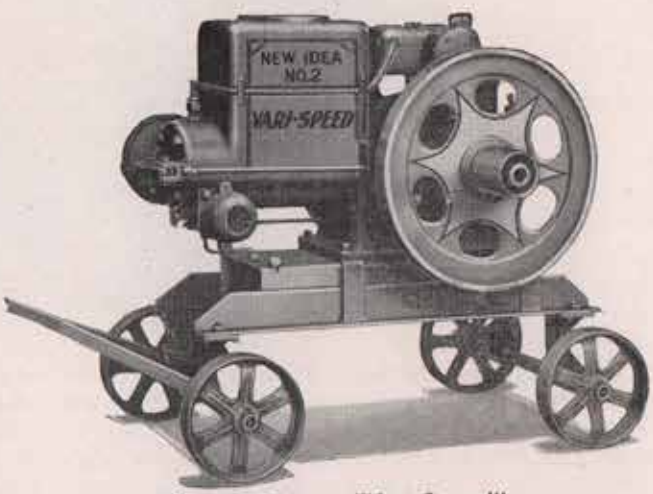
VALVE ACTION ROD—Single side rod.

VALVES—Unusually large—made from special alloy steel.

PISTON—Trunk Type—ground to close finish. Fitted with three compression rings and one "Sav-Oil" ring.

CONNECTING ROD—Drop forged, heat treated steel, with die cast Sae formula, anti-friction wrist bearing.

CRANK SHAFT—Drop forged, heat treated and ground, with ends tapered for fly wheels.



New Idea No. 2 "Vari Speed"
Mounted on Hand Portable Truck

New Idea Gasoline Engines

SPECIFICATIONS—(Cont.)

ROLLER BEARINGS—Crank shaft carried in Timken Roller Bearings.

FLY WHEELS—16" Diameter by 1½" Face, webbed, safety type, taper fit on crank shaft, perfectly balanced.

PULLEYS—One 3"x4" and one 4"x4" regular equipment. Larger sizes can be furnished.

AIR FILTERS—Efficient type—regular equipment.

LUBRICATION—Positive—splash system.

FUEL MIXER—Simple, but efficient, suction type—safe.

FUEL TANK—Heavy galvanized steel—2½ gallon capacity.

COOLING—Hopper cooled, 2½ gallon capacity, water surrounds cylinder and circulates throughout the head.

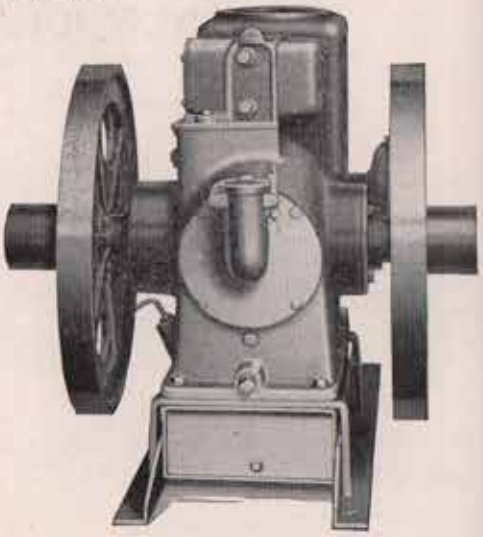
IGNITION—Bosch High Tension Magneto with Impulse starter.

MOUNTING—Steel skids regular equipment—portable hand truck extra equipment.

SPEED—500 to 800 R. P. M., variable at will.

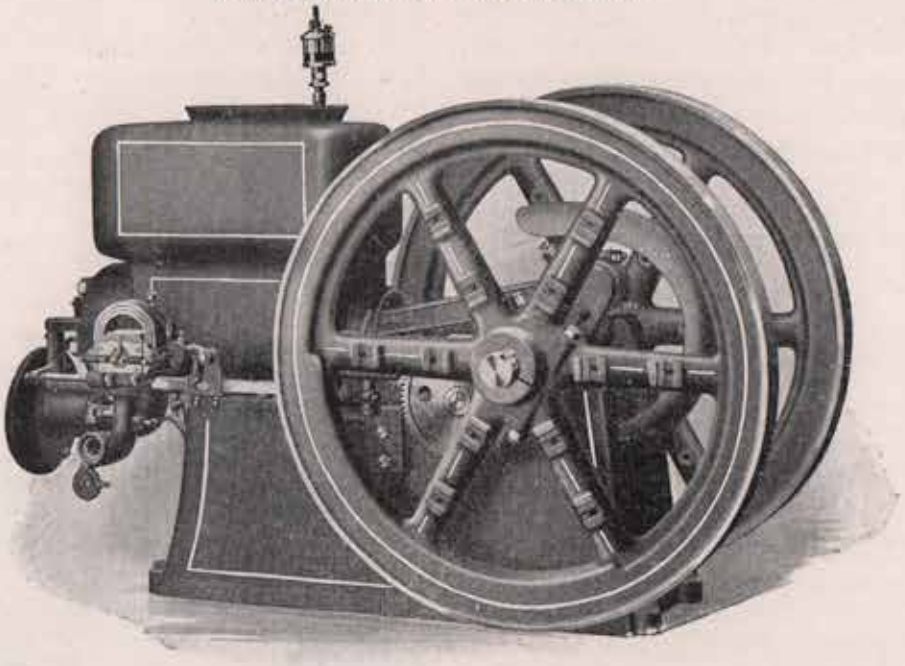
POWER—1½ to 2½ H. P. according to speed. Liberal surplus.

WEIGHT—Mounted on studs, 260 lbs.—on trucks 300 lbs.



The New Idea No. 2
"Vari-Speed" Engine is all enclosed and and self-oiling

HERCULES ENGINES



We have in stock some 9 horse and 12 horse Hercules Stationary Engines. The 9 horse are in the Gasoline or Kerosene burning type and the 12 horse are in the gasoline burning type only. These engines are all very high quality and made by one of the oldest manufacturers of engines.

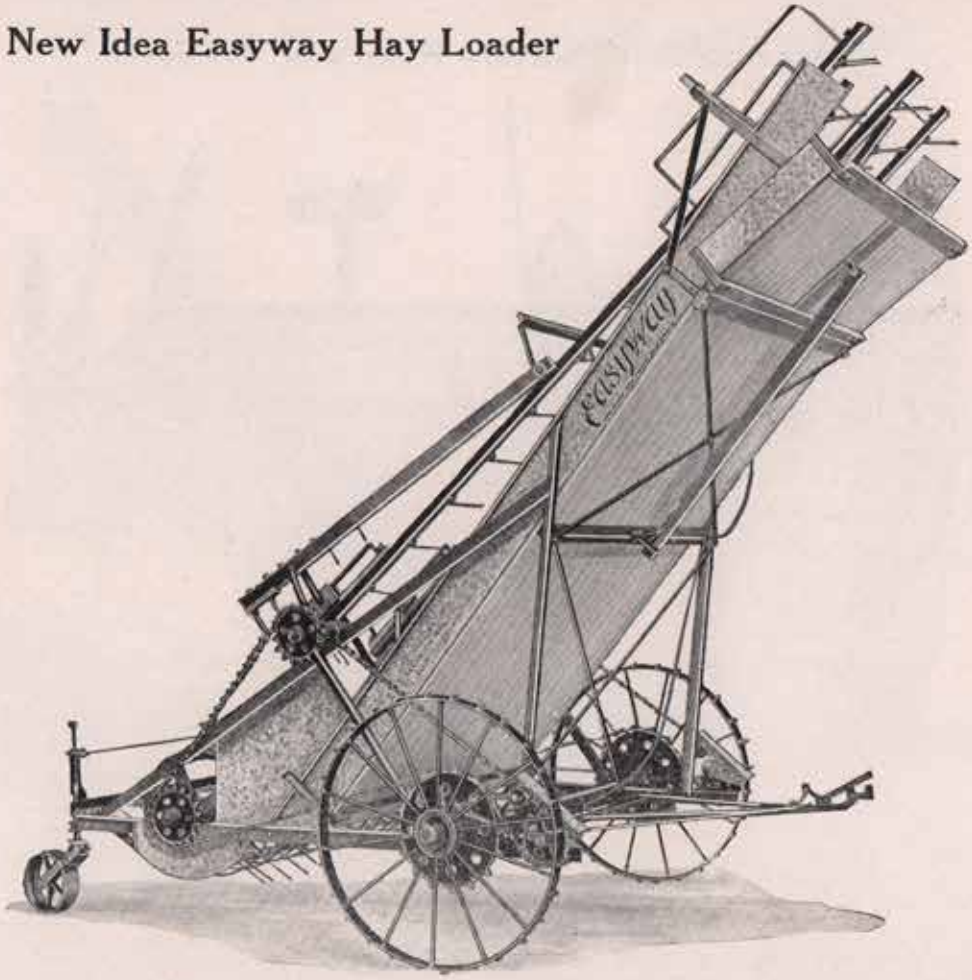
We have very low prices on these engines, far below our cost and any man who has use for an engine of this sort cannot afford to pass this up.

Prices are as given in the price book.

Weight:	9 Hore Power	1970 bls.
	12 Horse Power	2840 lbs.

Mounting can be furnished.

New Idea Easyway Hay Loader



The new NEW IDEA Easyway combined cylinder and push-bar hay loader is the last word in hay loader design and construction. In this loader are embodied two outstanding construction principles of successful types of hay loaders—the Cylinder and the Push Bar. These principles, plus the several exclusive and patented NEW IDEA features, make this loader unequalled in design, quality and performance. It is of steel construction and is roller bearing equipped.

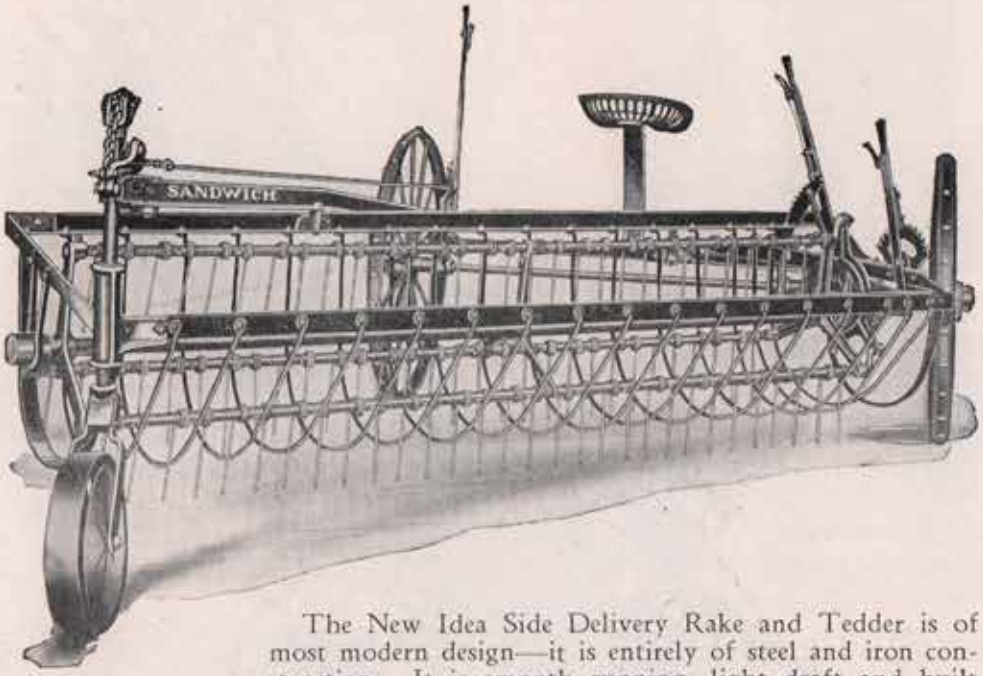
The Easyway is carried on four wheels. The main driving wheels are 39 inches in diameter, 3 inch face, with strong draft lugs. Both wheels are provided with driving sprockets and on each wheel there is a convenient device for throwing in and out of gear. The wheels turn on sturdy Roller Bearings. The rear wheels are of the caster type, 10x3 ¼ inches, with sleeve bearing 4 ¼ inches long which are removable in case of wear. The caster wheels are provided with means for raising and lowering the frame of loader to meet varying ground conditions. The weight is carried entirely on the four wheels—there is no weight on the tongue.

The Cylinder is of simple construction, equipped with four raking bars with oil tempered spring teeth. These raise the hay gently from the stubble, disturbing the ground litter but slightly. The cylinder possesses sufficiently flexibility to bend and pass over stones, clods and ridges, instantly returning to raking position and wasting no power in digging up the ground.

The Easyway Hay Loader is equipped with a solid or closed deck. This is very desirable for handling alfalfa or clover as it eliminates any loss of heads, leaves or short hay. The solid deck is what is termed a "yielding deck." This is an outstanding NEW IDEA feature. The deck is hung on springs at the lower end and automatically adjusts itself to the volume of hay being taken into the loader.

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA HAY LOADER

New Idea Side Delivery Rake and Tedder



The New Idea Side Delivery Rake and Tedder is of most modern design—it is entirely of steel and iron construction. It is smooth running, light draft and built to endure.

RAKING REEL—The frame of the reel is 10 feet 3 inches long and the reel itself 9 feet 9 inches, raking a swath about 8 feet in width.

RAKING TEETH—There are fifteen double teeth on each raking bar, giving 90 flexible, live, oil tempered spring teeth to the reel.

REEL ADJUSTMENT—The raking reel is raised and lowered to meet varying conditions of ground and hay, by two levers, conveniently located and working independently so each end of the reel may be adjusted without reference to the other. The rake is thrown in and out of gear from the driver's seat for either raking or tedding.

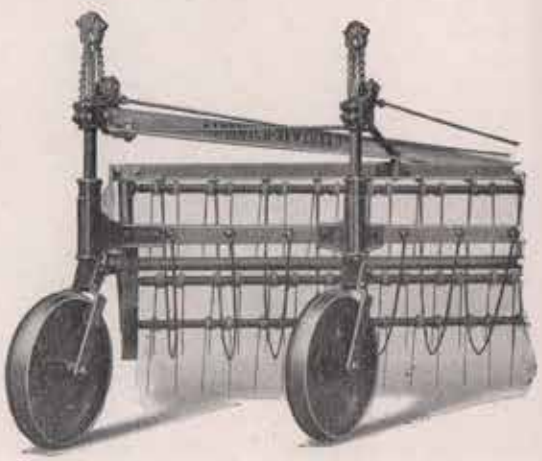
ROLLER BEARINGS—Six of them, relieve friction on all important journals.

TOOTH ANGLE ADJUSTMENT—A third lever enables the operator to change the position or angle of the raking teeth to meet varying conditions of hay and ground.

WHEELS—The two main drive wheels are strongly built. A single durable steel disc caster is regular equipment. However, all frames are bored to take a second caster attachment, which may be had at small additional cost. The extra caster is in advantage on rough meadows and irrigated land.

LEFT-HAND DELIVERY—The hay is delivered to the left of the driver, hence if the mower is followed—the correct method—the hay is placed on the clean, dry stubble and not upon unraked hay.

HAY TEDDING DEVICE—A movement of a lever converts the rake to an efficient Hay Tedder—two machines in a single unit. At no extra cost.

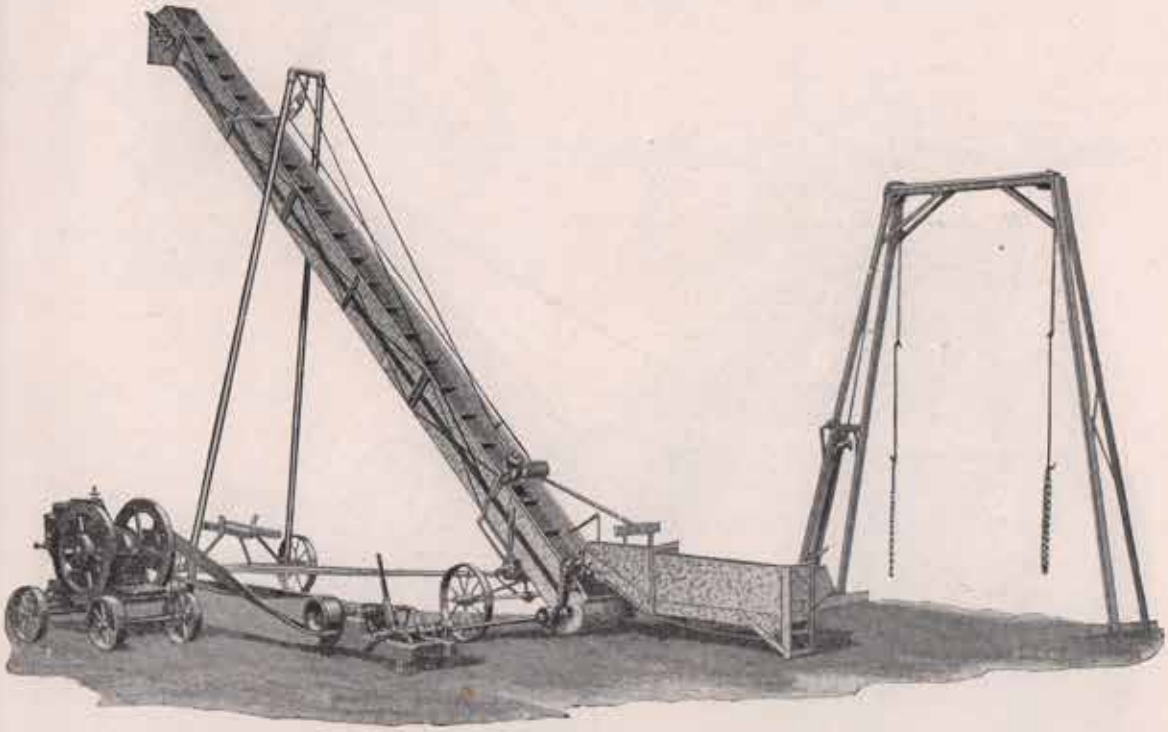


Showing extra Castor Wheel attached

	Lbs.
Weight with one castor wheel	Approx. 900
Weight with two castor wheels	Approx. 985

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA RAKE

NEW IDEA PORTABLE GRAIN ELEVATORS



The New Idea Portable Elevator is the modern machine for saving time, money and muscle in the unloading of corn and small grain from wagons to bins or cribs.

Strength, durability, smooth running and light draft have been built right into the New Idea Portable Elevator. One of these elevators will store grain crops quicker, better, with less work and at a lower cost than can be done in any other way.

Galvanized copper alloy steel is the sheet metal used the NEW IDEA. This material is the last word for portable elevator construction—it gives the utmost possible resistance to ravages of rust.

A sturdy all-steel truck and derrick is furnished with the New Idea. This truck and derrick handles all lengths of elevators.

The wheels are 22" high, axles of 1¼" steel. The reach is made of three pieces of steel pipe, each telescoping within the other so the truck may be expanded or retracted in length to suit the length of the elevator carried and in order to locate the elevator closer to crib or granary, thus delivering the grain farther in the building.

Bridge-Trussed is the term that can logically be applied to the superior construction of the New Idea elevator trunk. This consists of a unique system of truss rods on each side of the elevator body and eliminates any bending or buckling.

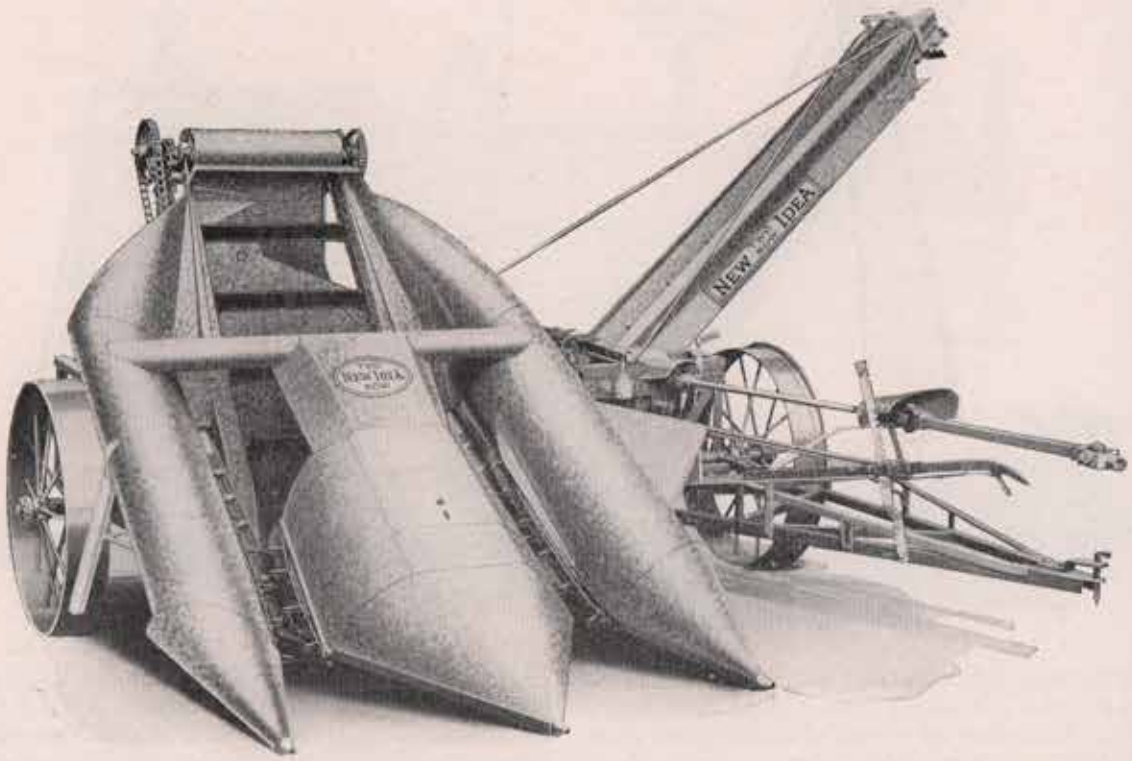
Extra bends in elevator body sides constitute another exclusive New Idea feature. The top side edges of the elevating and return slides are turned twice, making the equivalent of a Structural Channel the entire length. This construction provides for the maximum in strength and rigidity.

Wood carrying strips of hardwood are located in each corner of the elevating trough for the conveyor chains to run over. This superior construction gives longer life to the conveyor chain and metal trough and eliminates noise.

The New Idea overhead Wagon Dump is of steel, rigidly built and easy to operate. A simple and powerful screw lifting device is used for raising or lowering the wagon—action is positive and the maximum in safety is provided.

SECURED ON FACTORY ORDER ONLY

NEW IDEA TWO-ROW CORN PICKER



The New Idea Two Row Corn Picker is the modern machine for picking and husking the corn in the field. When in operation in the field it picks the ears from two rows of standing corn, elevates the ears into a husking unit, which husks the ears and elevates them into a wagon which is drawn alongside the Picker.

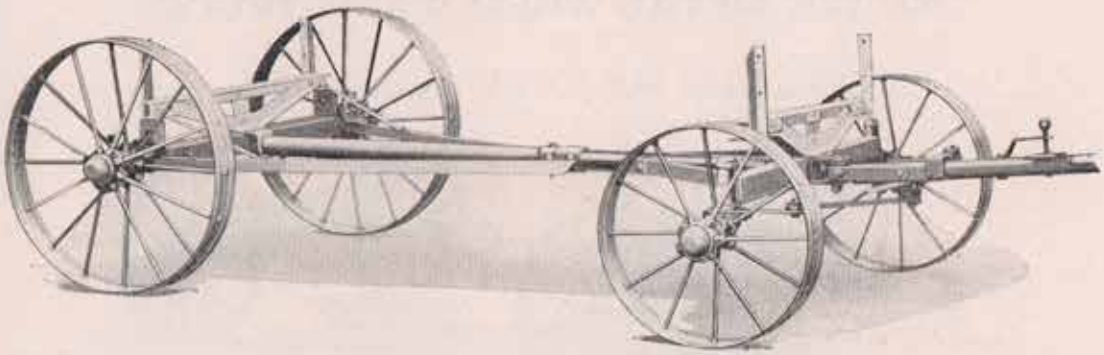
The mechanism of the Picker is operated by the power take-off on the tractor. The New Idea Picker will operate with any two plow tractor. The New Idea Picker will harvest from 12 to 18 acres a day depending upon conditions.

Weight ..... 3200 Lbs.

SECURED ON FACTORY ORDER ONLY

ASK FOR OUR SPECIAL FOLDER ON THE NEW IDEA TWO ROW CORN PICKER

NEW IDEA ALL-STEEL HARVEST WAGON



A wagon that is absolutely in line with modern farming practice and conditions. Built entirely of steel—no wood to shrink, crack or rot—no loose parts to adjust. Light, strong, economical—a revelation in handiness and adaptability. A wagon that will take care of every farm hauling job both in the field and on the road.

Pull a pin and you can telescope the reach of this wagon to any length between 7-ft. and 10 ft. 6 inches. Set the stakes in or out and you can accommodate a wagon box either 38 inches or 42 inches in width. Remove seven bolts and you can take off the bolster and lower the wagon bed to a height of only 18¾". Wide or narrow boxes, flat racks or flare sided platforms—long or short—this wagon is adjustable to them all with an ease that has never before been equalled. Rated capacity 4000 lbs.—and will carry with safety, an overload of 25%. Wheels strong enough for the roughest work with reinforced spokes and rims hardened to withstand the grinding of stony roads. Big roller bearings—two of them in each wheel and completely dust-proofed (hubs sealed at both ends)—make this the easiest rolling wagon you ever saw. The auto steer, oscillating, front axle reduces pole whip and provides for short and safe turning. The oscillating feature absorbs the strains and lurches of the roughest ground, however, when this feature is not desired brackets can be put on to take out all, or part of the oscillation.

SPECIFICATIONS

All-Steel Construction. Front Wheels 28" diameter. Rear Wheels 54" diameter. Rims, wagon can be furnished equipped with 4" or 6" tire wheels. Weight, 700 lbs. Tread, Standard 56" to spoke centers. Wheel base, telescopes, 7' to 10' 6". Inside turning radius, when coupled short, 10' 6". Front axle, Height 20½"; with bolster, 26¼". Rear Axle, Height 18½"; with bolster, 24½". Tubular Steel reach of a snug fit assuring the keeping of the front and rear axles in proper alignment at all times.

Bolsters—Removable front and rear. Box Stakes Adjustable for 38" and 42" outside width boxes. Tongue—Steel, 12 ft. Color—Orange gear, green wheels.

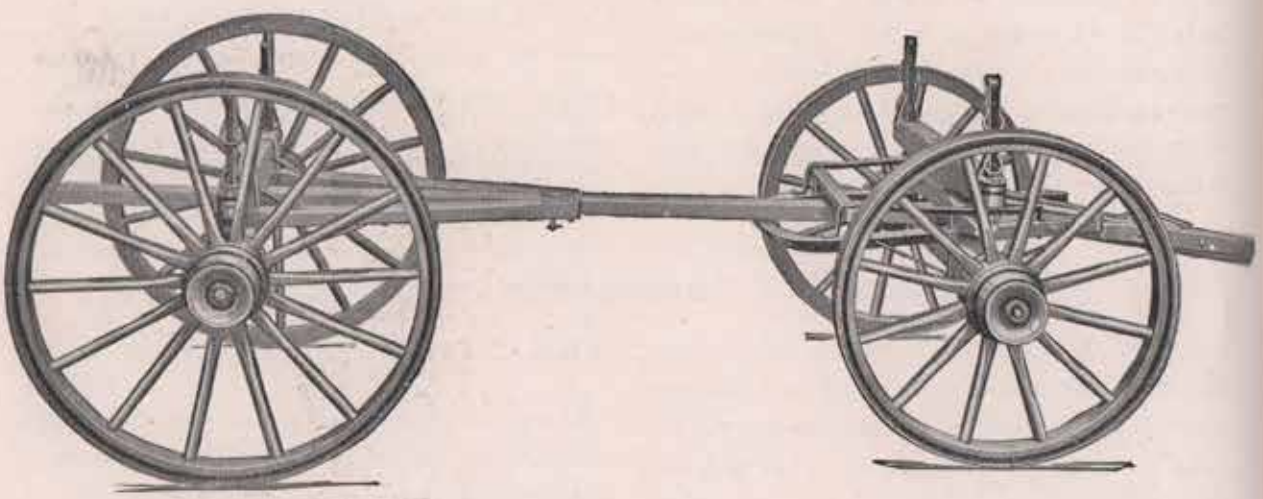
EXTRAS—Steel Stub Pole, Beam Brake, Steel Two Horse Hitch and Steel Neck Yoke at extra prices. No Wagon Boxes, Platforms or Racks furnished.

ASK FOR OUR FOLDER ON THE NEW IDEA ALL-STEEL HARVEST WAGON

No. 17½ METAL WHEEL FARM TRUCK

Truck illustrated above is very well built throughout, painted a permanent red, striped and varnished. It is equipped with clipped skeins, extra heavy sleeves, clipped gears, round steel front hounds, large heavy reach plate on rear gear making gear absolutely rigid, ironed from hound to skein on both front and rear axles, trussed axles both front and rear. It is built very strongly throughout and makes a very serviceable farm truck: cast skeins 3¼x10.

No. 18½ WOOD WHEEL FARM TRUCK



The above illustrated truck is the same gear as our No. 17½ only with wood wheels. This is a very handsome truck and one that will give very fine service.

Skein Size	*Tire*	*Wgt., Lbs.*
No. 18½, 3¼ wood wheels 36-40" wheels	3x½	646
No. 17½, 3¼ steel wheels, 28-32" wheels	4x⅜	509
Doubletrees and neckyoke, add		34
Stay chains, add		10

BLACK HAWK CORN SHELLER

These shellers are simple, durable and cheap. They will shell all sizes of corn easily and rapidly. Made mostly of malleable iron, and with fair usage are good for 10 to 20 years' service. Capacity, 6 to 8 bushels of ears per hour.

Weight ..... 15 lbs.

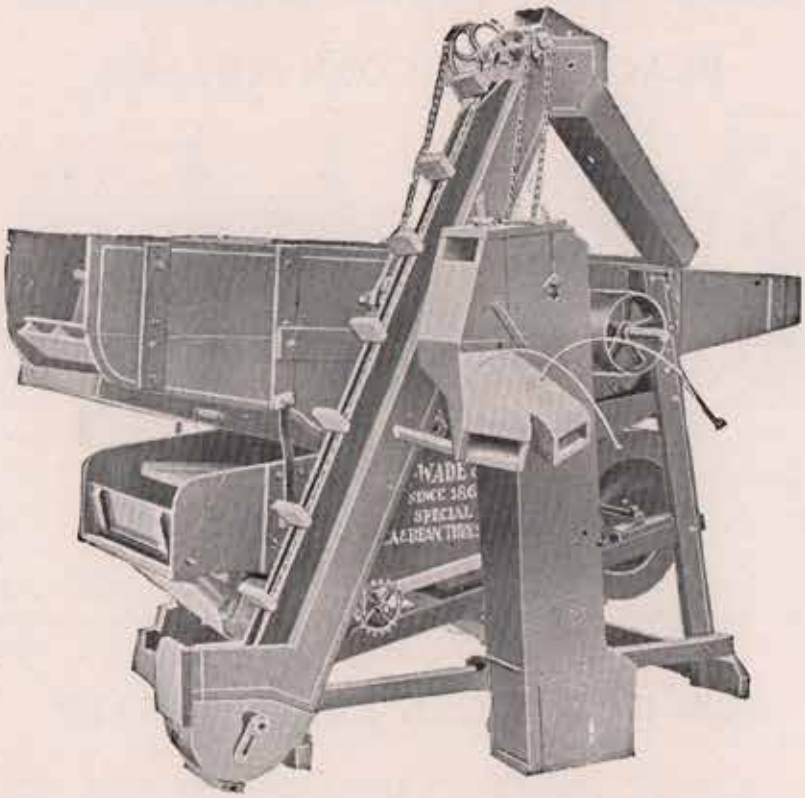
NEW IDEA "CORN KING" SHELLER

The Corn King is a one-hole sheller, with framework made of hardwood thoroughly mortised and pinned for stiffness and long life. The shelling device is extremely simple and durable. Almost any size and kind of corn, including pop corn, is handled satisfactorily.

Feed table, fan, crank and seed corn tipping device are regular equipment. As an extra, a pulley 8"x4" may be had for driving by motor or small engine.

Weight ..... 155 lbs.

WADE BEAN AND PEA THRESHER



With a Wade Bean and Pea Thresher every Farmer Can Handle His Crop at a Cost of a Few Cents A Bushel. It Will Enable Him to Make Big Profits from These Crops.

A Western product, made under Western conditions for the Western farmer. Built of the best materials throughout.

The wood used in the Wade Bean and Pea Thresher is extra select, air-dried No. 1 Western White Pine. All grooved and bolted together —no glued joints in the entire machine. All castings and metal parts have been carefully selected from the proper materials to insure long life and freedom from breakage. The belts furnished are the very best belting. The sieves, cylinders, concaves and all working parts are strongly made and carefully finished. The whole machine is built to give unusual long life and to "stand the gaff."

The Wade Bean and Pea Thresher is the result of actual experience in threshing bean and pea crops on farms in the Pacific Northwest. It is designed to meet Western conditions by men who understand those needs and conditions thoroughly. It is manufactured right here in the West.

The Wade Bean and Pea Thresher is not a custom machine, but a thresher which you can afford to own and use on your own crop. If you have two or more acres of beans or peas (or both), you will find a Wade Thresher a big money-maker for you.

The Wade is simply and strongly built. With ordinary care it will last for 15 to 20 years.

WADE BEAN AND PEA THRESHER

CONTINUED

Perfect Separation is Assured with Either Size Thresher

The No. 05 Thresher, which has a 20-inch separating space, is equipped with 20-inch cylinders made of heavy steel bars and cast iron heads with an intermediate spider. They are constructed throughout for heavy work. The cylinder bars are 7/16-inch thick and 1½ inches wide. The teeth in the cylinder and concaves are ⅜-inch round without points and are so constructed as not to crack the grain. They are of special design and are set in by a process of our own so they will withstand the most severe test. The cylinder shafts are 1¼-inch cold rolled steel and will last a lifetime.

The cylinder boxes are extra long and heavy, and have plenty of bearing surface. They are babbitted and fitted with hard oil cups, insuring smooth running cylinders.

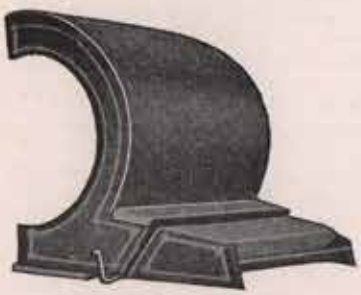
The No. 05 Thresher has two beaters, one back of each cylinder. Each beater has especially designed steel fingers that work between the cylinder teeth, keeping them clean and free to do their work properly. The first beater throws the vines and pods to the second cylinder after which the second beater carries them to the rear extension of the vibrator.

This size machine has a capacity of from 20 to 35 bushels an hour threshing beans, peas and their vines direct from the fields, at the same time shredding the vines. The capacity and power reqired vary according to the variety and condition of the crop that is being threshed. If the crop is dry and the vines not too long, three horsepower will be satisfactory, while if the crop is damp and the vines extra long, more power will be required to get full capacity.

You will note elsewhere in the catalogue the belting of our No. 05 machine and the grip the belts have on the pulleys. There is no belt-slipping and the machine has a steady motion.

If specified in the order, a Repeat Elevator is furnished with the No. 05 Thresher. This carries the pods and vines that go out through the tail spout. back to the first cylinder, where they go through the machine again.

NOTE THE BIG IMPROVEMENT IN THE WADE BLOWER

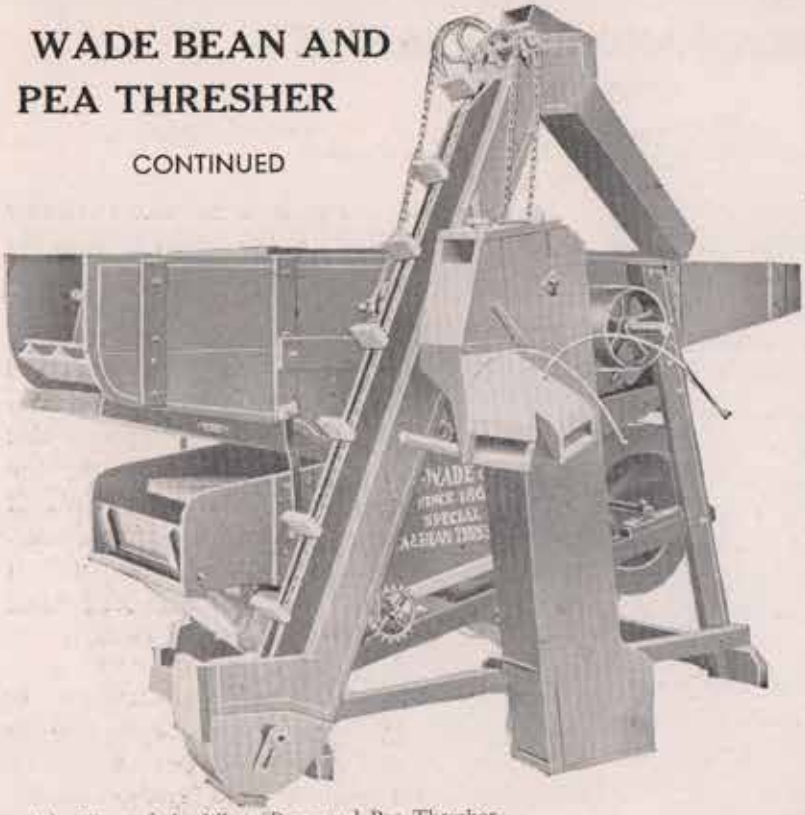


Here is the old type blower with the large mouth. It sends a blast of air through the whole machine; only part of the air does its work, because the air is not concentrated; it often sets up back air currents that waste the kernels and tend to choke the machine and give incomplete separation.

With the new Wade Blower all the force from the improved design, there is an improved damper at the mouth, which enables you to regulate the blast exactly as needed. This insures perfect separation and no waste.

WADE BEAN AND PEA THRESHER

CONTINUED



Side View of the Wade Bean and Pea Thresher, Showing Tailings, Elevator and Sacking Arrangement

OPERATION OF THE WADE THRESHER

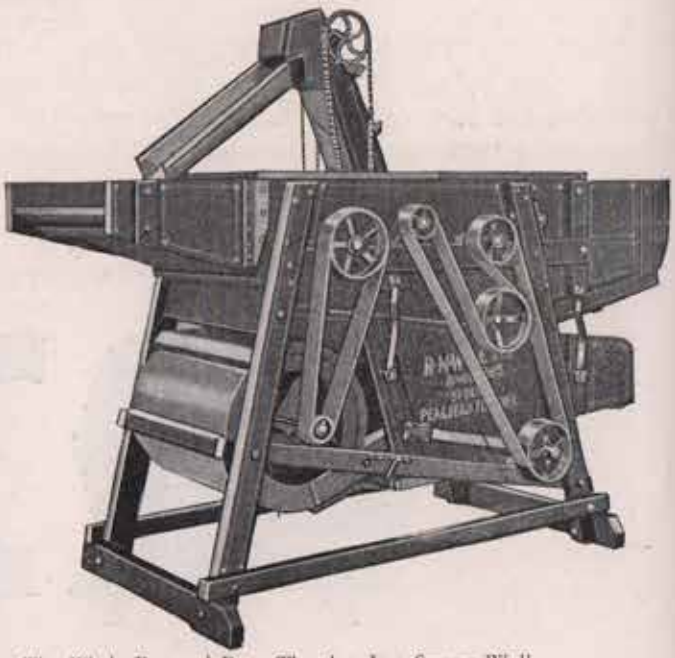
The shoe in the Wade Thresher is large and so shaped as to be very effective. It has an end shake and is hung on heavy steel rods. It is strong and durable and has an even motion.

The separation begins as soon as the vines reach the first cylinder and continues to the extreme rear of the machine. After passing through the first cylinder and concaves, the kernels drop through the grates beneath the cylinder and the vines pass over an open slat-work vibrator or bolter which extends from the first cylinder to the rear of the thresher. This vibrator or bolter, which is supported from swinging hangers, so as to give the easiest and most efficient movement for separating the kernels from the vines, can be raised or lowered to give the best results. From th second cylinder and concave, where practically all the kernels have been threshed out, the vines are delivered to the rear of the machine. Beaters back of each cylinder aid in keeping down the flying grain and in carrying the vines from cylinder to cylinder.

The kernels, which drop through the slat work of the bolter, are delivered to the head of the shoe by two conveyers or pans, one extending from beneath the first cylinder and the other from the extreme rear of the machine, are delivered to an anti-choke lip sieve in the shoe back of the fan. The kernels are here cleaned of all chaff and delivered through a spout clean and ready for market. By means of our specially constructed fan and air chambers, the wind from the fan can be regulated to meet varying conditions.

Superiority in these respects are obtained in the Wade by using an extra strong fan, in an improved housing. (See preceding page.) In this construction the blast is not thrown broadcast through the thresher as with the old type of blower, but is placed exactly where it is needed. The Wade also has an improved damper at the mouth or discharge point of the blower, to further regulate and control the blast. In this way the full effect of the fan is used to give a proper separation, and no back air currents are set up to choke and foul the machine. Everything is kept moving and the sieves are kept free and clear.

The passages in the Wade Thresher are larger than ordinary, and a greater volume of straw can be handled over the screens without choking than is possible in the ordinary thresher.

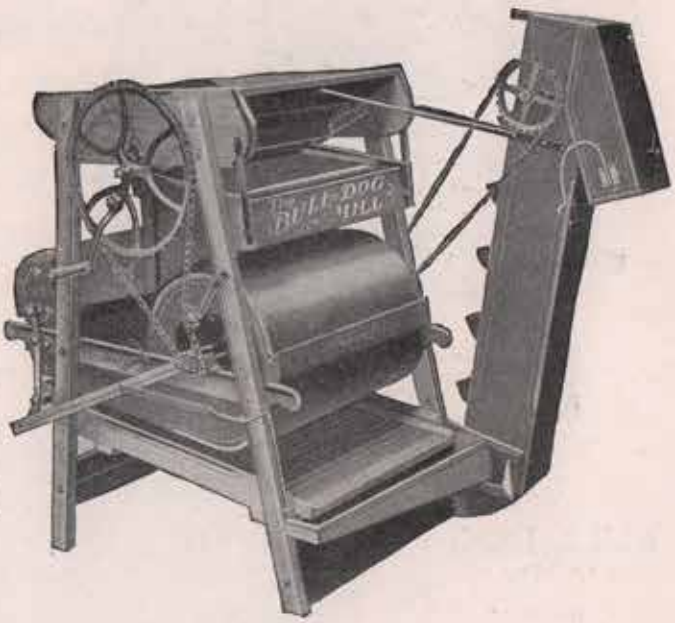


The Wade Pea and Bean Thresher Is a Strong Well-Built, Good-Looking Machine

	Wt. Lbs.	*Required Power*
Size 03—14-inch Double Cylinder ..	422	1½ to 3
Size 05—20-inch Double Cylinder ..	550	5 to 7
Repeat Elevator for either size	50	
Bagger for either size	35	

THE IMPROVED MODEL BULL DOG FANNING MILL

24-Inch Bull Dog Fanning Mill with Regular Bagger



This is a high quality mill. It is the result of 20 years of experience, and we are proud of it. It contains the best material, the strongest construction and has more good features than you can find in any mill on the market.

First, the hopper has a very large capacity from which the grain is fed over an adjustable feed roll. This assures an even unclogging flow of grain. You do not get too much grain at one time, and not enough at another. Your grain instead of going directly onto the gang passes over a scalping sieve. The purpose of this is to take off the coarse straw. Also it takes out the buckwheat, mustard, and small foul seeds before the grain reaches the gang. This is an excellent feature—an expensive one to put in a fanning mill, but it is worth the money.

The grain then passes on to the separating gang which consists of five zinc sieves. This gang is of special construction, each sieve supported with angle irons so that each sieve lies perfectly flat. There is no chance for it to sag allowing the grain to run to the center. You get an even flow of grain across the whole sieve.

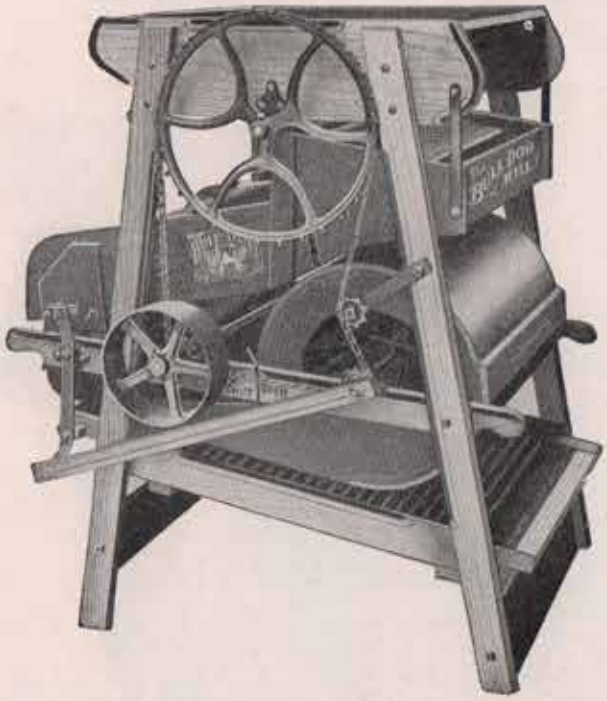
The fan is of extra large diameter which creates a blast against an adjustable blast board. This is a most important feature in cleaning oats.

Under the lower screen there is a cleaner bar or rack which prevents our lower grading sieve from clogging.

In the building this mill we have tried to make it the best we possibly knew how. It is an absolute fact that it costs more to manufacture a Bull Dog fanning mill than any other machine on the market today. Nevertheless, you will find the selling price very reasonable. If you buy a Bull Dog fanning mill, you will get more for your money than on any other purchase you could make.

It is a general purpose machine on which you can clean wheat, oats, barley, flax, spletz, and all other grain commonly raised on a farm.

BULL DOG FANNING MILL WITH POWER ATTACHMENT
No. 32



A Bull Dog mill will separate Oats, wild oats, wild peas, wild buckwheat, pigeon grass and mustard from wheat, durum, rye, barley, and tame buckwheat.

Wheat, mustard, wild peas, and pigeon grass from oats.

Mustard, pigeon grass, oats, wild oats, and wild buckwheat from flax.

Cockle, wild peas, wild buckwheat, pigeon grass, and mustard from wheat and oat succotash.

It will clean thoroughly timothy, clover, alfalfa, millet, and sorghum.

BULL DOG FANNING MILL WITH WAGON BOX ELEVATOR
No. 40

All mills regularly equipped with thirteen sieves.

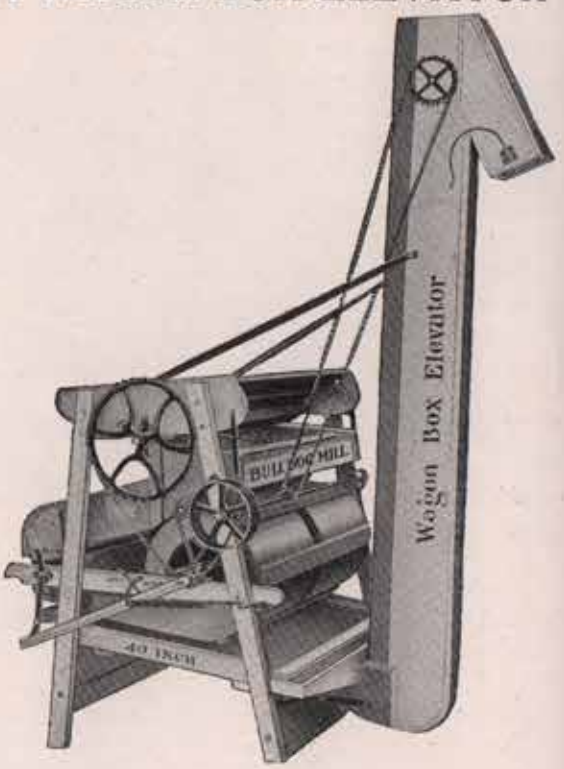
They are made in three sizes:

No. 24 has a 24-inch sieve width.

No. 32 has a 32-inch sieve width.

No. 40 has a 40-inch sieve wdth.

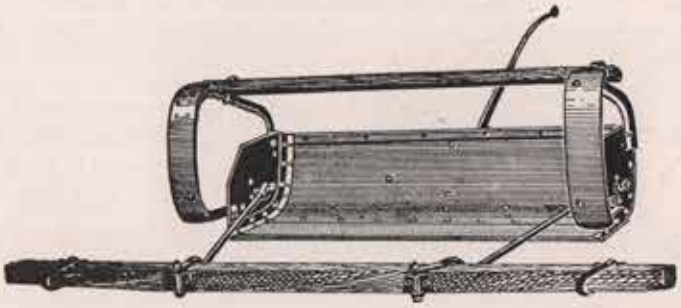
Special feaures—Force Feed Roll, Short Small Seed Scalper, Easily Adjustable Blast, Non-Chokable Cleaning Rack, Patented Wheat and Oat Separating Gang, Roller Bearings on Fan Shaft.



WEIGHTS

No. 24, Bagger	188 lbs. 40 lbs.	No. 32, Bagger	230 lbs. 40 lbs.	No. 40, Bagger	310 lbs. 60 lbs.
8-ft. Elev.	55 lbs.	8-ft. Elev.	55 lbs.	8-ft. Elev.	100 lbs.
10-ft. Elev.	70 lbs.	10-ft. Elev.	70 lbs.	10-ft. Elev.	125 lbs.
Power At.	10 lbs.	Pow. Att.	12 lbs.		

FRESNO SCRAPER



This scraper is useful in constructing ditches, and invaluable for leveling land for irrigation and other purposes. The cutting edge can be replaced at slight cost when worn out, making the scraper practically as good as new. The team can be driven and the scraper loaded and dumped by one man, no stopping required. Built from heavy plates of high carbon steel in a thoroughly workmanlike manner.

SPECIFICATIONS

	Weight, Lbs.
3½-ft. 2-Horse Fresno Scraper capacity 12 cu. ft.....	225
4 -ft. 2 or 3-Horse Fresno Scraper capacity 14 cu. ft.	265
5 -ft. 4-Horse Fresno Scraper capacity 18 cu. ft.	290

Perfection Automatic Tractor Hitch

The power of the tractor is used to dump, load and set the scraper. One finger will operate the loading rope or dumping lever. The scraper is locked in position so rocks or stumps cannot dump it.

The Perfection Automatic Hitch can be attached to any standard Fresno Scraper in thirty minutes. All the tools required are wrenches to tighten six bolts.

To load a rope is pulled, which acting through a powerful lever causes the same action as raising the lever on a horse Fresno. When loaded the rope is released and the load is carried to the place to dump, which is done by pulling the lever just back of the tractor seat. When empty return to place to load back tractor two feet and you are ready for the next load.

It is built of high grade steel. All wearing parts are special hard steel, and can be replaced at small expense.

SPECIFICATIONS

	Weight, Lbs.
5 Ft. Tractor Bowl for Fresno Scraper capacity 18 cu. ft. for use with Perfection Auto Tractor Hitch..	225
Perfection Automatic Tractor Hitch	125

ACME SPRAYERS

Acme Superbilt Sprayer

Capacity 4 Gallons

A high pressure compressed air sprayer of good quality. It is suitable for use with all spraying solutions on the farm and in the garden such as vegetable plants of all kinds, bushes, trees, vines, etc. Also for spraying whitewash, cold water paint, disinfectants, and for fighting fires, washing windows, as well as a number of other uses. It is a substantially built sprayer and will give splendid satisfaction. A few strokes of the air pump makes the sprayer ready for immediate action.

TANK—7⅜" diameter 21" high. Tight coated galvanized steel or sheet brass securely riveted beaded and soldered. Tested to 50% higher than working pressure. Heavy shoulder strap securely fastened and rivited.

PUMP—1¾" diameter, 14" long. Heavy seamless brass tubing that will not collapse under high pressure. Heavily threaded brass pump cap prevents stripping of threads and holds pump securely in place. Air check valve is of patented construction. Positive action and readily removed for cleaning.

DISCHARGE HOSE —22-in. of high pressure, moulded, oil resisting, spray hose securely fastened to supply tube with hose clamp, supported with coil wire spring at connection.

NOZZLE—Automatic shut-off brass nozzle for high pressure operation. Equipped with 24-in. brass extension tube and with angle nozzle cap. This makes it possible to reach all places to be sprayed including the underside of leaves on low growing plants without stooping over. Nozzle disc for heavy and fine spray, also for solid stream, included. Equipped with brass strainer to prevent clogging. Packed one in a fibre board carton. Shipping weight 11 pounds.

No. 288G—Acme Superbilt Sprayer, Galv. Tank.
No. 288B—Acme Superbilt Sprayer, Brass Tank.

Acme Wheelbarrow Sprayer

Especially designed for use in greenhouses, and on nursery stock. Also adapted for spraying garden crops, shrubbery and for spraying whitewash or disinfectants in poultry houses, and for the dairy farm, hog pens, and numerous other spraying operations.

Develops up to 150 pounds of pressure, which makes it very desirable for spraying fruit trees, nursery stock, etc. It is a well balanced outfit easily moved about like an ordinary wheelbarrow. This is a very convenient sprayer for general use. Designed to pass through narrow rows in a greenhouse.

PUMP—Same as No. 314A. Completely equipped with dash agitator, 6 feet of high pressure spray hose, brass extension tube, 2 feet long, equipped with brass nozzle cap having interchangeable discs for fine and coarse sprays, also solid stream. Pump is easily attached or removed from tank, being held in place with two bolts.

TANK—Heavy galvanized steel, hot dipped in pure zinc after making. 12 gallon capacity. Top rim of tank is reinforced with a heavy steel wire galvanized after making, which adds to the strength. Supporting lugs are malleable iron and securely riveted to tank.

FRAME—Heavy one piece steel tubing, making a strong support for the tank and substantial connection to the wheel. Handle grips are comfortable, being part of the round steel pipe. WHEEL—15-ft. diameter, 2-in. tire. Very sturdy and strong. Securely packed. Shipping weight 42 lbs.

No. 3170 Acme Superbilt Wheelbarrow Sprayer.

No. 314A Pump Only with Agitator and Barrel Attachment.

Acme Superbilt Sprayer

Capacity 2 Gallons

A well made, high pressure Compressed Air Sprayer, built along the same sturdy lines as the larger sprayers. The only general difference is the smaller capacity of the tank. Convenient for those having a few fruit trees, shrubs, vegetable plants, and for spraying disinfectants, whitewash, cold water paint, etc.

TANK—6¼" diameter, 17⅜" high. Made of tight coated galvanized steel or sheet brass. Securely riveted, beaded and soldered. Tested highly above working pressure before leaving factory.

PUMP—Heavy seamless brass tubing, 1¾" diameter, 12" long. Very heavy gauge brass and will not collapse under high pressure. Is attached to tank with a one-half turn of pump handle, tightly sealed with a heavy rubber gasket.

DISCHARGE HOSE—22" of high pressure moulded, oil resisting, spray hose, securely fastened to supply tube with hose clamp. Supported with coil wire spring at connection.

NOZZLE—Made of brass for high pressure, with automatic shut-off. 24" Brass Extension Tube with angle nozzle suitable for all spraying operations, which includes spraying the under side of leaves on all plants without stooping over. Nozzle is furnished for heavy and fine sprays, also for solid stream.

Packed one in a fibre board carton. Shipping weight 8 pounds.

No. 4G—Acme Superbilt Sprayer, Galvanized Tank.
No. 4B—Acme Superbilt Sprayer, Brass Tank.

ACME SPRAYERS
CONTINUED

Acme Superbilt Chemical Sprayer

Capacity 3 Quarts

Produces a Spray of Fine Fog
A Powerful Chemical Atomizer

For Flies, Mosquitoes, Aphis, Moths, Roaches, and Insects of all kinds, and for spraying Disinfectants, Theatre Spray, etc. Also for flowers and plants around the garden. Very satisfactory for small painting operations, such as applying Aluminum and Gold Bronze on radiators, etc. It also works with Creosote Stain, Cold Water Paint, etc. Very economical with spraying materials, yet the work can be done quickly and thoroughly. Will give satisfaction where many other sprayers have utterly failed.

Tank is of heavy leaded sheet steel, or brass, riveted and soldered. Nozzle is of brass with automatic lever action.

Adjustable for light or heavy sprays without change of nozzle. Funnel shaped pump end serves as a support when sprayer is set down for pumping high air pressure.

Packed one in a fibre board carton. Shipping weight, 4¾ pounds.

No. 35G—Chemical Sprayer, Galvanized Steel Tank.

No. 35B—Chemical Sprayer, Brass Tank.

Acme Superbilt Sprayer

No. 350 Capacity 12 Ounces

This small sprayer is for general use and will handle all the sprays used around the home, fly sprays, insecticides, disinfectants, etc.

TANK—3" diameter, 3¼" long.

PUMP—1¼" diameter, 10" long.

Heavy bright tin. Tested before leaving factory.

Packed 1 dozen in fibre board carton. Shipping weight 8 pounds.

No. 350—Acme Superbilt Sprayer, Tin, Lithographed Pump.

Acme Superbilt Sprayer

No. 326 Capacity 1 Quart

This is one of the most popular styles of 1-quart tin sprayers on the market. General purpose sprayer for farms, dairies, poultry, household, florists, fly sprays, and disinfectants of all kinds. The construction is very sturdy and is such that the air stream is always in line with the syphon tube. Each sprayer carefully tested for leaks before being packed.

TANK—4" diameter, 4⅝" long.

PLUNGER—Our own special type with soft leather cup that will stay alive and function efficiently for a long time.

Packed 1 dozen in a fibre board carton. Shipping weight 14 pounds.

No. 326 —Acme Superbilt Sprayer, Tin, Lithographed Pump.

No. 326A—Acme Superbilt Sprayer, Tin, Plain Pump.

Acme Superbilt Continuous Sprayer

No. 332 Capacity 1 Quart

For spraying oils, chemicals, insecticides, fly spray, disinfectants, etc. Brass nozzle for continuous fine misty spray. Nozzle cap, syphon tube and ball check valve made removable for cleaning. Pump is recessed into top of tank and securely soldered.

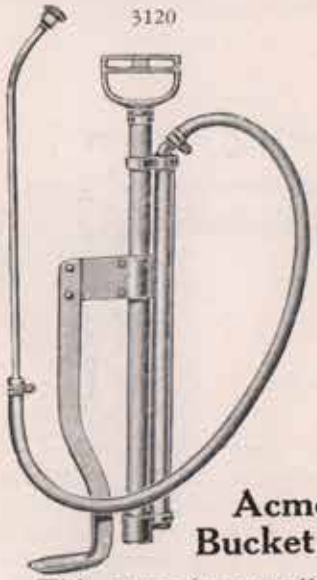
TANK—4" diameter, 4⅝" long. PUMP—1¼" daimeter 14" long.

PUMP PLUNGER—High quality leather cup that functions efficiently and makes the sprayer easy to operate.

Packed 12 in a fibre board carton. Shipping weight 15 pounds.

No. 332 —Acme Superbilt Continuous Sprayer, Tin.

ACME SPRAYERS
CONTINUED



Acme Superbilt Bucket Spray Pump

This pump is generally used for painting with whitewash, cold water paint, and for spraying insecticides, stock dip, etc. It is made with double cylinders, one is the air chamber for continuous high pressure and the other is the pump cylinder with which a high pressure is maintained. Operates in any ordinary bucket or small tank. Working parts are all of brass, easily reached for cleaning.

PUMP CYLINDER—1⅛" diameter, 19" long. Heavy seamless brass tubing. Air chamber—1⅛" diameter, 17½" long. Heavy seamless brass tubing. Large enough to maintain a uniform spray under high pressure. PLUNGER—best quality packing, will always remain free operating. Malleable D Pump Handle.

EQUIPMENT—3 feet of ⅜" Spray Hose. Extension tube 12" long fitted with nozzle cap for fine or coarse spray, also solid stream. Foot rest is of heavy pressed steel.

Packed 1 in a fibre board carton. Shipping weight 7 lbs.
No. 3120—Acme Superbilt Bucket Pump.

Acme Superbilt Spray Pump

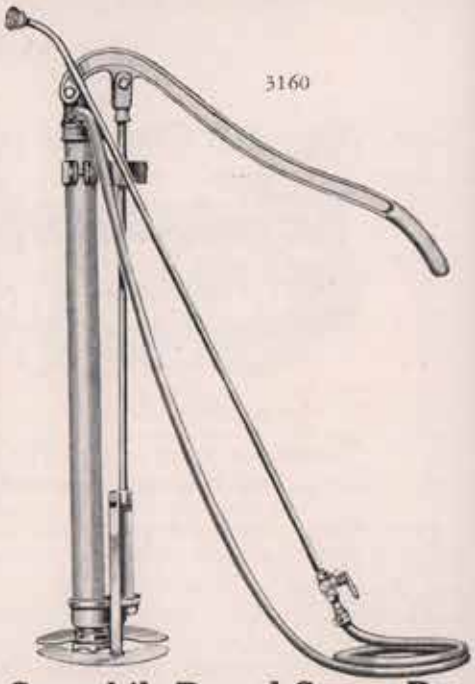
A proper type of bucket spray pump for spraying the orchards, vineyards, shade trees, shrubbery, also for field crops, etc. Works successfully with whitewash, cold water paint, disinfectants, stock dip, as well as a number of other uses. It is operated by placing the strainer end attached to the hose in a bucket, working the telescoped pump cylinder, holding one in each hand. All working parts are of brass, with easy access to the valves and plunger for cleaning.

PUMP CYLINDER—1⅛" diameter, 18" long. Heavy seamless brass tubing. AIR CHAMBER—¾" diameter, 23½" long. Heavy seamless brass tubing.

Equipped with high grade plunger packing and bronze ball valve carefully seated.

EQUIPMENT—3 feet of ½" hose, to which is attached intake pipe and strainer. NOZZLE—with four discs, for fine, medium and coase spray, also solid stream.

Packed 1 in a fibre board carton. Shipping weight 4 lbs.
No. 3100—Acme Superbilt Spray Pump.



Acme Superbilt Barrel Spray Pump

Designed to maintain a continuous high pressure of 200 pounds. Sufficient to easily keep two lines of hose in operation continuously. A very strong and durable spray pump, yet very easy to operate and maintain pressure. This is the same pump as used in No. 318 Wheelbarrow Sprayer.

Suitable for spraying in orchards and on shade trees, shrubbery and various kinds of garden crops. It is suitable also for spray with whitewash, cold water paints, disinfectants, used in poultry houses, stockyards, hog pens, cattle cars, dairy barns and in similar places.

PUMP—1¾" diameter, 6" long. Heavy seamless steel tubing, threaded connection to valve casting.

AIR CHAMBER—2" diameter, 30" long. Heavy steel tubing with threaded connections.

PLUNGER—Made of heavy specially treated leather, special construction for keeping leather spread out at all times.

BOTTOM VALVE CASTING—This holds two bronze ball valves carefully seated in brass to hold the high pressure developed by the pump. Easily removed for cleaning when necessary. Brass strainer screen prevents clogging of the pump.

AGITATOR—Made in two parts of the dasher type. Operating up and down with each stroke of the pump. Mixes the solution thoroughly with the smallest amount of effort.

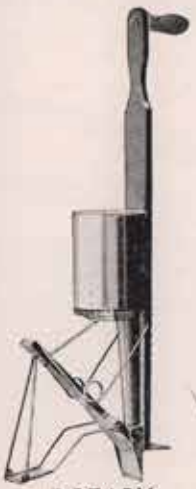
EQUIPMENT—Adjustable barrel clamp that will fit any barrel from the 50 gallon size and smaller. 6 feet of ½" spray hose and 4 feet of ¼" iron pipe extension rod, equipped with brass nozzle for fine and coarse spray, also solid stream.

No. 3160 Acme Superbilt Spray Pump, complete with hose, extension and nozzle. Packed one in a box. Shipping weight 35 pounds.

No. 3150 Acme Superbilt Spray Pump, without hose, extension pipe or nozzle. Packed one in a box. Shipping weight 25 pounds.

ACME PLANTERS

(Patented)



ROTARY
No. 309

SLIDE
No. 306

SEGMANT
No. 311

SOLID TUBE
No. 302

WIRE
No. 304

ACME ROTARY AUTOMATIC CORN PLANTER

Full Rotary Drop. Pressed steel hopper. Hopper cup cover, conveyor, depth gauge, dump foot and cut-off box. Steel stamped frame (or basket). Adjustable cast disc or seed plates. Malleable ratchet lever. Brass spring cut-off Center hung hopper, insuring even balance. Double coil mainspring. Hardwood sides finished in red enamel, hopper pleasing green.

Extreme accuracy of drop due to novel, exclusive and common sense design of seed plates and brass spring cut-off or stripper. Double coil spring automatically rotates disc and closes jaws.

Planter adjustable to any size for general service—planting ordinary dent corn, navy beans, peas and similar seed, also for large flat kernelled corn, kidney beans, etc.

Used in one hand, like walking stick. Disc is set for correct number of kernels by loosening screw beneath hopper and basket, moving star until pockets are of right size, then tightening screw again. Seed corn should be graded by shelling off butts and tips. Plunge planter into ground, rock forward to trip seed, and withdraw. Double coil spring automatically rotates disc and closes jaws, thus filling same for next hill. No. 309. Packed ½ dozen to carton. Shipping weight 30 pounds.

ACME SEGMENT CORN PLANTER

This is a very popular planter that has been well introduced and has given universally good satisfaction. There is not one piece of casting in this planter. There is no wear, for the segment slides in a steel guide.

Automatic slide type. Segmental pressed steel slide, adjustable for number of kernels running in segmental steel track. Chinese bristle brush cut-off. Double coil steel spring, adjustable depth gauge, fixed dump lever, galvanized hopper with hinged cover, galvanized seed spout, hardwood sides, handsomely painted in red enamel, pressed steel jaws, smooth handle. Can be used also for planting beans. Pumpkin seeds may also be planted by operator dropping seed into hole in spout. No. 311. Packed ½ dozen to carton. Shipping weight 28 pounds.

ACME HAND CORN PLANTER

The two-hand, slide type, is the oldest and most widely known form of Hand Corn Planters. The segmental slide is of pressed steel, adjustable to vary the drop. The jaws are of pressed steel securely riveted to hardwood sides, and the cover hopper is also of steel with hinges to cover the top. Handles are smooth and comfortable. The hopper, hopper bottom and conveyor tube are of pressed steel, thus making the planter complete, without a casting in its construction. Handsomely finished in red enamel. Can be furnished with the shoes or jaws on outside—one of the most popular planters ever sold. Weighs only four pounds.

Slide smooth, strong and durable. Won't crack corn; won't grind or bind; won't wear quickly like a cast slide. Most accurate, because all working parts are made in hardened tool steel moulds, which form each part to exact shape and size. Light and strong. Operates easily from start. Accuracy never impaired, because steel-spring cut-off won't wear, unlike a brush. Hopper has round corners, the best, strongest, neatest form.

No. 306—Shipping Weight, 50 pounds. Packed one dozen to carton.

ACME SELF-LOCKING TUBULAR POTATO PLANTER

The jaws are formed from bright steel dipped in a special preparation to prevent rust and have a simple and novel arangement to hold them tightly locked or closed until thrust into the ground, when they may be freely opened. This lock is secured by the front jaw slipping down three-eighths of an inch, which causes a pair of studs on its upper corners to slip over corresponding shoulders in the rear jaw. When thrust into the soil to deposit the seed, the front jaw is pushed up, releasing the lock. Galvanized iron conveying tube, natural finish. When the beak is withdrawn from the soil the jaws automatically close and lock themselves.

Good "hang" or balance, a comfortable handle, adjustable depth gauge, and strong, sturdy construction are further essential characteristics of the Acme Self-Locking Tubular.

No. 302. Packed ½ dozen to carton. Shipping weight 25 pounds.

ACME WIRE TUBULAR

Bright steel jaws dipped in a preparation to prevent rust. Is of the lock jaw type the same as the Acme Self-Locking and consequently there are no springs required for its operation—a very commendable feature, and one highly appreciated by the trade—no springs to break. Strong hardwood handle, set into malleable iron socket securely riveted to back jaw. Foot plates provided on socket. Adjustable dump or depth gauge. Wire mesh conveying tube by which each seed can be seen when passing through the tube, thus assuring the operator that each seed is planted. No rivet heads on inside of jaws to bruise eyes on seed.

No. 304. Packed one-half dozen to carton. Shipping weight 25 pounds.

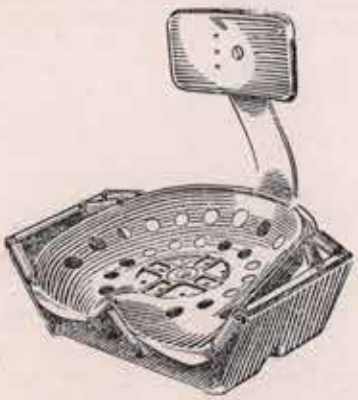
THE "CYCLONE" SEED SOWER

The Cyclone saves valuable seed by even distribution. Uneven seeding is wasteful. The Cyclone will sow many acres per hour and any amount per acre. Does the work quickly—Saves Labor. It has been a success for more than 40 years. Many hundreds of thousands of Farmers in America, Canada, Europe and other countries have long relied on it for sowing clover, timothy, alfalfa, oats, wheat or any seed that is sown broadcast.

Construction—Its well known Double Feed: insures a uniform flow of Seed. Slope Feed Board: keeps hopper properly filled. Feed Adjustment: is automatic and starts or stops flow of seed instantly. Distributing Wheel: scatters seed evenly. Throws equal amounts to equal distances on each side of operator.

One Dozen Cyclone Seeders. Weight 44 lbs.

DONALSON SPRING SEAT



Makes easy riding over plowed fields.

You don't feel jars—jolts—vibrations.

Do all your field work in comfort.

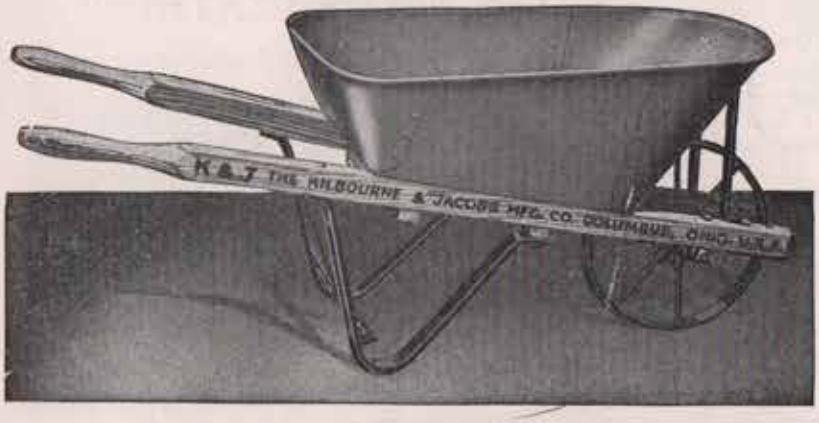
Donaldson Seat packed in cartons. Wgt. 25 lbs.

Interchangeable—can be used on many implements.

Sturdy construction insures long wear.

Adjustable back provides added comfort.

K. & J. WHEELBARROWS



The "K. & J." Concrete Wheelbarrow has the largest wheeling capacity of any concrete barrow.

This is an end dumping type, the front of the tray forming a perfect pouring channel.

The round steel wheel guard at the end of the handles, makes this barrow unusually handy for dumping forward into moulds.

This type is very handy for using in narrow runways as the tray is of narrow and deep design.

TYPE	Approx. Capy. cu. ft.	TRAY Length at Top	Width at Top	Depth at Wheel	Depth Handle end	Wheel	Approx. Weight Pounds	CODE WORD
K. & J. Concrete	4-Earth 2-Wet Concrete	38½	24½"	16"	7¼"	5-H	73	Misfortune

Columbus

This barrow is more particularly adapted to handling crushed stone, sand, gravel, etc. This type can be dumped from sides or end.

SIZE	Approx. Capy.	TRAY Length at Top	Width at Top	Depth at Wheel	Depth Handle end	Wheel	Approx. Weight Pounds	CODE WORD
2-A	4 cu. ft.	36"	29"	9¾"	4¾"	5-H	67	Misfare

The "Columbus" Tubular type is all steel and is the strongest kind of wheelbarrow. This type is adapted to a wider range of uses than any other being practically required for handling hot material such as castings, cinders and ashes, is highly desirable for wheeling ore or metal for reason of its strength. It is just as suitable for handling concrete and gravel.

The handles are tubular and in one piece passing around in front of the wheel to form a dumping rest. Is suitable for side or end dumping.

TYPE	Approx. Capy.	TRAY Length at Top	Width at Top	Depth at Wheel	Depth Handle end	Wheel	Weight Pounds	CODE WORD
5	4 cu. ft.	36 "	Tapered 29"	9¾"	4¾"	5-H	75	Mislay

THE "BLUE FEATHER"

A new "K. & J." barrow developed to meet the demand for a light article of good quality.

SOMETHING NEW

TYPE	Approx. Capacity	TRAY Length At Top	Width At Top	Depth at Center	Depth Handle End	Wheel	Approx. Weight	Code Word
Blue Feather	3 cu. ft.	51¼"	25" to 27"	8"	3½"	39837	35	Feather

BOSS BARROW

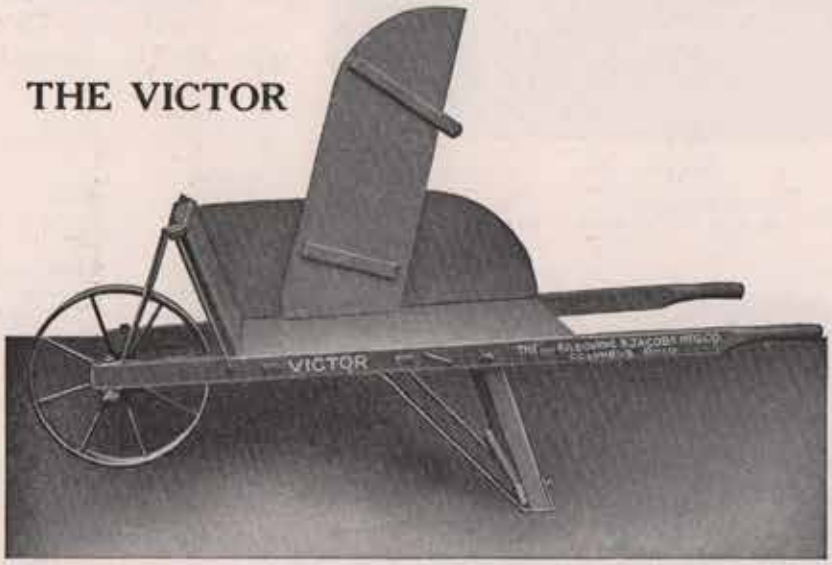
Brand—Boss.
Tray — Approx. Dimensions: Length— 29¾ in. Width—32¾ in. Steel Wheel—Lewis Pattern No. 33870.
Approximate Weight—Each, 57 lbs.
Code Word—Mindful.

The "Boss" is the best type of wooden barrow that has ever yet been marketed—bar none. The axle is fixed in the "K. & J." steel clip. Leg braces are of steel passing under the leg bottoms to form shoes and preventing any splintering or splitting. Frame thoroughly bolted with tray attached by eight bolts. Tray cleated and strapped. Front tray braces are steel.

Lewis Pattern Steel Wheel

A good wheel and good axle-bearings are the first principles of a good wheelbarrow. The LEWIS pattern Wheel has stood the test of thirty-five years' use.

THE VICTOR



Every desirable feature required in a garden barrow is embodied in the "Victor" Nos. 10 and 20. Removable side boards, well braced slanting dash. A wide ground bearing is provided to prevent injury to sod and the legs are protected by the braces which form a wearing surface. The boards in the bottom run length-wise and are braced by cross pieces tenoned into handles.

	Approx. cu. ft.	INSIDE DIMENSIONS OF BED Greatest Length	Width Rear	Width Front	Depth	Approx. Wgt., Lbs.	Code Word
Victor No. 10	3	32"	21¾"	17½"	11½"	55	Mise
Victor No. 20	4	35¾"	22"	17½"	11½"	56	Misenite

Steel Wheel—33874 Wood Wheel—35384

STEWART SHEARING MACHINES

FOR SHEEP AND GOATS

No. 9 HAND POWER MACHINE

For shearing sheep and goats. Gears cut from solid steel, enclosed, and run in bath of oil. Joints of drop steel forging, fitted with steel ball bearings. Shearing handpiece is the light running ball bearing Stewart No. 7. This machine, easy to turn, shears fast and is built to last a lifetime. Is supplied complete with 2 combs and 4 cutters. This machine takes the No. SC1050 Clipping Attachment.

Packed one in a wooden shipping case. Shipping weight, 45 lbs.

STEWART No. 4 GRINDER

For hand operated machines. Sharpens shearing and clipping plates and also barber clipping plates very efficiently. Packed one in a substantial wooden shipping case. Shipping weight, 32 lbs.

No. 4-G. With holders for shearing plates.

With holders for clipping plates.

With both clipping and shearing plate holders.

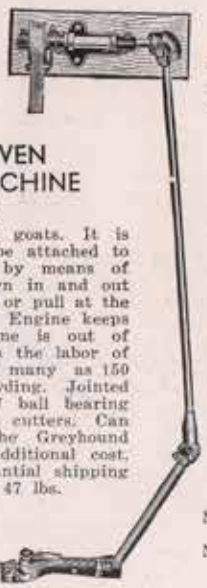
OS95 OVERHEAD ELECTRIC

This type of electric shearing machine is made to suspend from overhead. Is with a long universal jointed shearing shaft, a 15-ft. extension cord with through-all switch, the Stewart Greyhound Hand-piece, 2 combs and 4 cutters. As on the pedestial type machine the motor is full one-quarter H. P. heavy duty type. Shipping wgt., 60 lbs.

SHEARING COMBS

No. 277 ten point comb fits any narrow shearing handpiece.

No. G-287 thirteen point comb for Greyhound only.



ENGINE DRIVEN SHEARING MACHINE

No. OMS25

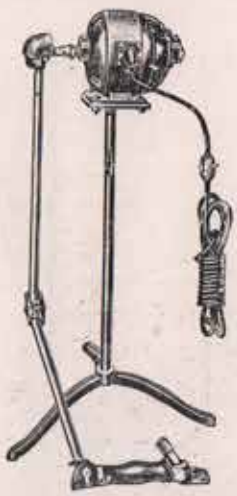
For shearing sheep and goats. It is quickly set up and can be attached to wall or overhead beam by means of two bracket bolts. Thrown in and out of gear by a simple push or pull at the top of the jointed shaft. Engine keeps on running when machine is out of gear. This machine saves the labor of one man and will shear as many as 150 sheep a day without crowding. Jointed equipped with the No. 7 ball bearing handpiece, 2 combs and 4 cutters. Can also be suplied with the Greyhound Shearing Handpiece at additional cost.

Packed one in a substantial shipping carton. Shipping weight, 47 lbs.

SHEARING CUTTERS

No. 276 three point cutter fits any narrow shearing handpiece.

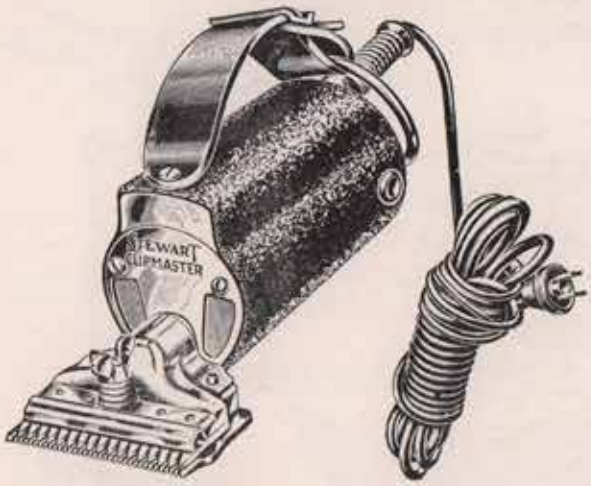
No. P-2311 four point cutter for Greyhound only.



PS95 PEDESTAL ELECTRIC

The pedestial type of electric shearing machine is most convenient where there is any necessity for moving it from place to place. The widespread tripod stand affords solid footing for the machine. Smooth and vibrationless. Very quiet and fast. Complete with through-all switch on fifteen feet of extension cord, Stewart Greyhound Hand-piece, 2 combs and 4 cutters. Shipping weight 100 lbs.

STEWART CLIPPING MACHINES



THE CLIPMASTER

The CLIPMASTER makes animal clipping amazingly easy. It's fastest—the world's fastest. It's powerful, having 100 per cent reserve power. It's convenient—just plug in at any light socket. Motor runs on any 110-220 volt current, direct or alternating. It is quality built—phosphor bronze bearings and every moving part scientifically hardened and tempered. Interior moving parts are packed in a special lubricant requiring no attention for at least a year. This new STEWART is truly the CLIPMASTER.

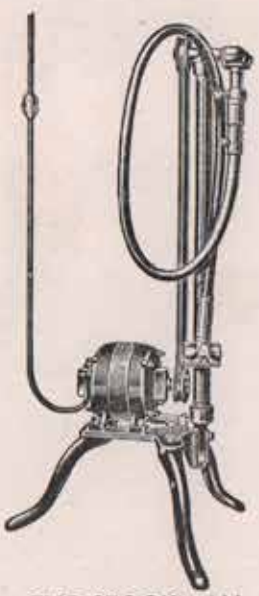
No. J-1. The Clipmaster with aluminum built-on handle.
No. J-2. The Clipmaster with adjustable leather strap.
No. E-1. Top clipping plate for Clipmaster only.
No. E2. Bottom clipping plate for Clipmaster only.

B-1 CLIPPING HEAD

This clipping head has a square shank, as indicated, and is used only with the Nos. 360 and 361 clipping plates. Fits only flexible shafts with square hole in lower ferrule.

No. 10 HAND POWER CLIPPER

For clipping cows, horses, mules and dogs. Built over-size throughout. Gears cut from solid steel, dust proof and run in bath of oil. Ball bearings scientifically fitted make it the easiest turning hand power clipping machine made. Equipped with B-1 head, 6-ft. flexible shaft and chain. This machine takes the No. 77 shearing attachment. Packed one in wooden shipping case. Shiping weight, 33 lbs.



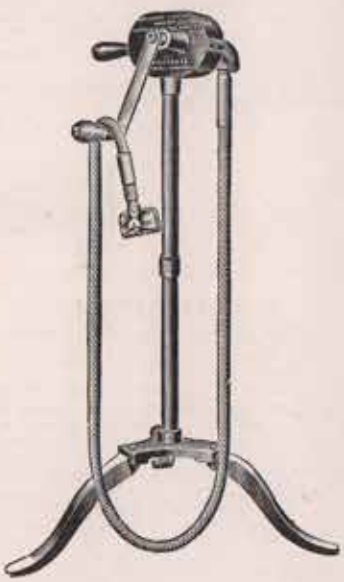
THE STOCKMAN

For clipping cows, horses, mules and dogs. Quiet, smooth running and powerful. Motor full one-quarter H. P. Fitted with latest model Stewart patent B-1 clipping head and 15 foot extension cord with throw switch. Plugs in at any light socket. Spring tempered coil steel shaft is 6 ft. long. The drive chain is specially heat treated — tough and strong as cable. Long belt makes power takeoff on one-quarter H. P. jobs easy.

C395. Stewart Stockman Electric Clipping machine complete.
LM395 Stewart Stockman Clipping Machine less motor and cord.
No. 77. Shearing attachment for Clipping machine.

SD1500 SERVICE KIT

Contains a minimum number of much called for parts for clipping machines which should be stocked by all dealers. By ordering this kit, there is a saving from the list price. The kit is self-inventorying and enables the dealer to service his customers with great dispatch and economy. Shipping weight two and one-half pounds.



No. 1 HAND POWER CLIPPER

Many thousands of No. 1 Clipping Machines throughout the world are giving complete satisfaction. This is a strong, well-built, easy turning clipping machine; ball bearing and fitted with latest patent Stewart B-1 clipping head. Packed one in a wooden case. Shipping weight, 30 lbs.

WADE BROODERS

The above cross-section of the WADE brooder Stove gives you an idea of its practical design and sturdy construction. This stove is made by men who have had years of experience in the brooder manufacturing business. It's built to provide the right amount of heat for keeping chicks lively and healthy. At the same time, every feature is designed for economy of fuel, for convenience of operation, and for a long life of usefulness. No wonder owners of the WADE Brooder are so enthusiatic over the results it gives them!

The Wade Colony Brooder is constructed to give a tremendous amount of heat when needed with a minimum amount of fuel. The stove is extra large. Castings are extra heavy. The stove holds heat longer. It requires less refueling. It gives perfect combustion under all conditions.

The WADE doesn't require constant watching. It holds the fire—day and night, in warm weather and cold weather. The fire burns steadily—not too fast, not too slow. Chicks don't chill or overheat in any weather.

RATED ACTUAL CAPACITY

The WADE Brooder is made in two sizes; one for as many as 1000 chicks and one for as many as 500 chicks. Each size is correctly rated and will easily accommodate the rated capacity without crowding. This is very important. Don't be deceived by claims of too large capacities for other brooders.

SEVEN BIG FEATURES OF THE WADE COLONY BROODER

1. HINGED HOVER—Either or both sides of the WADE Hover can be raised at one time. Each is automatically held up by a steel standard. When the hover is up, the space around the stove is clear. You can easily take care of the stove and chicks—and see just what you're doing. Besides, you can raise the hover on warm days and give the chicks direct sunlight. The WADE Hinged Hover is the last word in canopy design and convenience.

2. AUTOMATIC DRAFT REGULATION—The intake and check dampers are automatically regulated by a wonderful Wafer Thermostat. It is efficient and reliable. When more heat is needed, the thermostat opens the intake damper and closes the check damper. The moment less heat is needed, the thermostat closes the intake damper and opens the check damper. This controls th fire promptly and positively. WADE'S Automatic Thermostat is famous for protecting chicks from overheating or chilling; so they don't crowd and smother. You can feel safe and confident with your WADE Brooder.

WADE BROODERS

CONTINUED

Seven Big Features of the Wade Colony Brooder

3. EXTRA HEAVY CAST IRON STOVE—Note the sturdy construction of the WADE Stove, as shown in the picture. The fuel chamber, fire-pot, ash-pit, and base are extra heavy. This means longer life and more years of service. It means that the stove gives steadier heat and takes less fuel to keep it going. And the castings aren't merely heavy; they're also accurately machined and fitted together. The joints are cemented and the sections are held solidly in place by three long steel rods. Extreme care is taken to make the stove absolutely tight to prevent smoking or gassing and to avoid interference with the correct action of the drafts.

4. BIG OPEN TOP—The WADE Open Top makes fueling easy. The opening is big, and there's nothing in the way of it. No scoop or shovel is required. You just pour in the coal direct from the bucket. This is a convenience you will be sure to appreciate.

5. LARGE GRATE—The grate of the WADE stove is extra large, providing an extra large fire bed. This means better response to draft and more uniform heat. Ashes can be sifted out by slightly moving the shaker handle, or dumped by giving it a turn. There's no outside grill to catch and hold clinkers or ashes. This is an important advantage.

6. REMOVABLE SMOKE ELBOW—The Wade Smoke Elbow is bolted so that it can be easily removed for cleaning when soft coal is burned; and it is so located that it doesn't interfere with pouring in coal at the top.

7. INSULATED BASE PREVENTS FLOOR HEAT—The heat radiates out to the chicks instead of down to the floor. This absolutely essential to greater brooder success and is provided for perfectly in the WADE stove. An asbestos pad between the ash pit and base prevents heat passing down to the flour.

These seven points of the WADE Brooder superiority are vitally important. They give the WADE its ability to save more chicks and keep them healthy. And these features also make the WADE Colony Brooder and you'll be sure of the results that only the WADE can give.

SPECIFICATIONS

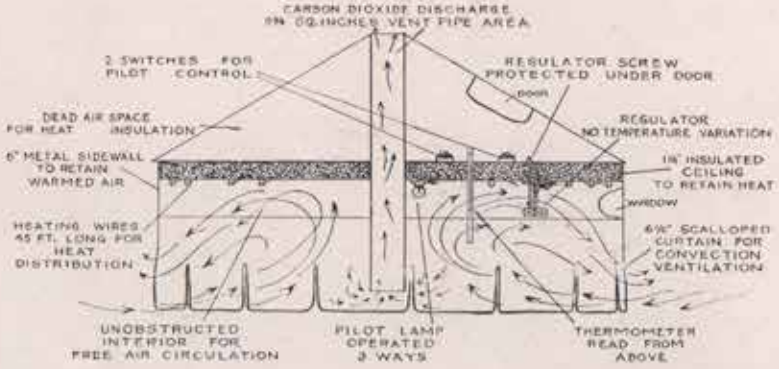
No. 71 Wade Colony Broder

Capacity, up to 1000 chicks.
Shipping Weight, 135 lbs.
Height, 24 inches.
Full Opening, 9 inches diameter.
Grate, 10-9/16 inches diameter.
Fire Bowl, 12½ inches diameter at center.
Base of Stove, 14 inches square.
Coal Capacity, 58 lbs.
Hover, 56 inches diameter.

No. 72 Wade Colony Brooder

Capacity, up to 500 chicks.
Shiping Weight, 119 lbs.
Height, 22 inches.
Fuel Opening, 8 inches diameter.
Grate, 9 inches diameter.
Fire Bowl, 11 inches diameter at center.
Base of Stove, 12½ inches square.
Coal Capacity, 36 lbs.
Hover, 52 inches, diameter.

GRAVES ELECTRIC BROODERS



The Graves Electric Brooder has the correct features of the successful electric brooder. Has even distribution of heat. Ventilation which is very important in electric brooders owing to its closed nature is provided perfectly by allowing the fresh air to come in under the canopy and the bad air to go out through the discharge pipe. All Standard Graves Brooders are constructed of heavy-gauge galvanized iron. The metal canopy consisting of the conical top, and wide, heavy side-wall, with steel rod rolled into the lower edge. All seams and joints are locked and riveted throughout. Ears are attached for suspension equipment.

The ceiling is constructed of redwood framing, covered on the bottom with fire-proofed wall-board, insulated solidly between framework and covered on top with heavy insulating paper. Such construction is expensive—but it is your protection.

Weights of Graves brooders average more than one-third heavier than any other electric brooder, yet every ounce of it is there for a purpose.

The central vent shaft is made in two pieces, the upper half being soldered to the canopy. The lower half is telescopic for raising or lowering the outlet point.

A large window is cut into the side-wall covered with flexible glass. It permits a view of the chicks in every part of the brooder.

The curtain is 8-ounce duck, 6½ inches wide Bound with heavy braid, zig-zag stitched to prevent fraying or tearing.

Thermostats are brass, ether-filled, double wafers. Each wafer is a unit within itself, and will function independently of its other half. You have the protection of two thermostats.

Each model is set up ready to operate. Compactly and securely crated, you will receive it in perfect order, and you may have it in operation five minutes after crating is removed.

SPECIFICATIONS

NO. 500-B DIAMETER—66 inches. Providing seven (7) square inches of floor space for 500 chicks, or up to thirty-five square inches for 100 chicks.

Weight, uncrated, ready for use—135 lbs.

Average power consumption, while operating continuously at 100 degrees—200 watts per hour.

Average cost of operation during six weeks' brooding period at power cost of 3c per K.W. with attention given to temperature reduction and growth of chicks—$2.25.

NO. 350 DIAMETER—54 inches. (Same area per chick for 350 chicks.) ,

Weight, uncrated, ready for use—105 lbs.

Average power consumption as above—150 watts per hour.

NO. 200 DIAMETER—42 inches (Same area per chick for 200 chicks.)

Weight, uncrated, ready for use—60 lbs.

Average power consumption, as above—125 watts per hour.

NO. 100 DIAMETER—30 inches. (Same area per chick for 100 chicks.)

Weight, uncrated, ready for use, 40 lbs.

Average power consumption, as above—100 watts per hour.

WADE DRAG SAWS

Light Weight or Standard Weight with Magneto or Battery Ignition

SPECIFICATIONS

STANDARD WEIGHT		LIGHT WEIGHT	
Weight	285 lbs.	Weight	215 lbs.
Power	4 H. P.	Power	3 H. P.

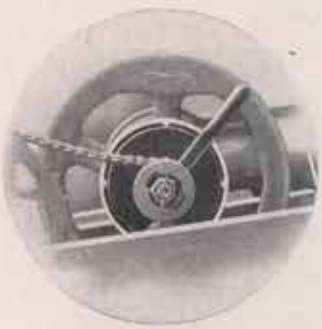
MADE IN FOUR MODELS

Model U Standard weight Drag Saw with 5-ft. Blade, Battery and Clutch.
Model UK Standard weight Drag Saw with 5-ft. Blade, Magneto and Clutch.
Model WO Light Weight Drag Saw with 5-ft. Blade, Battery and Clutch.
Model WK Light Weight Drag Saw with 5-ft. Blade, Magneto and Clutch.

Extra lengths of blade furnished at extra charge per foot above five foot. All saws equipped with disc clutch. *Light weight and standard weight exact duplicates except for specifications.*

AN AUTOMOBILE TYPE CLUTCH

All WADE Drag Saws come equipped with a clutch. With this clutch, you can run your motor without the saw blade moving. This does away with tie-ups while disengaging saw blade from a tight place in the log. It also makes the motor more useful as it can be used as an independent power plant to run a feed



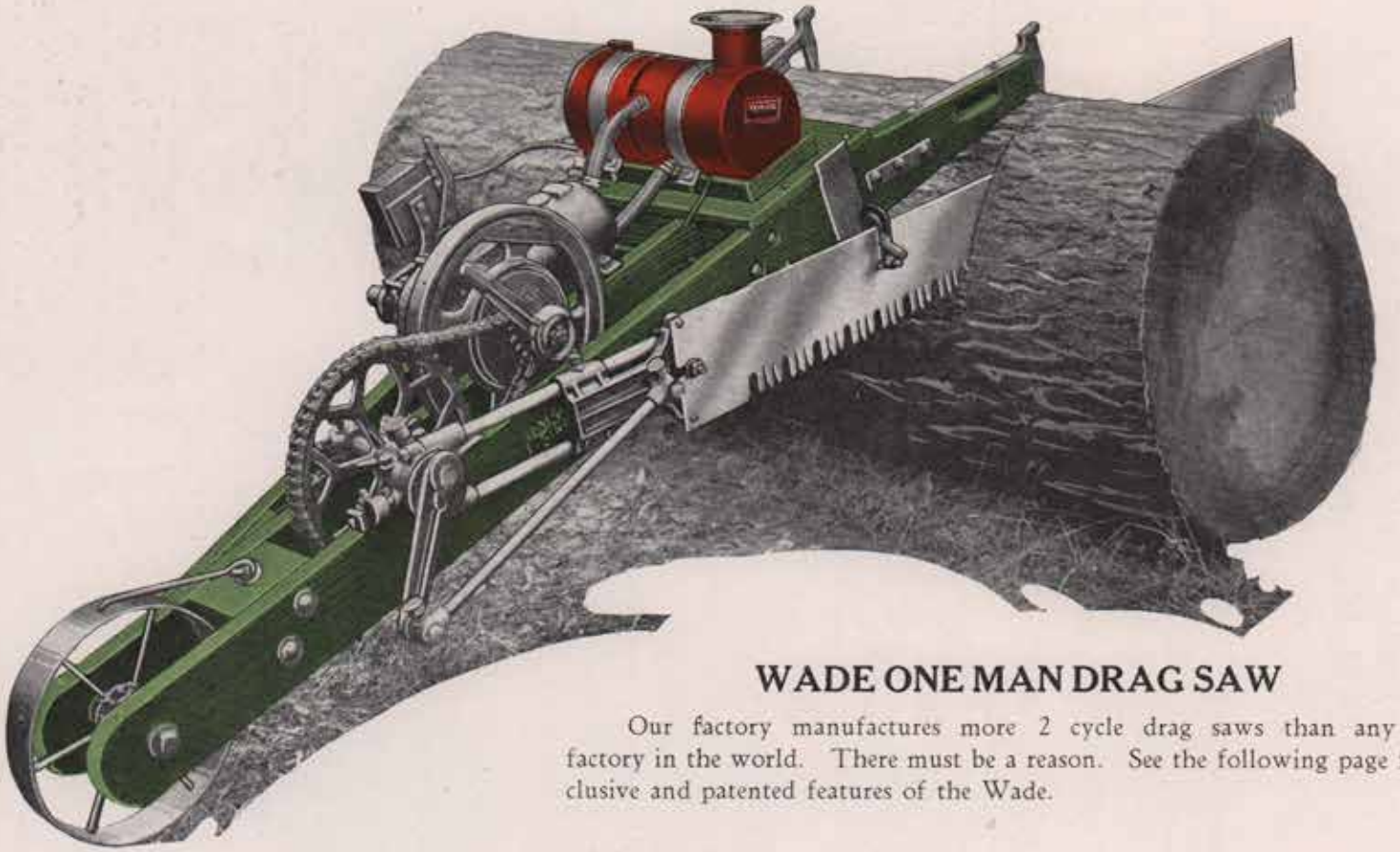
grinder, pump or any engine work you wish to do after your winter's wood supply is cut.

The Multiple clutch consists of four steel discs. There is no wear on the discs except when the motor is idling. No friction bands or linings to wear out and give trouble. The discs require no attention whatsoever, not even oiling as the surplus oil from the cam is sufficient lubrication. A reliable, practical and efficient clutch. The WADE clutch release shown in the picture is a patented feature.

WHEEL AT END OF FRAME

The WADE Drag Saw is the only saw that can have a wheel at the end of the frame as WADE holds a patent on this feature. When

the saw is resting on a log, the wheel is held in place by a hook that goes through an eye in the wheel, providing a simple but secure wheel lock. With the wheel the Wade Drag Saw can be wheeled around from log to log in the manner of a wheelbarrow, truly making it a ONE-MAN DRAG SAW.



WADE ONE MAN DRAG SAW

Our factory manufactures more 2 cycle drag saws than any other factory in the world. There must be a reason. See the following page for exclusive and patented features of the Wade.

FEATURES OF WADE DRAG SAW

(Continued)

NEW TYPE HANDLES

WADE found that with any handle that extended from the frame you had to drop the saw on the log or you would pinch your hand, also that it was very hard to get a hold of the handle when the saw was on the log. With the new style saw, holes have been made in the upper part of the frame and you can now lay the saw on the log and pick it up without jamming your hands or dropping the saw. A very simple method but the most efficient that anyone could design.

IMPROVED ENGINE

More Power, Longer Life—WADE engineers know that many high class automobile engines have honed cylinders, ground pistons, ground piston pins and ground piston rings and that these features give more power and longer life. An engineer from one of the large automobile plants told our plant engineer that he would no more think of trying to put on the market an automobile engine without honed cylinders, ground piston, ground piston pins and ground piston rings than he would try to put a car on the market without a body. WADE decided that nothing that improves the drag saw costs too much and so now WADE offers a two-cycle drag saw with a

1. Honed Cylinder
2. Ground Piston
3. Ground Piston Pin
4. Ground Piston Rings.

This gives the WADE Engine more power and longer life.

WADE is proud of the improvements on the WADE Saw. We know that you will be surprised to find that this improved Drag Saw is offered at no increase over its already low price, made possible through R. M. Wade & Co.'s large and constantly increasing volume of production and sales.

The WADE Drag Saw is offered with Battery or Magneto equipment. The Magneto on the WADE Drag Saw is the new style Wico. This magneto is entirely enclosed, making it waterproof. The new style magneto gives a hotter running spark and a quick starting spark. WADE believes that you will find the new Model EK Magneto the ideal generating unit. WADE also believes that the Magneto equipped Drag Saw is the universal saw for the reason there are many places where, on account of dampness, batteries cannot be depended upon to hold up. With dependable magneto equipment such as Wico, this condition is definitely overcome.

NEW DROP-FORGE DOG

The new style dog is made of one piece drop forged steel. It is guaranteed against breakage from any defect. You will find this new style dog a big improvement.

NON-BOIL-OVER TANK

The superior construction of the Wade Water Tank provides an overflow which prevents boiling water splashing over the top of the tank and scalding the operator.

QUICK CHANGE SAW HOLDER

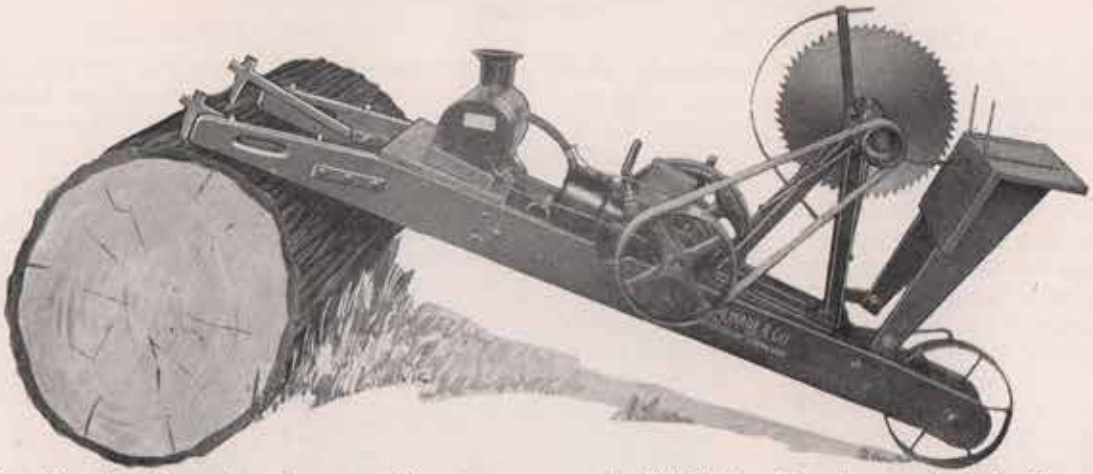
WADE has a patented blade holder with which the blade is held rigidly in place and yet can be removed by LOOSENING A SINGLE NUT.

NEW TYPE TIMER

The WADE One-Man Drag Saw has a new style timer. It is of very simple construction and we feel that it is as near trouble-proof as can be made.

Wico Magneto Type E. K.

WADE CIRCULAR SAW ATTACHMENT



Our Circular Saw Attachment will cut successfully small branches, limbs, poles, or saplings with ease, speed and economy. It will pay for itself in a remarkably short time on small wood of this kind that is usually wasted.

By removing the circular saw blade and replacing with emery stone, the attachment will quickly, easily and efficiently sharpen any number of axes or other tools after a hard day's work. By using a gumming stone, saw blades can be gummed as well.

Can be furnished to fit any drag saw as well as the WADE. Can be attached in five minutes. Simply remove four nuts and lift Drag Saw driving mechanism off as a whole. Circular Saw Attachment bolts on in place without alteration of any kind. Strongly built steel frame well braced assures long life. Outfit complete includes steel saw frame, 20-inch best steel blade, 12-inch power pulley, 4-inch pre-stretched endless rubber belt, weight 100 lbs.

When ordering for other than our present model Drag Saw or for other makes of saws please give spacing of jack shaft bearing bolts.

WADE DRAG SAW AND CIRCULAR SAW BLADES

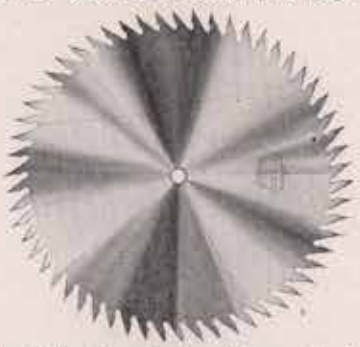
The Wade Drag Saw Blade is made with the style teeth as shown in the cut. It is a well made blade and we consider it to be the best all-purpose blade for machine wood cutting. Wade Blades are guaranteed by the manufacturers to be absolutely uniform in temper, of the proper degree of hardness, insuring saws that will stand up to their work with the least cost for refitting.

Wade Drag Saw Blades weigh 3 lbs. per foot and can be furnished in any length.

Wade Drag Saw Blades are drilled to fit the following A frame Drag saws: Wade, Multnomah and Vaughn.

Please note also that we can furnish any of the standard makes of blades but at a much higher price than our Wade Blades.

The Wade Circular Saw Blades are made for us by one of the oldest and best known saw manufacturers in the country. While the first cost is much less than any other saws, their cutting and lasting qualities are much greater in proportion to their cost than the higher priced saws and satisfaction derived from their use will be hardly less than of saws costing two or three times as much.



We carry a good stock at Portland in the following sizes:

	Weight, Lbs.
20-inch, 13-gauge, 1⅜-inch hole	11
24-inch, 11-gauge, 1⅜-inch hole	18
26-inch, 11-gauge, 1⅜-inch hole	20
28-inch, 10-gauge, 1⅜-inch hole	26
30-inch, 10-gauge, 1⅜-inch hole	30
32-inch, 10-gauge, 1⅜-inch hole	35

MULTNOMAH DRAG SAW

The Multnomah Drag Saw is a sturdy, well built machine that has stood the rigid test of time. There are thousands of these saws in constant daily use by Loggers, Woodcutters and Farmers.

The Motor is of the two-cycle water cooled type. It is equipped with a cone clutch, faced with regulation automobile brake lining.

The Multnomah is made in two sizes: the Standard 4 H. P. and the Lightweight 3 H. P. Both sizes can be furnished with either battery ignition or magneto ignition, using the Wico oscillating magneto.

The best materials possible go into the make-up of the Multnomah Drag Saw. Every machine is given a thorough inspection and an actual workout before being released for sale and is fully guaranteed by the manufacturer.

SPECIFICATIONS

Model Y Standard Weight—Battery Ignition—4 Horse Power. Net Weight 275 lbs. Shipping Weight 360 lbs.

Model YK Standard Weight—Magneto Ignotion—4 Hore Power. Net Weight 280 lbs. Shipping Weight 365 lbs.

Model MN Lightweight—Battery Ignition—3 Horse Power. Net Weight 210 lbs. Shipping Weight 285 lbs.

Model MK Lightweight—Magneto Ignition—3 Horse Power. Net Weight 215 lbs. Shipping Weight 290 lbs.

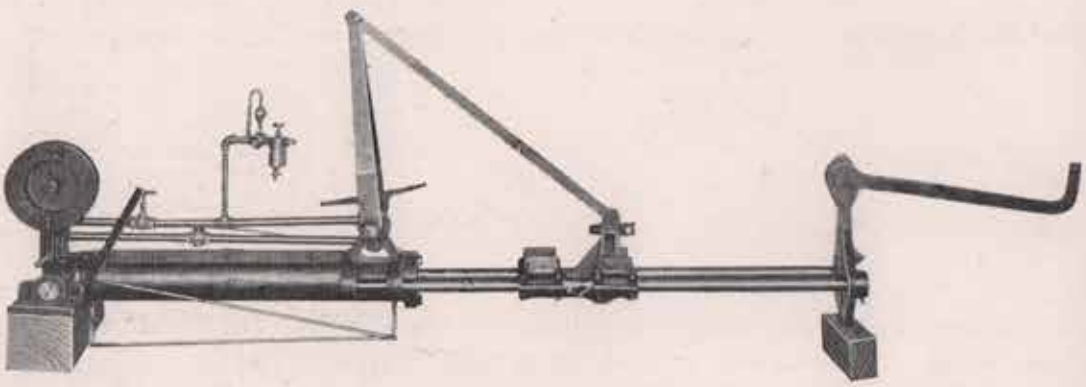
WADE - MULTNOMAH STEAM SAWS

3¼x30 PORTABLE DRAG SAW

Where steam is available, as around mills or donkey engines, the Wade-Multnomah Portable Steam Drag Saw is by far the most efficient log cutting outfit in use today. The machine is simplicity itself—the saw blade is directly connected to the piston rod of the steam cylinder and consequently there are very few moving parts—no chains, gears, or sprockets of any description.

When running at the normal speed of 225 strokes per minute, this machine will cut through a 30-inch log in two minutes. The cost of operation is reduced to a minimum, 90 to 100 pounds steam pressure being all that is required for the best results.

For saw mill and stationery use, the larger type, the 5x36 (illustrated below) and the 7x44 are being used. These are furnished either with a movable base for log deck use or with a dog and lever arrangement for pond use. All steam saws are not carried in stock but are made up on order in from two to three weeks.



5x36 STEAM SAW

	Net Wt.	*Ship. Wt.*
3¼x30 Portable Type with 6'x10 gauge Blade	250	330
5x36 Pond Type with 8'x7 gauge blade	1000	1150
5x36 Deck Type with 8'x7 gauge blade	900	1100
7x44 Pond Type with 8'x5 gauge blade	2300	2500
7x44 Deck Type with 8'x5 gauge blade	2400	2650

WADE ALL-STEEL SAW FRAMES

The steel frames are made of heavy angle iron. The machines are thoroughly braced in all directions and all bolts are firmly secured with lock washers to insure a permanent rigid frame.

The bearing boxes are split and are made of heavy cast iron. A good grade of babbit is used and oil wick holes are provided and all are poured for 1-7/16 inch arbors.

All arbors are made of cold rolled steel, 1-7/16 inches diameter by 48-inches long. They are machined at the saw blade end to 1⅜ inches with 1¼ inch thread. The arbors on Nos. 800 and 850 are 36 inches long.

The collars are sweated to the arbor and machined to insure a true running saw blade.

All Steel Frame

Tilting Table Saw Frame

Here is a frame which is very popular. It is especially adapted for sawing cordwood into stove lengths as the spacers are set 16 inches on center. This makes it very convenient to get uniform stove wood lengths. It can also be used for a pole saw.

No. 150 All Steel Saw Frame with 60 lb. balance wheel. Shipping Weight 204 lbs.

No. 350 All Steel Saw Frame with 90 lb. balance wheel. Shipping Weight 234 lbs.

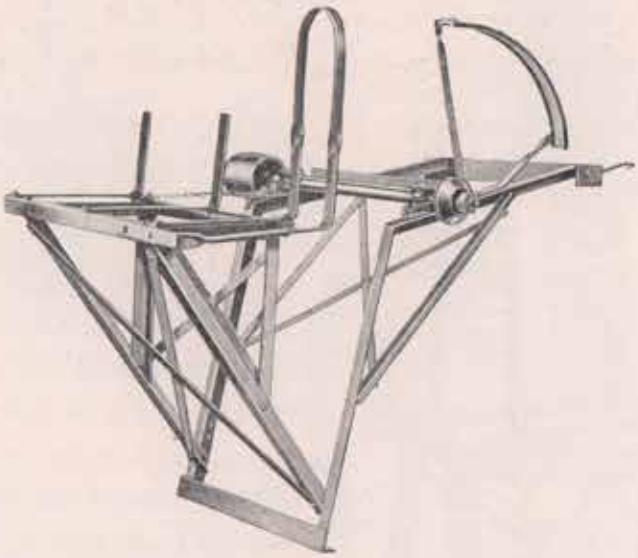
Pole and Cordwood Saw Frame

With this model the longest poles can be cut into any desired length with ease. The balance wheel is so arranged that it will not interfere with the longest poles.

No. 649 All Steel Saw Frame with 60 lb. balance wheel. Shipping weight 255 lbs.

All Steel Frame

WADE TRACTOR SAW FRAME ATTACHMENT



This saw frame is easily attached in a few minutes to any tractor without disturbing the tractor. Two grip bolts secured to the iron radiator shell holds it firmly. It rests on the ground when in operation and can be raised when a move is desired without dismounting the attachment. It is so constructed that no special starting crank is required. The arbor is of cold rolled steel 1-7/16 diameter by 36-in. long. The pulley is 10x6 inches. other size pulleys can be furnished if desired.

No. 850 All Steel saw frame with 10x6 in. pulley. Shipping Weight ..... 125 lbs.

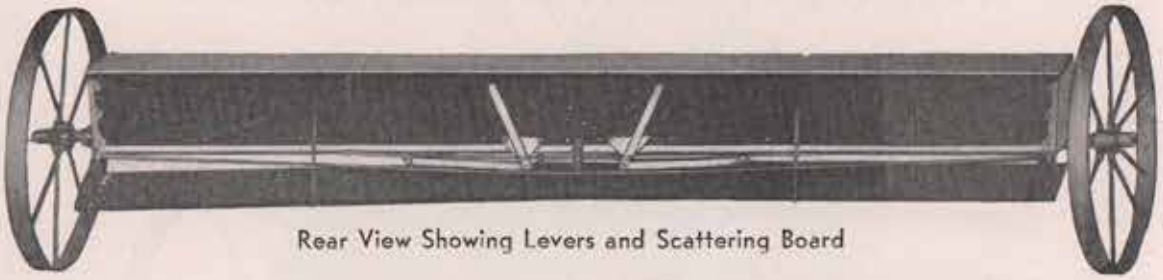
WADE MANDREL SETS

The No. 8 is a mandrel set consisting of a shaft. 1-7/16", fitted with 5" flanges. a 5x6 pulley. a 60 pound balance wheel and equipped with two flat boxes.

WEIGHTS

No. 8 Mandrel Set (no saw blade)	120 lbs.
60 lbs. balance wheel as extra	60 lbs.
75 lbs. balance wheel as extra	75 lbs.
90 lbs. balance wheel as extra	90 lbs.

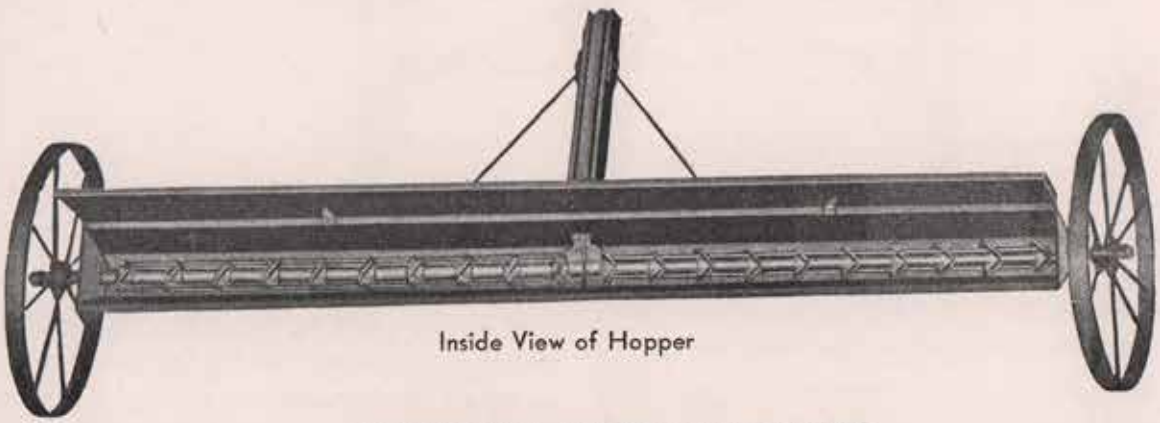
WADE FERTILIZER SPREADER



Rear View Showing Levers and Scattering Board

The WADE Fertilizer Spreader will successfully handle any dry commercial Fertilizer and is particularly adapted to the use of those highly concentrated Fertilizers requiring but a small distribution per acre. The Wade will sow as little as thirty pounds to the acre! The correct recommended amount is put on the soil with no waste—a highly economical feature.

In these days of specialized farming there is a constant drain on the mineral content of the soil—Sulphur—Nitrate—Phosphates and various other life giving elements that must be annually replaced to insure successful crops. Many of the higher priced and concentrated fertilizers now in use are distributed very sparingly, but to get results, that distribution must be even and accurate. The sensitive control mechanism of the WADE can be set and locked in any position from a minimum of thirty pounds per acre the full feeding capacity of the machine.



Inside View of Hopper

POSITIVE NON-CLOGGING

The positive, non-clogging action of the WADE Fertilizer Sower is the secret of its even distribution. Each wheel drives one half of the agitators and you will note in the above cut, that the agitators are so designed as to throw both right and left which will insure an even feed, with no tendency of the contents working towards the ends. The breaker rods connecting the agitators eliminate any clogging.

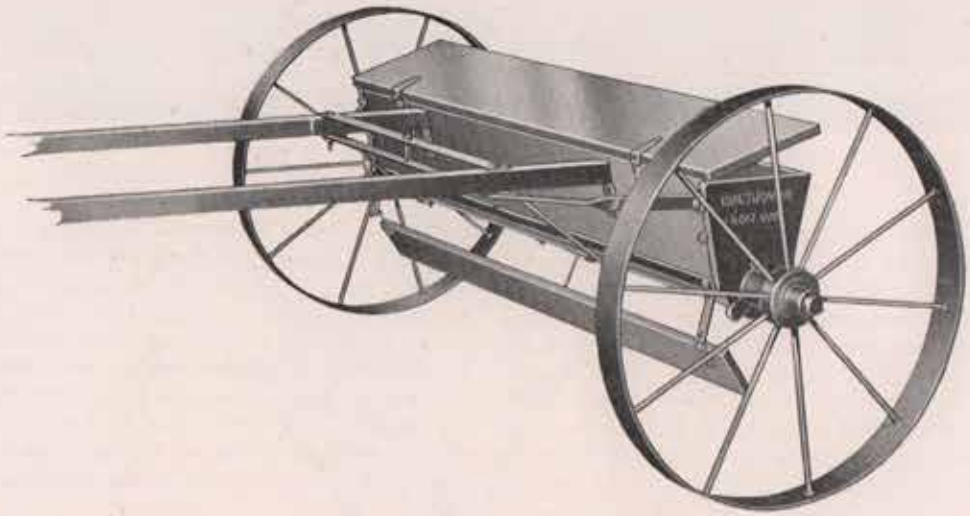
The agitator used on the WADE Fertilizer Sower is made of tough malleable iron, the other parts being steel or iron, and all parts are guaranteed against defective material or workmanship.

SPECIFICATIONS

The capacity of any Fertilizer Sower depends largely on the kind and condition of material to be sown, so the capacities given below are approximate.

	10 *ft. Size*
Hopper Capacity	400 lbs.
Sowing Width	10 ft.
Wheel Spread	11 ft. 2 in.
Height, Ground to bottom of hopper	14 in.
Height, Overall	34 in.
Shipping Weight	275 lbs.

WADE ONE-HORSE FERTILIZER SPREADER



NEW SINGLE HORSE MODEL

There are many places requiring fertilization that are inaccessible to a large machine, and we have developed a smaller single horse drawn model especially designed for such uses. Berry fields, Hop fields—any place where the space is limited by the actual width of the rows. This Small WADE is identical in construction with the larger model—the same design, same castings, same agitators and control—with the approximate capacity of one half.

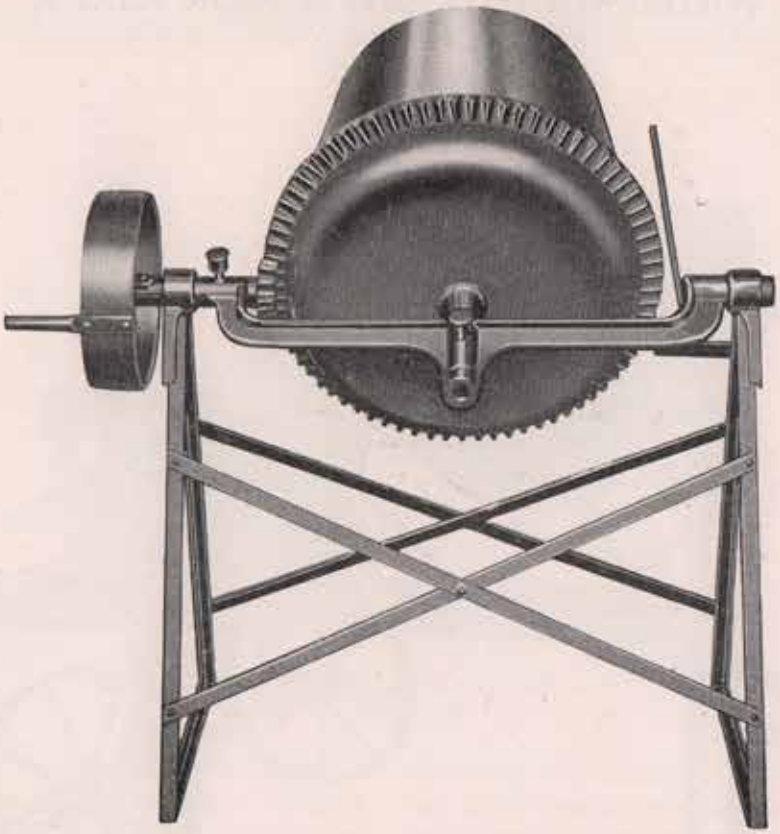
This 6-ft. WADE Fertilizer Sower has the same accurate feed as the larger size and will sow from a minimum of 30 lbs. per acre to a maximum of approximately 6,000 lbs. per acre. It is ideal for the berry fields or hop yards.

SPECIFICATIONS

The capacity of any Fertilizer Sower depends largely on the kind and condition of material to be sown, so the capacities given below are approximate.

	6 Ft. Size
Hopper Capacity	200 lbs.
Sowing Width	5 ft.
Wheel Spread	6 ft.
Height, Ground to Bottom of Hopper	14 in.
Height, Overall	34 in.
Shipping Weight	200 lbs.

WADE BATCH MIXER



MANY USES

It is surprising to know the number of uses to which a small batch mixer can be put. Mixing Feed—washing root crops—preparing fertilizer—dusting wheat, etc. We recently sold several for mixing paint.

A THOROUGH MIXTURE

Machine mixed concrete is absolutely thorough, every particle of sand and gravel is properly coated with cement. There is no guess work, no uneven batch. Poorly mixed concrete will crack, crumble and eventually go to pieces, regardless of the richness of the mixing formula. The Wade eliminates the back breaking job of hand mixing and at the same time gives a thoroughly and uniformly mixed batch of concrete.

SAVES CEMENT

In time the WADE Batch Mixer will pay for itself in the saving of cement alone. It is estimated that fully one fourth of the cement is wasted and washed away when mixed by hand. The WADE wastes no cement. Water is first poured into the drum, then the cement and the action of the machine mixes the cement and water so that when the sand and gravel are added, every single particle is thoroughly coated with the cement and water solution. Every ounce of cement goes into the concrete —none is washed away.

SPECIFICATIONS

Capacity—2½ to 3 cubic feet.

Power—Equipped with 12"x3" pulley with hand grip. Can also be operated with small 1½ H. P. Engine.

Frame—Made of 1" angle steel, well braced.

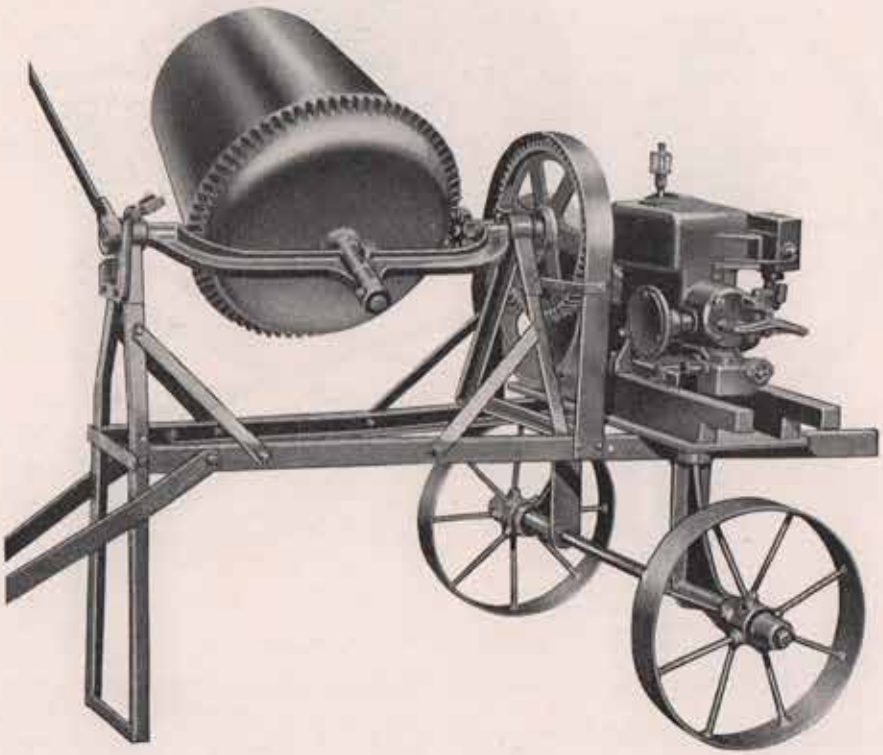
Drum—21" in diameter; 22" deep; 17" opening.

General Dimensions—Length overall 3' 4"; width 1' 9"; height 4' 4"; charging height 3' 2".

Weight—170 lbs.

WADE-MULTNOMAH JUNIOR MIXER

Model JR



This is an ideal mixer where an inexpensive motor driven mixer is required. This mixer is mounted on steel wheel trailer. Everything on the mixer is substantially built and yet wherever possible things are eliminated to make this mixer a low priced mixer and yet very high quality. It is built to stand heavy usage and is ideal for the small contractor.

SPECIFICATIONS

Drum	17x21x22	Overall Length	96"
Capacity	2½ to 3 cu. ft.	Width of Tread	38"
Discharge Height	23"	Wheels—Metal	20"
Loading Height	50"	Motor	2 H. P.
Overall Width	48"	Weight	550 lbs.
Overall Height	65½"		

WADE-MULTNOMAH CONCRETE MIXERS

BETTER MIXER

The Wade-Multnomah Concrete Mixer is built of the best material obtainable. The design and construction is such that the machines will stand up under the hardest usage. Note the solid, heavy construction of the frame, the reinforced drum and the well braced housing.

In designing the Wade-Multnomah the convenience and ease of operation were the major points considered. An intensive study was made of the contractors requirements as to loading, unloading and mixing. The driving mechanism is very simple and efficient,—no complicated gearing or special units.

The trailer wheels are of two types, 30 in. solid cushion tires mounted on heavy steel wheels and 30x3½ pneumatic tires mounted on standard demountable rims. All wheels are equipped with automobile type roller bearings. Any Speed is possible while trailing a Wade-Multnomah.

SPECIFICATIONS

MIXING DRUM—Capacity, unmixed, 5 cu. ft.—mixed, 3½ cu. ft. (a full half sack mixer) Width 27 in., Opening 19 in., Depth 29 in. Heavy gauge steel with reinforced shoveling edge riveted to solid bowl casting. Revolves on hardened steel ball thrust bearing, fully protected against leakage.

FRAME—Extra heavy steel channels, well braced. All bolts lockwashered.

POWER—2 H. P. Standard manufacture gas engine.

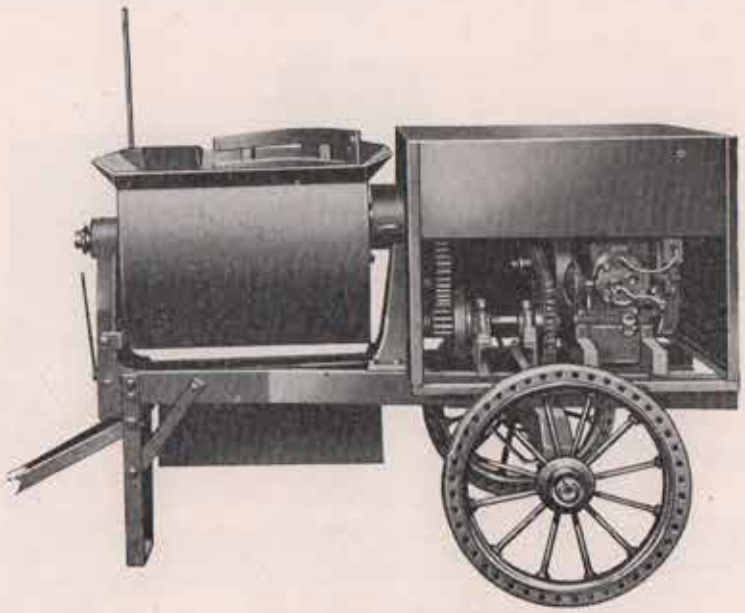
DRIVE—Gear driven throughout—no chains or belts.

WEIGHT—1155 lbs.

GENERAL—Tilting is regulated by geared crank, very easily operated and can be locked in any position. Mixing blades are extra long and so designed as to give maximum mix. Lubrication of all moving parts is amply provided.

The ball thrust bearing shown at the right is the secret of the ease of operation of the Wade-Multnomah as well as its long life. This oversized ball bearing is mounted at the base of the bowl and bears the weight of the entire load. A special copper gasket and nut fully protect it against any leakage.

WADE-MULTNOMAH PLASTER MIXER



Model P-50-C

The Wade-Multnomah Plaster Mixer is a high quality machine for mixing plaster. All varieties of Hardwall, Stucco, Lime and Cement plaster can be mixed and it is equally efficient for mixing mortar for brick and tile work. The spiral blades are so designed as to both cut and hoe at every revolution of the shaft. This insures an even, uniform mixture, free from all lumps or brown spots common to hand mixed batches.

SPECIFICATIONS

MIXING DRUM—Capacity, one sack; Size, 30 in. by 30 in.; Shaft 1¾ Steel; Arms, 1¾ Electric Steel Castings; Blades ⅜x2 Steel.

FRAME—4 in. Channel, Well braced. All bolts lock washered.

RUNNING GEAR—1½ Steel Axle by 51 in.; 30 in Tires; Extra heavy Steel Wheels, Roller Bearings.

POWER—3 H. P. Standard Manufacture Gas Engine.

CLUTCH—Multiple Disc type, operated from front end of machine.

WEIGHT—1450 pounds.

DIMENSIONS—Length Overall, 9 ft. 9 in.; Length without bar, 6 ft. 8 in.; Width Overall, 51 in.; Shoveling Height, 50 in.

SPEED—25 R. P. M.

BUILT IN TWO MODELS

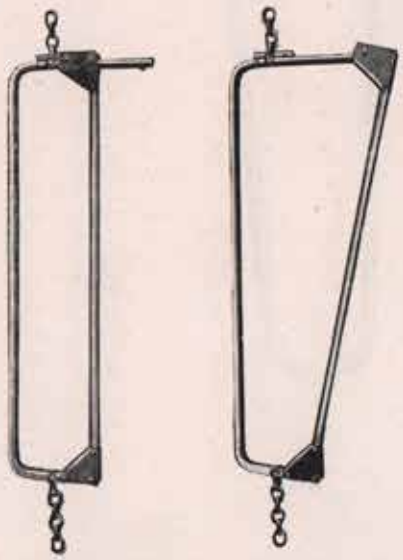
P-50-C Equipped with 30 inch Solid Cushion Tires.

P-50-P Equipped with 30x3½ Pneumatic Tires mounted on standard demountable rims.

PORTER BARN EQUIPMENT

"Red Tag" All Steel Adjustable Stanchion

Positive Latch



Lifetime Service

Fig. 884 Steel Stanchion

SPECIFICATIONS

CONSTRUCTION—All-steel, malleable fittings. High carbon steel U-bar bent hot and guaranteed to hold its shape.

Pressed steel corner brace and guide.

Pressed steel, one-piece latch, having piano wire double spring; absolutely positive in operation. Latch engages machine bolt in upper stanchion guide and snaps into position automatically when stanchion is closed.

Large headed rivet at outer end of U-bar provides a stop for the moving member when latter is in open position.

Lead is provided by steel guide and insures immediate registry with latch when stanchion is closed.

Pressed steel chain clevis at top and bottom.

ADJUSTMENT—Illustration shows wide position—to reduce neck space remove bolt holding clevis and latch at top and insert in other hole shown; similarly, remove bolts from bottom clevis and corner brace, moving these parts to the left to engage proper holes. Adjustment easily and quickly accomplished.

Inside width—6½ inches to 8 inches.

Inside length—43 inches.

FINISH—Porter Gray Enamel.

Also furnished with hard wood linings, and as such designated as Fig. 885.

	Weight, Lbs.
Fig. 884 All Stel Stanchion	17½
Fig. 885 All Steel, wood lined	18

PORTER BARN EQUIPMENT

CONTINUED

Fig. 14

Fig. 15 Stanchion, open

Showing Hinge Construction as used on No. 15 only

COW-PROOF LATCH as used on No. 15 Stanchion only

FIG. 14—COW STANCHION, WOOD LINED

This is the latest addition to our now complete line of stanchions. Made of high carbon steel U-bar and lined with selected hardwood. The fittings are of best malleable iron and extra heavy, giving unusual strength and durability. Latch is strictly cow-proof, yet easily opened by a downward pressure of the hand. Standard inside width is approximately 7¼ inches. Several other widths can be furnished at extra cost, these varying from 6¼ inches to 7½ inches. Approximate weight, 22 pounds.

FIG. 15—COW-PROOF STANCHION

Weight—Approximately 20 pounds.

Head castings and hinge are made of certified malleable iron.

Patented duplex-latch is absolutely cow-proof. Operates as simply as a pair of pliers in the human hand, but a perfect barrier to the cow.

Hinge has unusually large bearing surface—extra strength.

High carbon tubular steel sides made of 1 5/16-inch diameter tubing.

Latch spring made of stiff piano wire.

Inside length—43¼ inches.

Inside width—7½ inches.

Finish—Porter Gray Enamel.

The finest stanchion on the market today—the one you have waited years to see and now can buy.

Regularly furnished with all our sanitary steel stalls.

PORTER STEEL STANCHIONS

	Weight, Lbs.
Fig. 14. Wood-Lined Cow Stanchion	22
Fig. 15. Tubular Cow Stanchion	20

PORTER BARN EQUIPMENT

CONTINUED

Fig. 652
Top Stanchion Adjustment
for Steel Stall

Fig. 671

STANCHION ADJUSTMENTS

These stanchion adjustments are used where it is desired to line up short and long cows at the gutter. The dotted lines show how this result is obtained with the steel stall.

TOP STANCHION FASTENER

Fig. 629 "J" bolt is used for fastening stanchions where a wood stall is used. You will find our prices much more reasonable than having them made to order. These fasteners are for use through a 2x6 sill.

BOTTOM STANCHION FASTENERS

Fig. 671 Stanchion Anchor is the new drop-forged Stanchion Anchor, which is specified when the stall floor and curb are made of concrete. This is a very strong fastening for the lower end of the stanchion, which will withstand the severe strain received when the cow gets up or lies down. The large U bolt insures a permanent hold in the concrete, and the desired flexibility in the stanchion is obtained by using a long chain at the bottom.

STANCHION ANCHOR

Our figure 672 Anchor can readily be adapted for use with wood curb, as illustrated in the accompanying cut. In this case the U bolt is displaced by lag screws, the same drop forging being used. With this Anchor the most restless cow can be held securely in her proper place, yet at the same time enjoy the greatest amount of freedom.

In some cases a cheaper fastener than the above is wanted, and to fill this demand we have a "J" lag screw. It is about three inches long, and as the threads are very sharp, it can be quickly screwed into the sill.

PORTER STANCHION FIXTURES

	Weight, Lbs.
Top Stanchion Adjustment for steel stall	2
Fig. 629. "J" bolt top fastener, per dozen	6
Fig. 671. Bottom fastener for concrete floor	½
Fig. 672. Bottom fastener for wood floor	½
"J" lag screw bottom fastener, per dozen	3

PORTER BARN EQUIPMENT

CONTINUED

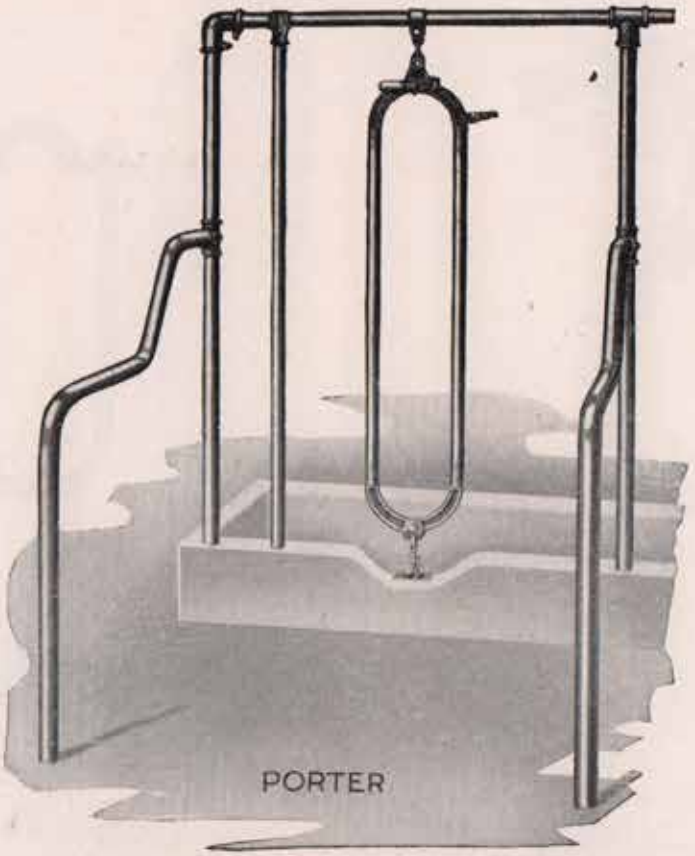


Fig. 749 Porter Steel Stalls With Double Curve Partitions

Porter Perfect Steel Stalls

The Fig. 749 stall, as shown above, with the double curve partition, is made of 1⅝-inch, outside diameter steel tubing. This style of stall has proven to be the most popular yet designed.

The standard width stall is 3 feet 6 inches, but if smaller stalls are preferred for smaller stock, the top rail can be shortened.

Note the partition clips provided to hold the stanchion when open.

These stalls can be furnished for either wood or concrete floor. When used for wood floor, a flange is needed for each partition.

We always send Fig. 15 tubular stanchion unless otherwise ordered.

It should be remembered that each stall includes but one partition and three uprights. When possible, draw diagram of installation, enabling us to fill your order correctly.

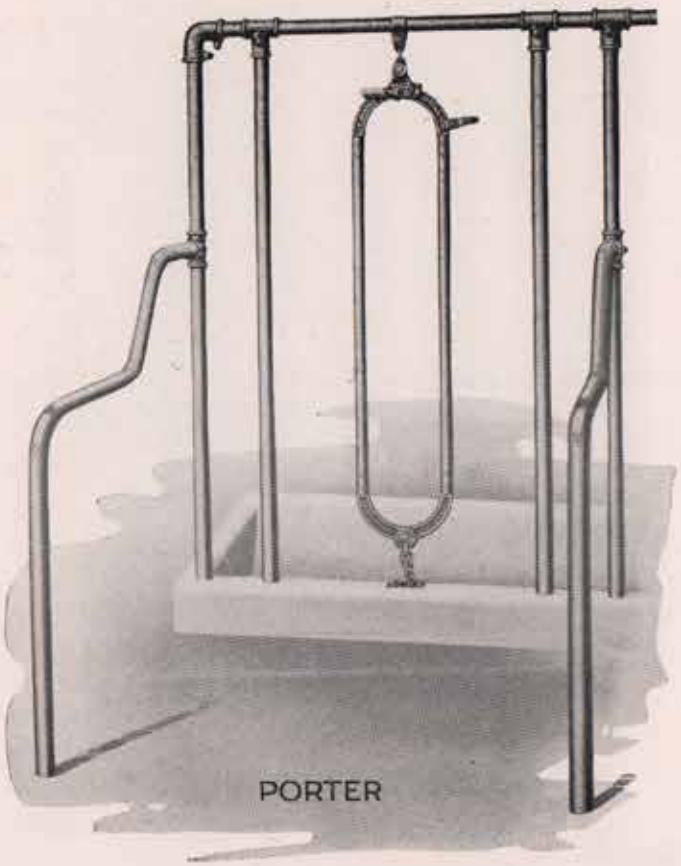
We can also furnish steel mangers, manger partitions, drinking cups, bull pens, calf pens and name plates. Ask for factory catalogue, which fully illustrates them.

PORTER STALLS

	Weight, Lbs.
Fig. 749. Cow Stall complete with Fig. 15 Stanchion, for concrete floor	65
Fig. 749. Cow Stall complete with Fig. 15 Stanchion, for wood floor	69
Double curve partition only, with tee and floor flange, for wood floor	24
Double curve partition only, with tee, for concrete floor	20
Extra upright with elbow	17

PORTER BARN EQUIPMENT

CONTINUED



Porter Fig. 604 Stall

This is the original fadless stall as designed by Porter years ago and is still one of the most popular stalls today. Thousands of these stalls are daily in use, delivering the satisfactory, dependable service expected of and featured by all Porter products. Sheer simplicity is featured here. Dust proof and sanitary.

All tubing is 1⅝" high carbon steel and the fittings are of certified malleable.

Standard width, 3 ft. 6 in. Other widths furnished without extra charge.

Regularly furnished with Fig. 15 Stanchion. Finished with Porter grey enamel.

Fig. 604 Porter Cow Stall; weight, approximately 88 lbs.

Illustration shows Porter Stall with 6 in. level curb. Porter feed-saving curb may be used, if desired.

PORTER BARN EQUIPMENT

CONTINUED

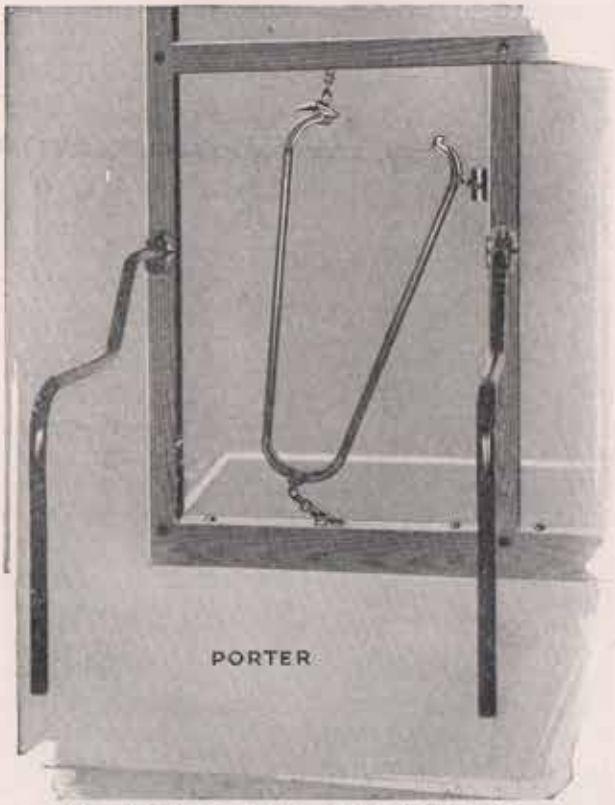


Fig. 607 Porter Stalls, 2x6-inch Wood Frame

Porter Perfect Stalls

Many dairymen fully appreciate the value of sanitary barn equipment, but at the same time do not feel that they can afford to install a complete steel outfit. Fig. 607 illustrates a plan whereby the farmer of moderate means can have as nicely arranged barn as his more fortunate neighbor.

In making this installation all that is needed outside of the woodwork is partition, two flanges, stanchion, stanchion clip and fasteners. If concrete floor is used, the floor flange can be dispensed with.

While we show the Fig. 15 stanchion, any style can be selected, as shown on previous page.

PORTER STALLS

	Weight, Lbs.
Fig. 607A. Consisting of one double curve partition, with floor and partition flanges, No. 15 Stanchion, fasteners and holder, for wood floor	56
Fig. 607. Same as above, but less floor flange, for concrete floor	53
Double curve partition only, with floor and partition flanges, for wood floor	20
Double curve partition only, with partition flange, for concrete floor	16
H342. Partition or floor flange with lag screw	4

PORTER BARN EQUIPMENT

CONTINUED

Ideal Fig. 901 Drinking Cups

This is a very popular type of drinking cup which has been on the market for many years and given perfect satisfaction.

The brass valve is accurately machined and fitted to insure perfect operation year after year. It can be easily removed and in construction is as simple as the drinking cup itself. A heavy brass bearing for the nose plate provides for long life. The nose plate is removable and has extremely wide bearings which positively prevents wobble from side to side. Tapped for 1 inch feed pipe from either top or bottom. Built for rough usage and for looks as well. Thousands in use.

The cup can be detached from the fountain (or goose-neck) on the Fig. 901 drinking cup by removing one small bolt. This allows free access to the valve which has a square head and can be turned out easily with a monkey wrench. Tapped for ¾-in. pipe. Weight 12 lbs.

Porter Gutter Drains and Manger Drains

Fig. 691

We recommend that drains be placed in the mangers and gutters at the time of laying the concrete. This provides a means of handling excess liquids when necessary, and either drain is provided with a solid cap for use when drain is not desired.

Fig. 874 Gutter Drain: weight, 25 lbs. Fitted to 4-inch tile.

Fig. 691 Manger Drain: weight, 5¼ lbs. Fitted to 1½" or 2" pipe or 3" tile.

Fig. 874

All-Steel Milking Stool

Weight—5¼ pounds.

Height—11½ inches.

Diameter of Seat—10¼ inches.

Finish—Porter Grey Enamel.

Most durable milking stool made; absolutely sanitary and strong enough for the heaviest man. Seat is flanged steel, slightly dished in the center.

PORTER BARN EQUIPMENT

CONTINUED

Porter Litter Carriers

The task of removing the litter from the barn is probably the most disagreeable daily work the dairyman has to perform. And yet with the use of a Porter Litter Carrier outfit this drudgery can be changed into a pleasure.

Besides doing away with a great deal of hard work, the Porter Litter Carrier makes it easy for you to keep your barnyard clean and sanitary. The carrier track is usually run from 50 to 100 feet away from the barn, and is very often dumped on the outside of the barnyard fence. This helps to keep your barnyard clean and dry, removing all odor which might contaminate the milk.

The proper handling of fertilizer is occupying the attention of all careful and successful farmers today. If the soil is to be cared for so that it will yield its very best, year after year, it must be given nourishment. And nothing is better than manure, but it must be taken care of properly. Tests and experiments prove that the liquid contains the greatest amount of nitrogen, which is so important to plant life, and right here is where a Porter Litter Carrier outfit will soon repay you many times over its first cost.

You will notice that the Porter Carrier has a steel tub. It is 4 feet long, 2 feet wide and will hold 12½ cubic feet, or 10 bushels. It allows you to save the liquid manure, as well as making it easy to clean out your barn every morning.

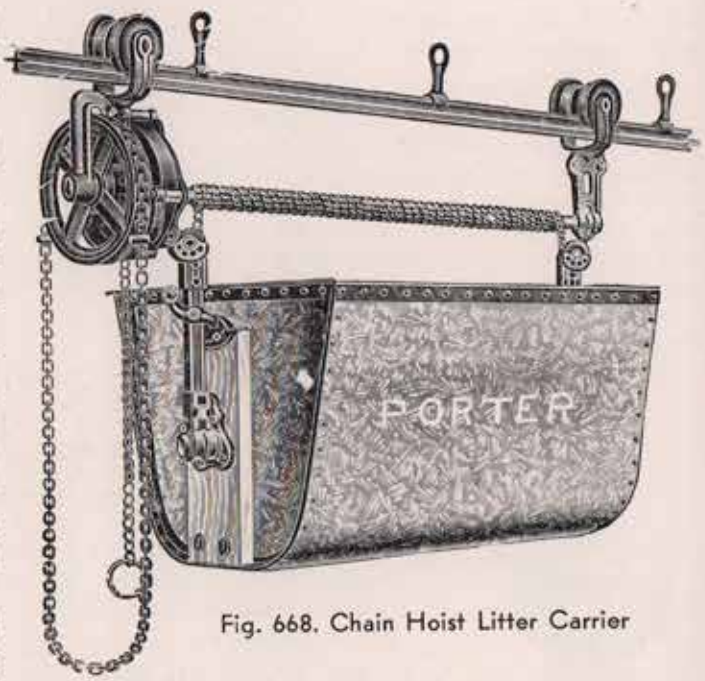


Fig. 668. Chain Hoist Litter Carrier

The Porter Chain Hoist Litter Carrier shown in the illustration above has large wheels and is roller bearing. This makes it very easy of operation and while the tub will hold 800 pounds of wet manure it is very easily run along the track. This carrier has a special advantage inasmuch as the bottom of the tub can be raised within 38 inches from the center of the track. This permits its use through small doors or windows, which would not accommodate the type shown on the following page. As it can be lowered nine feet below the center of the track, it can readily be seen what a large adjustment is possible.

The principle of the brake on this carrier is very simple You need only to pull the chain, thus applying the brake and stopping the downward travel of the tub. The brake can be applied as gently as desired, and when the chain is released, the emergency brake takes hold. There is no chance for the tub to drop, for proper control is always possible.

The same Columbian steel track is used as with Porter Hay Carriers.

SPECIFICATIONS

TUB OR HOPPER—Made of No. 20 gauge galvanized steel, with ends of heavier metal. Reinforced with 1x1x1⅛-inch angle iron, the whole being securely riveted together and soldered inside, making a watertight job. Trunnions are fastened to wood battens having large bearing surface. Tub has sloping sides and cleans itself. Width, 24 inches; depth, 22 inches; length, 48 inches.

HOIST—Chain wheel, which operates in connection with train of spur gears, these turning shaft either to right or left. Chain wraps neatly on the shaft, which is 1¼ inches in diameter. Gear ratio is such that nominal power is required to elevate load without sacrificing speed.

BRAKE—Emergency brake consists of hardwood shoe with anti-friction lining—entirely automatic and positive in action. Hand brake used to control speed of lowered tub; metal band encircles drum and exerts pressure when hand chain is pulled. Load always under control.

TRUCK WHEELS—Adapted for Columbian steel track. Diameter at tread, 3½ inches. Fitted with roller bearings and have swiveled trucks.

RANGE OF HOIST—When in highest position, bottom of tub measures about 3 feet 2 inches from the track above. It can be lowered 9 feet from the same point.

FINISH—Superior grey enamel, trimmed in bronze.

WEIGHT—Complete; 48-inch size, approximately, 220 pounds.

PORTER BARN EQUIPMENT

CONTINUED

Cable Track Litter Carrier

Fig. 692. Cable Track Litter Carrier

This carrier is only adapted for operating on cable track and in installations which do not require curves or switches. In other words, it has been designed for the man who wants something better than a wheelbarrow and yet does not care to have the more durable and slightly more expensive outfit comprising Columbian steel track.

It is quite evident to anyone that all cable installations require constant inspection and attention, since the instant the tension on the cable is relieved, the outfit becomes of little value. We therefore only advocate this carrier for those cases where either the building is old and will soon be replaced, or the question of a few dollars in the customer's opinion is an important issue as compared with a more efficient and permanent installation.

There is an automatic trip which can be placed at any point on the cable desired, and the tub or hopper is instantly capsized upon coming in contact with the former. The tub has two latches, which operate simultaneously, and if desired a hand trip line may be attached to assist in returning the carrier to the barn.

SPECIFICATIONS

TUB OR HOPPER—Made of No. 20 gauge galvanized steel, reinforced with 1x1x⅛-inch angle iron, securely riveted together and soldered inside, making a water-tight job. Trunnions are best malleable iron with large bearing surface. Width of tub, 24 inches; depth, 16 inches; length, 38 inches; capacity, approximately, 6 bushels.

TRUCK WHEELS—Diameter, 6 inches; fitted with roller bearings; wheel base, 26 inches.

FRAME—Special steel section, reinforced with braces.

HEIGHT—Distance from cable to bottom of tub, 5 feet 3 inches.

FINISH—Superior grey enamel, trimmed in bronze.

	Weight, Lbs.
Cable Track Litter Carrier	101
Cable per foot	

PORTER BARN EQUIPMENT
CONTINUED

Porter Litter Carrier Equipment

Fig. 804 switch is necessary when it is desired to run the carrier on more than one track. In performing the duties of a switch, it also provides a positive stop or lock on each track, making it impossible to run off the open end. This lock is automatic and is accomplished by means of a swinging latch, which operates in a notch in the track.

Fig. 804 Porter Two-Way Switch

Fig. 805 Three-Way Switch is of the same general construction as the two-way, but, of course, is for use where there are three tracks. It has the same positive lock and a latch prevents it from being shifted unintentionally.

Both switches come mounted, as shown in the illustrations, and are ready to install. It takes no experience to put up a mounted switch, as all parts are properly adjusted before leaving the factory, as well as being carefully inspected before leaving our hands. Porter switches are very strong and embody all essential features to accomplish the best results.

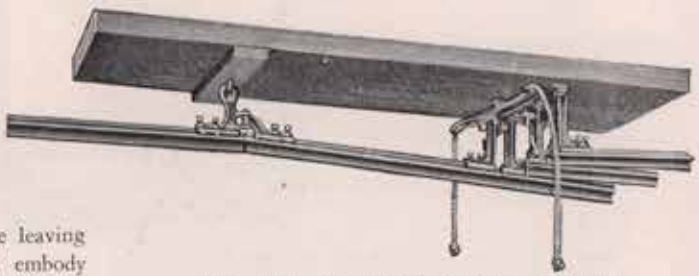


Fig. 805. Porter Three-Way Switch

The illustration to the right shows the Fig. 638 Swinging Removable Door Section. By its use it is possible to close a sliding door, making it unnecessary to cut out any part of the door. We can furnish same at a small charge.

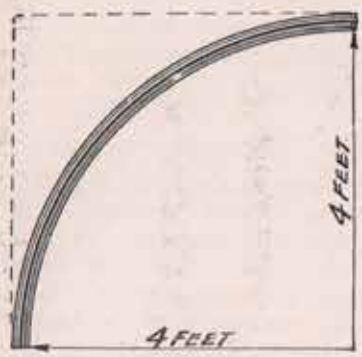


Fig. 645 Columbian Curved Track

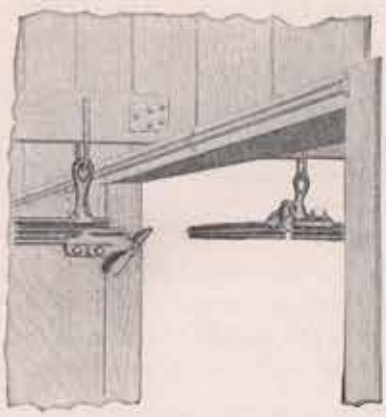


Fig. 638 Porter Swinging Removable Door Section

Fig. 645 represents a 6-foot length of Columbia steel track bent into a 4-foot radius. The 4-foot radius is considered best when making a turn and is furnished complete with connections at a slight charge.

LITTER CARRIER EQUIPMENT

		Weight, Lbs.			*Weight, Lbs.*
Fig. 804	Two-Way Switch, mounted	30	Fig. 645	Columbia 90 degree curve	12
Fig. 805	Three-Way Switch, mounted	35	Fig. 638	Swinging Door Section	6

PORTER BARN EQUIPMENT

CONTINUED

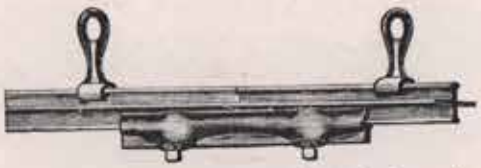


Fig. 644. Columbian Track With Coupling
Weight, per Foot, Two Pounds

Columbian Steel Track and Fixtures

A carrier installation has little value unless the track is strong and thoroughly adapted for the purpose. All Porter outfits give excellent service, due to the fact that particular attention has been given the question of proper materials entering their manufacture.

The Columbian high carbon steel track is unusually stiff, and the shape is such that it is exceptionally light in weight. Another feature of value to the customer is the ease with which the hangers may be attached; the spacing may be varied to suit the conditions, since the hangers fit over the continuous top bead of the track. This spacing should not exceed three feet.

The coupling illustrated in Fig. 644 indicates the manner of connecting two lengths of track. A wrench is the only tool required, and the set screws fit perfectly into the notches found at both ends of the track. After drawing these set screws up tight, tap the head of each, after which they may be turned slightly, and are then set properly. The couplings are malleable iron and make an unusualy strong joint, leaving no space between the ends of the track.

This track is furnished in 6, 8, 10, 12, 14 and 16-foot lengths. It is also used for our hay carrier outfits, and can be depended upon to give satisfactory and reliable service.

Fig. 645 shows the standard track curve, which is bent to a radius of four feet. This curve joins two tracks which would intersect at right angles. When special curves are required, it is necessary that we have a sketch with complete dimensions indicated.

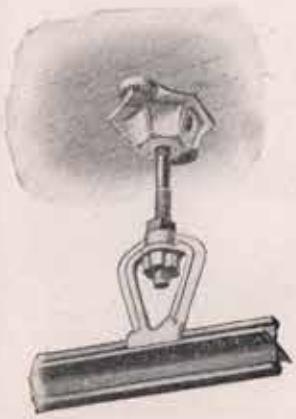


Fig. 665
Weight 6-in. Hanger, 1 lb.

Fig. 120
Wt., ½ Lb.

Fig. 124
Wt., ¾ Lb.

Fig. 212
Weight, ½ lb.

Fig. 213
Wt., ½ Lb.

Fig. 121
Wt., ¾ Lb.

Fig. 665 is a track hanger used when the barn is ceiled. Furnished in 2-inch galvanized lengths of 6 inches and longer.

Fig. 694, not shown, is the same hanger when attached to the side of a joint or stringer. Considerable adjustment can be obtained if desired.

Fig. 212 is the rafter bracket, specified when the track is hung at right angles with the rafters or joists.

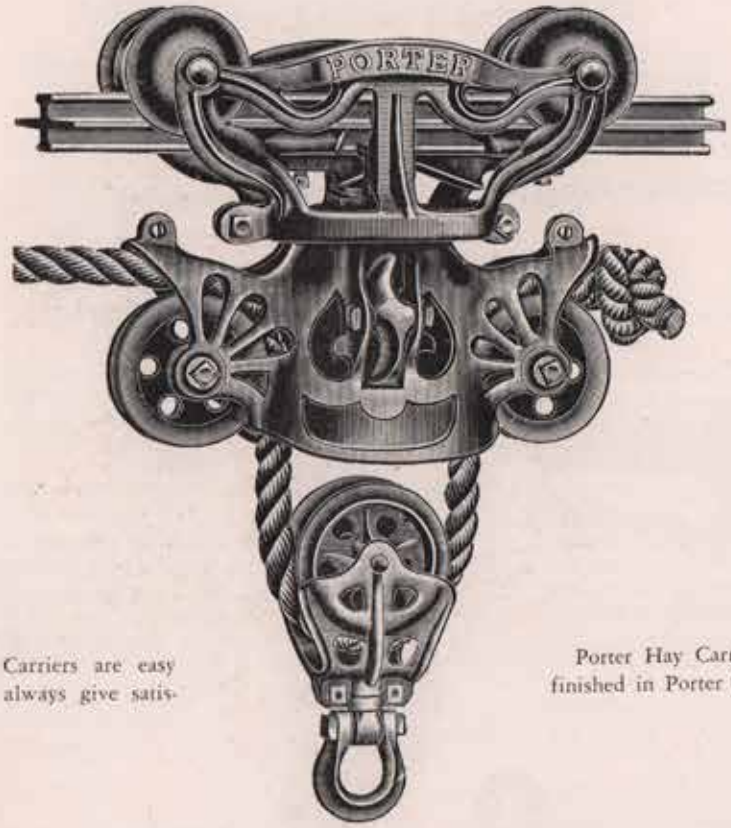
Fig. 120 shows the track hanger used with Figs. 212 and 213 brackets. It is slipped over the top bead of the track and requires no bolts.

Fig. 124 is a split track hanger. This is used when additional support is desired after the track has been hung.

Fig. 213 shows the ridge pole bracket for 2-inch timber, used when the track parallels the rafter or joist.

Fig. 121 is an 8-inch track hanger. This and all other hangers are made of best malleable iron.

PORTER HAY CARRIERS



Porter Hay Carriers are easy to install and always give satisfaction.

Porter Hay Carriers are nicely finished in Porter Gray.

No. 33 Porter Hay Carrier

On Columbian Steel Track (Patented)

The superior mechanical features, designs and finish of Porter Hay Carriers are equalled by none on the market. They are constructed of the very best malleable iron and steel obtainable.

No. 33, shown above, is a combination two-way carrier, which can be reversed either by turning the swivel or by drawing the rope through from end to end.

The drop lock casting and the two dogs form a positive lock, which is very simple, and will work in any position.

The distinctive feature of this carrier is that the supporting dogs catch and hold the sheave or wheel of the fork pulley, which allows the greatest range of adjustment with not a particle of friction, as the adjustment is obtained by the swinging of the pulley frame on the axle.

All Porter Hay Carriers are finished in a Porter Gray paint, making them very attractive.

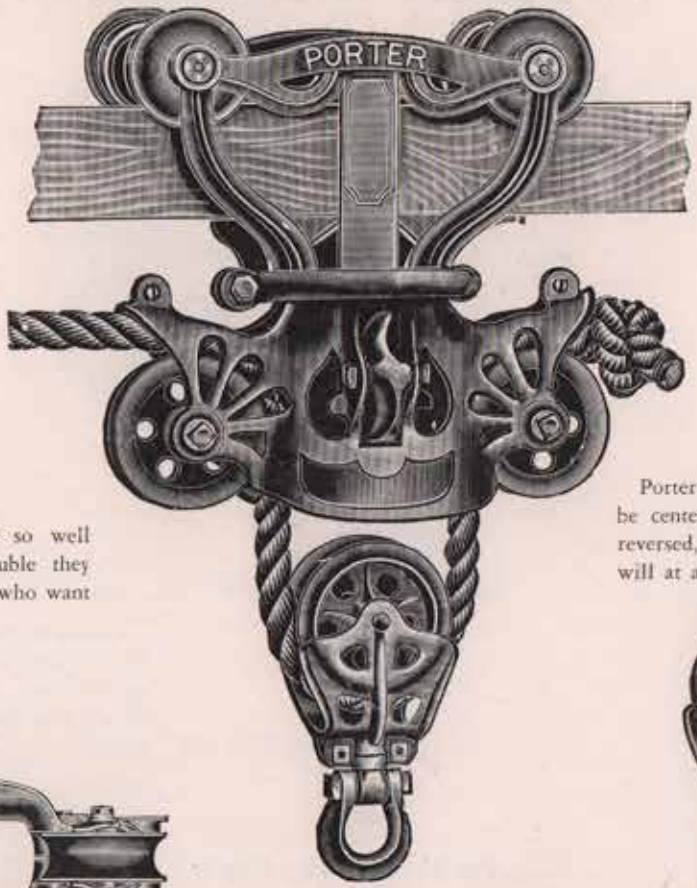
Bumper furnished free with all steel truck carriers to prevent running off the end of track.

H30 Trip Block used on Columbian steel track. Furnished regularly with all steel track carriers—this block never fails to trip.

	Weight, Lbs.
No. 33 Steel Track Carrier, for rope draft	28

PORTER HAY CARRIERS
CONTINUED

No. 34 Porter Hay Carrier
On Wood Track



Porter Carriers last so well and give so little trouble they are demanded by those who want the best.

Porter Carriers do not have to be centered on trip block to be reversed, but can be reversed at will at any location on the track.

View Showing Wide Mouth

Swivel Fork Pulley

The No. 34 Hay Carrier is of the same construction as the No. 33, except that it is built to run on a 4x4 wood track. The frames of Porter Carriers are made very strong and positively cannot spread with a heavy load. The superior construction of Porter Carriers insures durability and permanent wear. By ordering self-locking sling pulleys with carrier, hay slings can be used on any fork carrier.

The above cut to the right illustrates the fork pulley used in No. 33 and No. 34 wide mouth carriers; the edges of the sheave or wheel are beveled so it will enter the wide beveled mouth of the carrier regardless of the angle at which it strikes; also note the absence of any framework on upper half of pulley. This prevents the wheel from becoming locked in the pulley when frame is bent by striking carrier at any angle.

The above cut to the left illustrates the wide mouth feature of Porter Hay Carriers. Note particularly the beveled sides of this wide mouth, which form a perfect guide for the pulley, which never fails to enter the lock. This wide mouth is a valuable feature when filling a mow and dragging hay over beams; no matter at what angle the pulley strikes this wide mouth, it will always register and lock. Both No. 33 and No. 34 can be equipped with this sling pulley.

Weight, Lbs.

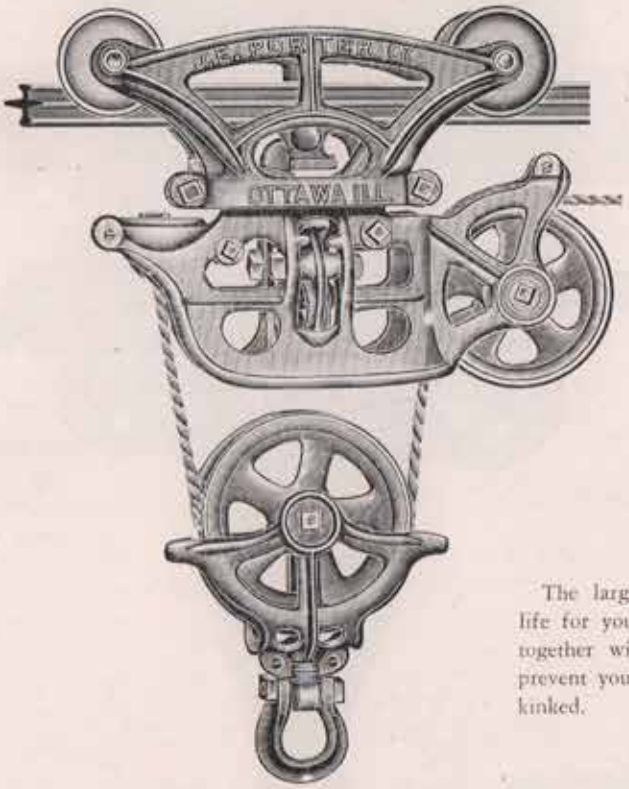
No. 34 Wood Track Carrier, for rope draft..... 35

PORTER HAY CARRIERS

CONTINUED

No. 43 Porter Hay Carrier

On Columbian Steel Track, Rope or Cable Draft

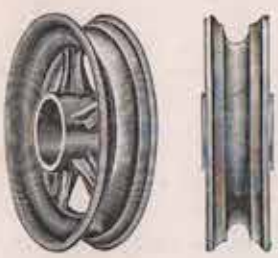


The large sheaves mean long life for your hoisting cable and, together with the swivel clamp, prevent your line from becoming kinked.

No. 43 Porter Hay Carrier

The above cut represents one of our latest pattern Hay Carriers. They are made with combination sheaves that can be used with either cable or rope.

We present Porter Large Sheave Hay Carriers to our customers with a feeling of pride, for they have been especially designed to meet conditions here in the Northwest. The fork pulley is 7 inches in diameter, while the sheave within the frame is 6 inches, thus making a much lighter draft carrier than where small sheaves are used.



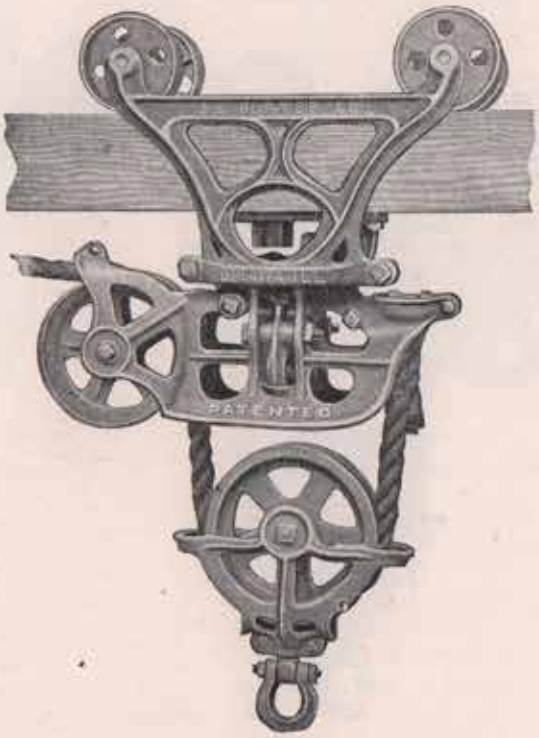
Large Roller Bearing Sheaves

Large sheaves mean much longer life for the hoisting cable, for it is not bent more than its natural spring. You will not have the annoyance of straightening out twisted cable if you use one of these Porter Large Sheave Carriers, and this one feature alone means a big saving of time and trouble.

	Weight, Lbs.
No. 43. Steel Track Carrier, for rope draft or cable	38

PORTER HAY CARRIERS

CONTINUED



No. 46 Porter Hay Carrier

No. 46 Porter Hay Carrier

For Wood Track, Rope or Cable Draft

No. 46 is similar to the carrier shown on the previous page, excepting that it is built for 4x4 wood track. The same large sheaves are used, as well as the roller bearings. A steel bushing is used between the axle bolt and the steel rolls, which is another reason why the Porter Large Sheave Carriers handle such heavy loads year after year without any appreciable wear.

The Patent Swivel, which is used on all large carriers, is only found on the Porter. With this device it is impossible for the cable to become twisted, and, of course, means long life and a saving of money each year.

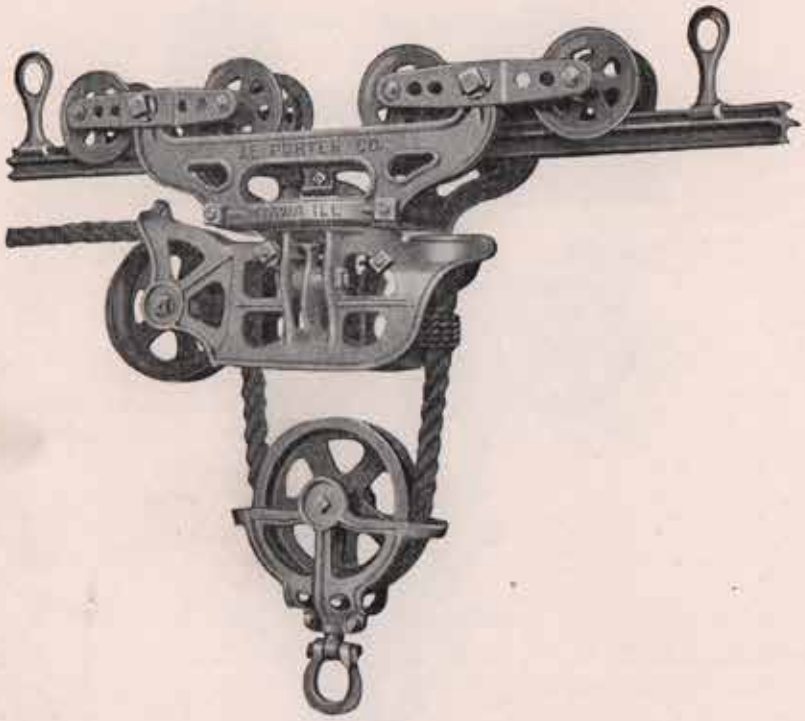
Notice the wide track wheels which are used on Porter Wood Track Carriers. No flange is used on these wheels and a much larger bearing surface is secured. These track wheels are over an inch wide, which not only saves wear on the track, but makes a much easier running outfit.

Sling pulleys can be furnished for any of our carriers.

	Weight, Lbs.
No. 46. Wood Track Carrier, for rope or cable draft	38

PORTER HAY CARRIERS

Continued



No. 52 Porter Hay Carrier

Porter Eight-Wheel Locomotive Carrier

Steel Track, Rope or Cable Draft

This carrier is adapted for the heaviest kind of work. Made entirely of malleable iron and steel.

This is our latest style Eight-Wheel Hay Carrier and has been designed for extra hard work. In many sections where alfalfa is raised extensively this carrier has become a great favorite.

You will notice that on all Porter Carriers the shell of the fork pulley does not enclose the upper half. This allows the dogs to grip and hold the sheave itself instead of the frame. When the load of hay is raised and locked in the carrier, it is, of course, swinging more or less. You will notice on the ordinary carrier that the dogs and upper part of shell are subject to great wear, but on the Porter the load swings easily on the axle of the sheave, causing no friction whatever.

Like all of the Porter Carriers shown on previous pages, this type can be equipped with sling pulleys.

	Weight, Lbs.
No. 52. Steel Track Carrier, for rope or cable draft	48

PORTER HAY SLING PULLEYS

Self-Locking Sling Pulley for Rope Draft

The self-locking sling pulley is used in connection with hay slings, and this particular style is adapted to any of the Porter Hay Fork Carriers shown on the previous pages which are built for rope draft. If the self-locking sling pulley is to be used with either No. 33 or No. 34 Carrier, it must be ordered with H69 registering head, but if desired for one of the large sheave carriers, specify H446 registering head.

Only order the above for use with rope draft hay carriers and be sure to specify the number of the carrier it is intended for.

The Giant Sling Pulley shown below is for use with Porter Hay Carriers using wire cable. The large sheave is 7 inches in diameter, which prevents the cable from being bent in too short a turn. Wire rope has a certain amount of flexibility, and by having the sheave of such size that the cable is not unduly strained, it will give much longer service.

In ordering this hay sling pulley it is necessary that we know the number of the carrier it is to be used with, so that we can send the proper registering head.

It should only be used with large sheave carriers built for cable draft.

PORTER HAY SLING PULLEYS AND HOLDERS

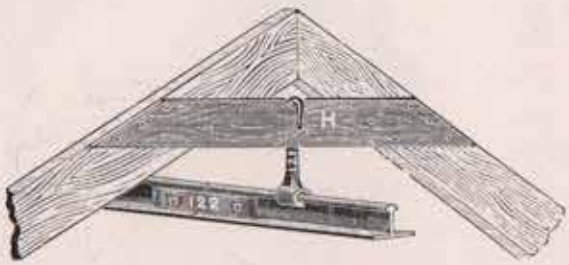
	Weight, Lbs.
Self-locking Sling Pulley, for rope draft	10
Giant Self-locking Sling Pulley, for cable draft	18
Fige. 1. End ttip Sling Holder	3
Fig. 2. End Trip Sling Holder	3
If when ordering carrier with sling pulley, fork pulley is not desired, on Nos. 33 and 44 deduct	....
On large sheave carriers deduct	....

Giant Self-Locking Sling Pulley for Cable Draft

Porter Columbian Steel Track and Fittings

Columbia Double-Beaded Steel Track is the strongest and easiest to put up of any track yet invented. It is rolled from high carbon steel. The wheel supporting flanges are 2 inches wide. It weighs 2 pounds to the foot, and with hangers placed every two or three feet apart it makes the strongest and most durable hay carrier track. Note coupling used in connecting ends of track. Two set screws in this coupling hold it solidly and positively prevents the track from bending at the joints or coming apart. The trip block can be placed at any point on this track, which is a great advantage, as large barns often take hay in at more than one driveway. We always recommend steel track for hay carriers, because it is easy to install and on account of its strength and durability will outlast any wood track. The same track is used for Porter Raising and Lowering Litter Carriers.

H120
Steel Track Hanger with Eye, Used with Columbian Track



H121. Extra Long Steel Track Hanger
By using our mallable rafter bracket in connection with steel track hangers, track can be placed close in peak of barn.

¼-in. Floor Hook

H212
Rafter Bracket

16-inch Straight Hanging Hook, for Wood Track

H213
Ridge Pole Bracket for 2-inch Ridge Pole

H124
Split Hangers, used with track when it is desired to add a hanger without opening a joint in the track.

PORTER TRACK AND FIXTURES

	Weight, Lbs.
Columbian Steel Track, per 100 feet	200
H120 Steel Track Hangers, per dozen	4
H121 Extra Long Steel Track Hangers, per dozen	6
H124 Split Steel Track Hangers	4
H212 Rafter Brackets, per dozen	4
H213 Ridge Pole Brackets, per dozen	4
¾-inch Floor Hooks, per dozen	18
16-inch Hanging Hooks, per dozen	12

Porter Double and Single Harpoon Hay Forks

25-inch Porter Double Harpoon Fork

All forks shown on this page are made of the best spring steel and malleable iron.

These forks are amply heavy to do the work intended, and your attention is directed to the location of the eye in the Porter 25-inch Double Harpoon Fork, which perfectly balances the fork when loaded. Also note brace extending from eye to cross bars; this makes the fork doubly rigid. It is especially designed for convenience and long service.

Our Alfalfa Double Harpoon Fork is made from extra heavy spring steel and malleable iron. It is without a peer among double harpoon forks. It is perfectly adapted for use in alfalfa and where large fork loads are desired.

31-inch Lock Lever Tooth

34-inch Alfalfa Double Harpoon Fork

Nellis Single Harpoon Fork

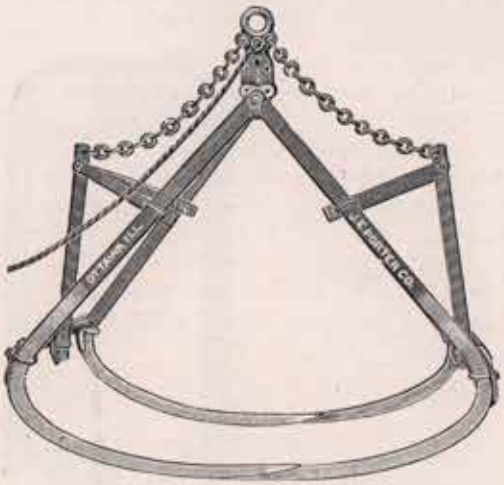
Illustration of Nellis Single Harpon Fork shows position of same when set in hay for raising load. We recommend this style to be without question the best pattern of Single Harpoon Fork obtainable.

Our Harris Double Harpoon Forks have met with exceptional favor. They are not to be compared with the cheaper grades of forks to be found on the market, but are made throughout of first grade spring steel and malleable iron.

31-inch Harris Extra Long Double Harpoon Fork

	Weight, Lbs.
Nellis Single Harpoon Fork	12
25-Inch Porter Double Harpoon Fork	18
25-Inch Harris Double Harpoon Fork	18
31-Inch Double Harpoon Fork	22
34-Inch Alfalfa Double Harpoon Fork	30
31-Inch Lock Lever Fork	20

PORTER CYCLONE GRAPPLE FORKS



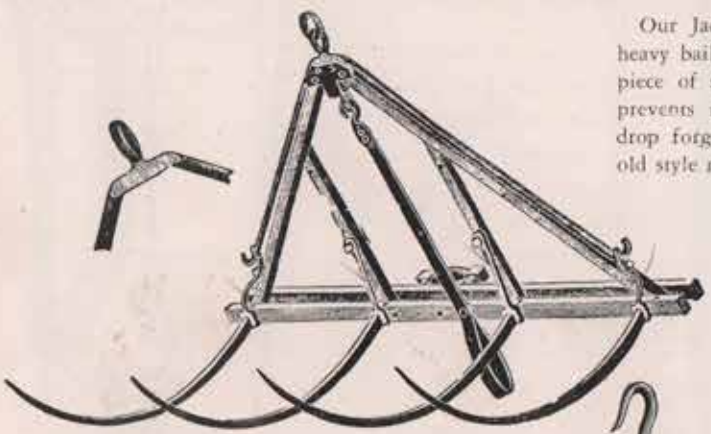
Four-Tine Cyclone Grapple Fork

Six-Tine Cyclone Grapple Fork

Cuts above illustrate our four and six-tine grapple forks. Cyclone grapple forks are made of the best steel that can be procured. They are especially desirable for those who wish to raise large loads of hay which cannot be handled with a harpoon fork.

	Weight, Lbs.
Four-Tine Cyclone Grapple Fork	40
Six-Tine Cyclone Grapple Fork	52

JACKSON PATTERN DERRICK FORKS



Derrick Forks

Our Jackson Pattern Derrick Forks are made with extra heavy bail. The head of this fork is made from one solid piece of steel instead of the eye being welded on. This prevents the fork from unlatching. The tine braces are drop forged, the center tine braces being longer than the old style malleable braces heretofore used on all forks. The outside tine brace is made separate from the bail hanger; the bail hanger having three bolts through the fork wood and one outside of the end tine materially strengthens the corner on frame. The tines are made of steel and in case they should get caught on some obstruction and straightened, they can be bent back into shape without damaging them.

DERRICK FORKS AND PULLEYS

	Weight, Lbs.
3 -ft. 4-Tine Derrick Fork	47
3½-ft. 4-Tine Derrick Fork	49
4 -ft. 4-Tine Derrick Fork	53
4½-ft. 4-Tine Derrick Fork	54
5 -ft. 6-Tine Derrick Fork	62
5½-ft. 6-Tine Derrick Fork	63
6 -ft. 6-Tine Derrick Fork	65
No. 60 Derrick Fork Pulley	30

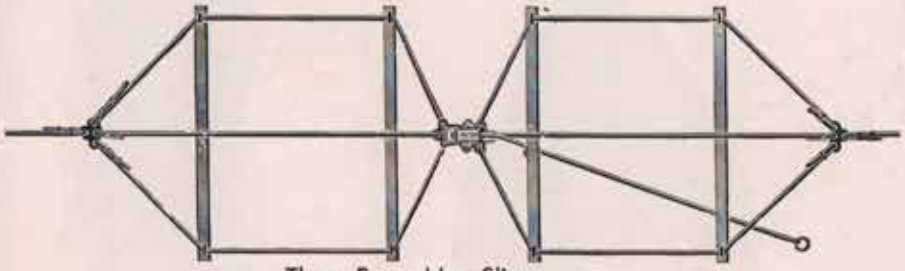
No. 60 Derrick Fork Pulley

DERRICK FORK PULLEY

The No. 60 Derrick Fork Pulley is used with hay forks where large quantities of hay must be handled quickly. It is well built and made for hard use. State whether wanted with bolt or hook and if for cable or rope draft.

PORTER HAY SLINGS

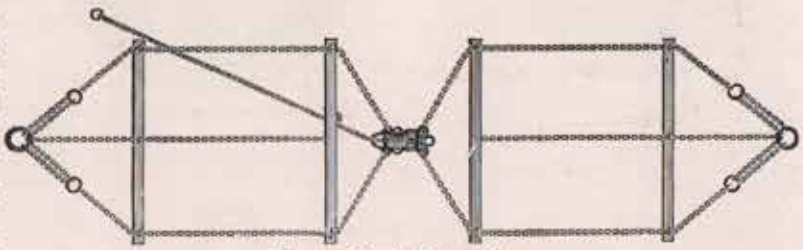
It is so much easier to handle hay with a set of Porter Hay Slings that many farmers are now using this method.



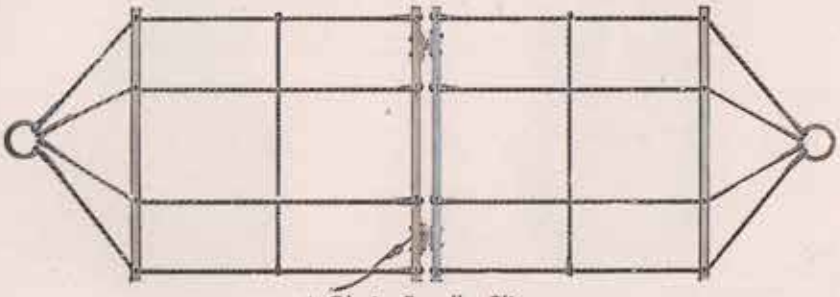
Three-Rope Hay Sling

The Three-Rope Sling shown at left can be furnished in two widths, with 5-foot cross bars and with 6-foot cross bars. This is one of our most popular styles and the material used is of the best throughout.

The illustration at right shows our Three-Chain Hay Sling. The design is the same as the rope sling shown above with the exception that chain is used in place of rope. The chain hay sling is only furnished in one width with 5-foot cross bars. This type of hay sling is built to meet the heaviest kind of work, and where hay is raised extensively, it is becoming very popular.



Three-Chain Hay Sling



4 Chain Bundle Sling

The Four-Chain Hay Sling at left has been designed and built especially for use in localities where hay is harvested with a binder. It is also valuable for handling short cut hay and fodder.

Illustration shows chain sling

PORTER HAY SLINGS

	Weight, Lbs.
Three-Rope 5-Foot Center Trip Hay Sling	25
Three-Chain 5-Foot Center Trip Hay Sling	40
Four-Chain 6-Foot Center Trip Bundle Sling	60

PORTER END TRIP ROPE SLINGS

For those who desire a sling without the wood slats, the PORTER rope slings offer a quality heretofore generally overlooked. In making these slings we use an EXTRA HIGH GRADE ROPE. Length of ropes 25 ft., ½ in. diameter.

Fig. 205 THREE-ROPE SLING, weight 8 lbs.

Fig. 204 TWO-ROPE SLING (not illustrated) weight, 5 pounds.

END TRIP ROPE LOCK

Fig. 207 TRIP LOCK can be used for either two or three-rope slings; weight each, 2 pounds. ONLY ONE LOCK NEEDED FOR EACH OUTFIT.

Fig. 205
3-Rope Sling

Fig. 207
Trip Lock

PORTER HAY PULLEYS

No. 50 represents our Heavy Steel Frame Pulley for cable draft. Diameter of sheave, 7 in. There are no wood parts on this pulley. Weight, 96 lbs. per doz.

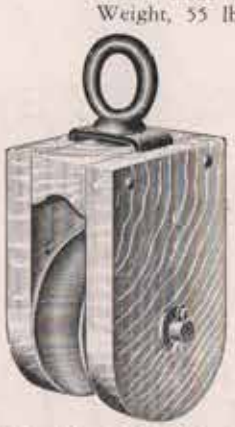
No. 222 represents our Large Malleable Hay Fork Pulley with 7-inch sheave for cable. Weight 96 lbs. per doz.

No. 144 represents our Steel Frame Knot Passing Pulley with 6-inch maple sheave and 1-inch pipe bushing. No. 143—Same as above but not knot passing. Weight, 40 lbs. per doz.

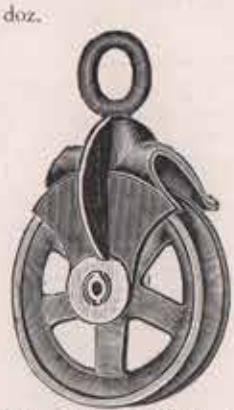
No. 895 represents our Cast Frame Knot passing Pulley with 6-inch maple sheave and 1-inch hollow axle.
Weight, 55 lbs. per doz.

No. 894 represents our Cast Frame Pulley with 6-inch maple sheave and 1-inch hollow axle. Weight, 40 lbs. per doz.

Fig. 133—Porter Snatch Pulley Block
Weight—5½ pounds.
Frame—Certified malleable iron.
Sheave—Gray iron.
Shortens distance team must travel in elevating load. By slipping washer on the rope and tying a knot just behind it the rope can be thrown off the pulley, and the empty fork returned without waiting for team to get back to barn.



No. 141 represents our "O. K." Wood Pulley with steel yoke and 1-inch hollow axle.
Weight, 40 lbs. per doz.



No. 142 represents our Cast Iron Pulley with 5½ inch sheave and 1-inch pipe bushing. No. 139 same as above only knot passing.
Weight 8 lbs. per dozen.

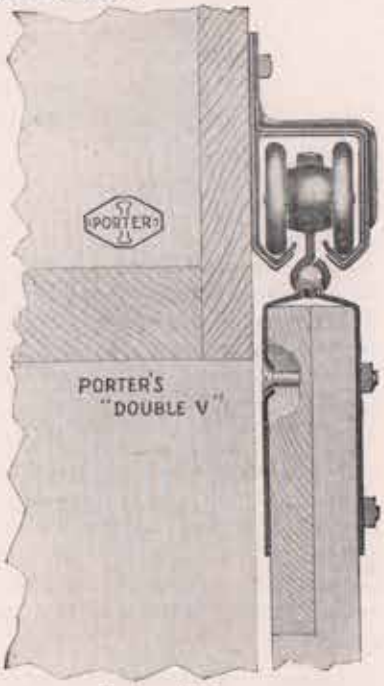
No. 145 represents our Malleable Frame Knot Passing Pulley with 6-inch maple sheave and 1-inch axle.
Weight, 40 lbs. per doz.

PORTER BARN DOOR HANGERS

Note Roller Bearings

"Double V"

A superior door track made of 14-gauge special steel and furnished in 6, 8 and 10-foot lengths. The novel "Double-V" shaped tread gives (1) maximum strength, (2) least contact or friction with the hanger wheel, (3) is self-cleaning, and (4) keeps the hanger in alignment at all times. The track is bird and storm proof, the ends being closed by the brackets shown. It is made on a huge press, which insures uniformity, since each piece is shaped exactly the same as any other. The weight of the track, per foot, is 2.2 pounds. Painted a durable black, it presents a neat appearance when installed.



Sectional View

The center and end brackets are identical, save that the latter has the additional end section, which fits into the bracket and is held firmly in place. Two end brackets and one center bracket, with lag screws and special wrench, are regularly packed with each pair of hangers. Additional center brackets and lag screws are an extra item, the number depending on the installation. Each bracket is a unit, as the two parts are locked together by means of a special swaging operation; this is further strengthened by the lag screw when in place.

The "Double V" Hanger is made with double tandem trucks and the axles turn on roller bearings. The superior mechanical features are evident in the trussed frame of the hanger, the pin joint giving flexibility, a minimum of friction due to the roller bearings, and the flush construction of the door strap. Note that the back of the strap, next the builing, has no bolt heads projecting to interfere wih the free rolling of the door. A close fit can be made, and this is appreciated by the farmer in cold or stormy weather.

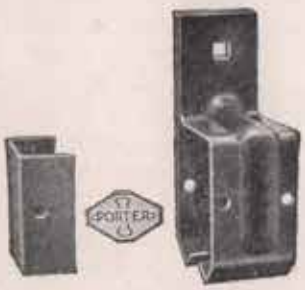


Fig. 758 Bracket

The wheels are shaped to conform somewhat with the V tread of the track, no chance for binding or sticking. (This tread has the same shape of the famous Portet "HUMMER" track, which has been so popular with the trade everywhere, and has proven to be the most practical tread ever designed.)

"DOUBLE V" Hangers are packed 1 pair complete in an attractive carton, or 6 pairs in a heavy shipping case. Weight per carton, or pair, 8 pounds. Hangers are painted black, with exception of door strap, which is bright red.

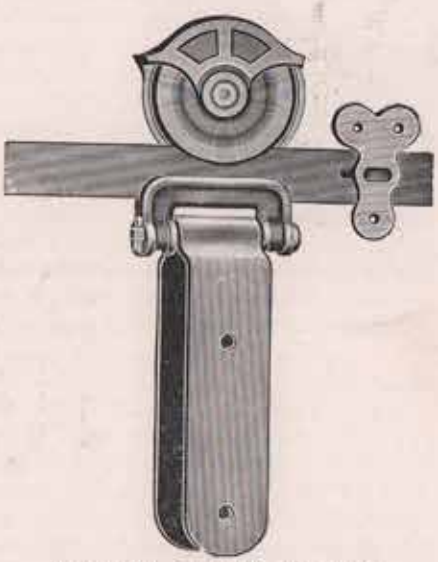
Remember the name—"DOUBLE V."

No. 2 Porter Barn Door Hanger

"Can't Get Off"

A valuable feature of this hanger is the manner in which it is ribbed, which permits of a maximum amount of strength being attained. The flange of the wheel, in combination with the lower track guide, is designed to prevent any possibility of the roller jumping off the track. The flange that forms the "Can't-Get-Off" feature extends the full length of the hanger.

The track is made of Bessemer steel, 3/16x1¼-inch, and wide brackets are firmly riveted every 16 inches. Each bracket is held by two screws from the top and one at the bottom, making a very strong and rigid track. We have it in 4, 6 and 8-foot lengths.



Porter No. 2 Hanger and Track

ABOUT THE DAIRY COW

Before we can intelligently consider the best methods of taking milk from a cow, we must know all we can about the cow and how she secretes and gives down milk. Unless every milking condition is recognized and proper provision is made for the comfort and health of the cow, the results are bound to be unsatisfactory.

In the design of the Empire Milking Machine, all guess work has been eliminated because the cow and her calf have been used as guides.

How the Cow Stores Milk—Every hour of the day the cow is making milk. The glands in the upper part of the udder are constantly at work storing up milk solids. At milking times these solids are mixed with water and pass through the milk channels to the milk reservoirs which are immediately over the teats.

Most of the milk is made while the cow is being milked. It is therefore, of the utmost importance that nothing must be allowed to irritate, excite, or fret the cow at this time. Any of these things cause her to hold back her milk, make it harder to get, cause her to make less milk.

In many successful dairies it is the rule that for an hour previous to milking, the cows must have perfect quiet, no loud talking or anything to disturb or excite them. While the cows are being milked the same rules are observed and no roughness in milking or handling the cows is tolerated.

A Delicate Mechanism—The modern dairy cow is a delicate, nervous animal. She is easily upset—especially when any unusual strain is put upon udder or when there is even slight teat irritation. The teats are extremely sensitive. They are easily injured. Even when the same person milks a cow every day, by hand, she is likely to be restive and uncomfortable when the milking begins. With a stranger on the milking stool few cows will keep up to their standard production. For best results, milking must be regular, uniform and comfortable—almost impossible when milking is done by hand, because after milking a few cows the hands become tired and often the milker's temper becomes frayed, or he is in a hurry to get the chores done and is likely to be a bit rough.

How Should a Cow Be Milked—The calf is the world's champion milker. Hands and machines can only imitate the calf's method. Hand milking is much further away from the natural calf style of milking than the Empire way which recreates the sucking and massage action of the calf so perfectly that heifers and even old cows have been observed licking the Empire pail just as they would lick their calves. Milking should be so comfortable that it does not disturb the cow. During milking cows continue to contentedly chew their cuds when Empire Milkers are used. They have been known to try and lie down while milking was going on. When it comes to the question of suiting the cow, there is no doubt about where the Empire Milker stands.

Alternate Milking or All Teats at Once—If men had four hands, no question would ever have been raised as to how many teats to milk at one time. If it were easier to milk two teats in unison instead of alternately, which gives each hand a little rest and allows the milker to focus his attention on the hand which is giving the pressure, that would have become the accepted method.

As it stands, we have only two hands and it is easier and more comfortable to milk in rhythm, first one hand and then the other. So many have come to look upon this as the natural, normal way.

Let the Cow Decide—The cow can't talk but let us see what she might say. In the first place she secretes milk in all four quarters of her udder at one time and lets it down as soon as secreted. If only one teat is being milked the weight of the milk let down to the other teats soon distresses a cow unless it is drawn away. It puts a strain on the udder muscles and support (mammary muscles) which is bad for the cow. When the calf milks it frequently switches from teat to teat and relieves this strain.

With hand milking this switching around is imperfectly accomplished. Two teats are milked and then the other two. Then all the teats are stripped dry.

The Empire Way—Using the Empire Milker, all the teats are milked at once. As fast as the cow lets down her milk it is drawn away from all four quarters of the udder. There is no unnecessary strain put on the mammary muscles. The time taken to produce and get rid of the milk is less than by any other method. Consequently, the strain on the cow is less. To put it another way, she has the strength and en-

ABOUT THE DAIRY COW

Continued

ergy to put into producing which is wasted by a longer, slower method of milking. That this is not mere theory is abundantly proved by hundreds of letters from Empire users which tell of increased daily milk production and longer lactation periods when Empire Milking was substituted for hand milking.

What Suits the Cow Benefits the Owner—Over twenty years of successful milking of all breeds and types of cows by the Empire Milker is the best kind of evidence. Scores of letters written by owners of Empire Milking Machines, who have used them continuously for periods ranging from a few months to seventeen years, indicate the settled conviction of progressive dairy farmers that this milker meets every requirement of the dairy cow and its owner.

The letters from Empire users, which we are including in this book, tell just what their experience has been. They indicate what you may expect when the Empire goes to work for you—quicker milking at less cost of time and labor—more milk per cow—longer lactation profits from your present herd—an opportunity to build up your herd without building up labor costs.

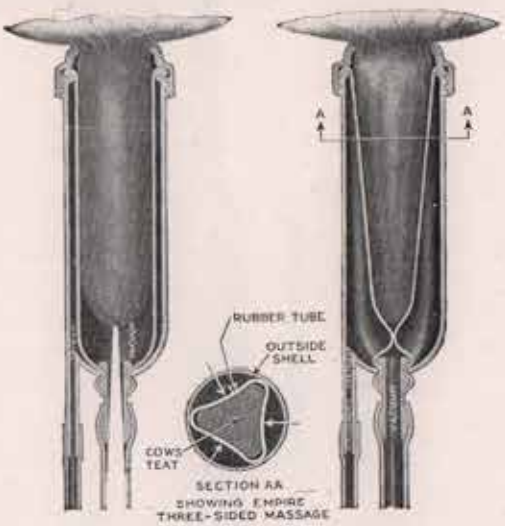
THE PATENTED EMPIRE TEAT CUP

The Teat cup is one of the two most important parts of the milking machine. How perfectly they do the work and stand up under service determines the value of the entire milking machine installation.

THE NEW, ONE-PIECE EMPIRE INFLATION

The illustration shows how the Empire teat cup faithfully recreates the natural, calf method. After the teat cup is slipped on the teat comes a gentle suction, a suction that is similar to that of the calf. This draws a spurt of milk which is carried to the pail. This suction tends to stimulate circulation in the teats, especially near the tip. If this suction were exerted continuously as in some milkers the teat would soon become red and swollen.

With the Empire to avoid this, and to follow the calf method, this suction continues for only a little over a second when air is forced in near the bottom of the teat cup. This stream of air comes in between the inside of the teat cup and the soft rubber tube, called the inflation, and causes the sides of the inflation to come together at the bottom and cut off the suction. It causes the inflation to gently press and massage the teat from the top to the udder causing the blood drawn into the teat by suction to flow back toward the udder.



The Patented Empire Teat Cup

This is exactly what happens as the calf swallows. The teat is pressed against the roof of the mouth by the tongue, with the pressure applied from the tip of the teat to the udder while he swallows the milk and draws his breath for the next suck.

This alternate suction and massage is the ideal milking method. It accurs with absolute regularity from forty-four to forty-seven times a minute, or slower or faster if desired. The United States Department of Agriculture recommends forty-four to forty-seven pulsations a minute as the safest and most efficient milking speed.

Empire Teat Cups have the only milk resisting nickel silver shells in the milking machine industry and are exceptionally strong and durable.

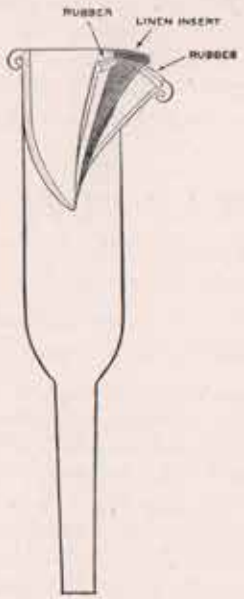
WHY THE EMPIRE MILKS FASTER

Just as the teat cup is the vital part of the milking machine, so is the inflation—the vital element of the teat cup. If it stretches or leaks the most perfect power mechanism will fail to give satisfactory milking. If it stretches, besides sluggish, unsatisfactory milking, there is the time lost trimming it to exact size and the trouble of doing this every few days.

THE EMPIRE ONE PIECE INFLATION

Continued

Another thing about teat cup liners that stretch—they become porous and are difficult to keep clean and sanitary. When relaxed, the natural elasticity of the rubber seals the bottom of the pores, making it practically impossible to completely remove butterfat and bacteria



Sectional View of Inflation with Linen Insert and Rubber Sides

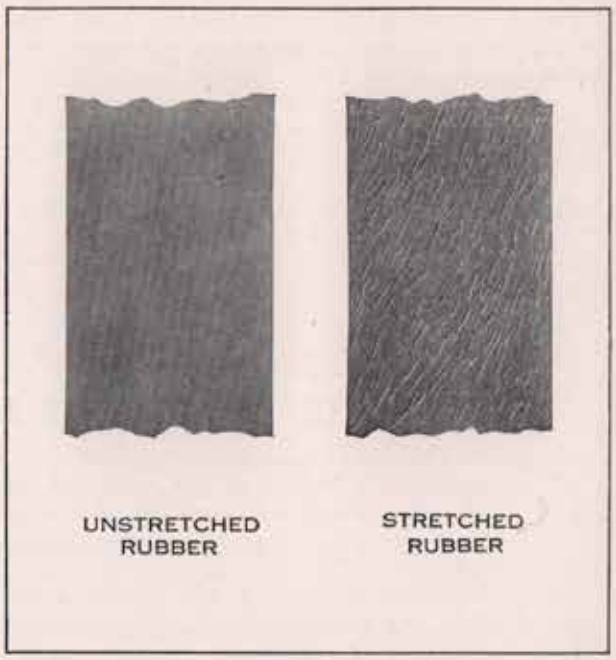
which enter while the inflation is stretched during operation.

A patented feature which is exclusively Empire is the reinforcement of the inflation with an insertion of strong, flexible linen. This linen takes all the strain from the continual contraction and expansion of the inflation while the machine is in operation.

Because the rubber does not stretch, its surface remains smooth and free from pores where bacteria can lodge. It also assures a far longer life for the inflation. Repeated tests have proved that the Empire Inflation, with its insert of linen, lasts five times as long as an ordinary pure, gum inflation.

SCALD-PROOF AND BOIL-PROOF

Scalding and boiling pails, pans, cans and the surfaces of apparatus that come into contact with milk, has long been recognized as the ideal way to insure the cleanness of milk. No matter what quality of rubber is used, it quickly



Photograph of Stretched and Unstretched Rubber Shows Porous Condition of Stretched Rubber Where Bacteria Can Breed

deteriorates under the strain of frequent scalding of boiling *if it is porous from being stretched*. On the other hand, you can boil a piece of rubber that has not yet been stretched, indefi-

Cut of One-Piece Teat Cup Dismantled

EMPIRE ONE PIECE INFLATION

CONTINUED

nitely without the slightest injury. It may swell a trifle, but when perfectly dried you will find that it returns to normal size and has every quality of dense, close grain and elasticity that it possessed previous to boiling. The linen insertion, exclusive to Empire Inflations, gives you an inflation that is scald-proof and boil-proof. While from a month to two months' reasonably satisfactory service may be had from an inflation that lacks this reinforcement, perfect service of six months to well over a year is by no means unusual for an Empire Inflation.

FEATURES OF EMPIRE ONE-PIECE TEAT CUPS

The Empire one-piece Teat Cup consists of an exceptionally heavy shell of nickel silver, practically indestructible, and the famous patented teat cup liner or inflation with its insert of linen to prevent stretch moulded in one piece with short milk tube.

PUTTING THE EMPIRE TEAT CUP TO WORK

Adjusting the teat cup over the teat requires only an instant. It consists of sliding the teat cup over the teat to the udder with a slight rotary motion. While doing it, cut off the vacuum by keeping the milk tube and the air tube pressed against the top of the claw. When the teat cup is adjusted, relieve this pressure and milking begins at once.

The vacuum holds the teat cup to the udder—easily demonstrated by hanging the teat cup on your cheek. It will milk teats of all usual sizes or shapes equally well and will not fall off. You don't have to tie Empire Teat Cups on or put any sort of harness on the cow. To milk abnormally long teats, teat cup extensions are supplied which fit over the large end of the teat cup and bring the extended cup up to the udder.

TEAT CUPS DO NOT CLIMB OR FALL OFF

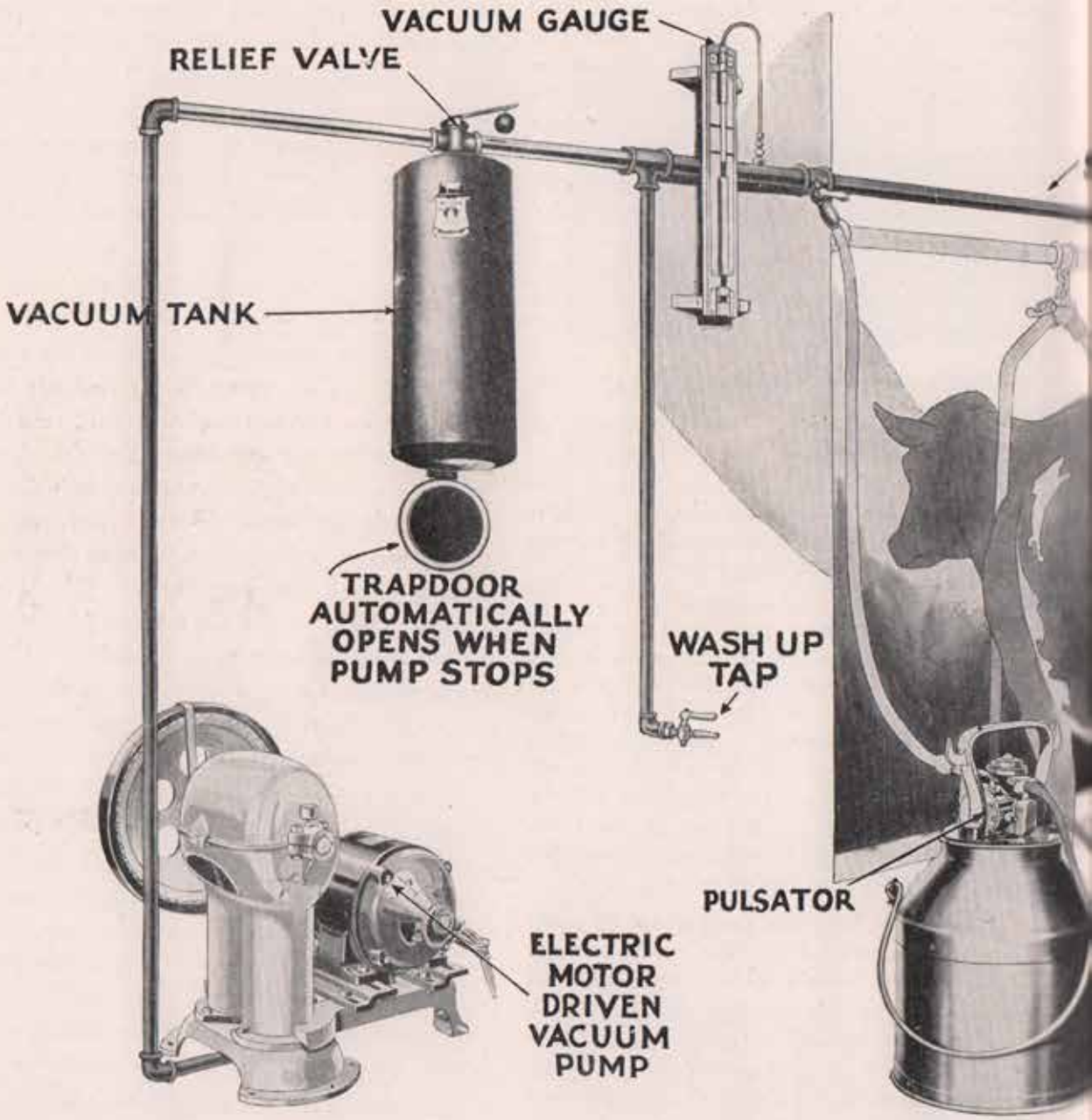
Because the Empire Teat Cup is held to the udder by vacuum and does not in any sense hang to the teats, there is little tendency to climb up or slip down or off during milking—regardless of the length or size of the teats This is further guarded against by having the suction stroke somewhat longer than the squeeze stroke and applied gradually. It saves the time and labor required to tie and hold the teat cups in place.

NO STRAIN ON TEATS OR UDDER

The milking assembly consisting of the teat cups, milk and air tubes—in the case of the new, one-piece teat cup the short milk tube is attached to the teat cup liner—and the claw have been so carefully designed that all unnecessary weight has been eliminated. The weight is slight and so perfectly distributed to the four quarters, that it puts no strain on the udder muscles. In case two of the teats are higher on the bag than the other two, equal distribution of the weight is secured by arranging the teat cups so that the milk outlet tubes point toward the lower quarters.

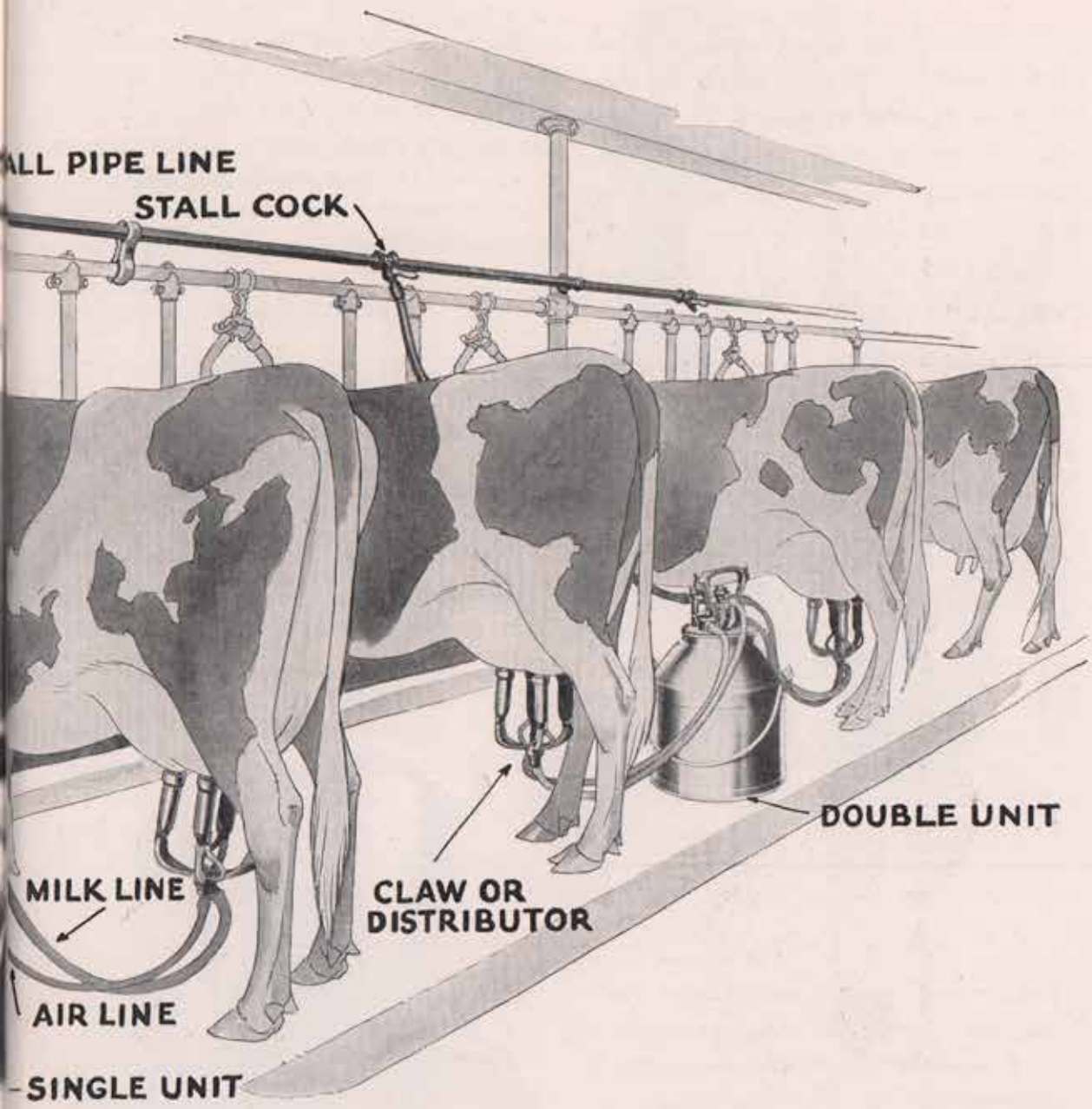
Milking a three teat cow, you simply hang a fourth cup across the top of the claw or let it hang down. The weight of the cup kinks the air and milk tubes enough to cut off vacuum to the idle cup. For heifers with small teats, old cows with large, long teats or big diameter teats—for every cow on the line—the Empire is the perfect milker. It gets all the milk in the shortest time and keeps the cow comfortable.

Year after year users write us that they have run up almost unbelievable records for speed in milking and cleaning milker. Users write that the Empire operates so nearly perfect, that stripping is almost unnecessary. Records of fifteen years without missing a milking are by no means uncommon.



THE GREAT

Showing the complete installation, direct connected motor driven pum
line to pulsator, vacuum line to teat cup that draws the milk and air line
ation.



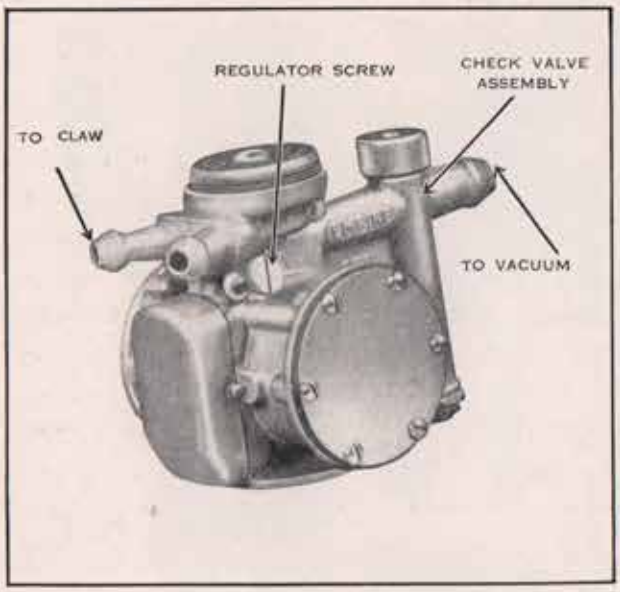
EMPIRE MILKER

Vacuum line, vacuum tank, relief valve, mercury gauge, stall cocks, vacuum teat cup that collapses inflation, teat cup, double unit and single unit in oper-

The New Empire Milks Gently and Uniformly

The Empire Pulsator

The pulsator regulates the speed at which a cow is milked. On the regularly and uniformity of its action depends to a *very great* degree the success of the milking operation. Any irregularity tends to make the cow nervous, lengthens the milking time and cuts down the yield of milk.



The Empire Pulsator

The famous Empire Pulsator has a valve system that is simple and positive and differant. In place of uncertain and complicated mechanical devices for opening and closing the valves which controls the suction and massage strokes, the Empire valves are opened and closed by a simple cam—assuring regularity of operation as accurate and unfailing as the cow's own heartbeats.

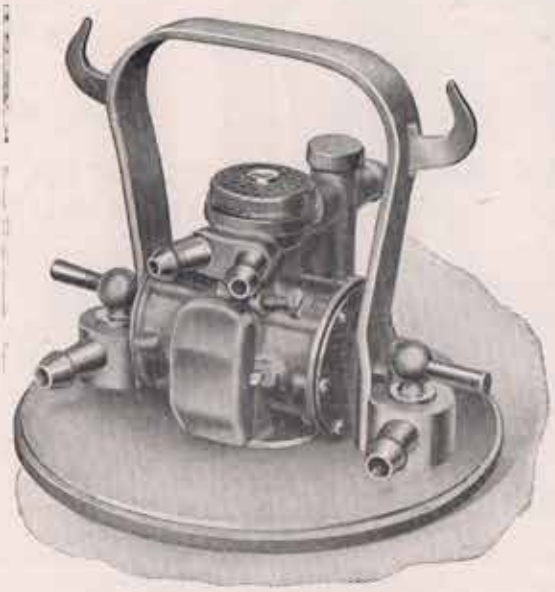
Pulsator the Heart of the Milker

Many attempts have been made to design cheaper pulsators, and some are sold on claims that they have fewer parts than the Empire, but the facts remain that the Empire Pulsator is not only the most durable and rugged but it also has fewer actual working parts than any pulsator in existence.

Pulsator Regulations

The speed of these pulsators is regulated by simply turning one screw, the amount of vacuum by a check valve which guards against exposing the sensitive teats to too strong a suction.

The different type of Empire milkers are so designed that while they use different check valves the amount of vacuum used for milking is always the same.



Empire Pail Cover Showing Milk Spigot and Empire Pulsator

EMPIRE DOUBLE AND SINGLE UNITS

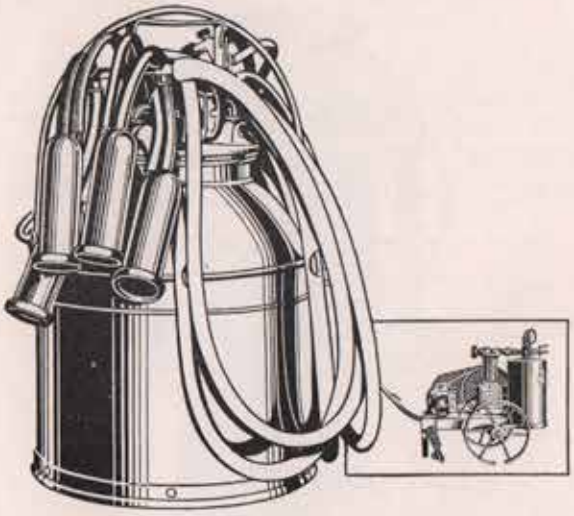
While the vacuum as it comes from the line to the pulsator is fifteen inches or thirteen inches depending upon the line vacuum used, the check valve between the pulsator and the pail—the valve which lets the vacuum into the pail and through the milk tubes to the teats—requires for opening a fixed amount of vacuum. So the actual vacuum applied to the teat is only 10½ inches, thus assuring a gentle suction which draws the milk most effectively but without distressing the cow in the slightest degree.

The pulsator sets on the top of the pail and is similar in construction and appearance whether for milking two cows at once with a double unit or for milking one cow at a time with a single unit. The only practical difference is that instead of having two milk spigots and two air spigots for connection to two claws, the pulsator for the single unit has only one milk spigot and one air spigot.

The Empire Check Valve

A valuable feature of the check valve construction is that of the moisture reservoir which surrounds it. This is so designed that any moisture that condenses in the vacuum line or any drops of milk which splash into the open valve will not run into the open pail—helps to assure clean milk of low bacteria count.

Single Unit



Double Unit

Another feature of the Empire check valve is that it can be varied to suit the amount of line vacuum without effecting the actual vacuum used in milking. As an example the line vacuum required for the Portable and Model "L" Empire is somewhat less than that required by the Standard or Model "K" milker. And yet by varying the size of the check valve the actual vacuum applied to the cows teat remains the same. This feature plus the three sided squeeze and massage accounts for the rapid, gentle action of the Empire.

Single and Double Units

Whether you use single or double units will be determined by your needs and preferences. If you wish to keep accurate record of the yield of each cow, single units will be your selection. If you wish to cut the time and labor costs of milking to the lowest possible figure, you will naturally use double units which milk two cows at once and cut in half the number of times you have to shift the milk pail.

EMPIRE MILKING MACHINES

PAILS—TANKS—GAUGES

50-lb. Nickel Silver Pail

Nickel Silver Pails Assure Safe Milk

Nickel silver pails cost a bit more but have the great advantage of not being affected by the fats and acids in milk even when left in contact for a long time. For this reason nickel silver milk pails are supplied as equipment for all Standard Empire Units, both single and double. Like all parts of the Empire Milking Machine, they are designed for easy and complete cleaning—rounded corners with no hard-to-get-clean crevices where bacteria can lodge and increase the bacteria count of your milk.

Some people prefer aluminum pails which we will supply at a lower price.

They are lighter in weight and are made of heavy gauge aluminum. They are strong and durable. Many successful dairy men are using these aluminum pails and finding them completely satisfactory.

40 Lb. Aluminum Pail

Mercury Gauge

Vacuum Tank Model "K"

In both nickel silver and aluminum pails Empire maintains its high standard of providing the finest possible equipment that money can buy.

Vacuum Line, Tank and Pump

In the construction of the vacuum line, the vacuum tank and the pump, the greatest care and thought have been given to suiting the mechanism perfectly to the milking job and the convenience of the operator.

The Empire Mercury Gauge, which measures the vacuum or suction on the line, is placed between the vacuum tank and the first stall cock so that it accurately indicates the line pressure going to the pulsator.

A reliable spring gauge is furnished with Model L outfits.

The Standard Empire Vacuum tank is equipped with a trap door which automatically opens after the vacuum power has stopped, thus allowing the tank and pipe line to become thoroughly aired between milkings.

The tank is made of heavy steel, painted inside as well as outside to prevent rust.

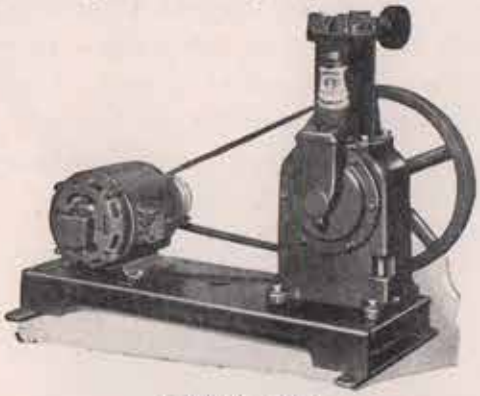
A heavy, steel tank with large drain plug is furnished with the Model L milker.

Empire vacuum tanks are built for years of constant service under the most adverse conditions and are guaranteed to give complete satisfaction.

EMPIRE VACUUM PUMPS

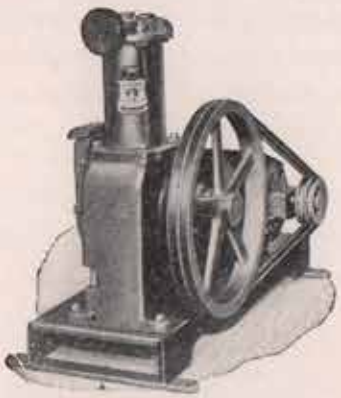
Model "M" Vacuum Pump

A reliable, quiet source of vacuum is a most essential part of a milking machine installation. Realizing this necessity, Empire engineers have spent years in the development of the present Empire vacuum pumps.



Model "M" Pump

The Model "M" Empire vacuum pump for the average installation is undoubtedly the finest of its kind. All bearings, shafts, valves and moving parts are greatly oversize to insure long life. Lubrication is adequated for long periods without replenishing. Dual "V" automobile type belts require practically no attention and should last indefinitely if properly cared for. Furnished as belt or electric motor drive.



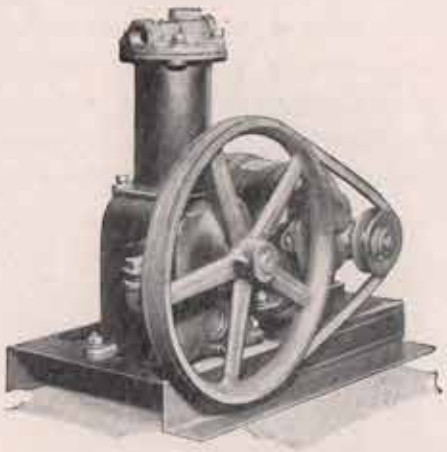
End View Model "M" Showing Dual V-Belts

Specifications

Model "M" Pumping Outfit—Bore 4" x stroke 4". Lubrication—Combination pump and splash. Crankshaft—Drop forged and counter balanced. Connecting rods—Drop forged. Valves—Steel disc type. Motor—½ H. P., standard make. Drive—Dual "V" belts, latest type. For 3 single or two double units.

Model "L" Vacuum Pump

Built to furnish an unusually large volume of vacuum at a relatively low cost, the Model "L" vacuum pump has proven exceptionally efficient and successful. Built like a high grade automobile engine with drop forged crank shaft



Model "L" Vacuum Pump

and connecting rod, honed cylinders, leak proof rings, the Model "L" pump is exceptionally durable. A unique lubricating system consists of an oil well with a system of wick fed bearings, a system requiring practically no attention other than occasionally supplying fresh oil. The Model "L" pump is furnished for belt drive where power is already available or as electric motor or gasoline engine driven units, either portable or stationary.

Model "L" Pump Belt Drive

Specifications

3" bore x 2¾" stroke. Crankshaft—Drop forged. Connecting rod—Drop forged. Bearings—Highest grade bronze. Motor—1/3 H. P. Drive—"V" belt. Platform—Pressed steel. Operates 1 double or 2 single units.

VACUUM PUMP AND ENGINE COMBINATION

Model "J" Vacuum Pump

The oldest and perhaps the best known of the Empire vacuum pump family, the Model "J" is one of the most efficient vacuum pumps ever built. Years of successful operation on dairies throughout the world have been the basis of constant improvement and refinements so that the Model "J" Empire is undoubtedly the most popular pump for larger dairies in existence. The model "J" is so simple in construction that any person can operate and care for it with ease. Two grease cups lubricate the main bearings and a small amount of oil in the inverted cylinder walls and connecting bearings being all that is necessary to keep this simple pump in good condition.

The Model "J" is furnished with flat pulleys for belt drive when power is already available and electric motor driven through a quiet running chain for those who prefer electric operation.

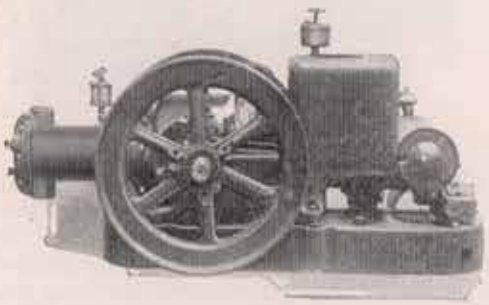
Model "J" Belt Drive

Specifications

Two cylinders—4⅛" bore x 5" stroke.
Drop forged crank shaft and connecting rods.
Motor—¾ H. P.
For six single or three double units.

Model "FX"

On many farms not equipped with electricity the dairyman prefers a combination gasoline engine and vacuum pumping outfit which lessens installation costs and makes a very compact, serviceable source of vacuum. These vacuum engine combinations are furnished complete with pulley for operating cream separators, water systems, etc.



Model "FX" Vacuum Engine Combination

The Model "FX" vacuum engine combination is of the standard 2 H. P. gas engine type, magneto equipped. Water cooled with hopper, sight feed oiler lubrication.

The Empire vacuum pump built into this unit is a single cylinder model specially designed for this unit.

SPECIFICATIONS

Bore 4⅛"x stroke 5".

Valves are chrome vanadium disc, heat treated and ground.

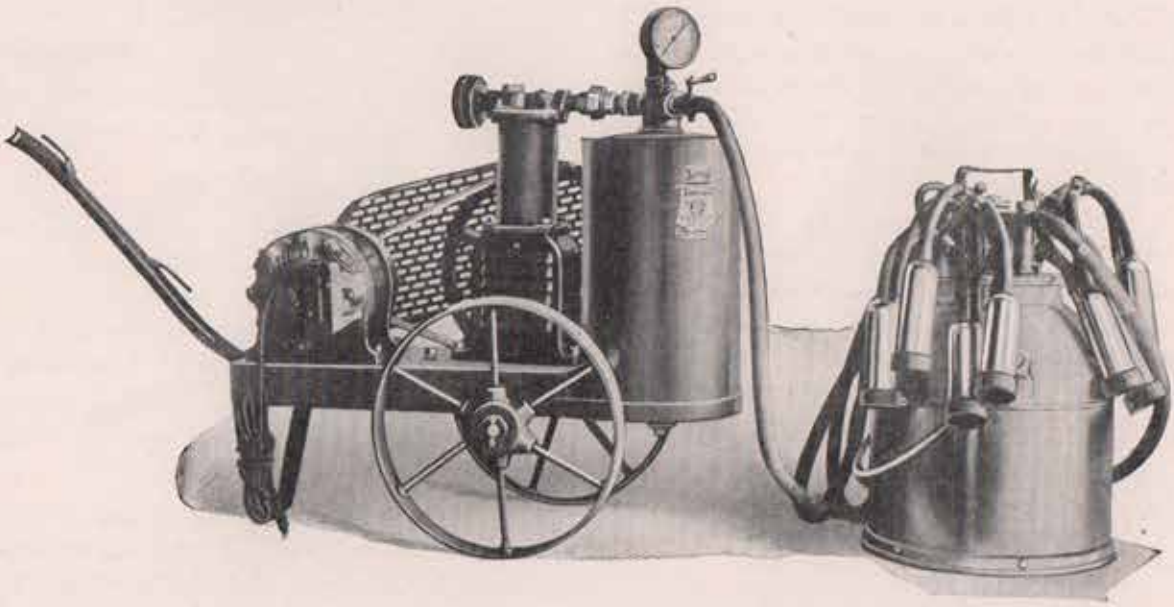
Special, gray iron cylinder, bored and honed.

Automobile type pistons with leak proof rings.

Hand unloader for easy starting.

This vacuum pump has a capacity of five single or three double units.

THE NEW EMPIRE PORTABLE MILKER



Model "B" Electric Portable Milker Complete

Thousands of dairymen thruout the United States and Canada actually need a milking machine, but cannot install a permanent pipe line. The Empire Milking Machine Company, after years of experimental work, now offers the dairy industry a complete portable electric motor driven milking machine of the "pipe line type," at a price well within the reach of every dairyman.

The new Empire Portable works exactly like the famous standard Empire Milker. It has the same reliable pulsator, tried and proven on hundreds of Dairy Farms, the same Empire boil proof rubber goods and the same patented Empire teat cup and inflation made into the popular one-piece type. It can be readily seen that the new Portable milks just like the older Empire—the standard of better Dairies throughout the world.

Instead of a permanent pipe line with stall cocks, the vacuum hose connects the pail with vacuum tank direct as shown in the accompanying illustration.

The vacuum pumping outfit has been especially designed to operate the double milking unit. It consists of a quiet running crank case lubricated pump with extra large bearing, drop forged crank shaft and connecting rod, hardened and ground piston pins, constructed throughout like a high grade automobile engine, equipped with a 1/3 horse power electric motor with 15 feet of extension cord. The drive is thru "V" belts, protected by a guard, motor and pump and vacuum tank assembly are mounted on a sturdy pressed steel platform and wire wheels. The handle is long and the whole outfit can be readily moved about the barn.

EMPIRE ACCESORIES

Empire Vac-U-Clippers

Now Empire offers a high speed vacuum operated clipper which meets all requirements of the dairy and farm at a reasonable price. It is designed to operate in connection with Empire Milkers or other milkers of the so-called "pipe-line type." Simply connect it to the vacuum pipe line and it is ready to clip your cows with speed and convenience.

Easy to Operate

The Vac-U-Clipper is a one hand device. It makes just a compact handful and because of its light weight and ease of operation clipping becomes a simple and speady job. It is entirely automatic—all you have to do is to guide it.

Gives a Superior Clip

The clipper blades operate at an extremely high speed, giving a clean, smooth and even clip. It operates quietly and will not annoy or disturb a restless animal.

Clips Cattle in the Stalls

This clipper is particularly convenient because cattle can be clipped in the stalls in which they are milked.

Always Ready for Use

Because of its simple and rugged design there is nothing to give out and cause trouble. An Empire Vac-U-Clipper will give years of satisfactory service with no attention other than an occasional oiling or resharpening of the blades.

Vac-U-Clipper With Hose

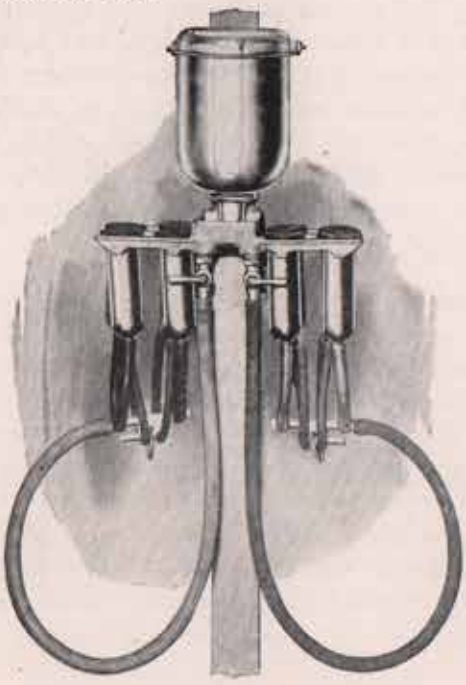
Teat Cup Scrubbing Brush

Teat Cup Solution Rack

For those who do not care to dismantle the one-piece cups after each milking the Empire teat cup rack is provided. After thoroughly scalding and cleaning the teat cups may be kept in solution as illustrated without dismantling.

Under any circumstances, once a week, oftener in very hot weather, the teat cups should be taken apart, scrubbed and boiled.

The importance of scalding cannot be exaggerated. Without scalding pails and apparatus used in the dairy, clean milk cannot be marketed. So vital is this to the production of Certified, Grade A or Grade B Milk, that the Empire Milking Machine Company urges every Empire owner to provide for boiling water in the milking barn.

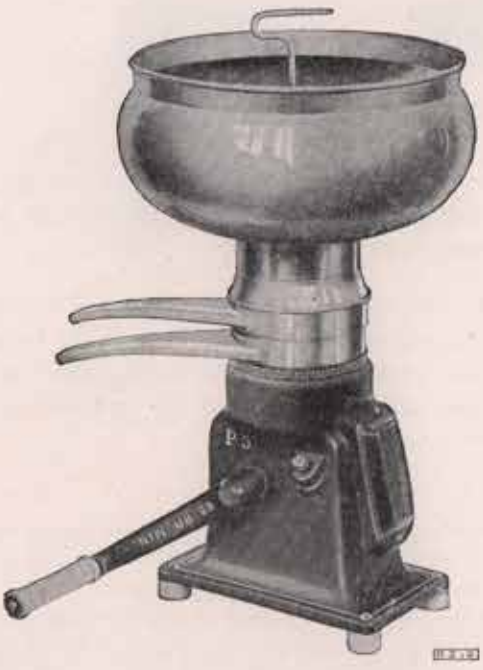


Empire Teat Cup Solution Rack

EMPIRE OLYMPIC CREAM SEPARATORS

The Olympic Nr. P-1
180 lbs. Capacity

Sectional View of the Self-Balancing
Olympic Bowl



The Olympic Nr. P-3—325 lbs. Capacity

The Olympic Cream Separator is manufactured by one of the world's oldest and most prominent manufacturers in the dairy line.

In recent years there has been a steadily increasing demand for a cream separator which will take care of the requirements of the average farmer with a few cows, at a price easily within his means.

The Olympic fills that need. Owing to the fact that it is manufactured in large quantities with standardized parts of the very highest grade materials, the farmer is given the advantage of an exceptionally low price for a machine as durable as the Olympic.

EMPIRE OLYMPIC CREAM SEPARATORS

CONTINUED

Every Olympic is subjected to severe tests before leaving the factory, both as regards skimming and general efficiency, and the result is a close skimming, easy and noiseless running separator.

Any farmer who owns one or more cows cannot afford to lose the additional profit which comes from separating by machine as compared with the old pan method. A good separator extracts more cream the profit of which, will shortly pay for an Olympic.

Your cows represent an important investment and may be made to pay better by using a good separator like the Olympic. An old separator; or an inferior one cannot give you the same percentage of profit.

It is highly important that every farmer take periodical tests of the skim-milk so as to secure himself against the loss of butter-fat.

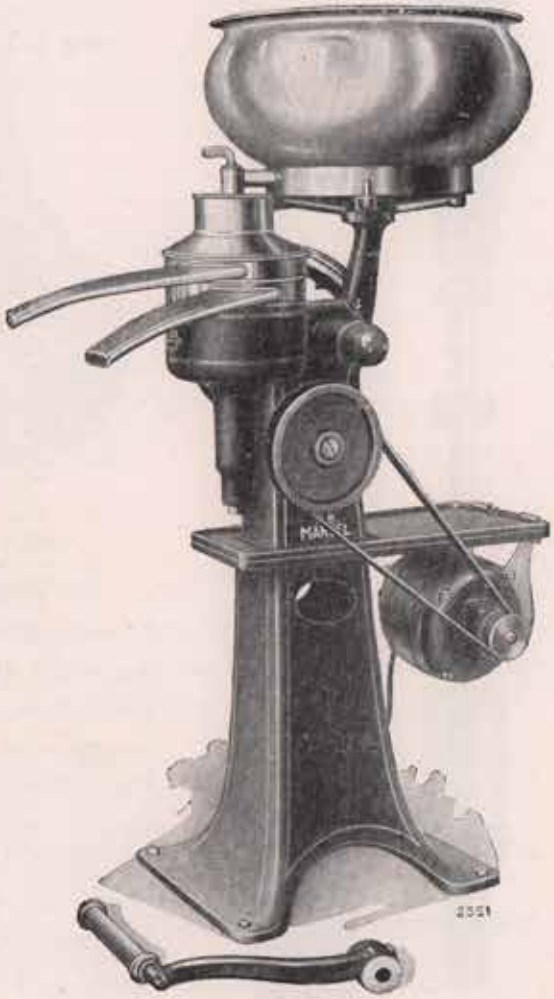
It happens in a great number of cases that the farmer is losing butter-fat without knowing it, but by installing an Olympic, this loss will immediately be saved and the creamery profits correspondingly increased.

SPECIFICATIONS

		Weight, Lbs.
No. P-1.	Capacity 180 lbs.; Hand Power; less Stand....	40
No. P-3.	Capacity 325 lbs.; Hand Power; with Stand....	140
No. P-5.	Capacity 400 lbs.; Hand Power; with Stand....	170

The B. B. Marvel Ball-Bearing Cream Separator

F-5 B. B. Marvel, hand driven.
Capacity 600 pounds of milk per hour



F-6 B. B. Marvel, electric motor driven. Supplied also with universal drive for gasoline engine power. Hand crank may be taken off, or left on, as desired.
Capacity 725 pounds of milk per hour.

	Weight, Lbs.
F-5 B. B. Marvel Separator, with High Stand, Hand Power	205
F-5 B. B. Marvel Separator with Low Stand and Motor Attachment	203
F-5 B. B. Marvel Separator with Low Stand and Universal Drive Attachment	209
F-6 B. B. Marvel Separator with High Stand; Hand Power	210
F-6 B. B. Marvel Separator with Low Stand and Motor Attachment	208
F-6 B. B. Marvel Separator with Low Stand and Universal Drive Attachment	214

See following pages for detail description.

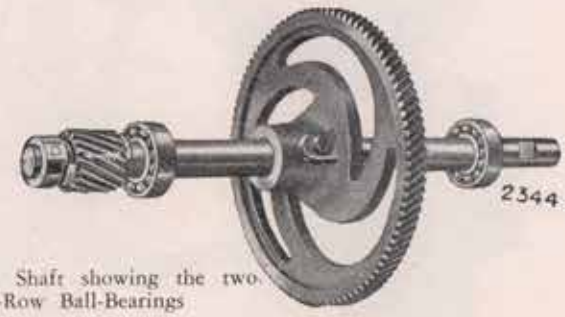
EMPIRE MARVEL CREAM SEPARATORS

CONTINUED

The Spindle taken apart

Sectional View of Spindle

THE B. B. MARVEL BALL BEARING WORM-WHEEL SHAFT



Worm-Wheel Shaft showing the two Single-Row Ball-Bearings

By using Ball-Bearings on the worm-wheel shaft the side bushings which are necessary in the ordinary separator have been completely abolished. The amount of friction is therefore reduced to the lowest possible point and the natural result is that the separator requires less power both in starting and running. This difference is particularly pronounced in the starting of the machine, and this is to a geat extent due to the absence of bushings which always retain a certain amount of old oil which as soon as the weather gets a little cold becomes very heavy. The Ball-Bearings, on the other hand, are absolutely unaffected by any change in the temperature either way.

A very important feature about the Ball-Bearings as constructed in the B. B. Marvel is that all of them take up axial thrust equally well in both directions. This is of particular advantage when the machine is run by mechanical or electric power as it effectively prevents the bowl from lifting when the power is shut off. Radial thrusts are also absorbed in the same easy and efficient manner.

LUBRICATION ONLY ONCE A YEAR

The Ball-Bearings on the worm-wheel are lubricated with grease and as is the case with the spindle, the operation needs only to be performed once a year.

EMPIRE MARVEL CREAM SEPARATORS

THE NEW B. B. MARVEL F-BOWL

The B. B. Marvel F-Bowl

The second outstanding feature of the B. B. Marvel Ball Bearing Separator is the New F-Bowl. To almost the same extent as the introduction of the B. B. Marvel system of Ball-Bearings has been responsible for the machine being many years ahead of other types of separators in general construction, so have the new features embodied in the F-Bowl placed the latter far ahead of all other existing bowls.

In designing the bowl the weight of material has been carefully calculated and distributed on a new principle. By employing this principle, the self-balancing qualities of the bowl are greatly improved, the importance of which must not be underrated.

The Bowl-Bottom and the Center-Tube are stamped out in one piece and the usual loose distributor has been entirely eliminated.

One very important improvement in the Center-Tube is the construction of the very large open Milk Channels. They are very easily cleaned and the milk flows through them freely, enabling the bowl to separate at full capacity the whole time.

The intermediate Discs have been specially designed to give a larger skimming surface than usual to each individual disc. The skimming is therefore exceptionally close.

The Bowl taken apart

EMPIRE MARVEL CREAM SEPARATORS

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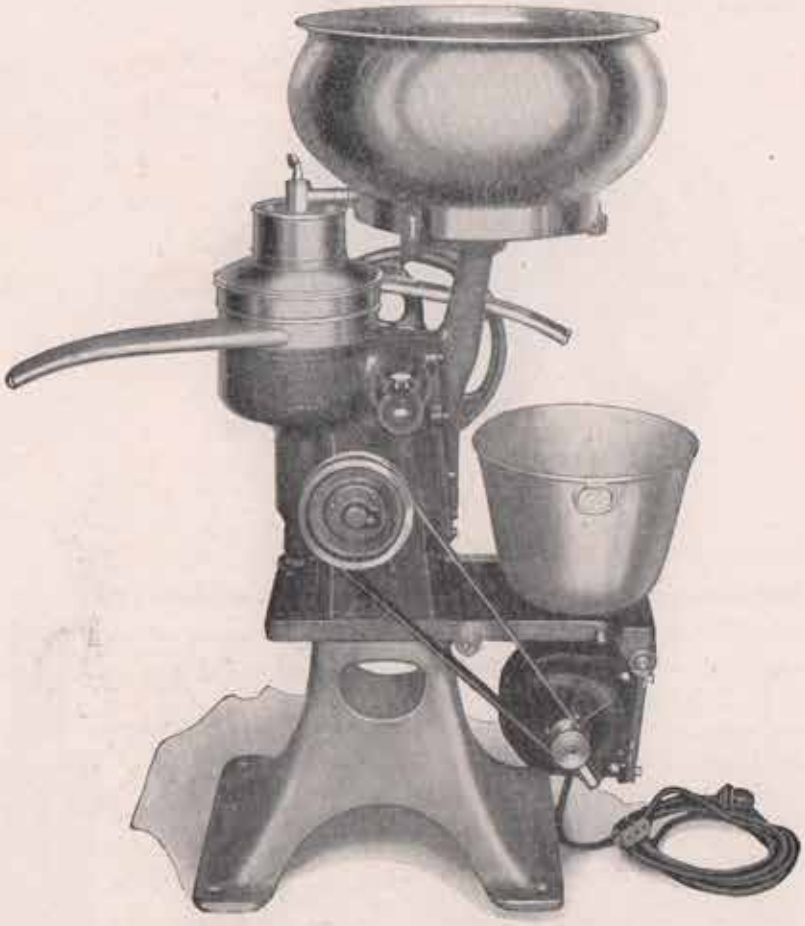


F-7-B. B. Marvel

F-7 B. B. Marvel, on low stand, complete with electric motor drive. Top of supply can only 43 inches from floor. Hand crank may be taken off, or left on, as desired. Capacity 1000 pounds of milk per hour.

	Weight, Lbs.
No. F-7, Capacity 1000 lbs. with High Stand for Hand Power	291
No. F-7, Capacity 1000 lbs. with Motor and Low Stand	298
No. F-7, apacity 1000 lbs. with Universal Drive and Low Stand	280

EMPIRE MARVEL CREAM SEPARATORS

CONTINUED

F.-8-B. B. Marvel

F-8 B. B. Marvel, on low stand, complete with universal drive. Electric motor attachment, as shown on F-7 can be supplied if desired. Top of supply can, only 43 inches from floor. Hand crank may be taken off, or left on, as desired. Capacity 1300 pounds of milk per hour.

	Weight, Lbs.
No. F-8, Capacity 1300 lbs. with Universal Drive and Low Base	282
No. F-8, Capacity 1300 lbs. with Motor and Low Base	300

VIKING CREAM SEPARATORS

Model A
Capacity 180-200

Model B, C & D

Just look it over—take it apart—and see for yourself why Viking owners would never buy any other kind of separator. Take hold of the handle and give it a few turns. It runs so easily and smoothly—without vibration. Even a child can operate it. Never has so much been put into a cream separator for the money.

For instance, the Viking main frame or base is heavily built from strong, durable castings. Constant vibration is costly—it means loss of cream through displacement of the separator mechanism, and unnecessary wear. No vibration can be transmitted through the Viking.

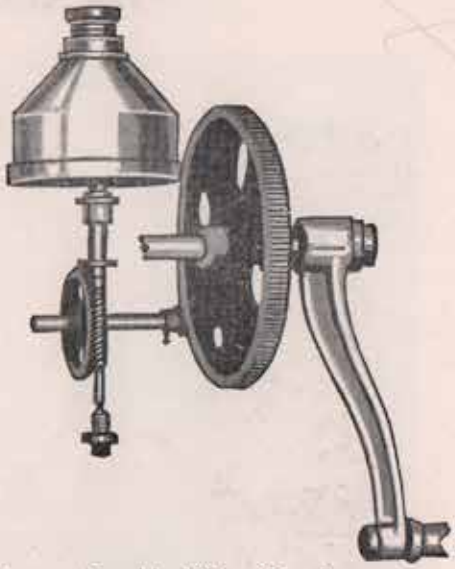
The entire Viking Cream Separator has but few parts. Gears are precision cut from phosphor-bronze and steel, all enclosed in main frame. Lost motion is eliminated because all gears are cut to mesh. Their large wearing surface, in addition to each gear being placed close to shaft bearings, insures Viking for long wear.

The Viking bowl is very carefully balanced and runs at high speed. Finely tempered springs of these bearings absorb all vibration. In addition, between the upper frame and the base are small wooden vibration absorbers. Viking discs and all bowl parts are made of genuine Swedish nickeled steel.

After a comparison of other machines you will find it impossible to buy a separator that lasts longer or does better work than a Viking. It is sold at a price easily within the limits of your pocketbook. Look the machine over. To protect your dairy profits your choice will be a Viking.

VIKING CREAM SEPARATORS

CONTINUED



Strong—Durable Viking Gearing

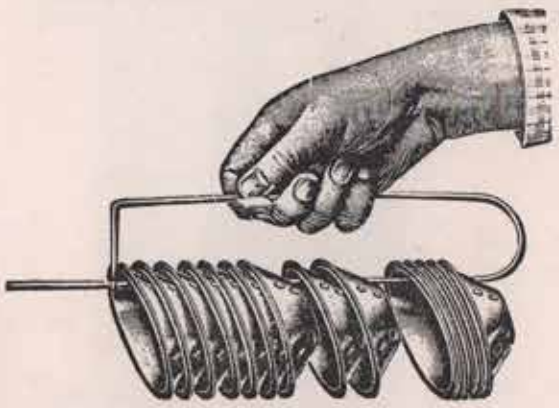
MODEL D. 900-1000 LBS. CAP.

Built only with Flat Disc Bowl

The Viking Model D size is recommended for farms milking a large number of cows.

This sized machine is recommended to be operated by hand or it can be easily equipped to be operated with either belt power or electricity.

The Model D is an exceptionally strong, durably built machine and will give a long number of years of satisfactory service. It is built of the finest grade of material throughout, which combined with its durable construction and the extreme accuracy of the workmanship, this model has established for itself an enviable reputation. For its capacity it is an extremely easy machine to turn.

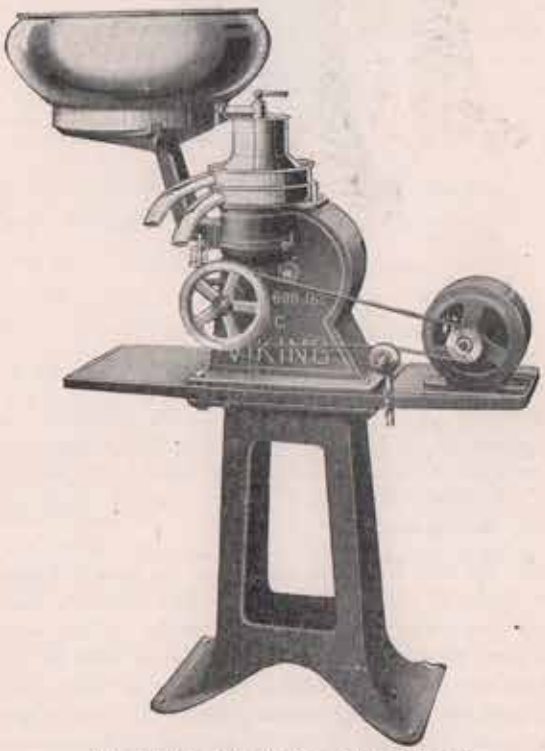


This Disc Holder Permits the discs to be easily transferred for washing

ALWAYS CLEAN AND SANITARY

In the construction of the Model D Viking Discs there is no place where the milk and cream can collect and become unsanitary.

The bowl is built from the best Swedish Steel, light, easy to turn and easy to keep clean. It is scientifically supported, the bowl being separate from the spindle. The bowl can easily be taken apart by removing the small nut on the top. The disc holder enables the discs to be instantly transferred for washing. Each piece of the bowl can be as easily washed and dried as a saucer.



Model C with Motor Attachment. Capacity 550-600 lbs.

VIKING—With Universal Power

The B, C and D Models can be operated by belt power or motor. The crank does not have to be moved to put on this attachment. The machine can be operated either by hand or power without making a change.

MOTOR DRIVE

Wherever electric power is obtainable this driving arrangement is most suitable. Special electric motor turned to correct speed. This does not interfere with crank.

Supplied on Models B, C, and D.

VIKING CREAM SEPARATORS

CONTINUED

Viking runs so easily that a child can operate it

MODEL D
Capacity 900 to 1000 lbs.

Model C with Universal Drive

"YOUR COWS WILL PAY YOU MORE WITH A VIKING"

You will notice that the crank handle is placed at a convenient height for ease in turning. The accurate and scientifically constructed gearing, combined with our perfectly balanced bowl makes an easy turning, quiet and steady running machine.

You can help your cows save cream by using a Viking. The Model D has won fame as a close skimmer, which means cream saved and larger cream checks. Viking skims and saves more pounds of cream over more years for less money than other separators. Hence, it is always first choice of the best dairy farmers. The well known conical discs used in Viking Model D are popular because they have proven their skimming efficiency. These discs are free from crevices, easily and quickly washed and cleaned.

The separator is equipped with oil bath, i. e. the worm gear and the bowl spindle are continuously running in oil.

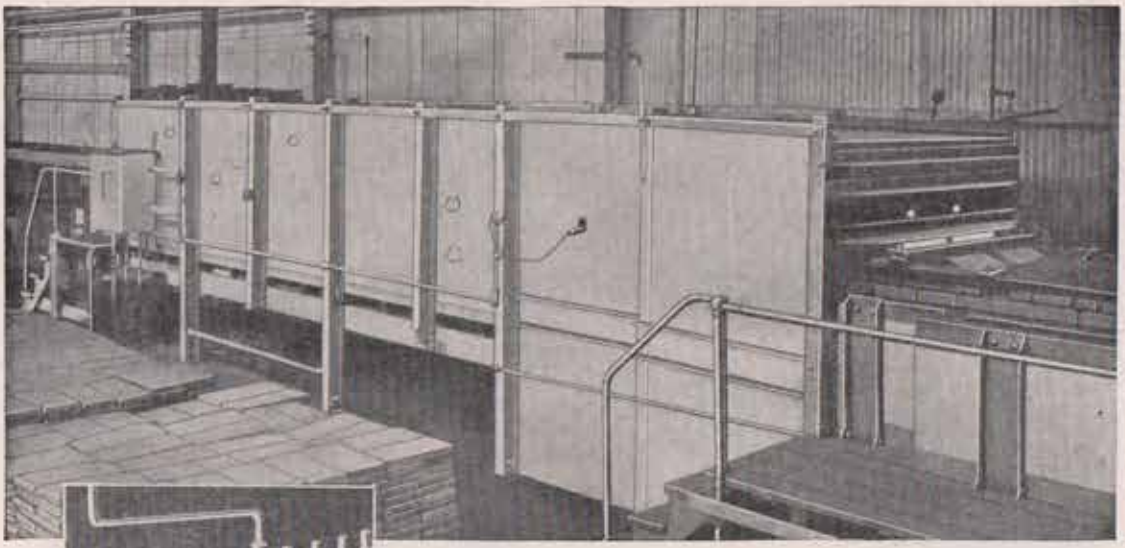
The durability of Viking Cream Separators is proven by the fact that hundreds of thousands of Vikings have been built and sold to every part of the world where dairying industries exist. Its durability and performance have never been questioned. Every part is constructed of the highest grade material, carefully inspceted and tested.

Built in the famous Viking plant, the largest separator factory in the world, these separators have for years attained the rank of the greatest cream separators.

	Capacity an hour	*Wgt., lbs.*
Model A, Less Stand	180 to 200 lbs.	40
Model A, With Stand	180 to 200 lbs.	80
Model B, With Stand	300 to 350 lbs.	140
Model C, With Stand	550 to 600 lbs.	200
Model D, With Stand	900 to 1000 lbs.	235
Motor attachment for Models B, C and D		25
Universal Drive attachment for Models B, C and D		25

KEYSTONE "GALVANNEALED" WIRE

Why Patented "Galvannealed" Wire Carries a Heavier Zinc Coating



The asbestos compression wipes, pictured above, are still in general use by wire makers, except by Keystone.

The "Galvannealing" process is protected against infringement by patents dated October 3, 1922; December 18, 1923; April 13, 1926; other patents pending

Heat Treating Furnaces Bond a Heavier Zinc Coating to "Galvannealed" Wire Without Breaking or Distributing The Tough Outer Surface by Wiping

For many years, Keystone engineers tried to find a way to put a heavier, smoother, unbroken coating of zinc on fence wire, to protect it against rust longer.

The asbestos-wiped method, pictured to the left, then in use, could not always be depended upon to leave a smooth, even thickness of zinc on the wire. The wire had to be wiped while the zinc was still hot, to keep it smooth and workable in the fence machines.

Finally, the heat-treating furnace pictured above was developed. This method eliminates the compressed asbestos wipes entirely. It leaves practically all the hot, pure zinc on the wire picked up while passing through the 28-foot zinc pan, or furnace. As the wire leaves the hot zinc bath, it passes on into the "Galvannealing" furnace, without the compressed asbestos wiping.

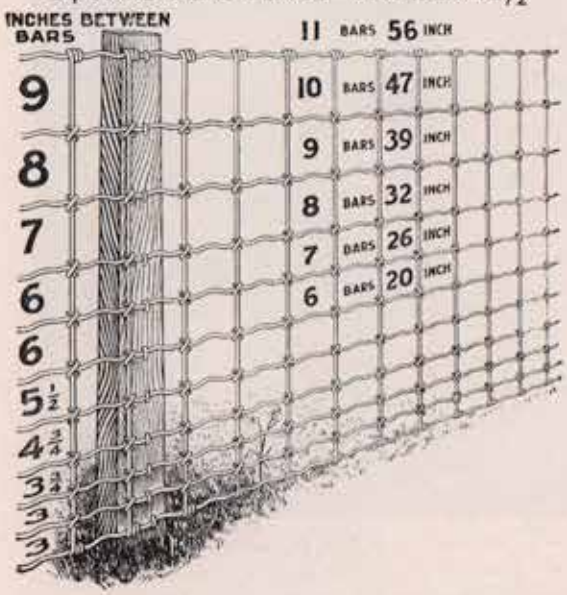
The high temperature of the long heat-treating furnace causes a more positive fusion between the zinc coating and the outer surface of the steel, forming a zinc and iron alloy that firmly bonds the zinc coating to the wire. As the wires leave the heat-treating furnace they gradually cool without breaking or disturbing the tough outer coating. The result is a uniformly heavy coat of zinc, free from pin holes and abrasions.

This heat-treating furnace is fully protected against infringement by patents owned and controlled entirely by Keystone.

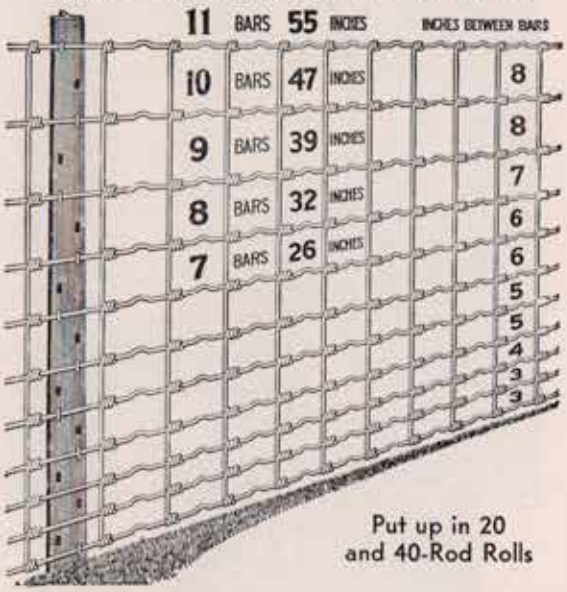
KEYSTONE "GALVANNEALED" FENCE

Continued

SQUARE DEAL FENCE—NUMBER 12½



MONARCH HOG AND FIELD FENCE



Square Deal and Monarch Field Fence

No. 12½ "Square Deal" fence has No. 10 top and bottom wires with stay and strand wires of No.12½ wire.

Made in five different heights, as shown in the illustration, with either 6 or 12-inch spacing between stay wires. Put up in either twenty or forty-rod rolls.

This weight of fencing was designed to meet the needs of the farmer who cannot afford to buy the heavier weights, or who is erecting only temporary fences. Made from comparatively light wire, it goes up easily, and is just as easily taken down.

Quality has not been slighted in the least in this low priced fence. It is constructed just as accurately as modern machinery makes possible, and will give splendid service in proportion to its cost, as compared with the heavier styles.

Its low price and high quality make it an especially good article with which to meet low priced competition. Your stock should include at least a few rolls of this comparatively new line of quality goods.

Monarch is a cut stay, or hinge joint type of fence, scientifically constructed from the very best grade of material, with well crimped line wires, neatly wrapped joints, fully meeting every requirement as to quality, looks and service of those who prefer the cut-stay type of fabric.

The stay and strand wires are from full gauge, well galvanized open hearth steel.

Only the very best grade of spelter is used, well applied, insuring the maximum resistance against rust.

The knot is unusually neat, with the ends pressed in close to the line wires, thus eliminating the ragged appearance of some types of hinge joint fabric. This knot will not slip with the fence under proper tension.

The deep crimps in the line wires add to the trim appearance of Monarch fence, giving good live tension. Accordingly, Monarch fence hinges under heavy pressure, but comes back into position again when the pressure is removed. Farmers preferring this type of construction are well impressed with the trim appearance of Monarch fence, which adds considerably to its salability.

All wire used in the Keystone plant is made in our own mills from the raw materials to the finished product, insuring uniform quality throughout.

Monarch fence is neatly wrapped in both 20 and 40- rod rolls, in both the 6 and 12-inch stay styles.

SQUARE DEAL OR MONARCH

SPECIFICATION 12½

Weight per 100 *Rods*

Top and Bottom Wires, No. 10. Intermediate Wires and Stay Wires, No. 12½

7 Bars, 26-in. high, 6-in. space	613
7 Bars, 26-in. high, 12-in. space	492
8 Bars, 32-in. high, 6-in. space	706
8 Bars, 32-in. high, 12-in. space	559
9 Bars, 39-in. high, 12-in. space	630
10 Bars, 47-in. high, 12-in. space	705

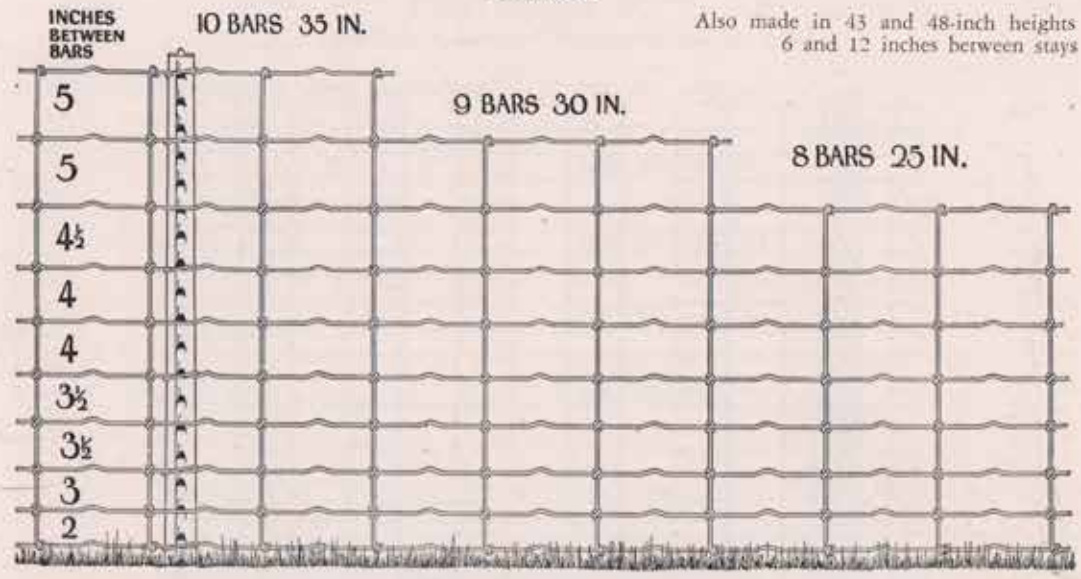
SPECIFICATION 11

Top and Bottom Wires, No. 9, Intermediate Wires and Stay Wires, No. 11

8 Bars, 32-in. high, 12-in. stay	797
9 Bars, 39-in. high, 12-in. stay	904
10 Bars, 47-in. high, 12-in. stay	1016

KEYSTONE "GALVANNEALED" FENCE

Continued



Also made in 43 and 48-inch heights
6 and 12 inches between stays

Square Deal Wolf-Proof Fencing

This style fabric is made particularly for the stock farmer who must also turn wolves and coyotes, especially in the Northwest. Made from "Galvannealed," copper-bearing steel wire, with line wires more closely spaced than regular hog and field fence, this No. 14 gauge fabric, with No. 11 gauge top and bottom wires, fully meets the requirements of this type of fence.

Even the corn belt territory, where wolves do not bother, there are frequent calls for a more closely spaced fabric than the standard hog and field fence. Wolf-proof also turns hogs and sheep and, because of its closer spacing, is often preferable to the standard spaced fabric for use around orchards, yards, for division fence, etc.

The illustration shows only the first three heights; namely, 25, 30 and 35 inches, but wolf-proof fence is also made in 43 and 48-inch heights, as shown under specifications.

Wolf-proof fence is put up in 20 and 40-rod rolls, with either 6 or 12-inch spacing between the stay wires. Marked with the "Red Strand" top wire.

SPECIFICATIONS

Style Number	*High, Inches*	*Between Stays*	*Weight, 100 Rods*
825-12-14	25	12	371
825- 6-14	25	6	448
930-12-14	30	12	412
930- 6-14	30	6	502
1035-12-14	35	12	456
1035- 6-14	35	6	562
1443-12-14	43	12	590
1443- 6-14	43	6	718
1548-12-14	48	12	635
1548- 6-14	48	6	778

Number 9 Gauge
Number 10 Gauge
Number 11 Gauge
Number 12 Gauge
Number 12½ Gauge
Number 14½ Gauge
Number 15½ Gauge

The illustration to the left shows the approximate thickness of the various gauges of wire used in making the fences described in this catalog.

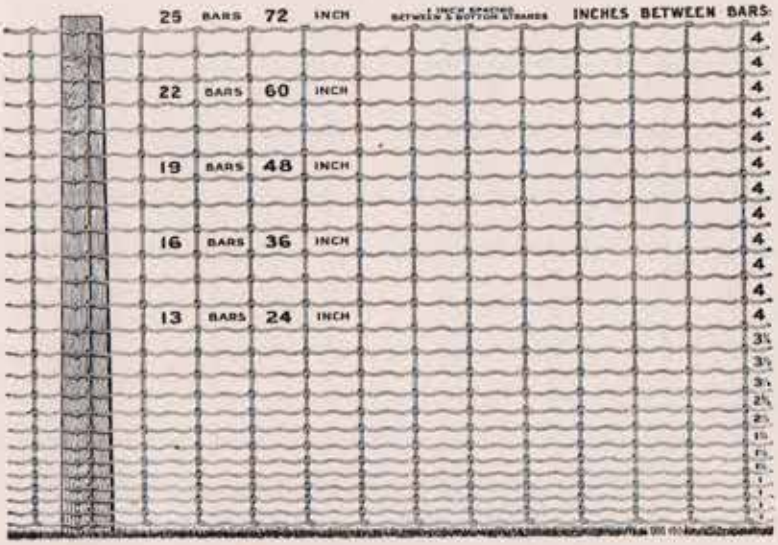
The wire gauge is a convenient tool to have about the store, as the strength and efficiency of the fence is determined largely by the gauge of the line and stay wires. Weight alone cannot be depended upon, as the weight of the different fences varies largely according to the amount of the wire used in the knots

KEYSTONE "GALVANNEALED" FENCE

Continued

SQUARE DEAL FENCE

Close Spacing—One Inch at Bottom



Square Deal Poultry Fence

This is the ideal poultry fence because it will turn the smallest chick, also keep out the small varmints that ravage the chicken pens. The first five line wires at the bottom are only 1 inch apart.

"Square Deal" Poultry Fence requires no top and bottom boards, and fewer line posts, to keep it erect and trim. Thus it costs erected, much less than poultry netting. Lasts many times longer than netting because its wires are twice the size of netting wires.

Put up in 10 and 20 rod rolls.

SPECIFICATIONS

Top and Bottom Wires, No. 11. Intermediate Wires and Stay Wires, No. 14½.

	Weight per 100 *Rods*
16 Bars, 36-in. high, 6-in. stay	697
19 Bars, 48-in. high, 6-in. stay	835
22 Bars, 60-in. high, 6-in. stay	973
26 Bars, 72-in. high, 6-in. stay	1110

MONARCH POULTRY FENCE

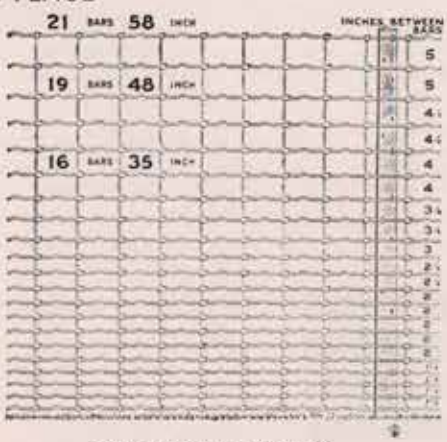
Monarch Poultry Fence meets every requirement as to quality, looks and service of those who prefer the hinge joint type of fabric.

The quality of material used is the best grade of open hearth steel, the line wires are well crimped, the knots neatly wrapped, resulting in a fence that is very neat in appearance and gives the maximum of service.

The spacing between the wires is 1½ inches at the bottom and graduated to 5 inches at the top, as shown in the illustration.

Monarch Poultry Fence Specifications

No. 14½ Poultry—Top and bottom wires are gauge No. 11 with No. 14½ gauge filler wires. Made in 3 heights as pictured. Packed in 10 and 20-rod rolls with 6 inches between stay wires.



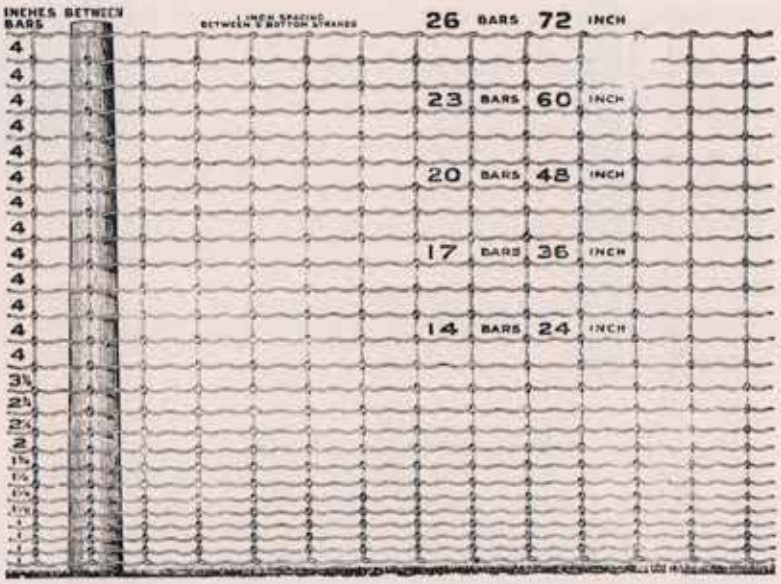
SPECIFICATIONS 14½

	Wt. per 100 *Rods*
16 Bars, 35-in. high, 6-in. stay	705
19 Bars, 48-in. high, 6-in. stay	849
21 Bars, 58-in. high, 6-in. stay	950

KEYSTONE "GALVANNEALED" FENCE

Continued

GALVANNEALED BLUE RIBBON CHICKEN TIGHT



The illustration shows spacing of light "Blue Ribbon" fence

"Blue Ribbon" Poultry Fence has, for years, been made only in the one style; that is, with No. 17 gauge line and stay wires, No. 15½ top and bottom wires.

BLUE RIBBON FENCE Versus POULTRY FENCE

The small wires used in ordinary netting, usually No. 19 gauge, combined with the fact that it cannot be easily erected, excepting at considerable expense—these are the facts which created a logical demand for a square mesh poultry fence like "Blue Ribbon."

In fact, the usual complaints about the use of netting run about as follows:

"It's hard to erect." "Bags too much." "Had to have top and bottom boards." "Took too many posts." "Costs too much when completed." "Lets chicks through." "Won't last long."

All these objections have been overcome in "Blue Ribbon" fencing, as per specifications herewith.

THE "RED STRAND" BRAND

An extra Long Life Fabric—made from a patented process wire that carries a much heavier zinc protection against rust than ordinary galvanized wire.

Nationally known authorities say that "Galvannealed" wire out-tests ordinary galvanized wire two to three times. Besides this outer protection against rust, Blue Ribbon fence wire is drawn from copper-bearing steel, thus making it rust resisting clear to the core.

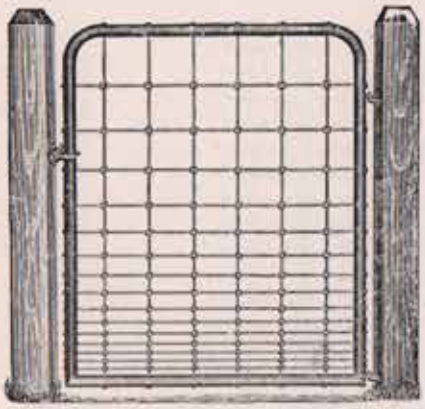
To make sure the fence is genuine "Galvannealed"—look for the Red Strand top wire.

"BLUE RIBBON" FENCE

Style No.	*Line Wires*	*Height*	*Weight*
1424-4-17	14	24	301
1736-4-17	17	36	384
2048-4-17	20	48	467
2360-4-17	23	60	550
2672-4-17	26	72	633

KEYSTONE GATES

"SQUARE DEAL" STEEL GATES



Strongest Gates Made

Jointless steel frame, heavily galvanized. Square corners; steel reinforced, unbreakable hinges welded to the gate frame. No screws, nuts or bolts used.

When ordering gates, note that the width listed is the distance apart the posts should be set. For instance, a gate listed as 4x3 means four feet high and three feet wide; height first, width next. The width, or three feet, is the space between the posts, and allowances are made, in making up the gates, so that when fittings are attached, "Square Deal" gates will swing accurately between the posts set just three feet apart.

The illustrations shown are from actual photographs, without any exaggeration as to size of the wires. "Square Deal" gates are more closely spaced than any other gate now on the market, with the heaviest wire used, No. 9 gauge.

WALK AND DRIVE GATES

"Square Deal" Walk and Farm Gates combine features that cannot be found in any other make, and are fully protected by patents. For instance, not a screw, bolt or nut is used in the whole gate.

A heavy No. 9 filler is placed within the frame under strong tension and "headed" into place. Wires positively cannot slip and are so closely spaced that the smallest chick cannot crawl through at the bottom. These No. 9 wires which are so closely spaced within the heavy steel frame, produce a gate that cannot be surpassed for rigidity, neatness and lasting qualities.

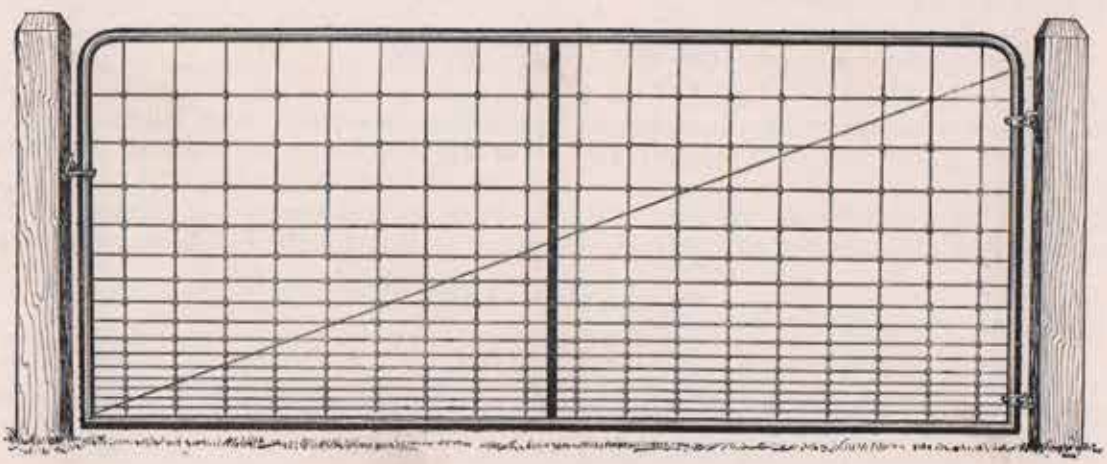
"Square Deal" gate frames are one continuous piece of steel tubing with square reinforced bottom corners, which are pressed into shape under a melting heat, so are doubly strong.

The bottom corners are square, so poultry cannot crawl through at the corners. The hinges are of heavy steel welded to the frame, doubly reinforced at point of contact, and are guaranteed not to break loose under strongest strain.

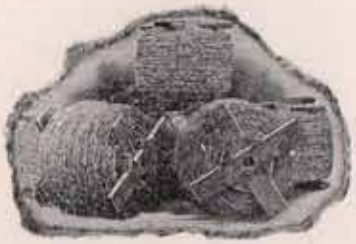
Gates more than seven feet wide are braced in the center with a flat steel bar welded into place. No danger of this style of gate ever sagging, making one of the neatest, most serviceable and satisfactory Farm and Walk gates made by any manufacturer.

Post bolts and latch are wired securely to each gate. Prices given are for wood post attachments, but steel post attachments can be furnished at a slight additional cost. See "List Price" figures for weights.

Walk Gates		Drive Gates	
Style	*Weight*	*Style*	*Weight*
3 x3 W	17	4 x 8D	56
3 x3½W	19	4 x10D	69
3½x3 W	19	4 x12D	78
3½x3½W	20	4½x10D	69
4 x3 W	20	4½x12D	81
4 x3½W	22	4½x14D	92
4 x4 W	24	4½x16D	103
5 x3 W	23		
5 x3½W	24		



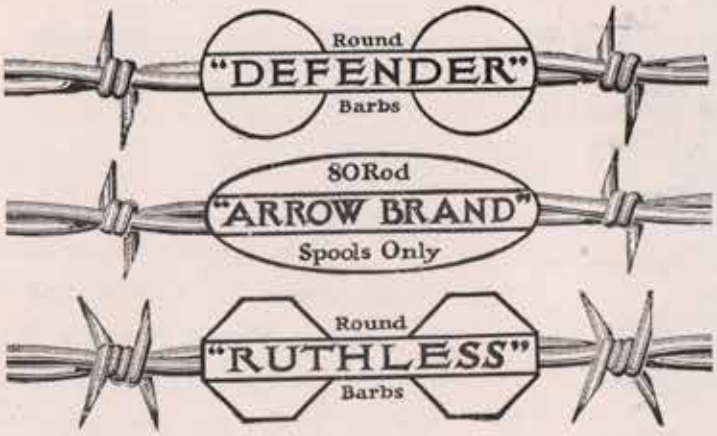
KEYSTONE "GALVANNEALED" BARBED WIRE



The various brands of barbed wire illustrated below are manufactured within the Keystone mills, from wire of our own manufacture.

The steel from which this wire is drawn is produced at our Steeldale plant, so we can guarantee a highest class product. Goods not perfect in every respect will be promptly replaced or made right.

Order by Number to Avoid a Lengthy Description



KEYSTONE WIRE NAILS

We manufacture a complete assortment of wire nails of standard quality. Keystone nails have good points and well made heads that will not fly off. All our nails are made from open hearth wire—the same quality as that from which our fencing is woven, so are guaranteed to be standard goods in every respect. Mixed car loads of nails, barbed wire, fence, etc., our specialty.

STAPLES

Keystone Standard Fence Staples are made from No. 9 wire, either bright or galvanized, in the following lengths: 1½ and 1¾-in.

Keystone Standard Poultry Staples are made from No. 14 wire, galvanized, in ¾-inch length only.

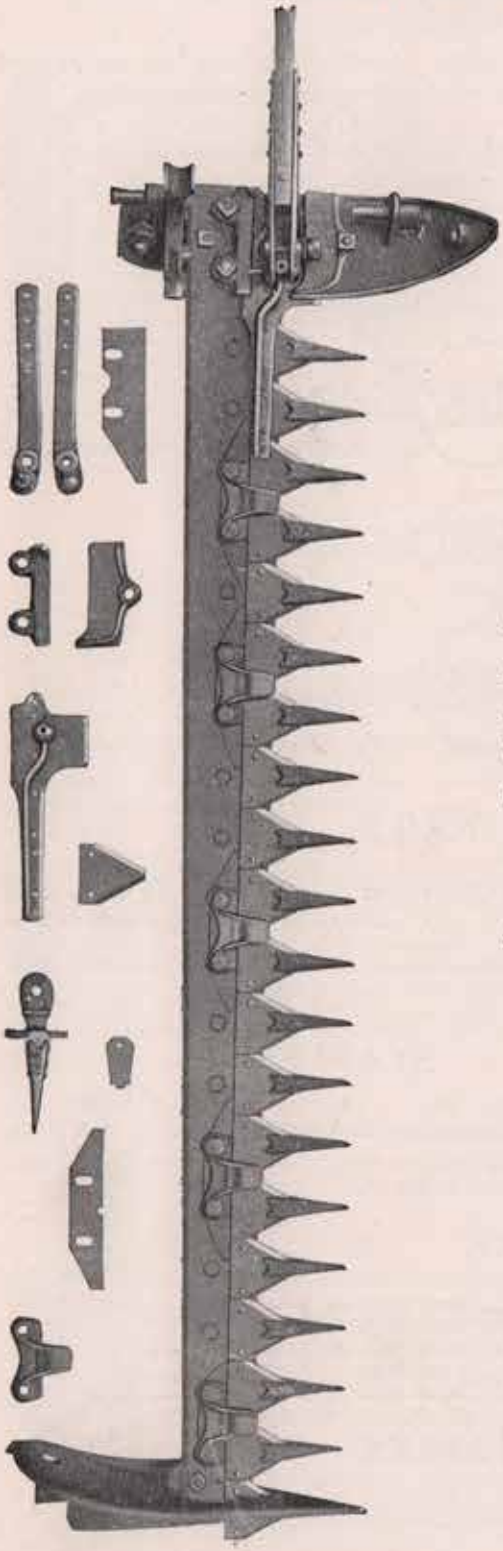
BARB WIRE

		Weight, Lbs.
No. 51 Defender, 80 rods—Hog	Same Spec. as Am. Glidden	85
No. 52 Defender, 80 rods—Cattle	Same Spec. as Am. Glidden	80
No. 71 Arrow Brand, 80 rods—Hog	Same Spec. as Am. Special	56
No. 72 Arrow Brand, 80 rods—Cattle	Same Spec. as Am. Special	53
No. 81 Ruthless, 80 rods—Hog	Same Spec. as Am. Lyman	92

GALVANIZED STAPLES

1½-inch Staples	100 Lbs. to keg
1¾-inch Staples	
¾-inch Poultry Staples	

WHITAKER CUTTING PARTS



We carry a complete line of cutting extras in stock for all makes of mowers and binders. We do not list the different parts for lack of space but on request we will be very pleased to send to you the latest Whitaker catalog that gives you illustrations and numbers of extras for all mowers, binders and combines.

We are equipped to ship orders the same day received and promise you prompt service.

See price book for various prices.

WHITAKER CUTTING PARTS

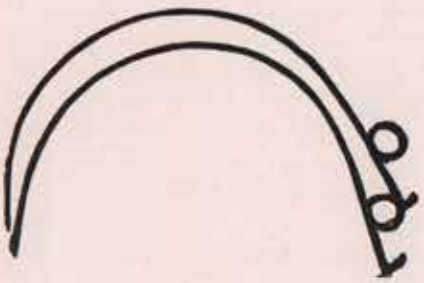
Continued

Binder Slats

We carry Binder Slats for all makes of binders.

Binder Canvasses

We carry a complete line of binder canvasses for all makes of binders.



Rake Teeth

We carry a complete line of rake teeth for all makes of rakes.

Blank Mower Poles

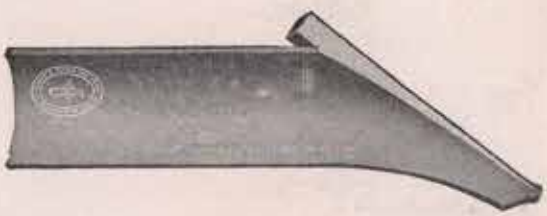
We carry blank Mower Poles that can be made over to fit various mowers. Prices and specifications are as given in the price book.

Blank Plow Handles

We carry 1¼x2¼x5 No. 1 Grade Blank Plow Handles. See price book for prices.

Blank Plow Shares

We carry blank plow shares which can be fitted to any plow in 12, 14 and 16-inch sizes. See price book.



Chain

We carry a good stock of all sizes of steel and malleable chain. If you will send us in the number of the chain, we will be very glad to fill your order on any size steel or malleable chain.

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INDEX—Continued