

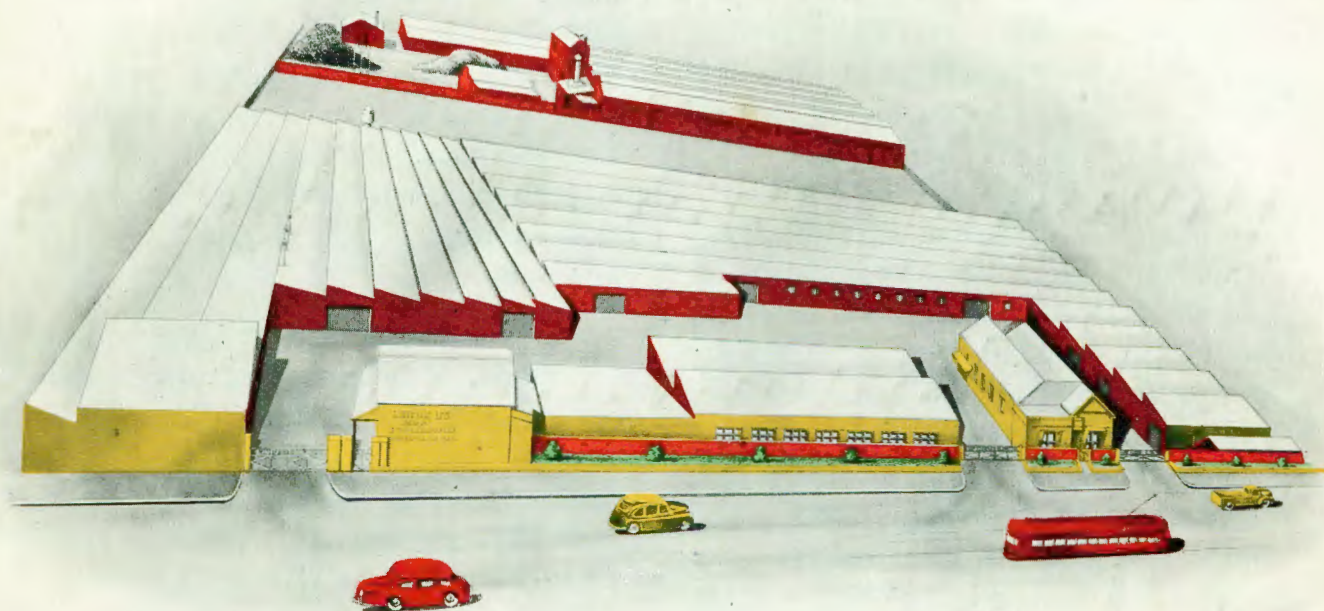
Mettlers
Windmills and Pumping
Equipment

Catalogue No 50

Metters Limited

SOUTH AUSTRALIA

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Adelaide



Factory and Offices :
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NEW SOUTH WALES

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VICTORIA

Metters K.F.B. Pty. Ltd.,
64 Elizabeth St., Melbourne
Gordon St., Footscray

NEW ZEALAND

Metters (N.Z.) Limited,
Petone, Wellington

OUR MESSAGE

TODAY, as in the past, the demand of the Pastoralist, Grazier, Farmer, and Orchardist is for greater efficiency both in respect to his own production and the machinery he uses in conjunction with same.

Demands of this nature are very important factors in development of all industries and must of necessity ever be in our minds. Greater efficiency in respect to Windmills and everything that is concerned with water whether it be for stock to drink, irrigation, spraying, or household purposes, is and must always be our constant aim.

There is a greater necessity for cautious selection of water pumping appliances than for any other equipment used in primary production. So many factors must be considered and great care should be exercised.

The result of injudicious purchasing may result in equipment not suitable for the requirements with the inevitable consequence of loss of time, loss of profit, loss of efficiency, and most important of all, loss of valuable sheep and cattle.

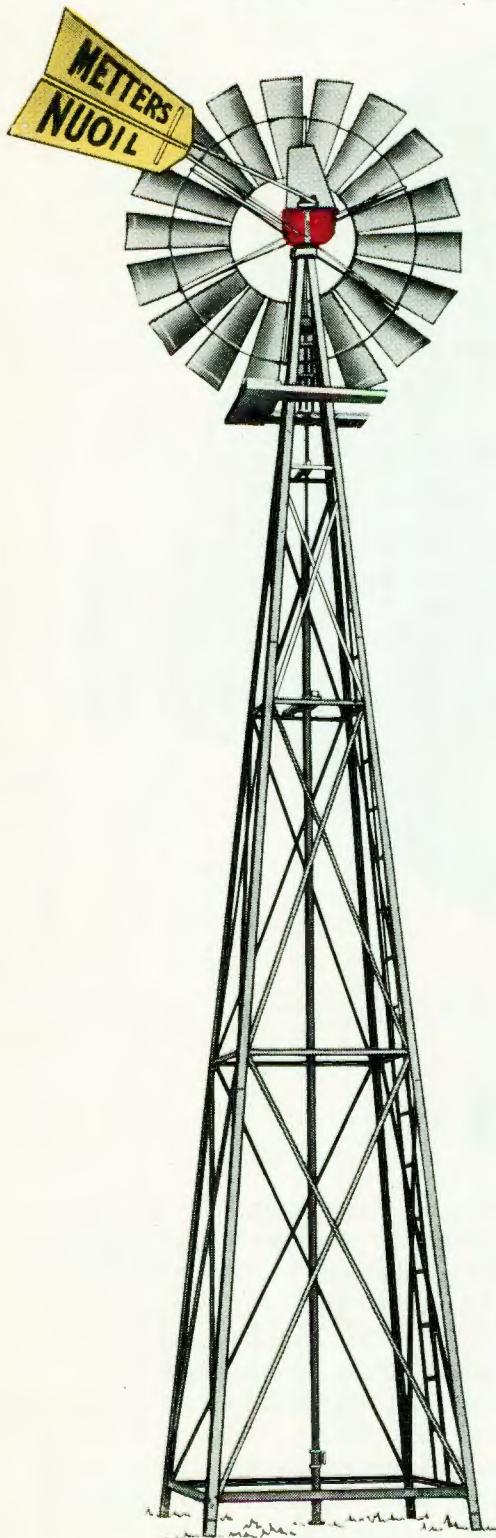
It is, and has always been our policy to maintain in all our manufactures the maximum standard of efficiency, workmanship, and material. The modern production facilities and technical skill which are at our disposal are constantly focused on the manufacture of the highest quality products.

In presenting Catalogue Number 50 our object is to assist patrons in the selection of the most suitable equipment for their requirements, by conveying to them by lucid descriptions and photographic reproductions, details of the various Windmills, Pumps, Pumping Gears, Tankstands, Squatter's Tanks, etc., of our manufacture.

The progress of Metters Limited can be measured from the fact that from a humble beginning back in the "eighties" when only three or four men were employed, today nearly three thousand people are engaged throughout all States of the Commonwealth of Australia in maintaining the high reputation so well and truly established by their predecessors. The preservation of our reputation is your guarantee.

Metters Master Nuoil Windmill

Manufactured in sizes 8 ft., 10 ft., 12 ft., and 14 ft.

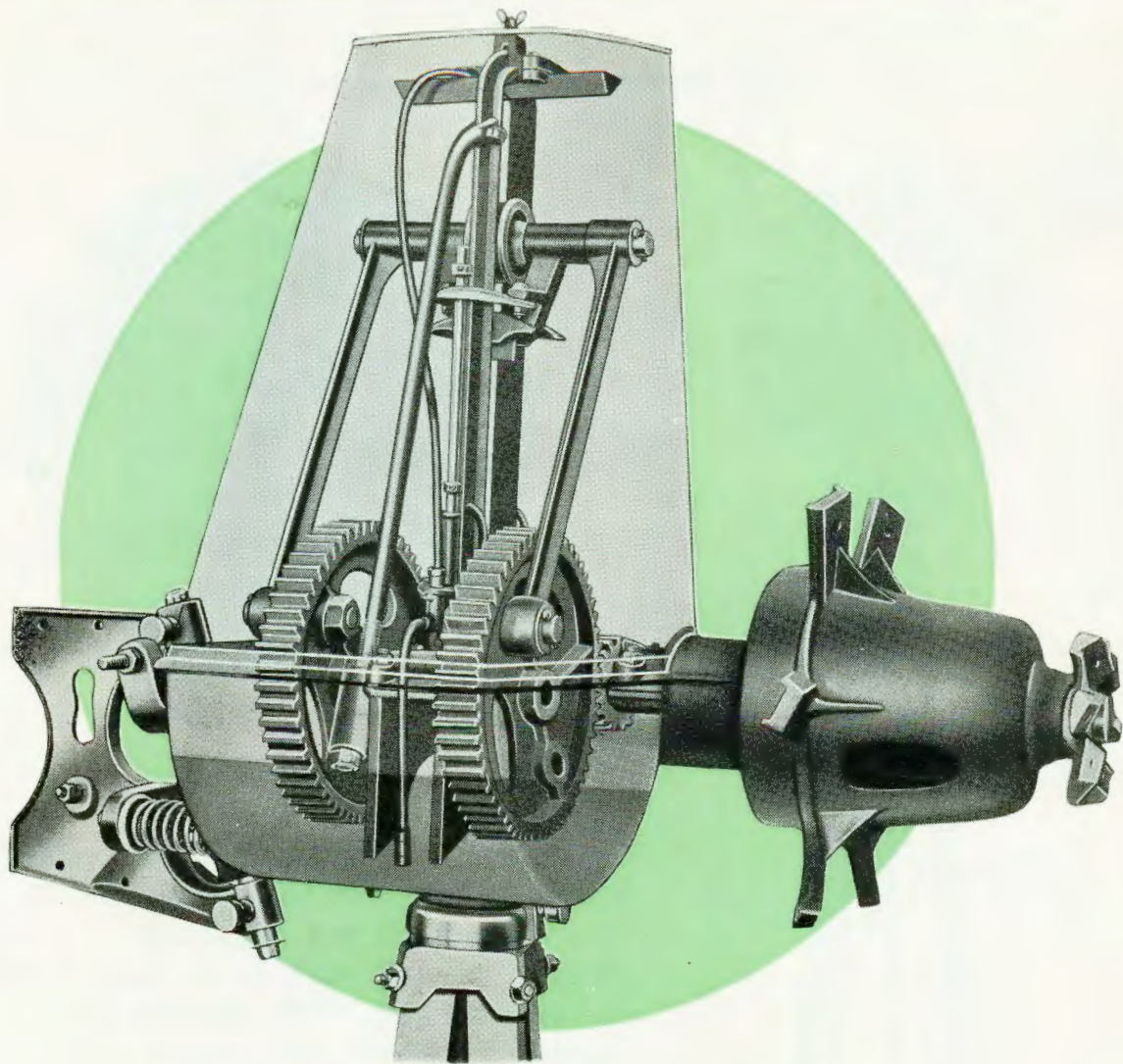


*Outstanding in
Design
Construction and
Performance*

Every known feature of advantage is included. No effort has been spared to make this the best. It will withstand the strongest wind and it will work on the lightest breeze, it is equipped with interchangeable and replaceable bearings of ample surface, ball-bearing turntable, automatic governing device, a positive automatic lubricating system, and a most effective pump rod anti-swivel attachment.

The main casting and working gears of the Master Nuoil Windmill have a greater margin of strength than any other known windmill of similar size.

Metters Master Nuoil Windmill



X-Ray view of working gears etc., 14/12 ft. Master Nuoil

Specifications

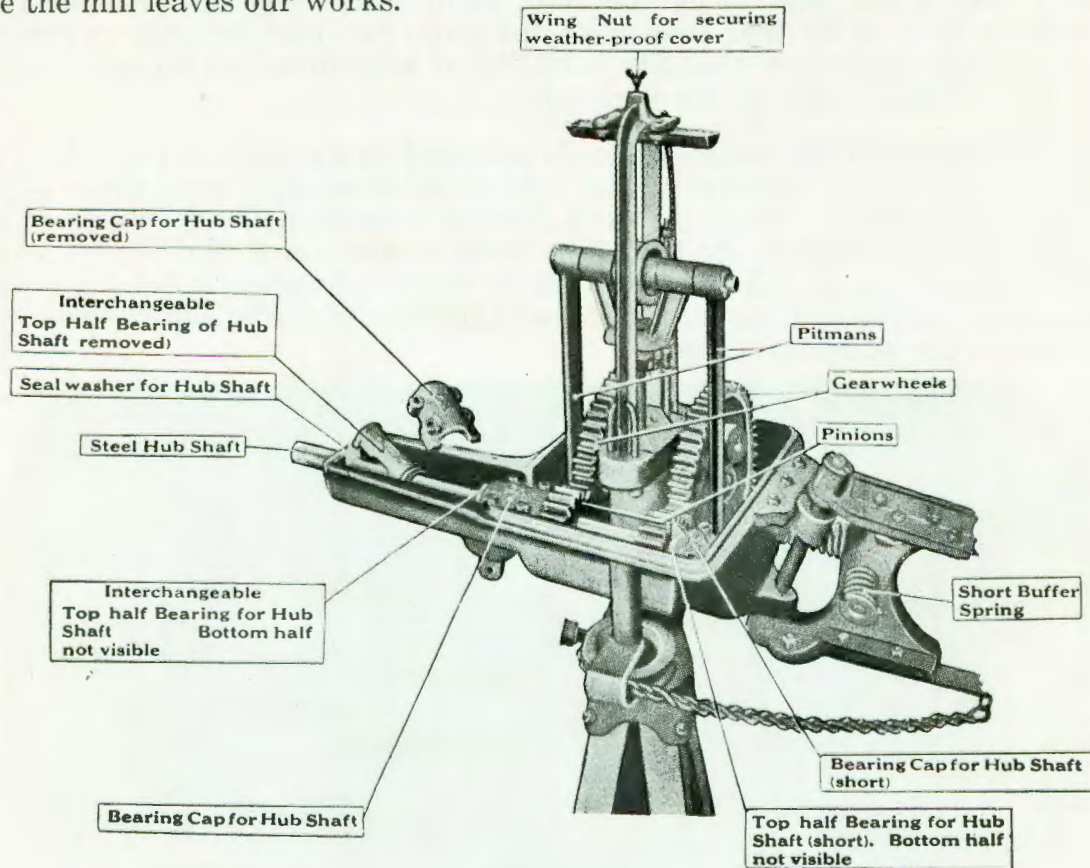
THE MAIN CASTING is also the oil container, and is made in one piece so as to eliminate any possibility of the oil leaking away. It also accommodates the working gears. The sleeve portion receives the main driving spindle, which is automatically lubricated. The surplus of oil drains back through the sleeve into the sump. The central pillar is integral with the main casting.

TWIN GEARS consist of two gear wheels and two pinion wheels, which are securely keyed to the gearwheel spindle and the hub spindle respectively, with the bottom end of the pitman arms connected to the gearwheels by machined cold-rolled mild steel crankpins, with a feather steel key and drawn up tight by a faced steel nut, and operate in the oil contained in the main casting.

Metters Master Nuoil Windmill

Continued

AUTOMATIC GOVERNING is thoroughly reliable, and controls the speed of the windwheel. This is achieved by the poise of the tail without the aid of springs or weight controls. The maximum wheel revolutions are in accordance with the setting of the adjusting bolt, which can be altered without the slightest difficulty, according to the maximum speed desired. This does not stop the mill, but prevents it from working too fast. In the case of a new mill the adjustment is made to suit average requirements before the mill leaves our works.



THE CROSSHEAD is connected to the pitmans by a steel shaft which passes through each of the pitmans, the crosshead and the guide roller, and held in position at each end by a cotter pin.

GUIDE ROLLER positively ensures a true and smooth stroke movement of the crosshead in the guide loop.

A TEE IRON GUIDE LOOP penetrates through the top flange portion of the central pillar of the main casting, and is held in position by two steel U bolts on the outside and by specially machined steel plates on the inside, which are let into a recess on the pillar casting, and welded to the guide loop.

MAIN PUMP ROD passes through a hole in the central pillar portion of the main casting, and is screwed right through the crosshead and prevented from becoming unscrewed by a steel cotter pin and locknut. The bottom end of the pump rod is attached to the pump rod anti-swivel.

Metters Master Nuoil Windmill

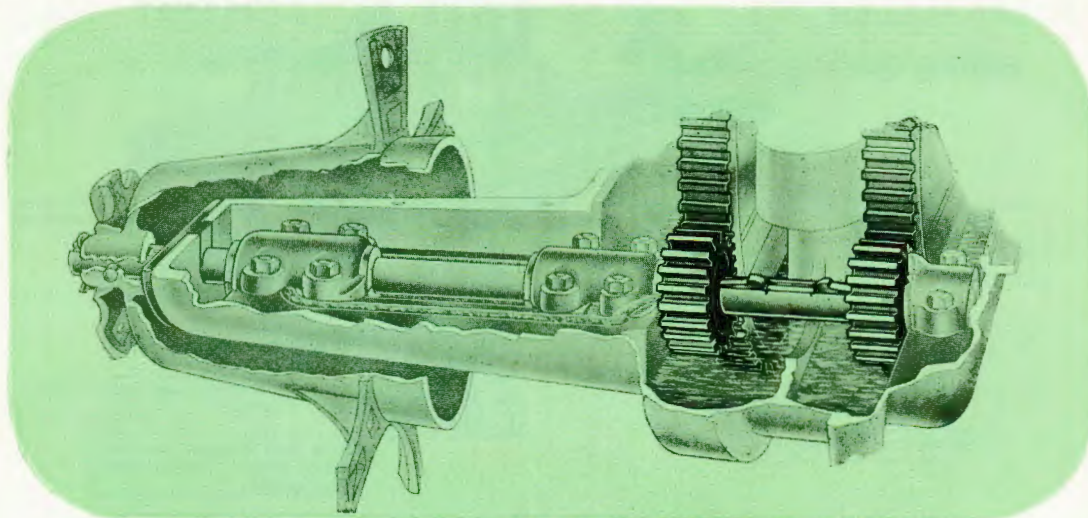
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WHEEL HUB is securely fastened to the hub shaft by an extra strong steel key fitted tight into a deep keyway. A cotter pin passes through the outer end of the shaft and bears hard up against the key as a special precaution against the key working loose.

BALL BEARING TURN-TABLE consists of a series of steel balls in a gunmetal cage protected from weather conditions by a cast iron cover fitted around the pipe barrel between the main casting and Tower Block. The steel balls travel on a chilled steel track washer and are lubricated by a screw down grease cup.

The Tower Block also holds the four main tower legs together at the top and is held in position by four steel bolts and nuts; two cast projections engage the flange of the main casting so that any variation of wind direction compels free movement of the windmill head on the turn-table.

OIL FORCE FEEDER is automatically operated by a solid steel ram which passes through a clamp securely attached to each side of the crosshead from whence is derived the up and down motion. The oil is forced through a copper delivery tube into the cast oil trough, which is secured to the top of the guide loop by a cast clip. The oil overflows down from the oil trough and lubricates the movement of the guide roller and top end of pitman arms, and then drops back into the sump clear of the hole in the main casting through which the pump rod passes.



In this block portion of the hub and main casting has been cut away so as to show the hub shaft, bearings, etc., and oil channels.

SPLIT BEARINGS are interchangeable and replaceable, and consist of selected anti-friction metal, held in position by cast bearing caps bolted so as to permit of easy replacement by an ordinary handy man in a few minutes. The windwheel shaft is supported by three split bearings, two long on the hub end and one short on the opposite end. The gearwheel shaft is supported by one long split bearing between the two gearwheels.

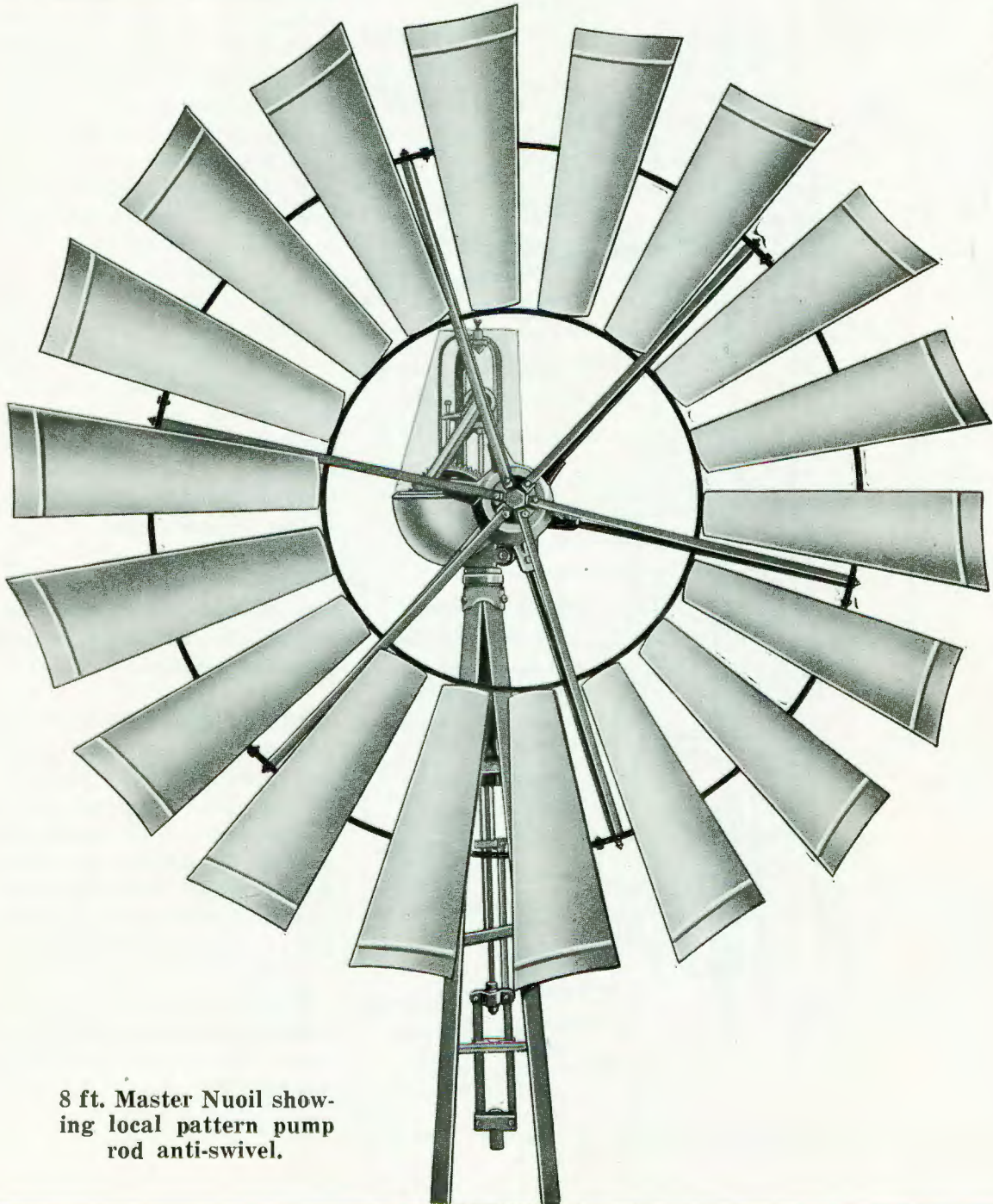
GALVANISED COVER is fitted over the main working parts of the mill and double flanged at the bottom to fit over the edge of the top of the main casting and securely held in position by a steel bolt and wing nut, fitted to the top of the guide loop, thus eliminating any possibility of dust or rain penetrating into the working gears and preventing oil from escaping.

Metters Master Nuoil Windmill

Continued

Windwheel

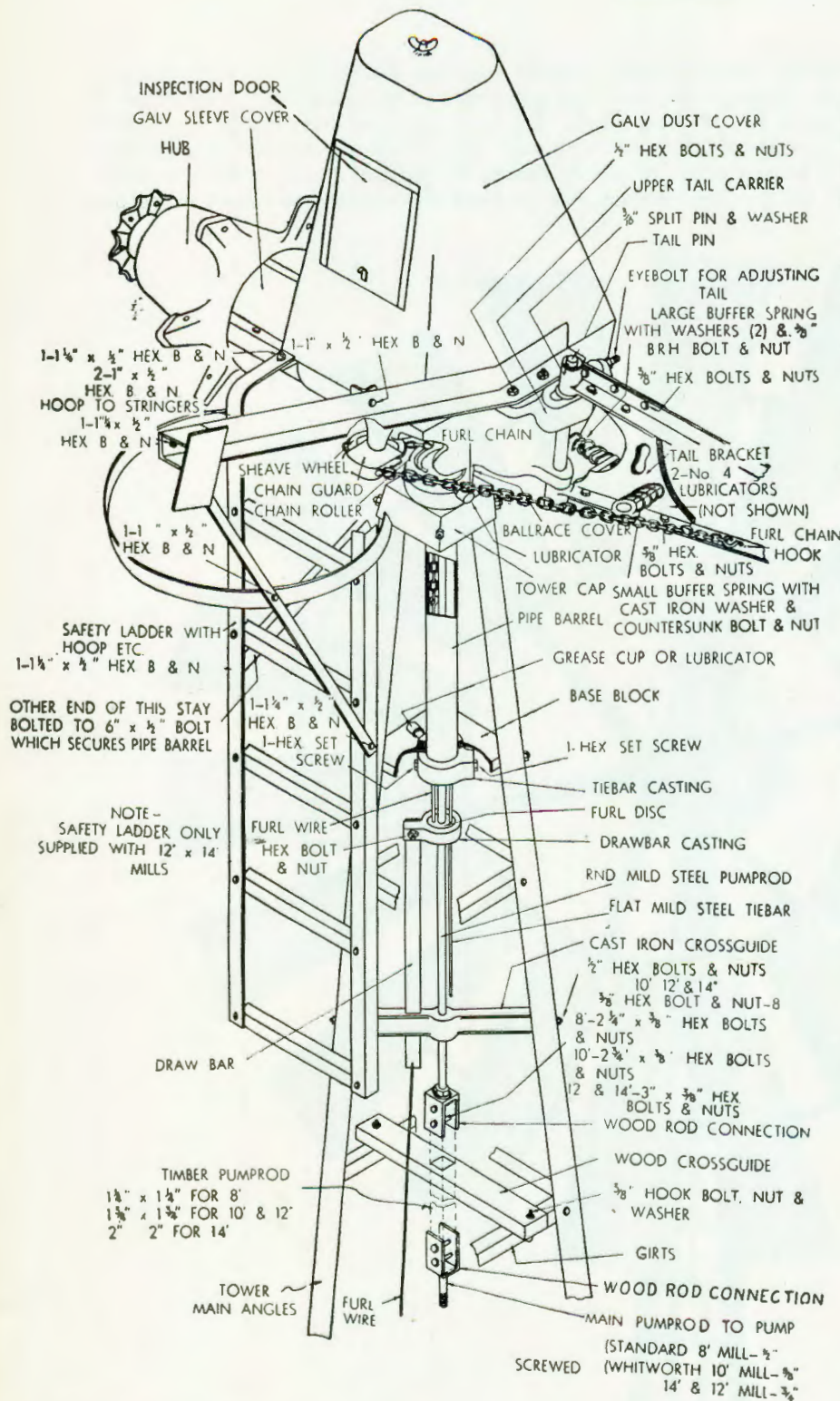
Designed to take full advantage of the lightest breeze. Double staggered flat steel spokes held firmly in recess in hub casting and securely bolted. Rings of flat steel and galvanised sails scientifically designed so as to transmit every ounce of wind pressure to the working gears. For local trade, wheels (except 14 ft.) are despatched in assembled sections, i.e., sails electrically welded to sail clips which are riveted to steel ring sections thereby permitting the wheel to be assembled by simply bolting the sections to the spokes. In order to reduce shipping measurements, wheel sections for overseas and interstate are despatched unassembled, but bolts and spring washers are included.



8 ft. Master Nuoil showing local pattern pump rod anti-swivel.

Metters Master Nuoil Windmill

Continued



Detailed illustration of 14-12 ft. Master Nuoil Windmill showing safety hoop and ladder and overseas pattern pump rod anti-swivel.

FURLING GEAR is the most reliable known to windmill constructional engineers and has definitely proved most effective and efficient. A strong twisted link chain is applied to a hook fitted to the tail bracket and passes over two sheave wheels and through the main casting and pipe barrel and is connected to the furl wire at a point inside the pipe barrel. The Furl Wire Disc is attached to the lower end of the furl wire. The pumprod and tie bar pass through slotted holes in the disc which turns inside of the draw bar casting which is held securely in permanent position by mild steel draw bar passing through slotted hole in crossguide. The top of the tie bar is secured to a cast iron collar which fits around the bottom of the pipe barrel underneath the Baseblock.

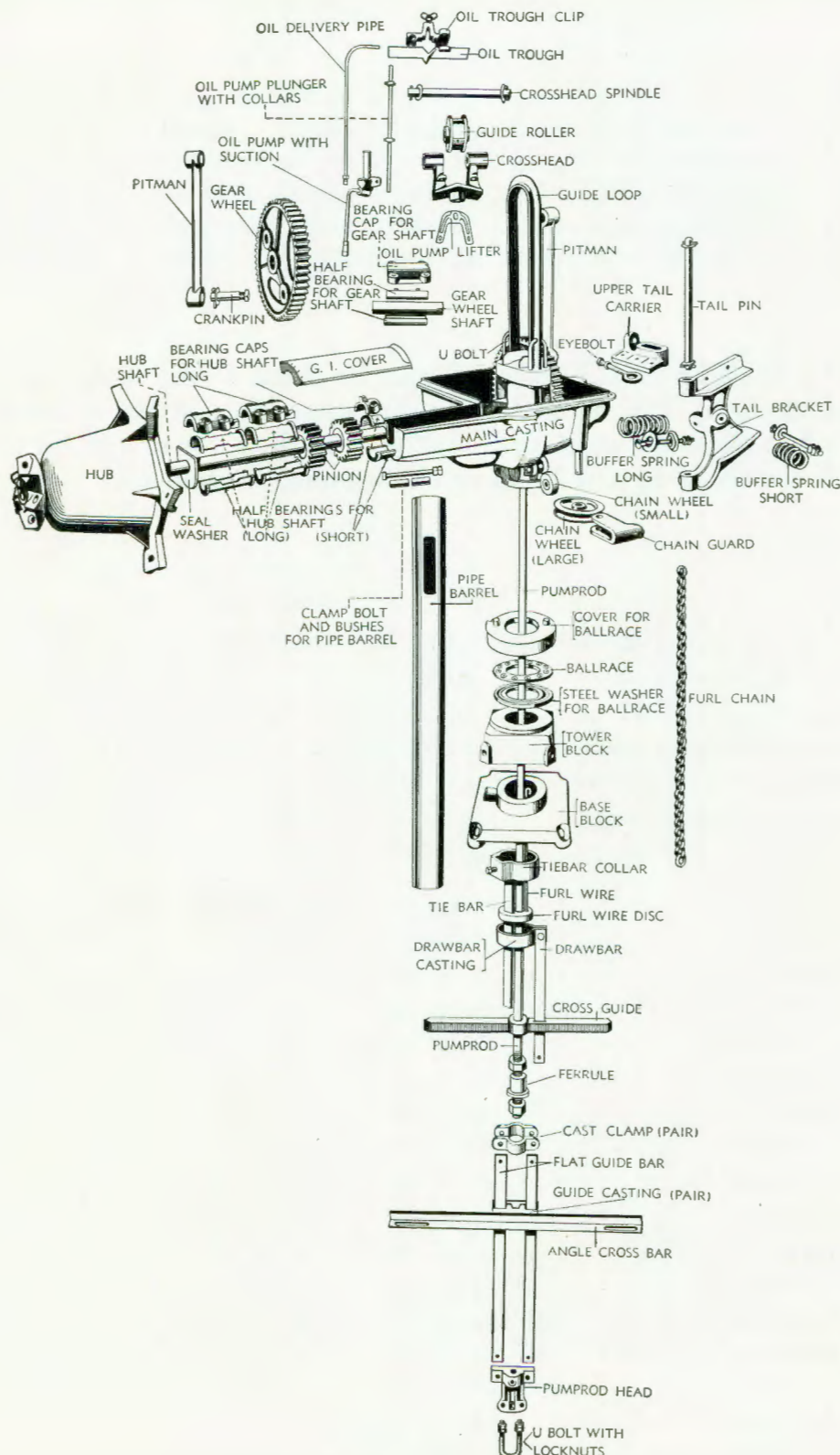
No. 8 Gauge Reefing or furling wire connects the pull out lever fitted to the Tower leg approximately four feet above around to the Draw Bar. This system enables the Windmill Head to turn freely on the turntable without fouling the furling gear.

PIPE BARREL is of specially selected steel tube clamped to the main casting and passes through the ball bearing turntable, top tower block and baseblock.

PUMP ROD ANTI-SWIVEL positively prevents pump rod from unscrewing. Local pattern consists of two flat bars connected to the main head pump rod by a swivel casting. The rod turns in the casting which is held in position by the two flat bars which pass through slotted castings secured to angle steel cross bar fitted between the tower. See illustration of component parts. Page 9.

Overseas pattern pump rod anti-swivel consists of square wood pump rod passing through square hole in wood crossguide. See illustration this page.

Metters Master Nuoil Windmill



Detailed illustration of component parts.

Metters Master Nuoil Windmill

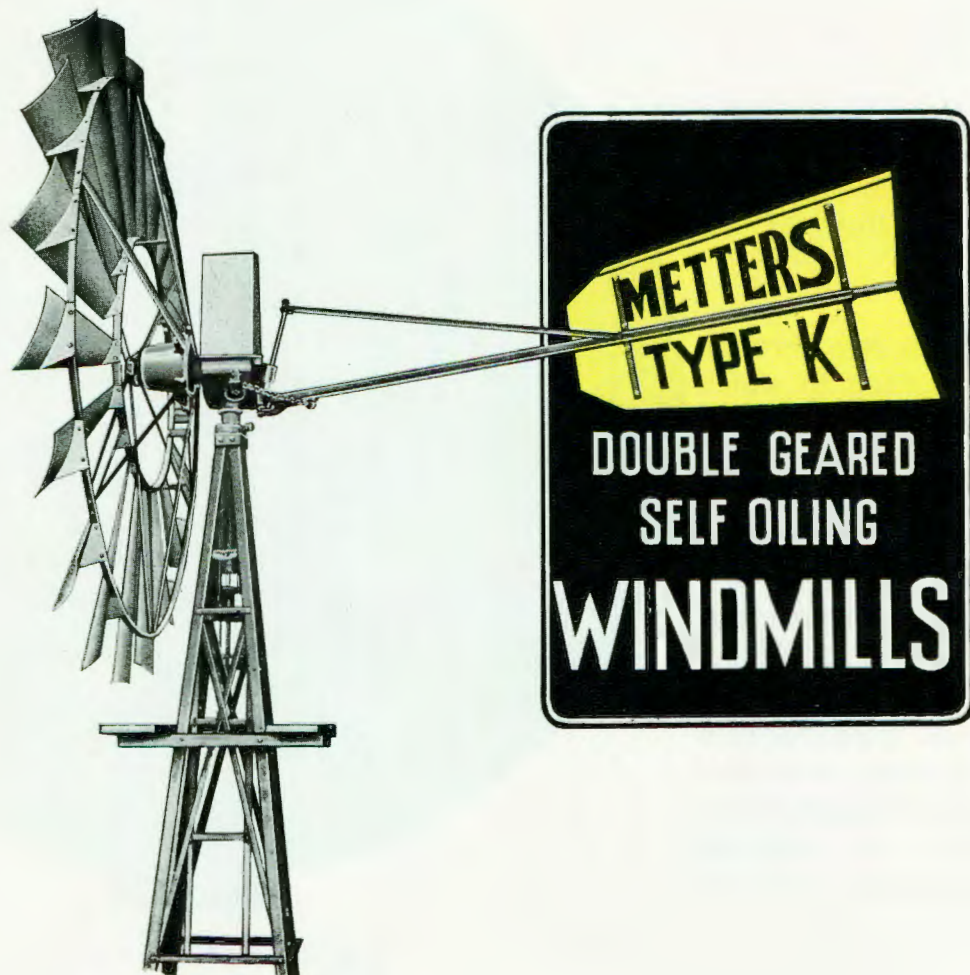
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FOUR POST TOWERS of any height, either Painted or heavily Galvanized after manufacture. Stock sizes are 20 ft., 30 ft., and 40 ft. high. Special towers to suit local conditions up to 70 ft. high can be supplied. Towers are designed to resist wind storms, keeping in mind their responsibility in respect to the strain of central loads, and consist of four heavy steel main angle legs, each of the four sides having double angle diagonal stays, also angle girts, heavy angle steel anchor posts for concrete, and angle steel ladder.

MASTER NUOIL WINDMILL HEADS can be fitted to any existing windmill tower of required strength. It is necessary that the dimensions of top of the old tower be made to suit tower block and base block and holes made in tower legs for bolts that secure same. Stub towers to fit new heads can be supplied if required.

	8 ft.	10 ft.	12 ft.	14 ft.
Length of Stroke - - - - -	7 in.	6 & 8 in.	8 & 10 in.	8 & 10 in.
Spread of 20 ft. Tower at ground level - -	5 ft. 4 in.	5 ft. 4 in.	5 ft. 4 in.	5 ft. 4 in.
Spread of 30 ft. Tower at ground level - -	5 ft. 9 in.	5 ft. 9 in.	5 ft. 9 in.	5 ft. 9 in.
Spread of 40 ft. Tower at ground level - -	7 ft. 6 in.	7 ft. 6 in.	7 ft. 6 in.	7 ft. 6 in.
Maximum pipe clearance inside 20 ft. Tower -	12 ft. 6 in.	12 ft. 6 in.	12 ft. 3 in.	12 ft. 3 in.
Maximum pipe clearance inside 30 ft. Tower -	22 ft. 3 in.	22 ft. 3 in.	22 ft. 0 in.	22 ft. 0 in.
Maximum pipe clearance inside 40 ft. Tower -	32 ft.	32 ft.	31 ft. 9 in.	31 ft. 9 in.
Gear Ratio - - - - -	3.4 to 1	3.24 to 1	3.33 to 1	3.33 to 1

	Nett Weight C. Q. Lbs.	Gross Weight C. Q. Lbs.	Shipping Measurements CUBIC FEET
8 ft. Mill only No Tower - - - - -	3 0 22	3 3 13	28½
8 ft. Mill with 20 ft. Tower - - - - -	7 2 15	8 1 6	33½
8 ft. Mill with 30 ft. Tower - - - - -	8 3 23	9 2 14	36½
8 ft. Mill with 40 ft. Tower - - - - -	11 0 23	11 3 14	39½
10 ft. Mill only No Tower - - - - -	6 1 10	7 0 15	25½
10 ft. Mill with 20 ft. Tower - - - - -	11 3 6	12 2 11	33
10 ft. Mill with 30 ft. Tower - - - - -	13 2 22	14 1 27	36¾
10 ft. Mill with 40 ft. Tower - - - - -	16 1 22	17 0 27	39½
12 ft. Mill only No Tower - - - - -	9 0 0	9 3 18	37
12 ft. Mill with 20 ft. Tower - - - - -	15 0 19	16 0 9	45¾
12 ft. Mill with 30 ft. Tower - - - - -	17 2 22	18 1 20	49½
12 ft. Mill with 40 ft. Tower - - - - -	20 2 22	21 2 12	51
14 ft. Mill only No Tower - - - - -	10 1 8	11 1 12	46½
14 ft. Mill with 20 ft. Tower - - - - -	16 2 19	17 2 23	57½
14 ft. Mill with 30 ft. Tower - - - - -	18 3 13	19 3 17	59¾
14 ft. Mill with 40 ft. Tower - - - - -	21 3 13	22 3 17	61



Extra-ordinarily sensitive to wind pressure

A most unusual combination of high efficiency and low price.

Made in sizes 5ft., 6ft., 8ft., 10ft.

Metters Type K Windmill

Continued

MAIN CASTING accommodates the working gears etc., and is made in one piece in order to eliminate possibility of oil escaping.

PIPE BARREL passes through bottom of main casting to which it is securely welded.

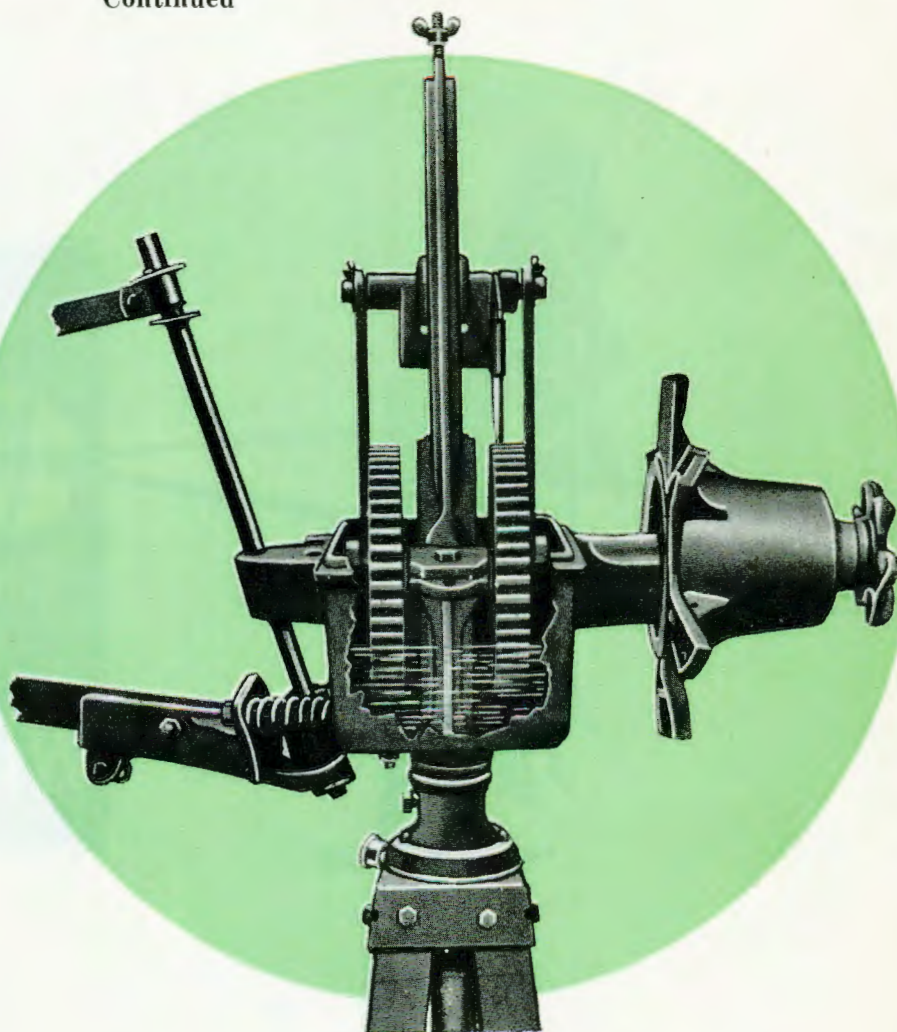
GUIDE LOOP consists of tee shaped steel electrically welded to the top end of the pipe barrel and effectively guides the movement of the crosshead.

CROSSHEAD is fitted between the top of the pitmans with steel shaft which passes through crosshead and pitmans and takes the top crank movement of the pitmans.

DOUBLE GEARS ensure even distribution of the pumping load and smooth up and down movement of the pump rod. The gearwheels and pinions are cast perfectly true in special moulding machines thus the hard outer skin of the metal is retained, and the life of the teeth considerably prolonged. Both gearwheels are secured to gear shaft by steel keys fitted to machine cut keyways in gears and shaft. Both pinions are secured to the hub shaft

by steel gib head keys fitted to keyways in pinions and shaft.

PITMANS, or lifting arms are of steel and convert the circular movement of the gears to vertical movement of the crosshead. The bottom end of each pitman is attached to the gearwheel by a steel crankpin welded at right angles and integral with pitman. Each pin is securely held in position by a steel cotter pin.



8 ft. Type K Windmill Head with portion of main casting cut away to show working gears etc.

Metters Type K Windmill

Continued

MAIN PUMP ROD screws into crosshead and further secured by locknut underneath crosshead and steel cotter pin above.

PUMP ROD ANTI-SWIVEL. Local pattern consists of two round steel guide rods which pass through holes in base block, one each side and connected at bottom underneath base block to cast iron pump rod head. The bottom end of main pump rod is shaped to fit into a recess in the rod head casting between the guide rods and enables the rod to swivel in the casting which is prevented from turning by the round guide rods. Overseas and Interstate pattern pump rod anti-swivel consists of a square wooden pump rod working through a square hole in wooden crossguide.

AUTOMATIC GOVERNOR protects the windmill during storms. This is achieved by the set of the tail pin which controls the angle of the tail.

REPLACEABLE BEARINGS of selected anti-friction metal to Hub and Gear shaft and pitmans. Ample bearing surface.

HUB SHAFT, of selected bright steel shafting secured to Hub of Windwheel by steel Key in deep machine cut keyway in casting and shaft. Wheel hub further secured by steel cotter pin passing through shaft hard up against Key. Both ends of hub shaft effectively supported by main casting.

LUBRICATION. Sufficient oil is contained in the main casting to enable the bottom cranks to dip into the oil. The bottom of the gears operate in the oil bath and in turning convey the oil to the pinions from whence it is diverted to hub shaft thereby providing a continuous flow of oil to the bearings.

The movement of the gears also ensures ample lubrication to the gear shaft bearings. A steel ring loosely attached to a clip which is secured to the crosshead picks up oil from the gearwheel teeth and automatically conveys it to the crosshead spindle thus providing lubrication to the top crank movement and the guide roller.

BALL BEARING TURNTABLE, consisting of steel balls in gunmetal cage in between two case hardened steel washers effectively protected from dust and rain by cast iron Ballrace cover. The turntable movement is lubricated by screw down grease cup to both Ballrace Cover and Baseblock. This combination provides free movement of the windmill head on the cast iron Tower Cap.

GALVANISED COVER is fitted to the main casting and securely held in position by a steel thumb screw welded to the top of the guide loop thus protecting the working gears, etc., against dust and rain.

WINDWHEEL. Designed to take full advantage of the lightest breeze. Double staggered flat steel spokes held firmly in recess in hub casting and securely bolted. Rings of flat steel and galvanised sails scientifically designed so as to transmit every ounce of wind pressure to the working gears. For local trade wheels are despatched in assembled sections, i.e., sails electrically welded to sail clips which are riveted to steel ring sections thereby permitting the wheel to be assembled by simply bolting the sections to the spokes. In order to reduce shipping measurements wheel sections for overseas and interstate are despatched unassembled, but bolts and spring washers are included.

Metters Type K Windmill

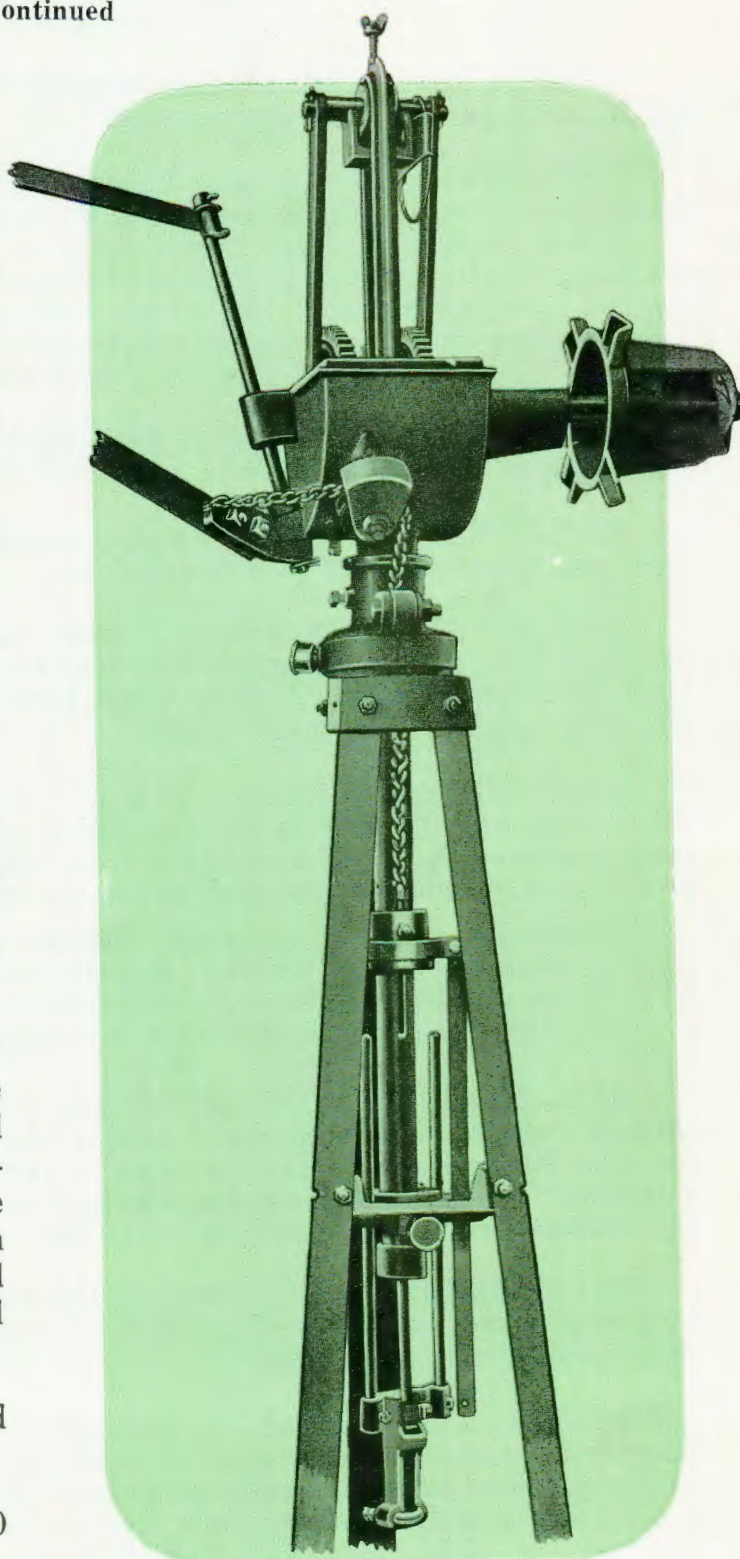
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FURLING SYSTEM. A simple but very reliable method of stopping the windmill by diverting the wheel from the direction of the wind. A chain attached to the tail passes over a sheaf wheel on the main casting and then down over a small chain roller through the turntable and tower cap and finally attaches to the furl collar casting. The collar fits over the pipe barrel so as to move up and down on the barrel. The bottom of the collar is flanged so as to engage inside of the ring portion of the furl bar in order to form a swivel which permits the mill head to turn on the turntable without fouling the furl bar. The flat steel furl bar passes through a slotted hole in the base block. A wire is attached to the bottom of the furl bar and when pulled from below with the assistance of the furl lever clamped to a tower leg the windwheel is pulled away from the wind.

TOWERS, consisting of either three or four angle steel legs, angle steel girts and flat steel tension braced diagonal stays for local trade or specially selected high tensile steel wire diagonal stays for overseas and certain interstate trade. Can be supplied either painted or heavily galvanized after manufacture.

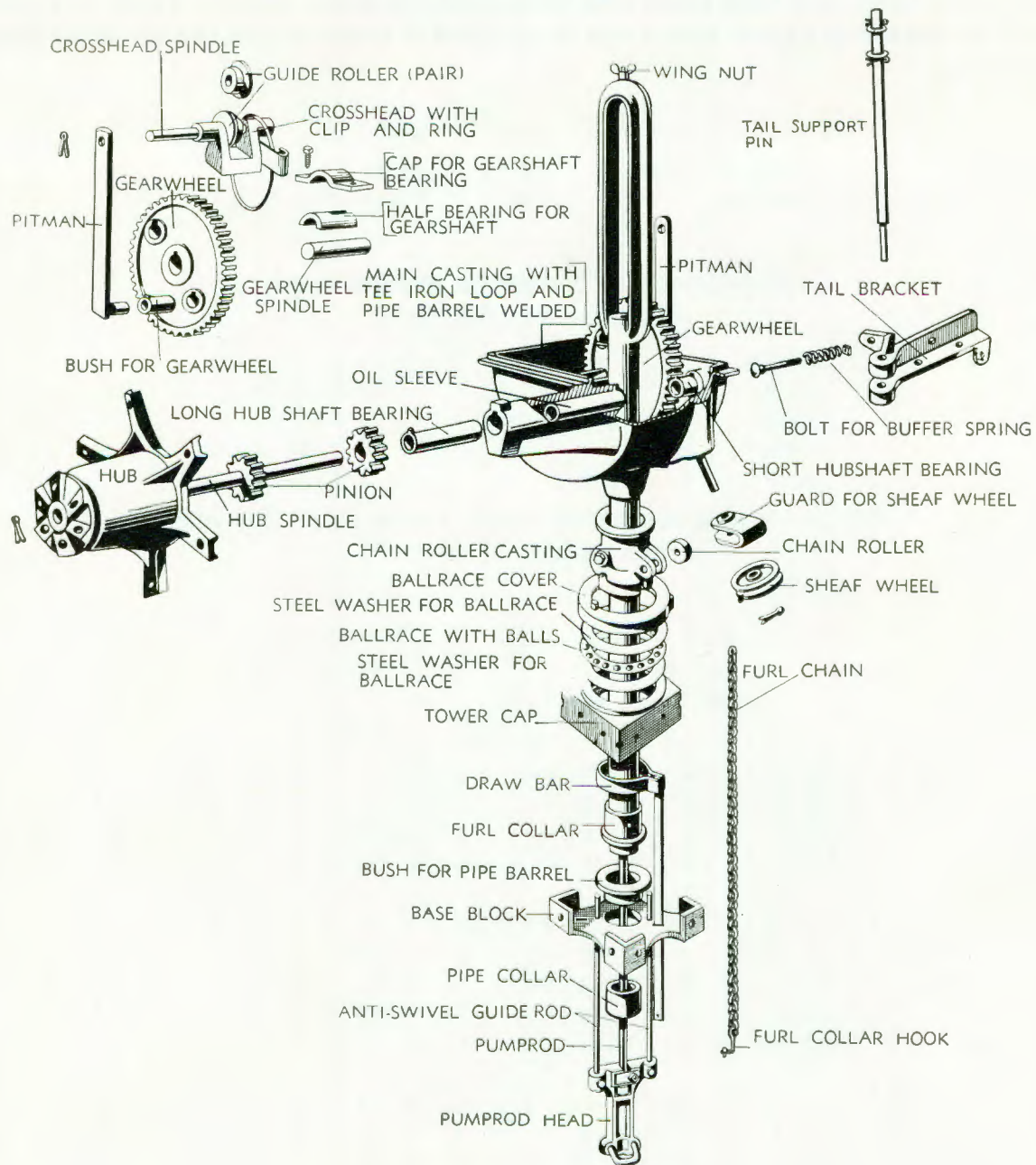
Angle steel Anchor Posts and Plates included.

Stock sizes—15, 20, 25, 30 and 40 ft. high.



Illustrating Furling system and local pattern pump rod anti-swivel 6ft. Type K.

Metters Type K Windmill



Detailed illustration of component parts.

Metters Type K Windmill

Continued

TYPE K WINDMILL HEADS can be fitted to any existing windmill tower of required strength. It is necessary that the dimensions of top of the old tower be made to suit tower block and base block and holes made in tower legs for bolts that secure same. Stub towers to fit new heads can be supplied if required and the tower altered to suit the stub.

	5/6 ft.	8 ft.	10 ft.
Length of Stroke	4-5 in.	5-6 in.	6-7 in.
Gear Ratio	3.9 to 1	3.8 to 1	3.4 to 1

Dimensions of Tower at ground level (distance between legs)

Height	3 post	4 post
20 ft.	4 ft. $6\frac{3}{4}$ in.	4 ft. $6\frac{1}{8}$ in.
25 ft.	5 ft. $6\frac{3}{8}$ in.	5 ft. $5\frac{3}{4}$ in.
30 ft.	6 ft. $7\frac{1}{4}$ in.	6 ft. $6\frac{5}{8}$ in.
40 ft.	8 ft. $7\frac{1}{16}$ in.	8 ft. $7\frac{1}{16}$ in.

Maximum pipe clearance inside tower four feet less than height of tower

	Nett Weight cwt. qrs. lbs.						Gross Weight cwt. qrs. lbs.						Shipping Measurements cubic feet	
	3 post			4 post			3 post			4 post			3 post	4 post
6 ft. Mill no Tower	1	2	0	1	2	0	1	3	17	1	3	17	$11\frac{2}{3}$	$11\frac{2}{3}$
6 ft. Mill with 20 ft. Tower	3	2	11	4	0	25	4	0	0	4	2	14	$14\frac{3}{4}$	$15\frac{1}{4}$
6 ft. Mill with 25 ft. Tower	4	0	6	4	3	2	4	1	23	5	0	19	$15\frac{1}{2}$	$15\frac{3}{4}$
6 ft. Mill with 30 ft. Tower	4	2	11	5	2	3	5	0	0	5	3	20	16	$16\frac{1}{2}$
6 ft. Mill with 40 ft. Tower	5	2	6	6	3	15	5	3	23	7	1	4	$17\frac{1}{4}$	$17\frac{1}{2}$
8 ft. Mill no Tower	2	1	20	2	1	20	3	0	11	3	0	11	$15\frac{3}{4}$	$15\frac{3}{4}$
8 ft. Mill with 20 ft. Tower	4	2	3	5	0	17	5	0	22	5	3	8	19	$19\frac{1}{2}$
8 ft. Mill with 25 ft. Tower	4	3	26	5	2	22	5	2	17	6	1	13	$19\frac{1}{2}$	20
8 ft. Mill with 30 ft. Tower	5	2	3	6	1	23	6	0	22	7	0	14	$20\frac{1}{4}$	$20\frac{1}{2}$
8 ft. Mill with 40 ft. Tower	6	2	7	7	3	7	7	0	26	8	1	26	$21\frac{1}{4}$	$21\frac{3}{4}$
10 ft. Mill only no Tower	4	1	9	4	1	9	5	1	0	5	1	0	$25\frac{3}{4}$	$25\frac{3}{4}$
10 ft. Mill with 20 ft. Tower	6	2	7	7	1	1	7	1	25	8	0	19	$28\frac{3}{4}$	$29\frac{1}{4}$
10 ft. Mill with 25 ft. Tower	7	0	7	7	3	16	7	3	25	8	3	6	$29\frac{1}{2}$	$29\frac{3}{4}$
10 ft. Mill with 30 ft. Tower	7	2	13	8	2	16	8	2	3	9	2	6	30	$30\frac{1}{4}$
10 ft. Mill with 40 ft. Tower	8	2	25	10	0	9	9	2	15	11	0	0	31	$31\frac{1}{2}$

In order to reduce shipping space two Type K Heads can be packed in standard size crate without increasing dimensions.

INFORMATION REQUIRED TO CORRECTLY CO-ORDINATE A WINDMILL PUMPING INSTALLATION.

1. Does the water have to be pumped from Well, Bore, or surface supply such as River, Dam, Channel or Underground Tank.
2. If Well or Bore state depth from ground level to lowest water level, size of well or size of bore casing (outside and inside diameter).
3. If surface supply what is the distance and elevation from lowest water level to centre of windmill tower.
4. What is the distance and elevation between windmill and ultimate point of water delivery.
5. Quantity of water available for pumping per hour.
6. Quantity of water required to be pumped per day.
7. Are there any wind obstructions such as Buildings, Trees or Ground Undulations in vicinity of pumping site? If so, full particulars are essential.
8. Should pump, pipe and/or pump rods be already on job full particulars regarding sizes, etc., to be given. Also type of pump.

HOW TO ESTIMATE THE QUANTITY OF WATER REQUIRED DAILY.

ALLOW

- 1 Gallon per day for every head of sheep.
- 10 Gallons per day for every head of cattle or horses.
- 50 Gallons per day per person for domestic use; that is, household purposes, shower, bath, septic tank installations, etc., in an average house.
- 3000 Gallons per day per acre for garden purposes. Thus, if the garden is one-quarter of an acre, approximately 750 gallons per day are required. (This is based on providing the equivalent of one inch of rain per week over the garden).

Windmill Pumping Capacities

Wind is the prime mover governing the capacity of a windmill plant. The wind-wheel must have sufficient area to harness the required wind pressure according to the load, and the gears, etc., must be of ample strength. The best results are usually obtained from a windmill lightly loaded for the reason that it will operate on a lighter wind, and a greater number of strokes per minute are obtained.

Variations in wind velocity prevent definite capacity calculations, but the information contained in the following schedule can be regarded as reasonably reliable for average conditions over a period.

Wind conditions above average may permit of greater pumping head or greater water capacity, but if below average either a larger windmill or smaller pump should be used.

DIAM. OF WINDWHEEL		INTERNAL DIAMETER OF PUMP									
		2"	2 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "	3"	3 $\frac{1}{2}$ "	4"	4 $\frac{1}{2}$ "	5"	6"
6 ft.	Total head in feet	55	42	35	28	24	—	—	—	—	—
	App. av. galls. per day	1000	1390	1570	1920	2250	—	—	—	—	—
8 ft.	Total head in feet	117	90	72	60	50	40	30	—	—	—
	App. av. galls. per day	1000	1410	1580	1920	2250	3120	4000	—	—	—
10 ft.	Total head in feet	212	170	135	104	86	63	50	39	31	—
	App. av. galls. per day	930	1300	1470	1800	2100	2900	3730	4670	5830	—
12 ft.	Total head in feet	363	286	220	170	132	105	83	66	55	50
	App. av. galls. per day	850	1190	1340	1640	1920	2560	3470	4340	5330	7730
14 ft.	Total head in feet	484	382	293	228	176	140	110	88	74	66
	App. av. galls. per day	750	1040	1190	1440	1680	2240	3030	3830	4670	6370

Pump Capacities

APPROXIMATE HOURLY CAPACITY OF METTERS SINGLE ACTING PUMPS AT 30 STROKES PER MINUTE

Pump Stroke	Internal Diameter of Pump											
	2 in.	2 $\frac{3}{8}$ in.	2 $\frac{1}{2}$ in.	2 $\frac{3}{4}$ in.	3 in.	3 $\frac{1}{2}$ in.	4 in.	4 $\frac{1}{2}$ in.	5 in.	6 in.	8 in.	10 in.
4 inch	80	112	127	154	180	250	325	410	500	725	1300	2000
5 inch	100	139	157	192	225	310	400	510	625	900	1625	2500
6 inch	120	169	190	231	270	375	480	615	750	1080	1950	3000
7 inch	140	195	220	270	315	435	560	715	875	1260	2270	3500
8 inch	160	223	254	308	360	480	650	820	1000	1450	2600	4000
9 inch	180	261	284	346	400	550	725	920	1125	1625	2925	4500
10 inch	200	280	317	384	450	620	800	1020	1250	1800	3250	5000
11 inch	220	308	347	423	495	680	880	1125	1375	1980	3575	5500
12 inch	240	335	380	462	540	750	960	1230	1500	2160	3900	6000
14 inch	280	390	440	540	630	870	1120	1430	1750	2520	4540	7000
16 inch	320	447	508	612	720	960	1300	1640	2000	2900	5200	8000
18 inch	360	501	568	692	800	1100	1450	1840	2250	3250	5850	9000
20 inch	400	559	634	768	900	1240	1600	2040	2500	3600	6500	10000
24 inch	480	668	760	924	1080	1500	1920	2460	3000	4320	7800	12000

These are the theoretical quantities delivered. No allowance has been made for the slip or leakage which may take place owing to wear of the leathers or valves. For double-acting pumps multiply the above quantities by two.

FRICITION

The following table shows the friction head per 100 feet of piping, which must be added to the static head to arrive at the total so that the power required may be computed.

For example, to pump 500 gallons per hour through 1000 feet of 1" piping to a height of 200 feet requires sufficient power to pump against a total head of:—

Static Head	200 feet
Plus Friction Head	130 feet

Total 330 feet

It will be obvious that by using larger piping and so reducing the friction head, much less power will be required. For example, by using 2" piping for the same job, the friction head would be reduced to only 4 feet, making a total head of 204 feet.

FRICITION HEAD PER 100 FEET OF NEW PIPE

Galls. per hour	Diameter of Pipe in Inches							
	$\frac{3}{4}$ in.	1 in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{2}$ in.	2 in.	2 $\frac{1}{2}$ in.	3 in.	4 in.
100	3	.7	.2	—	—	—	—	—
200	9.5	2.3	.7	.24	—	—	—	—
300	21	4.7	1.5	.6	—	—	—	—
400	—	8.2	2.7	1.1	.2	—	—	—
500	—	13	4.3	1.6	.4	—	—	—
800	—	—	10	4	.95	.3	—	—
1000	—	—	16	6.3	1.5	.5	—	—
1200	—	—	22	9	2.2	.75	.28	—
1600	—	—	—	15	3.5	1.2	.5	—
2000	—	—	—	22	5.5	1.8	.75	—
2500	—	—	—	40	8.8	2.9	1.2	.28
3000	—	—	—	50	12	3.8	1.6	.35

Metters Force Pumps

For illustrating purposes portion of pump exteriors have been cut away.

No. 1-a

Specially suited for mounting at ground level and pumping through long delivery pipe. Constructed of heavy cast brass throughout, with inspection door and removable retaining valve. Solid brass rod, with gunmetal plunger and machine faced valve.

Stuffing Box with deep gland controlled by two gland bolts.

Flanged to take horizontal delivery pipe.

An extra strong pump suitable for heavy duty.

Internal Diameter of Barrel.	Maximum Plunger Movement.	Size of Pipe.	Size of Rod w/w thread.	Approx. Weight.
3 in.	13½ in.	1½ in.	22 x 5/8	36 lbs.
4 in.	13½ in.	2 in.	22 x 5/8	60 lbs.

No. 1

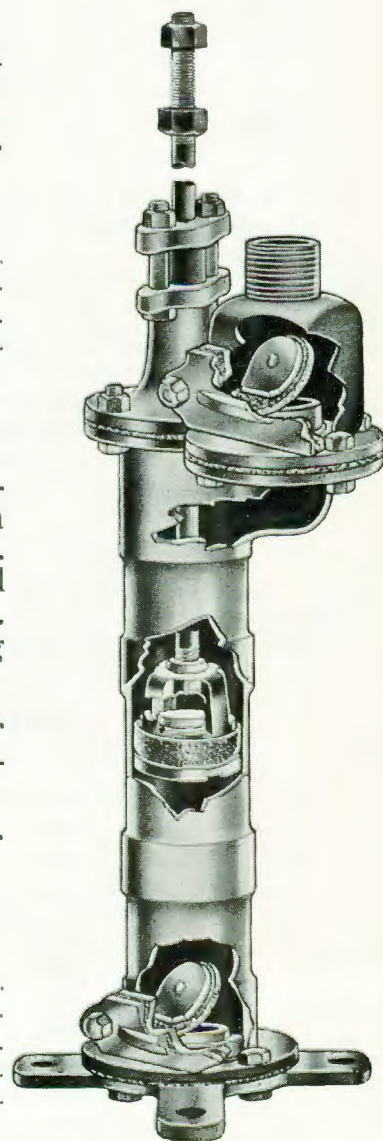
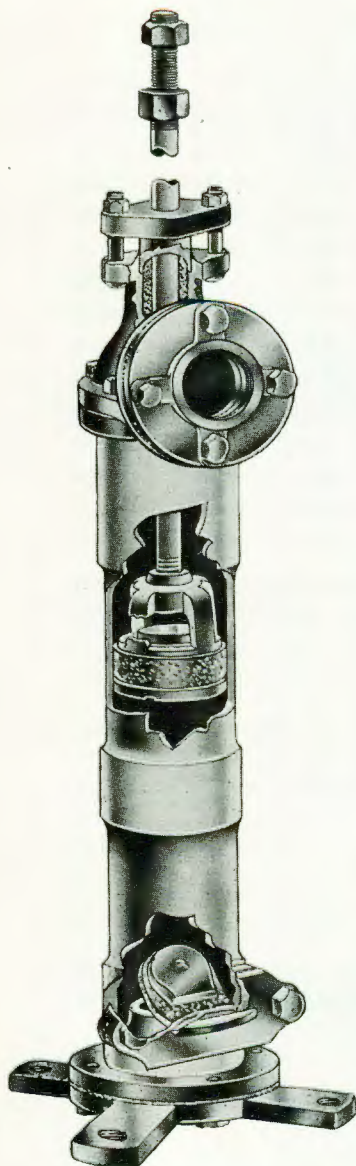
Heavy Cast Brass throughout with inspection cleaning doors to the bottom retaining valve and to the delivery valve. Solid brass plunger rod with gunmetal plunger castings, and mushroom valve. Valve seatings are machined, thus assuring pump against losing its priming.

Brass gland packing box for plunger rod well packed and controlled by two compression bolts with brass nuts.

Specially adapted for deep wells or long delivery pipe.

SIZES STOCKED

Internal Diameter of Barrel.	Maximum Plunger Movement.	Size of Pipe.	Size of brass rod w/w thread.	Approx. Weight.
3 in.	13 in.	1½ in.	21½ x 5/8	49 lbs.
3½ in.	13 in.	2 in.	21½ x 5/8	55 lbs.
4 in.	13 in.	2 in.	21½ x 5/8	62 lbs.



Metters Force Pumps

No. 2

A Heavy Cast Brass Cylinder, with brass top and bottom castings held together with long bolts with brass nuts. Solid brass plunger rod and gunmetal plunger castings with mushroom valve. Cylinder fitted with inspection door for bottom valve, top casting with brass flange, screwed to receive the delivery pipe

Brass packing gland controlled by two bolts with brass nuts.

SIZES STOCKED

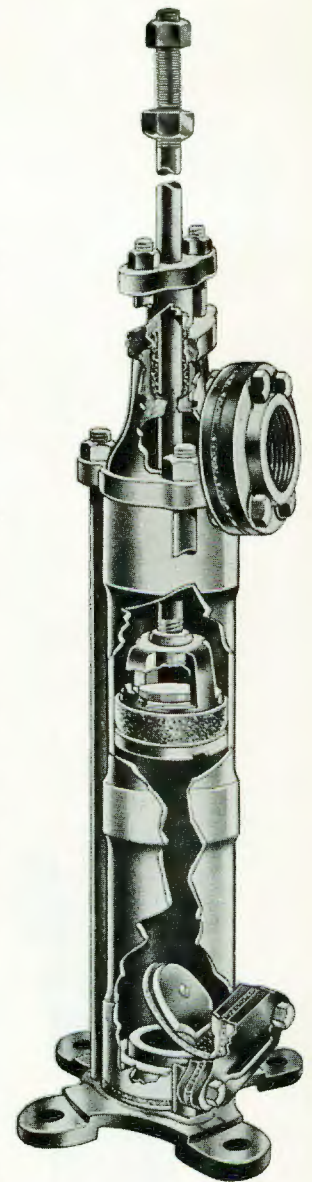
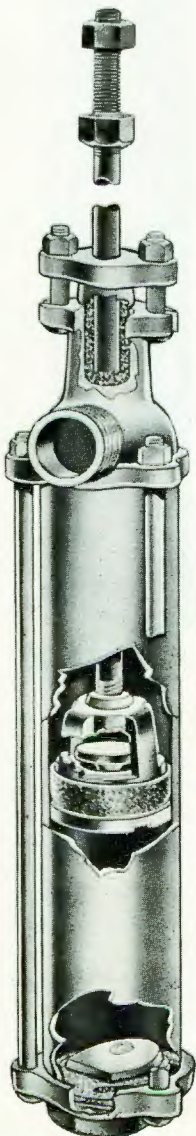
Internal Diameter of Barrel	Maximum Plunger Movement	Size of Pipe	Size of rod w/w Thread	Approx. Weight
3 in.	12 in.	1½ in.	21 x ⅝	37 lbs.
3½ in.	12 in.	2 in.	21 x ⅝	45 lbs.
4 in.	12 in.	2 in.	21 x ⅝	50 lbs.
5 in.	13 in.	2½ in.	24 x ¾	86 lbs.
6 in.	13 in.	3 in.	26 x 7/8	106 lbs.

No. 3

Solid drawn brass barrel, brass plunger rod and gunmetal plunger castings, mushroom valve, built with brass top and bottom castings held together with side bolts, with brass nuts. Brass packing gland controlled by two bolts with brass nuts. The top and bottom castings have a specially machined groove in which is placed the leather packing to receive the edge of the cylinder, which prevents the packing from being blown out under pressure.

ONE SIZE ONLY

Internal Diam. of Barrel	Maximum Plunger Movement	Size of Pipe	Size of rod w/w Thread	Approx. Weight
3 in.	11½ in.	1½ in.	20" x ⅝	24 lbs.



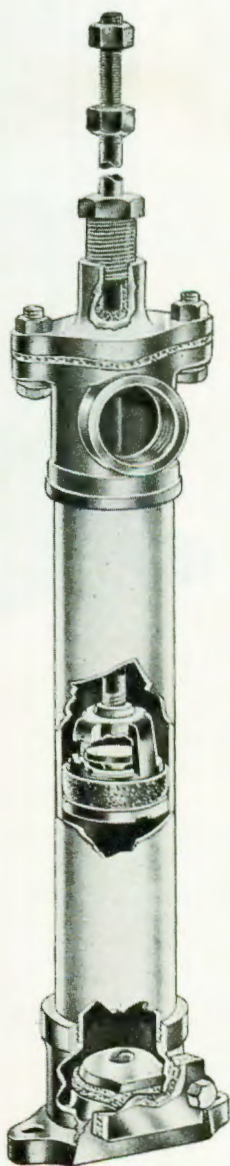
Metters Force Pumps

No. 2A

Solid drawn brass barrel, top and bottom castings of brass with steel side bolts with brass nuts. Brass plunger rod and gunmetal plunger with mushroom valve and best quality leather; screw type brass packing gland.

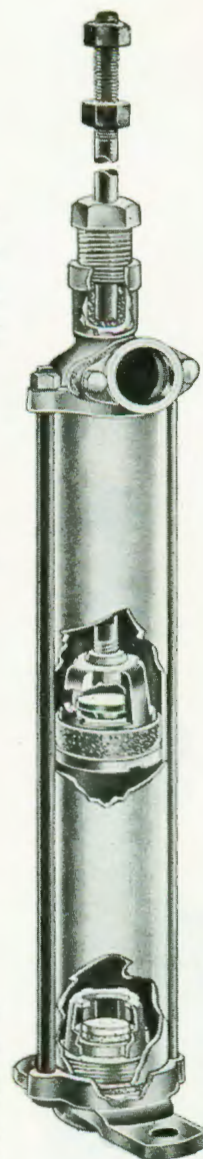
MADE IN ONE SIZE ONLY

Internal Diameter of Barrel	Maximum Plunger Movement	Size of Pipe	Size of rod w/w Thread	Approx. Weight
2½ in.	12 in.	1¼ or 1½ in.	22" x 5/8	22 lbs.



No. 2B

Especially designed for long delivery pipe where pump is established on ground level. Brass top and bottom castings screwed to brass barrel. Bottom casting fitted with bolting down lugs and cleaning clack door, which allows the bottom clack to be removed without disturbing the pump. Brass screw type packing gland and brass rod.



STOCK SIZES

Intern. Diam. of Barrel	Length of Barrel	Maximum Plunger Movement	Size of Pipe	Size of Rod w/w Thread	Approx. Weight
2 in.	14¼ in.	14 in.	1¼ in.	22 in x ½	22 lb.
2½ in.	14½ in.	14 in.	1¼ or 1½ in.	22 in. x 5/8	26 lb.

Metters Cylinder Pumps

No. 4A

Top, Bottom and Barrel are of cast brass held together with long side bolts with brass nuts, Brass Plunger Rod with gunmetal plunger, mushroom valve. The top and bottom castings have a machined groove in which is placed the leather packing to receive the edge of barrel, which prevents the packing from blowing out under heavy pressure. Detachable clack.

SIZES STOCKED

Intern. Diam. of Barrel	Length of Barrel	Maximum Plunger Movement	Size of Pipe	Size of rod w/w thread	Approx. Weight
3 in.	15 $\frac{1}{4}$ in.	10 in.	1 $\frac{1}{2}$ in.	16 x $\frac{5}{8}$	24 lbs.
3 $\frac{1}{2}$ in.	15 $\frac{1}{2}$ in.	10 in.	2 in.	16 x $\frac{5}{8}$	30 lbs.
4 in.	15 $\frac{1}{2}$ in.	11 in.	2 in.	16 x $\frac{5}{8}$	35 lbs.
5 in.	18 in.	12 in.	2 $\frac{1}{2}$ in.	18 x $\frac{3}{4}$	57 lbs.
6 in.	18 $\frac{1}{2}$ in.	12 in.	3 in.	20 x $\frac{7}{8}$	75 lbs.

No. 4

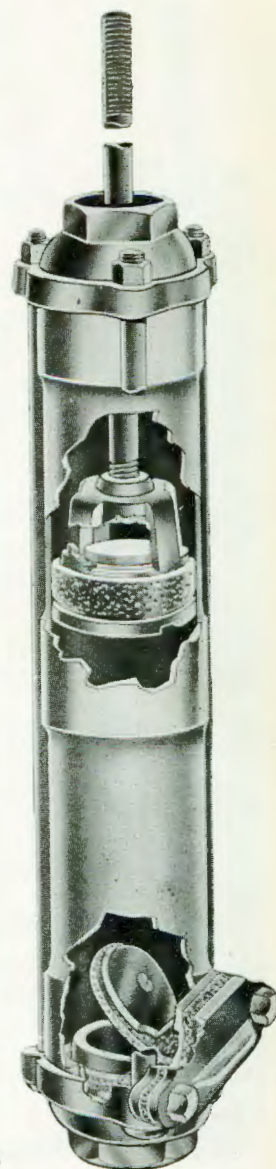
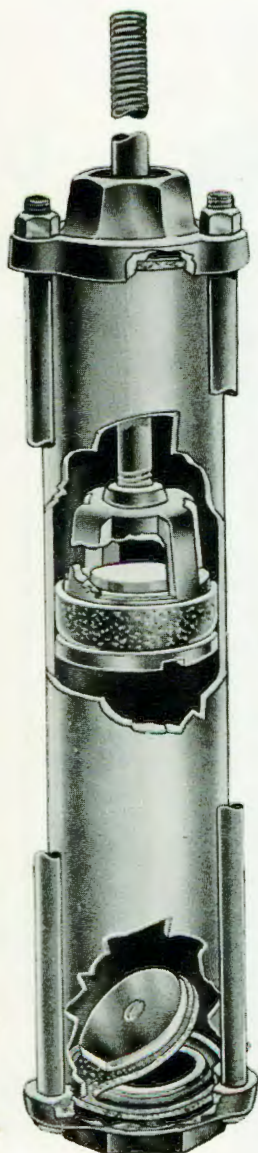
Seamless drawn brass tube barrel.

Brass top and bottom castings, held together with long bolts with brass nuts, which permits pump to be easily taken apart.

The top and bottom castings are specially machined to receive the leather packing. Brass plunger rod with gunmetal plunger fitted with mushroom valve.

SIZES STOCKED

Intern. Diam. of Barrel	Length of Barrel	Maximum Plunger Movement	Size of Pipe	Size of rod w/w thread	Approx. Weight
2 $\frac{1}{2}$ in.	12 $\frac{1}{2}$ in.	9 in.	1 $\frac{1}{4}$ or 1 $\frac{1}{2}$ in.	12 x $\frac{5}{8}$	11 lbs.
2 $\frac{3}{4}$ in.	12 $\frac{1}{2}$ in.	9 in.	1 $\frac{1}{4}$ or 1 $\frac{1}{2}$ in.	14 x $\frac{5}{8}$	12 lbs.
3 in.	14 $\frac{1}{4}$ in.	12 in.	1 $\frac{1}{2}$ in.	16 x $\frac{5}{8}$	16 lbs.
3 $\frac{1}{2}$ in.	15 in.	12 in.	2 in.	16 x $\frac{5}{8}$	20 lbs.
4 in.	15 in.	12 in.	2 in.	16 x $\frac{5}{8}$	23 lbs.
5 in.	19 in.	14 in.	2 $\frac{1}{2}$ in.	18 x $\frac{3}{4}$	44 lbs.
6 in.	19 in.	14 in.	3 in.	20 x $\frac{7}{8}$	67 lbs.



Metters Cylinder Pumps

No.5

Flush exterior suitable for bores

Solid drawn brass tube barrel $\frac{3}{16}$ inch thick with brass top and bottom castings screwed to barrel, gunmetal plunger castings, mushroom valves. The bottom or retaining valve of this pump is also mushroom pattern with caged follower. The inlet valve openings are arranged to allow free ingress of water. Brass plunger rod.

SIZES STOCKED

Intern. Diam. of Barrel	Length of Barrel	Maximum Plunger Movement	Size of Pipe	Size of rod w/w thread	Approx. Weight
2 in.	18 in.	13 in.	$1\frac{1}{4}$ in.	$16 \times \frac{1}{2}$	13 lbs.
$2\frac{3}{8}$ in.	18 in.	13 in.	$1\frac{1}{4}$ in.	$16 \times \frac{1}{2}$	14 lbs.
$2\frac{3}{4}$ in.	18 in.	$13\frac{1}{2}$ in.	$1\frac{1}{2}$ in.	$16 \times \frac{3}{4}$	18 lbs.
3 in.	18 in.	$13\frac{1}{2}$ in.	2 in.	$16 \times \frac{3}{4}$	19 lbs.
$3\frac{1}{2}$ in.	18 in.	13 in.	2 in.	$16 \times \frac{3}{4}$	22 lbs.
4 in.	18 in.	$12\frac{1}{2}$ in.	2 in.	$16 \times \frac{3}{4}$	30 lbs.
$4\frac{1}{2}$ in.	20 in.	13 in.	$2\frac{1}{2}$ in.	$18 \times \frac{3}{4}$	46 lbs.
5 in.	20 in.	13 in.	$2\frac{1}{2}$ in.	$18 \times \frac{3}{4}$	50 lbs.
6 in.	24 in.	16 in.	3 in.	$20 \times \frac{7}{8}$	71 lbs.

Obtainable with two Plunger Leathers or with two complete Plunger Valves and Leathers, and longer barrel at extra cost. This pump can be supplied with 10 gauge, solid drawn brass barrel, any length, in sizes 2, $2\frac{1}{2}$, $2\frac{3}{4}$, and 3 inches (internal diam.).

No.6

Plunger and bottom Valve may be withdrawn through pipe column without disturbing pipe. Special tool supplied with pump.

Solid drawn brass barrel $\frac{3}{16}$ in. thick, brass plunger rod and gunmetal plunger castings and bronze mushroom valve. Provision is made for full flow of water into barrel by increasing the internal diameter of the bottom casting. To enable the withdrawal of plunger and bottom valve, pipe slightly larger in diameter than the internal diameter of barrel is essential.

SIZES STOCKED

Intern. Diam. of Barrel	Length of Barrel	Maximum Plunger Movement	Size of Delivery Pipe	Size of Suction Pipe	Size of rod w/w thread	Approx. Weight
$1\frac{3}{4}$ in.	18 in.	13 in.	2 in.	$1\frac{1}{2}$ in.	$18 \times \frac{1}{2}$	19 lbs.
$2\frac{3}{8}$ in.	18 in.	13 in.	$2\frac{1}{2}$ in.	2 in.	$18 \times \frac{1}{2}$	24 lbs.
$2\frac{3}{4}$ in.	18 in.	13 in.	3 in.	$2\frac{1}{2}$ in.	$18 \times \frac{3}{4}$	35 lbs.

Can be supplied with two Plunger Leathers or with two complete Plunger Valves and Leathers at extra cost.



Metters Draw Plunger Pump

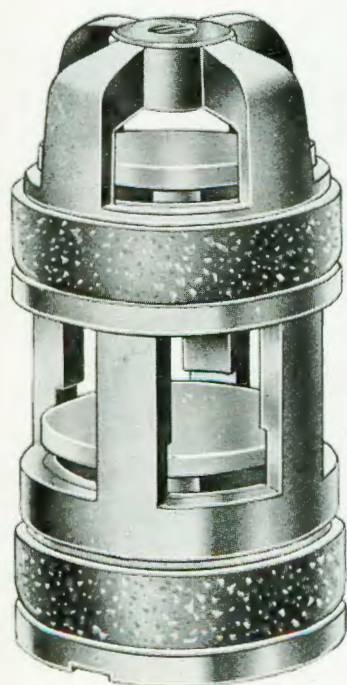
No. 7

Solid drawn brass barrel, 3/16 in. thick, brass rod and gun-metal plunger. Double ball plunger valves of specially selected bronze, and three plunger leathers. Bottom ball valve of bronze, with double leathers. To enable plunger and bottom valve to be withdrawn through pipe column, the delivery pipe must be slightly larger in diameter than internal diameter of pump barrel. To raise bottom valve, plunger should be slightly lowered to engage thread on valve.

SIZES STOCKED

Intern. Diam. of Barrel	Length of Barrel	Maximum Plunger Movement	Size of Delivery Pipe	Size of Suction Pipe	Size of rod w/w thread	Approx. Weight
2 ³ / ₈ in.	30 in.	14 in.	2 ¹ / ₂ in.	2 in.	18 x ⁵ / ₈	23 lbs.
2 ³ / ₄ in.	30 in.	14 in.	3 in.	2 in.	18 x ⁵ / ₈	32 lbs.

Longer barrels made to instructions



Double Valve Plunger



Single Valve, Double Leather Plunger

All Metters Pumps with solid drawn brass tube barrels can be supplied with either double valve plunger with double leathers, or single valve plunger with double leathers, at extra cost.

List prices include single valve, single leather plungers.

Note ample water clearance. Valves shown are only half open.

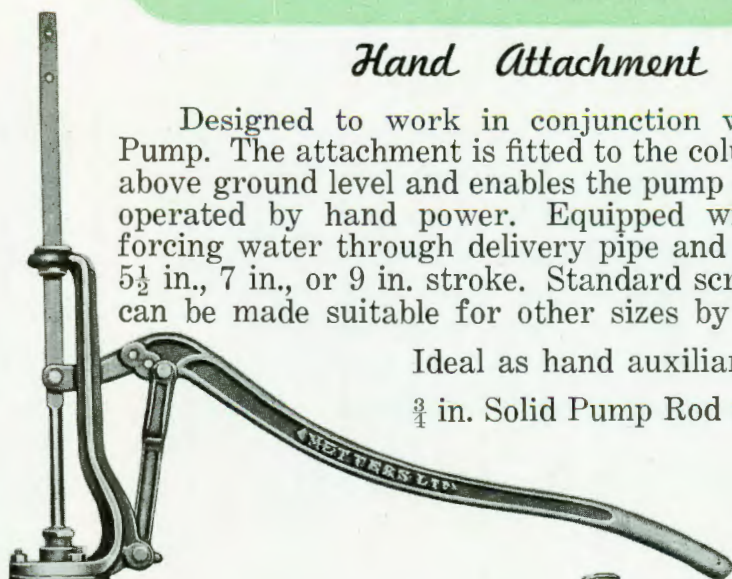
Metters Pumping Equipment

Hand Attachment No. 3

Designed to work in conjunction with ordinary cylinder Pump. The attachment is fitted to the column pipe and pump rod above ground level and enables the pump down bore or well to be operated by hand power. Equipped with packing gland for forcing water through delivery pipe and adjustable fulcrum for $5\frac{1}{2}$ in., 7 in., or 9 in. stroke. Standard screwed for 2 in. pipe but can be made suitable for other sizes by ordinary pipe fittings.

Ideal as hand auxiliary to windmill plant.

$\frac{3}{4}$ in. Solid Pump Rod with $\frac{5}{8}$ W/W. thread.



Illustrating method of establishing Hand Attachment to column pipe, rods and pump.

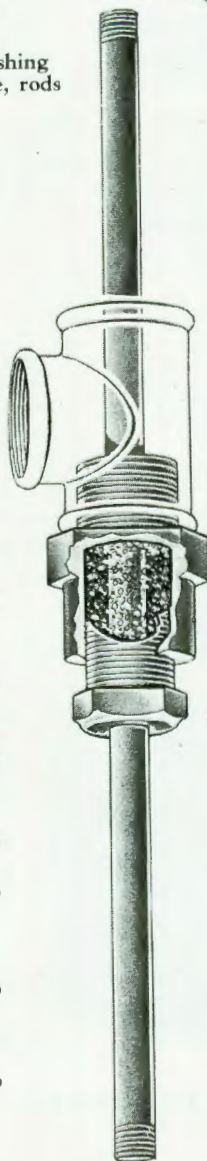
Brass Stuffing Box and Rod

When applied with with a tee piece to the delivery pipe and connected up to the pump rod will convert a cylinder into a force pump.

Sizes stocked are screwed for pipe $1\frac{1}{4}$ in., $1\frac{1}{2}$ in., 2 in., $2\frac{1}{2}$ in., and 3 in.

$\frac{5}{8}$ W/W. brass rod for $1\frac{1}{4}$ in., $1\frac{1}{2}$ in., 2 in.

$\frac{3}{4}$ in. W/W. brass rod for $2\frac{1}{2}$ in., 3 in.



All Brass Differential Compensator

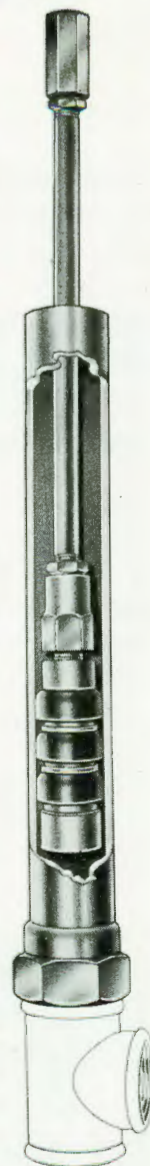
Used in conjunction with cylinder pumps to force water. Utilizes weight of column rods in deep bores and wells on down stroke, but not recommended for shallow depths.

The barrel takes in portion of the pump discharge on the up stroke, and on the down stroke this portion is forced out of the compensator through the delivery pipe line.

Thus the power of the down-stroke is used to relieve the up-stroke of portion of the load resulting in a double action movement.

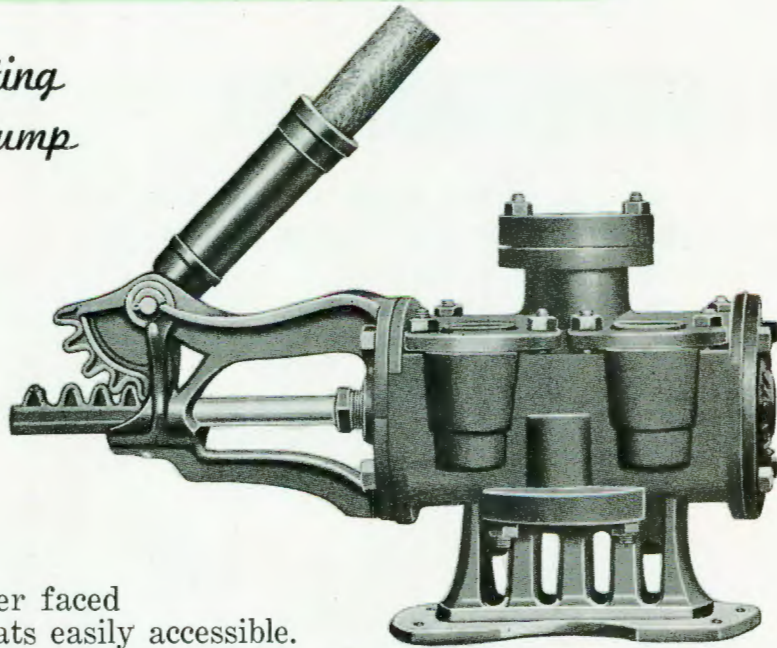
Manufactured to suit column Pipes from $1\frac{1}{4}$ in. to 3 in.

Size and thread of the pump rod connections to be specified.



Metters Hand Pumps

No. 10 Double Acting Lowdown Hand Pump



Equipped with four rubber faced valves and brass valve seats easily accessible.

Waterways full 2 inch diameter. Machine faced cylinder bright steel piston rod and brass packing gland nut. Standard screwed for 2 inch pipe but can be supplied for 1½ inch.

Diameter of cylinder—5 inches.

Length of stroke—5 inches.

Capacity at 30 strokes per minute—1,250 gallons per hour.

Maximum suction—20 ft.

Maximum total head—60 ft.

Weight—approximately 94 lbs.

Can be supplied with brass cylinder liner at extra cost.

Metters Douglas Pattern Hand Pump

Maximum suction 25 ft. Equipped with brass plunger castings, machine faced barrel and bottom casting with machined brass valve seat.

No.	of Barrel	Pipe	Weight
2	2½ in.	1½ in.	22 lbs.
3	2¾ in.	1½ in.	26 lbs.
4	3 in.	2 in.	32 lbs.
5	3½ in.	2 in.	35 lbs.
6	3½ in.	2½ in.	52 lbs.

If any variation in size of suction is desired, same can be obtained by the use of a reducing socket or brass ring and tail at extra cost.



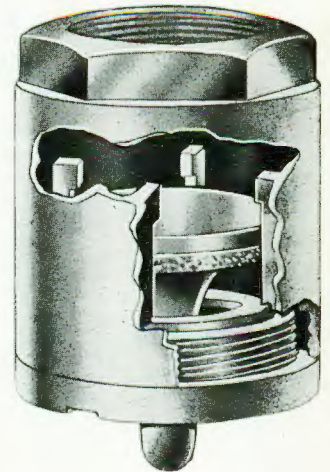
Metters Pumping Equipment

All Brass Bore Foot Valve

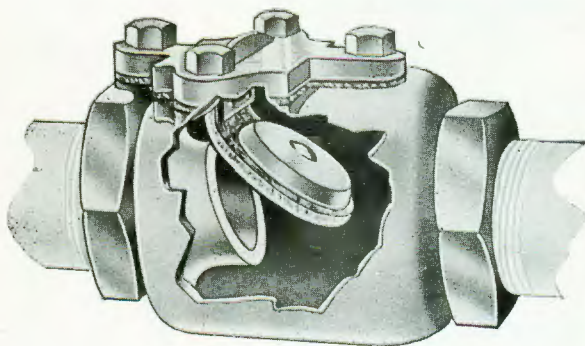
Compact in area, and giving a free passage for water. Can be supplied with poppet valve as illustrated, or with clack valve. (To be specified.)

Sizes stocked are screwed for— $1\frac{1}{4}$ in., $1\frac{1}{2}$ in., 2 in., $2\frac{1}{2}$ in., 3 in. pipe.

Can be supplied with brass gauze strainer at extra cost if required.



Metters Check Valve



The cleaning door enables replacement of leathers without disturbing the pipe line. Can be used in a vertical position or placed horizontally. If the latter, the door must face upwards. Can be supplied in all brass, galvanised, or black cast iron. Sizes stocked are screwed for— $1\frac{1}{4}$ in., $1\frac{1}{2}$ in., 2 in., $2\frac{1}{2}$ in., 3 in. pipe.

Galvanised Foot Valve and Strainer

Supplied in sizes from $\frac{3}{4}$ in. to 3 in. pipe.



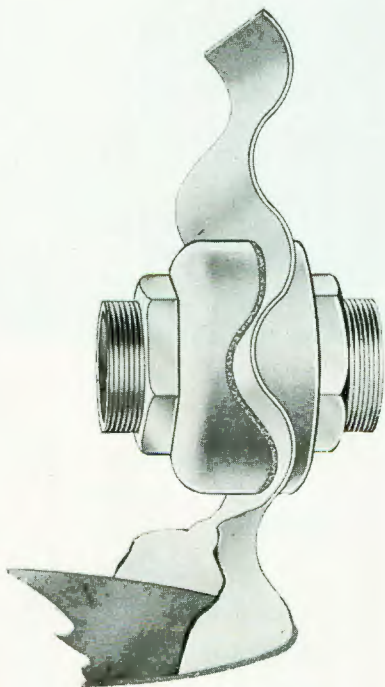
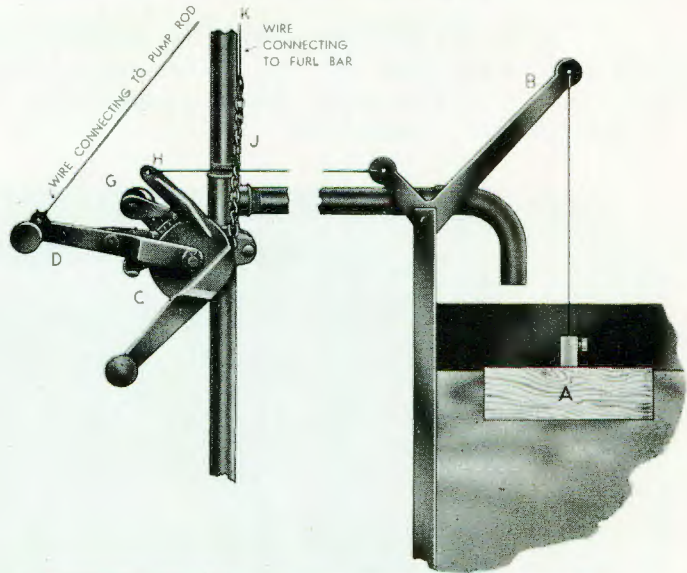
Metters Pumping Equipment

Automatic Stopping Gear for Windmills

MADE IN TWO SIZES:

No. 1—For 5, 6, and 8 ft. Mills.

No. 2—For 10, 12, and 14 ft. Mills.



Cast Corrugated Flanges

For connecting pipes to corrugated tanks.

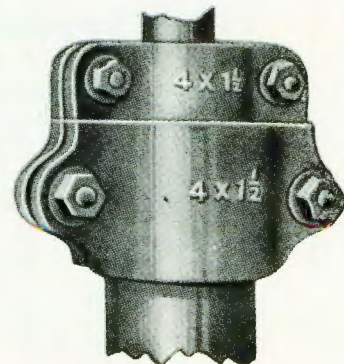
No solder required. Supplied complete with long nipple and back nuts, and necessary packing or castings only. Made in all sizes from $\frac{1}{2}$ to 3 in.

Cast Iron Bore Clamps

Compact, easily applied, and requires very little attention.

A three-part clamp to apply to steel bore casing and to support pipe column. Also forms cover over bore.

Stock sizes for 4 in., 5 in., 6 in., and $6\frac{1}{2}$ in. steel casing and for $1\frac{1}{4}$ in., $1\frac{1}{2}$ in., 2 in., $2\frac{1}{2}$ in., and 3 in. pipe. When ordering please quote outside diameter of casing and inside diameter of pipe.

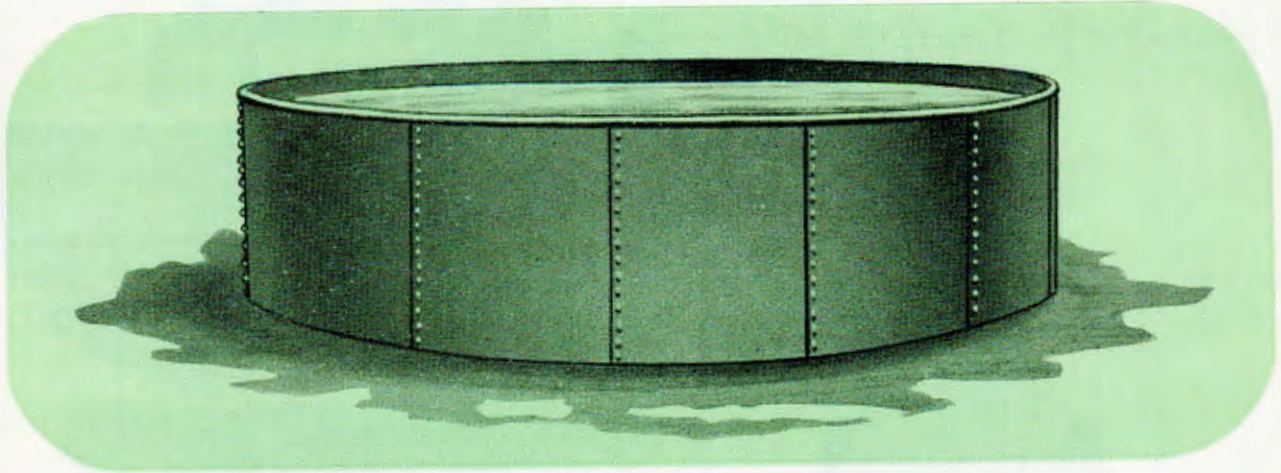


Metters Steel Squatters Tanks

WITH OR WITHOUT BOTTOM

Galvanised 18 gauge steel sheets 6 ft. high. Black 14 gauge steel sheets 6 ft. high.

Supplied in sections ready to assemble complete with bolts, battens, felt packing and angle iron ring for top. Extra angle iron ring for bottom and outlet flanges can be supplied at extra cost. Stock sizes 5,000, 10,000, 15,000, 20,000, and 30,000 gallons (approximate) capacities.



BLACK

Without Bottom			With Steel Bottom	
Approx. Capacity Galls.	Diameter	Approx. Weight Cwt.	Diameter	Approx. Weight Cwt.
5,000	14 ft. 8 in.	11 $\frac{3}{4}$	13 ft. 5 in.	17 $\frac{1}{2}$
10,000	19 ft. 6 in.	15 $\frac{3}{4}$	18 ft. 3 in.	25 $\frac{1}{2}$
15,000	24 ft. 6 in.	19 $\frac{3}{4}$	23 ft. 2 in.	35 $\frac{1}{2}$
20,000	27 ft.	21 $\frac{3}{4}$	25 ft. 6 in.	43
30,000	31 ft. 8 in.	25 $\frac{3}{4}$	30 ft. 6 in.	54

GALVANISED

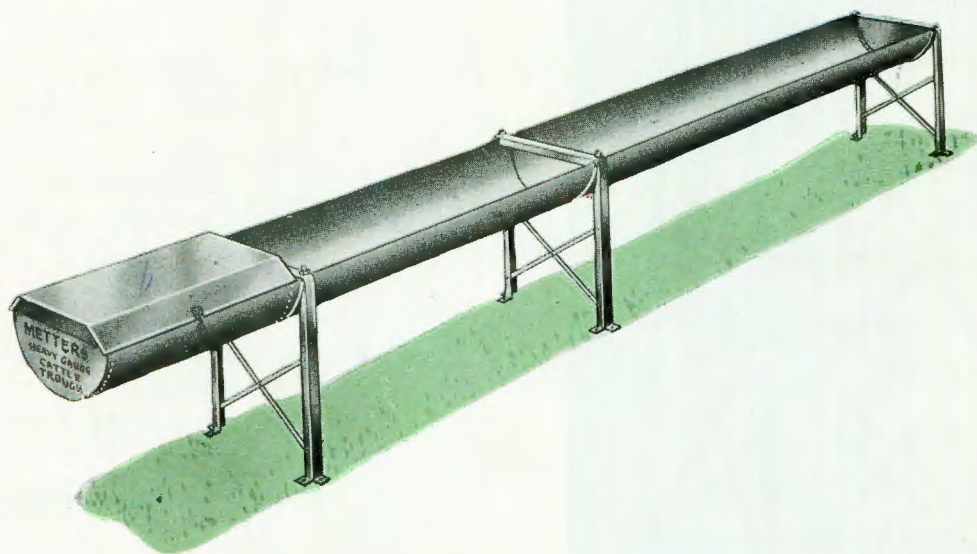
Without Bottom			With Steel Bottom	
Approx. Capacity Galls.	Diameter	Approx. Weight Cwt.	Diameter	Approx. Weight Cwt.
5,000	14 ft. 8 in.	8 $\frac{3}{4}$	13 ft. 5 in.	12
10,000	19 ft. 6 in.	11 $\frac{1}{4}$	18 ft. 3 in.	17 $\frac{1}{2}$
15,000	24 ft. 6 in.	14 $\frac{1}{4}$	23 ft. 2 in.	24 $\frac{1}{2}$
20,000	27 ft.	15 $\frac{3}{4}$	25 ft. 6 in.	28
30,000	31 ft. 8 in.	18 $\frac{3}{4}$	30 ft. 6 in.	37

Metters Stock Troughing

Heavy series, 12, 14 or 16 gauge. Galvanised. Supplied in six foot sections. Sections to be joined together by yokes and bands, or standards (legs), to form any length trough required.

Flanged ends, riveted or with yokes and bands.

Illustrating a 12-ft. Metters Heavy Series Cattle Trough, with one high end riveted, Cover and Division, 30 in. Standards, which include Yokes and Bands for joining, also for coupling other end, which can be very easily removed for flushing out purposes.



Stock Sizes		Approx. Weight per 6 ft. section		Approx. Capacity per 6 ft. section	
Width	Depth	12-G.	14-G.	16-G.	Galls.
15 in.	8 in.	0 1 20	0 1 10	0 1 4	22
18 in.	10 in.	0 2 4	0 1 22	0 1 12	34
21 in.	12 in.	0 2 16	0 2 4	0 1 20	48

Troughing quoted per foot. Ends, Yokes and Bands, or Standards and Cover and Division for Ballcock, quoted separately.

Metters Pattern Trough Standards include angle steel legs, yoke and band. Standards for cattle trough are 30 in. high, and for sheep trough 13 in. high.

Supplied painted or heavily galvanised after manufacture.

Metters Steel Tank Stands



Stock sizes—6 ft., 10 ft., 15 ft., and 20 ft. high for 1,000, 2,000, and 3,000 gallon tanks. Other sizes made to instructions.

Can be supplied painted or heavily Galvanised after manufacture and with or without hardwood bearers and decking.

TIMBER SPECIFICATIONS

1,000 Gallon

Deck 6 x 1½. 6/6' 2/5'3" 2/4'6" 2/3'3".
Bearers 6 x 3. 4/4'3".

2,000 Gallon

Deck 8 x 1½. 5/8'6" 2/8' 2/7'3" 2/6' 2/4'3".
Bearers 9 x 3. 3/5'9" 2/6'3".

3,000 Gallon

Deck 8 x 1½. 2/10'6" 2/10'3" 2/10' 2/9'6" 2/6'6"
2/8'8" 2/7'8" 2/4'4".
Bearers 12 x 4. 3/7'2" 2/7'10".

List prices include timber.

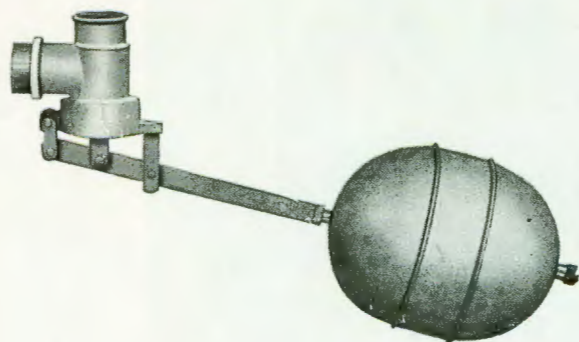
Showing a 2,000-Gallon Tank on a stock pattern 20 ft. Stand

Approximate Weights complete with timber

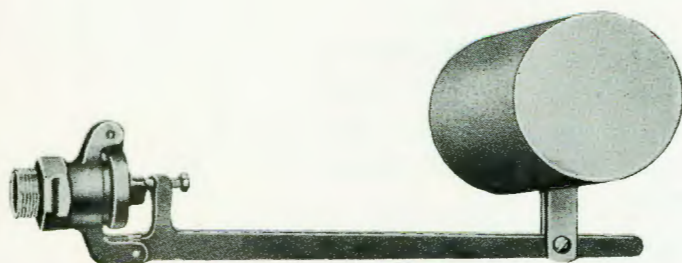
Capacity of Tank	6 ft. High C. Q. Lbs.	10 ft. High C. Q. Lbs.	15 ft. High C. Q. Lbs.	20 ft. High C. Q. Lbs.	Diam. of Deck
1,000 Galls.	6 0 23	6 3 24	8 1 3	9 1 13	6 ft. 0 in.
2,000 Galls.	12 3 5	14 2 7	15 3 6	17 3 11	8 ft. 6 in.
3,000 Galls.	17 0 10	18 2 5	20 0 12	22 0 21	10 ft. 3 in.

Metters Trough Valves

Lambert Pattern



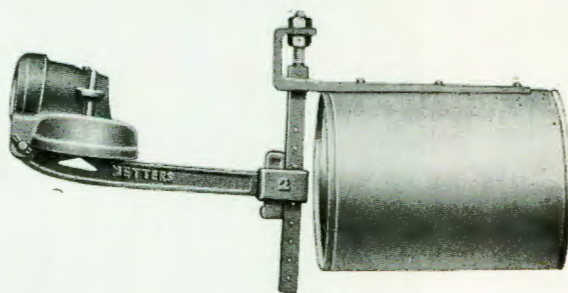
A Highly-finished Valve, constructed of Brass, with a Copper Float and a very efficient seating arrangement. Recommended for use in conjunction with long Sheep and Cattle Troughs. Manufactured for 2 in., 2½ in., and 3 in. pipe. Capable of holding water against pressure up to 60 lb. sq. inch.



Metters Pattern

A Full Flow Brass Valve with Galvanised Float. Can be supplied with Copper Float if required. Sizes stocked for ¾, 1, 1¼, and 1½ in. pipe.

"Pastoral" Pattern



This Valve is favoured by pastoralists throughout Australia owing to its simplicity and absolute reliability.

Constructed of specially selected Brass with Rubber Seating.

Will take full pipe flow.

Supplied with either Brass or Galvanised Iron Float. (To be specified.)

Float provided for double adjustment.

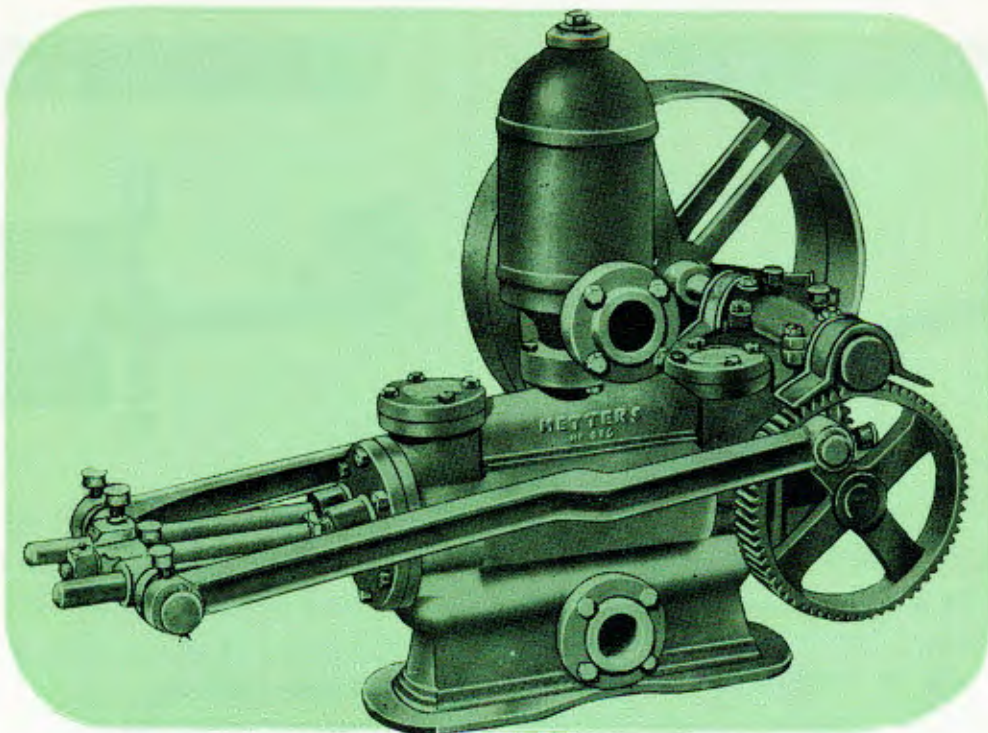
One size only—for 2 in. pipe, but can be bushed for smaller pipe.



High Low Ballcock

An All-Brass Valve with Copper Float for ¾ in., 1 in., 1¼ in., or 1½ in. Pipe. For use on Small Troughs.

Metters Double Action Power Pump



Can be supplied with a special cylinder reduced to 4 in. bore to enable 2 in. pipe to be used over long distances where cost of pipe is a great consideration.

Approximate Weight, 7 cwt. 2 qrs.

No. 510 Heavy Duty

Brass Lined Cylinder, 5 in. bore x 10 in. stroke, double geared 5 to 1, 24 in. fast and loose pulleys.

Piston of brass and secured by brass nuts and cotter pin to polished brass piston rod which passes through brass packing gland.

Valves of prepared rubber seated on brass gridseats and furnished with bronze spring.

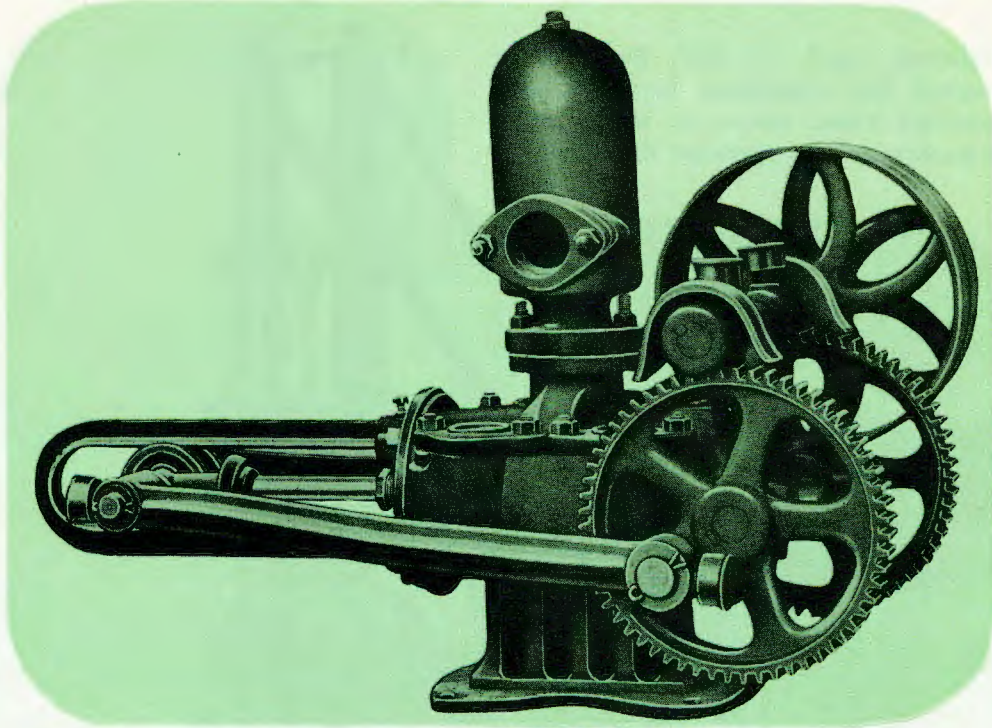
Inspection plates give easy access to valves.

Air chamber and outer bearing for drive shaft included in standard equipment.

Flanges for 2½ in. suction and delivery pipe are provided. Other sizes to instructions.

Tested capacity at 25 strokes per minute, 2,050 gallons per hour; at 35 strokes per minute, 2,860 gallons per hour. Capable of delivering water to an elevation of 350 feet through 2½ inch pipe at 25 strokes per minute.

Metters Double Action Power Pump



No. 10A

Cylinder 5 in. in diameter, fitted with four easily accessible metal valves, rubber faced, and with brass seats.

Piston of polished steel, with brass Stuffing Box nut. Suction and delivery ports are screwed for 2 in. pipe.

12 in. x $2\frac{1}{2}$ in. fast and loose pulleys.

Gear Ratio—5 to 1; 5 inch stroke.

Capacity at 30 strokes per minute—1,250 gallons per hour.

Specially designed for shallow pumping.

Maximum total head—60 feet.

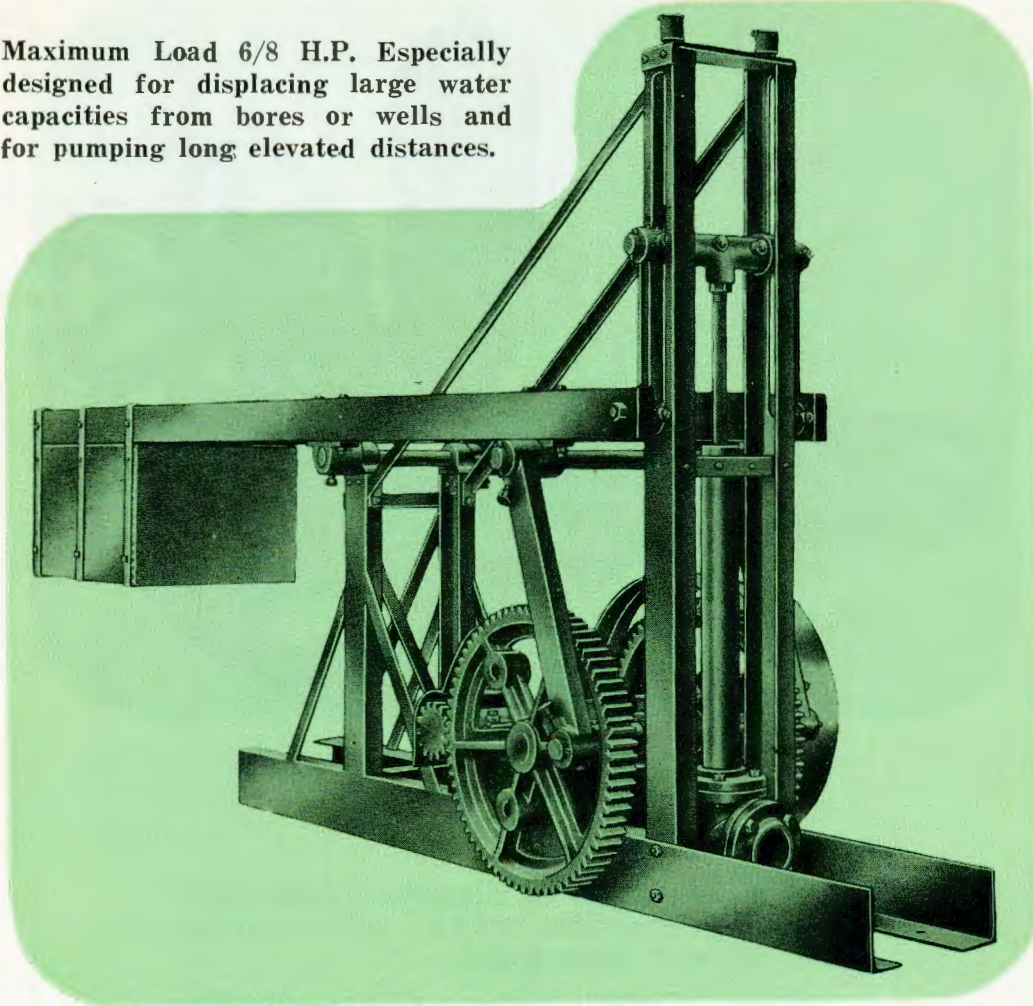
Maximum Suction—20 feet. (Vertical.)

Weight—1 cwt. 3 qr. 7 lb.

Can be supplied with heavy brass lined cylinder and with 16 in. or 24 in. pulleys at extra cost.

Metters Heavy Duty Pumping Beam

Maximum Load 6/8 H.P. Especially designed for displacing large water capacities from bores or wells and for pumping long elevated distances.



Equipped with $2\frac{3}{4}$ inch brass compensator tapped for $\frac{3}{4}$ or $\frac{7}{8}$ w.w. pump rod at bottom end and fitted with $1\frac{1}{8}$ inch steel rod to crosshead.

Crank movement effectively guided in 4 x 2 inch channel steel uprights.

Channel Steel Base—6 x 3.

Double Rocking Beam of 4 x 2 Channel Steel

Adjustable Strokes—16, 20, and 24 inch.

Replaceable Bronze Bearings to all pitman arms.

Cast in anti-friction Bearings to pinion and gearshaft.

Gear Ratio—5 to 1.

Fast and Loose Pulleys—27 x $4\frac{1}{4}$ inch.

For $2\frac{1}{2}$ or 3 inch column and delivery pipe.

Overall measurements—Width 3 ft. 10 in.; Height 5 ft. 9 in.; Length 12 ft.

Maximum Speed—25 Strokes per minute.

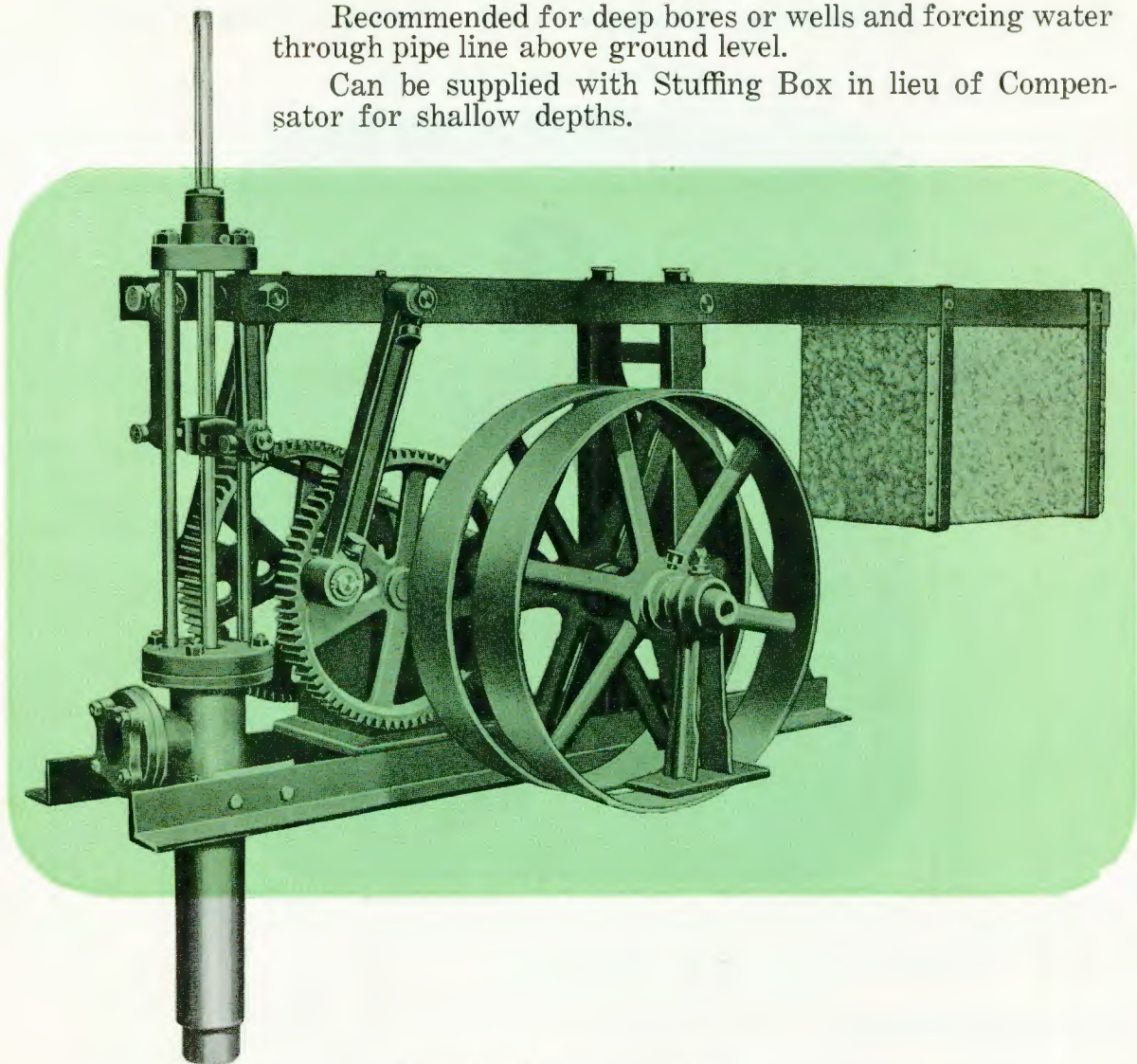
Weight—13 cwt.

Metters Medium Pumping Beam

Fitted with Compensator—Maximum Load 4 H.P.

Recommended for deep bores or wells and forcing water through pipe line above ground level.

Can be supplied with Stuffing Box in lieu of Compensator for shallow depths.



Standard Specifications:

Gear Ratio—7 to 1.

Fast and Loose Pulleys—27 in. x $3\frac{1}{2}$ in.

Length of Adjustable Strokes, $13\frac{3}{4}$ in., $16\frac{1}{2}$ in., and $19\frac{1}{4}$ in.

For $2\frac{1}{2}$ in. Column and Delivery Pipes.

Replaceable Anti-friction (Whitemetal) Bearings for Gearshaft and Pinion Shaft.

Steel Rod— $1\frac{1}{8}$ in. diameter screwed for $\frac{3}{4}$ in. gas both ends.

Inside Compensator Casting, lower end, screwed for $\frac{3}{4}$ in. Gas pump rod.

Brass Compensator Tube—2 in. internal diameter.

Overall Measurements—Length, 8ft.; Width, 3 ft.; Height from top of rod when at top of stroke to base angles, 5 ft. 1 in.

Weight—8 cwt.

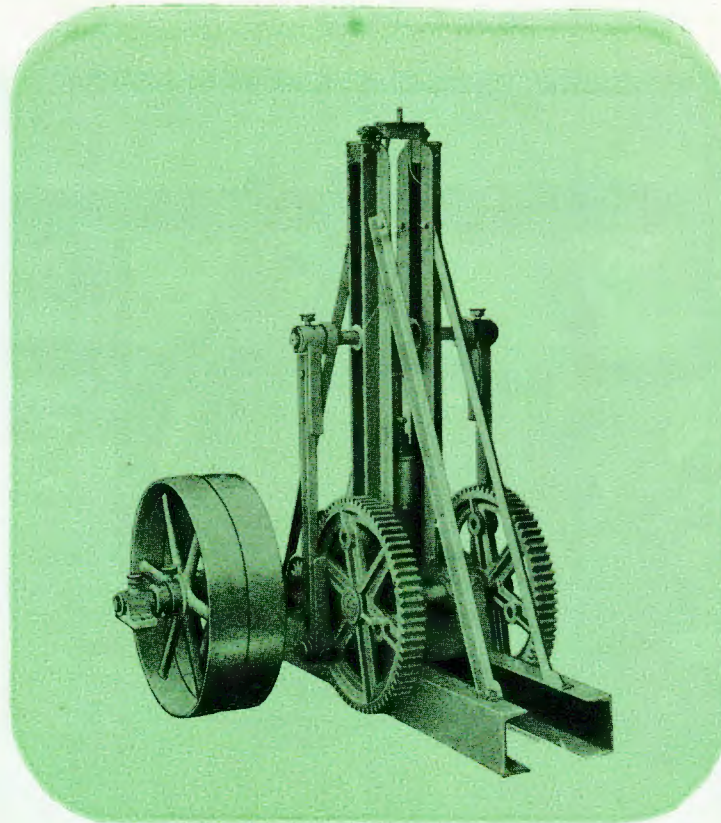
Maximum Speed—25 strokes per minute.

Metters Pumping Gears

No. 180

Especially designed for heavy duty

Maximum Load 6.8 H.P.



Adjustable Stroke—12 in., 15 in., or 18 in.

Gear Ratio—5 to 1.

Fast and Loose Pulleys—27 in. diam. x $4\frac{1}{4}$ in. face.

Double Angle Steel Rod Guides with Lubricated Rollers, supported by Angle Steel Stays.

$2\frac{1}{2}$ in. Gear Shaft and $1\frac{3}{4}$ in. Pulley Shaft of polished steel with high-class anti-friction bearings.

Outer Bearing for pulley shaft included.

Brass Stuffing Box and $1\frac{1}{8}$ Steel Rod screwed for $\frac{3}{4}$ Gas pump rod.

Approximate Weight—10 cwt. 0 qr. 17 lb.

Metters Pumping Gears

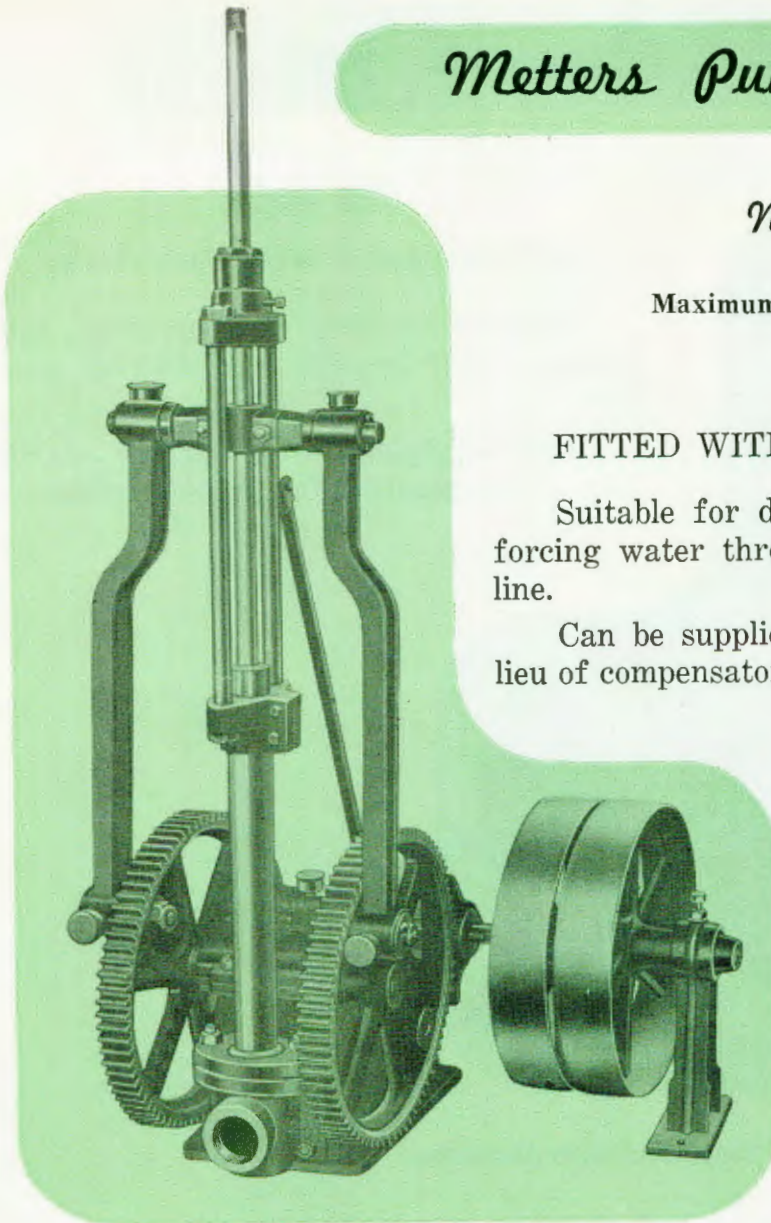
No. 14

Maximum Load 4 H.P.

FITTED WITH COMPENSATOR

Suitable for deep wells or bores and forcing water through long pipe delivery line.

Can be supplied with Stuffing Box in lieu of compensator for shallow depths.



Standard Specifications:

Gear Ratio—7 to 1.

Fast and Loose Pulleys—18 in. diameter x $3\frac{1}{2}$ in. face.

Length of Adjustable Strokes—10 in., 12 in., and 14 in.

For $2\frac{1}{2}$ in. Column and Delivery Pipes.

Replaceable Anti-friction (Whitemetal) Bearings for Gearshaft and Pinion Shaft

Crosshead Clamp, detachable for operation as auxiliary to windmill
Steel Rod— $1\frac{1}{8}$ in. diameter screwed $\frac{3}{4}$ in. gas.

Compensator Body screwed for $\frac{3}{4}$ in. gas column pump rods.

Compensator Brass Tube—2 in. internal diameter.

Overall Measurements—Width, 3 ft.; Height to top of rod when at top of stroke, 5 ft. 9in.

Weight— $4\frac{3}{4}$ cwt.

Maximum Speed—30 strokes per minute.

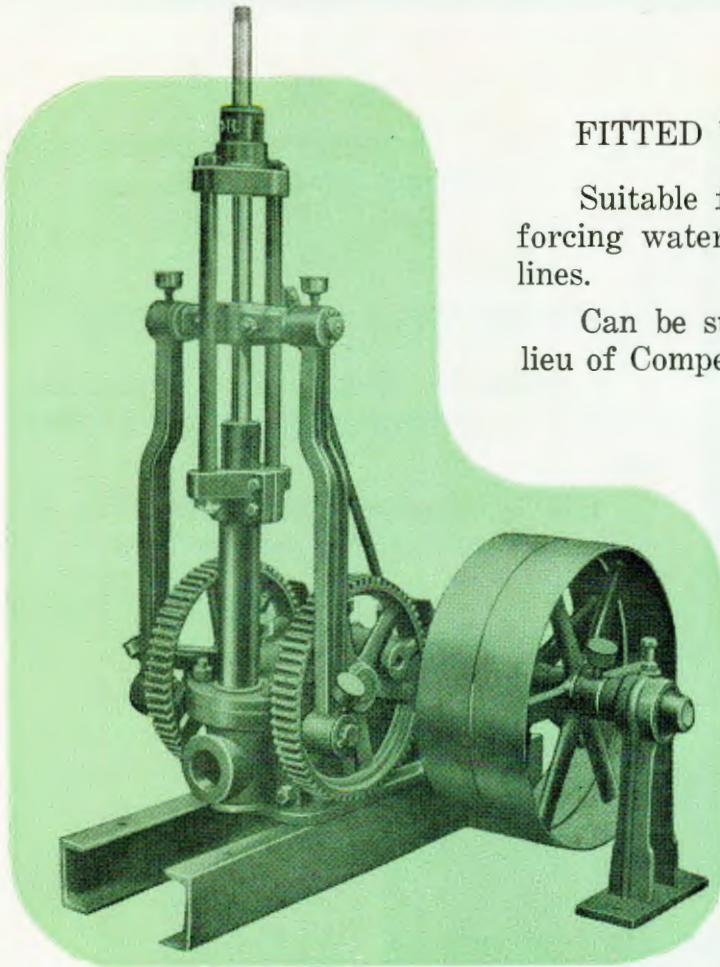
Metters Pumping Gears

No. 401

FITTED WITH COMPENSATOR

Suitable for deep wells or bores, and forcing water through long delivery pipe lines.

Can be supplied with Stuffing Box in lieu of Compensator for shallow depths.



Standard Specifications:

Gear Ratio—5 to 1.

Fast and Loose Pulleys—18 in. diameter x $3\frac{1}{2}$ in. face.

Length of Adjustable Stroke—5 in., 7 in., 10 in.

For 2 in. Column and Delivery Pipes.

Replaceable Anti-friction (Whitemetal) Bearings for Gearshaft and Pinion Shaft.

Steel Rod, $1\frac{1}{8}$ in. diameter screwed $\frac{3}{4}$ gas. Crosshead clamp detachable for operation as auxiliary to windmill installation.

Compensator Body—screwed for $\frac{3}{4}$ gas column pump rods.

Brass Compensator Tube—2 in. internal diameter.

Channel Iron Bed Base.

Overall Measurements—Base, 3 ft. x 2 ft. 9 in.; Height, 4 ft. 9 in. to top of rod when at top of stroke.

Weight—4 cwt.

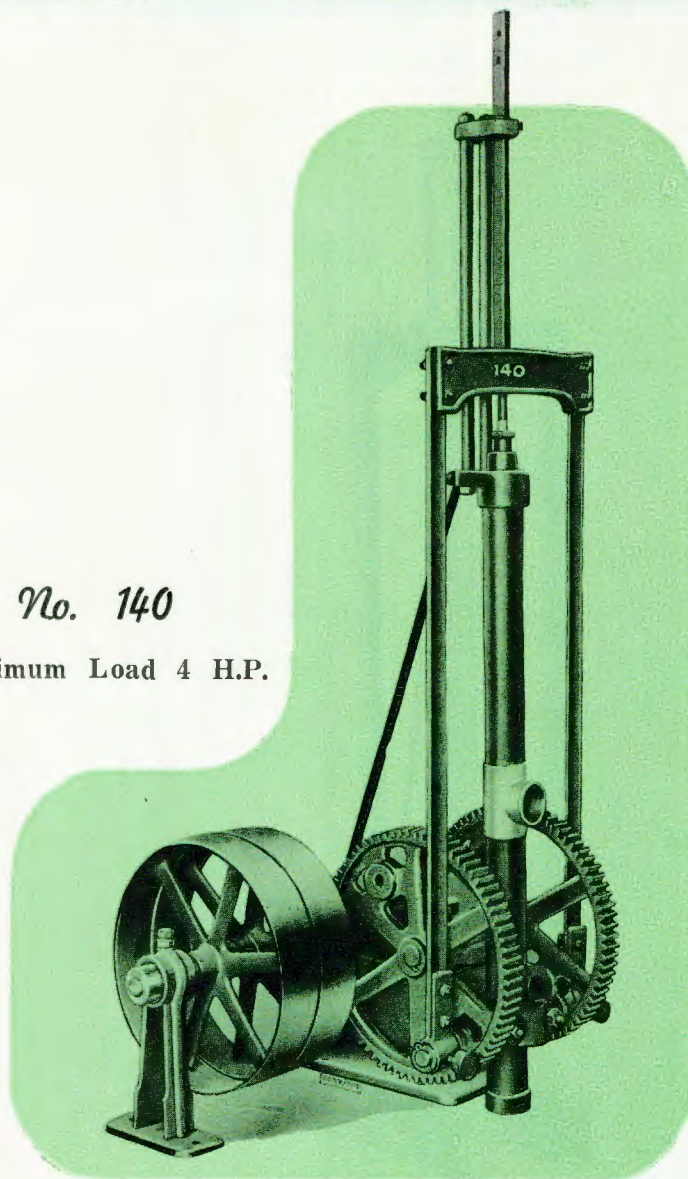
Maximum Speed—30 strokes per minute.

Maximum Load—4 h.p.

Metters Pumping Gears

No. 140

Maximum Load 4 H.P.



Supplied complete with Bracket, Stuffing Box, Rod and Guide, $2\frac{1}{2}$ in. pipe and tee, as illustrated.

Gear Ratio—7 to 1.

Fast and Loose Pulleys—18 in. diameter x $3\frac{1}{2}$ in. face.

Length of Adjustable Strokes—10 in., 12 in., 14 in.

Replaceable Anti-friction Bearings.

$\frac{3}{4}$ in. Steel Pump Rod, bottom end screwed $\frac{3}{4}$ W.

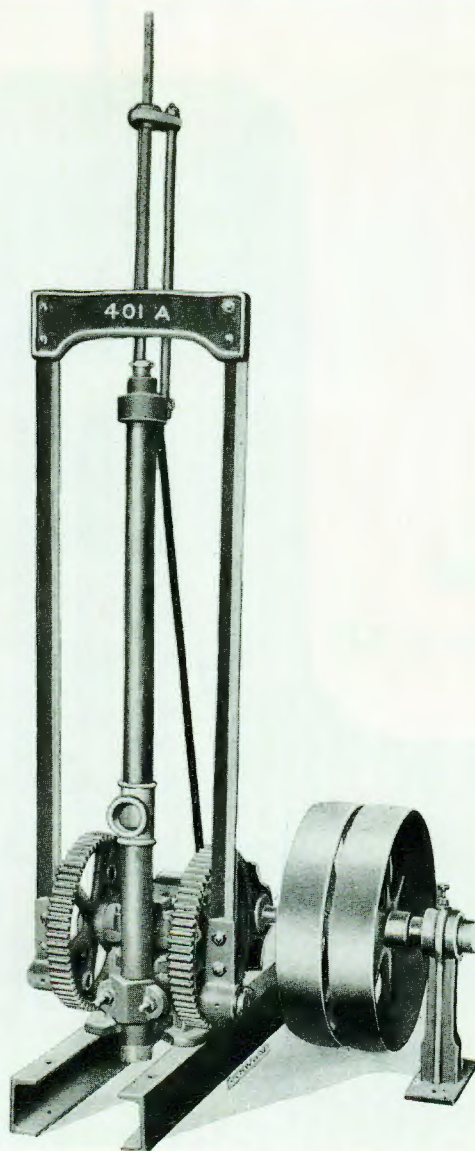
Brass Gland Nut— $1\frac{3}{8}$ in. diameter.

Speed—30 strokes per minute.

Weight—4 cwt. 1 qr.

Easily adapted to windmill installation, providing pump has sufficient length of stroke.

Metters Pumping Gears



No. 401A

Maximum Load $3\frac{1}{2}$ H.P.

A compact unit which may be readily connected to Windmill installation for power drive.

Supplied complete with Bracket, Stuffing Box, Rod and Guide, 2 in. pipe and tee and Channel Iron Base, as illustrated.

Gear Ratio—5 to 1.

Fast and Loose Pulleys—18 in. diameter x $3\frac{1}{2}$ in. face.

Length of Adjustable Strokes—5 in., 7 in., 10 in.

Replaceable Anti-friction Bearings.

$\frac{3}{4}$ in. Steel Pump Rod, bottom end screwed $\frac{5}{8}$ W.

Brass Gland Nut— $1\frac{3}{8}$ in. diameter.

Speed—30 strokes per minute.

Weight—3 cwt. 3 qr.

Metters Pumping Gears

No. 601A

Maximum Load— $2\frac{1}{2}$ h.p.

Can be readily connected to Windmill installation for power drive.

Gear ratio—5 to 1.

Adjustable Strokes—5 in., 7 in., 10 in.

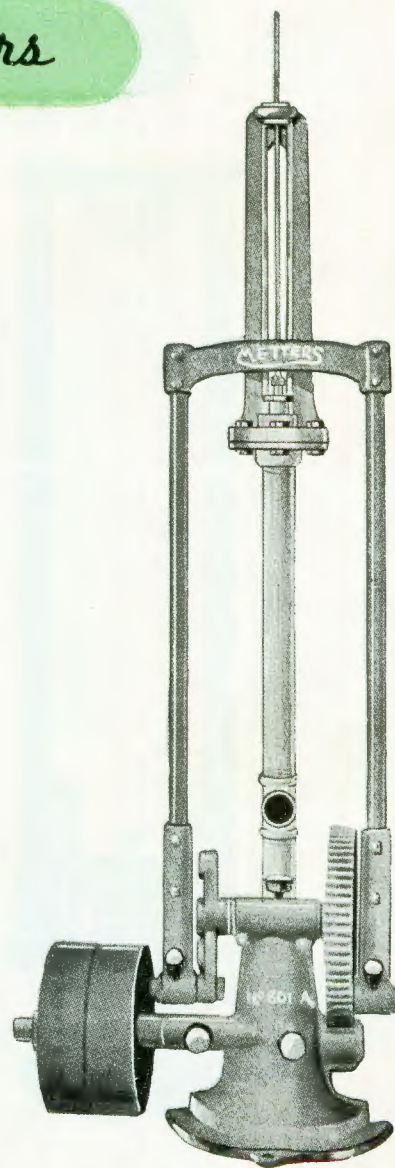
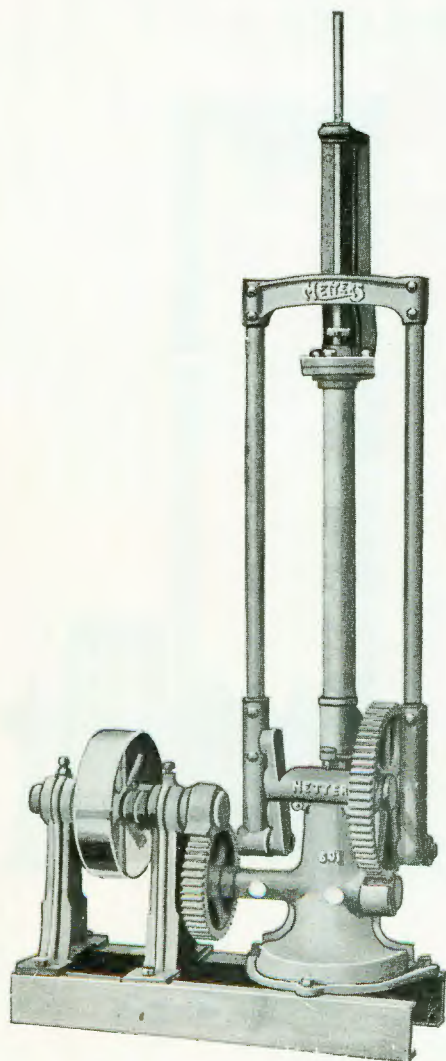
12 in. Fast and Loose Pulleys x 3 in. face.

Maximum Speed—25 strokes per minute.

Approximate weight—1 cwt. 1 qr. 13 lb.

Brass Stuffing Box with $\frac{3}{4}$ Steel Rod screwed $\frac{5}{8}$ W. and guide for forcing water overhead or through delivery pipe extra, to be specified.

List price does not include Pipe or Tee.



No. 601A fitted with countershaft

Designed for use with High Speed Engines or Electric Motors.

Consists of standard No. 601a Pumping Gear, fitted with Special Countershaft, having adjustable alignment bearings and 12 in. pulley, mounted on channel iron base.

Total gear ratio—16 to 1.

Length of Stroke—5, 7, 10 inches.

Size of Pulley can be varied by arrangement when ordering.

Supplied complete with 2" pipe, tee, Bracket, Guide, Brass Stuffing Box, and $\frac{3}{4}$ Steel Rod screwed $\frac{5}{8}$ W. as illustrated.

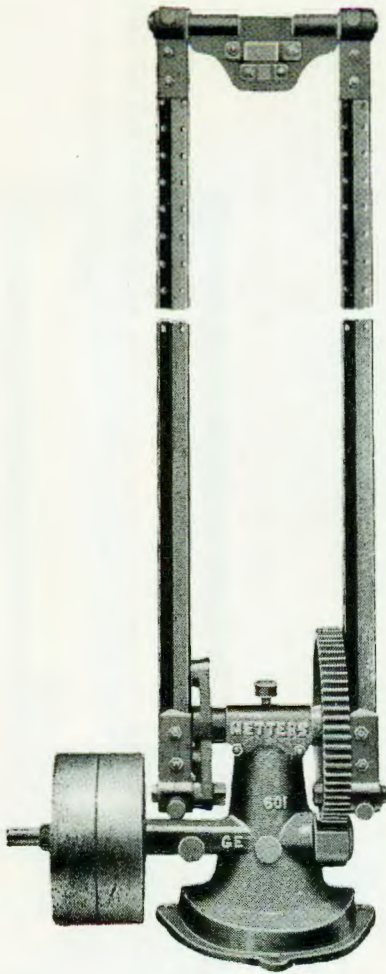
Maximum Load— $2\frac{1}{2}$ h.p.
Speed—25 strokes per minute.

Metters Pumping Gears

Convenient Pumping Gears for use as auxiliary to windmill installation for water reticulation from pipe column to tank.

No. 601A with side arms adjustable up to ten feet

Maximum Load $2\frac{1}{2}$ H.P.



Crosshead with clamps for solid steel, pipe, or wood pumprod.

Steel Loop Clamp to secure pipe column to gearing included:

Gear Ratio—5 to 1.

Fast and Loose Pulleys—12 in. diameter x 3 in. face.

Adjustable Stroke—5 in., 7 in., and 10 in.

Maximum Speed—25 strokes per minute.

Approximate Weight—1 cwt. 2 qr. 10 lb.

No. 401A with side arms adjustable up to ten feet

Maximum Load $3\frac{1}{2}$ H.P.

Crosshead with clamps for solid steel, pipe, or wood pumprod.

Cast Clamp to secure pipe column to gearing included.

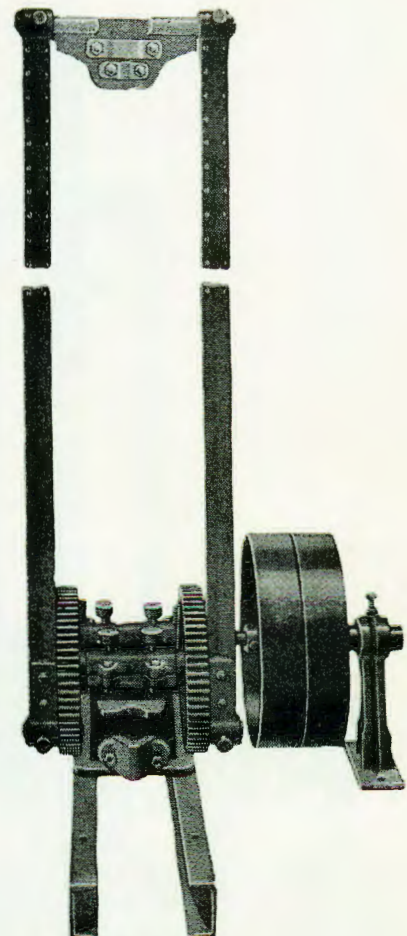
Double Geared—5 to 1.

Fast and Loose Pulleys—18 in. diameter x $3\frac{1}{2}$ in. face.

Adjustable Stroke—5 in., 7 in., and 10 in.

Maximum Speed—30 strokes per minute.

Approximate Weight— $3\frac{3}{4}$ cwt.



Metters Pumping Gears

No. 503

Maximum Load 4 H.P.

Gear Ratio—5 to 1.

Length of Adjustable Strokes—5 in., 7 in. and 10 in.

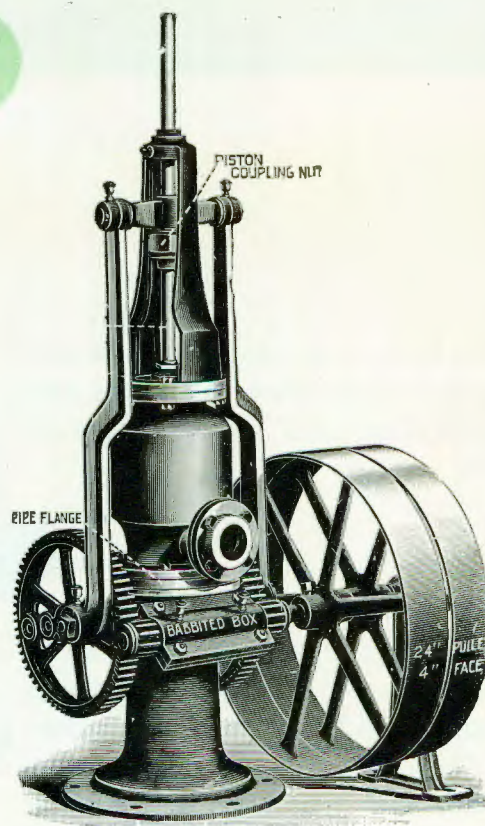
Fast and Loose Pulleys—24 in. diameter x 4 in. face.

Top guide pumprod of $1\frac{1}{4}$ in. steel screwed $\frac{3}{4}$ gas at top end x $1\frac{1}{8}$ w/w to cross-head. Brass packing gland with $1\frac{1}{8}$ brass rod screwed $\frac{1}{2}$ gas at bottom and x 1 in. w/w to piston coupling nut.

Intake and Outlet Flanges—for 2 in., $2\frac{1}{2}$ in. or 3 in. pipe, to be specified.

Speed for Shallow Depths—35 strokes per minute, but slower for deep wells or bores.

Weight—3 cwt. 3 qr. 20 lb.



No. 901

Maximum load 1 H.P.

Gear Ratio—6 to 1.

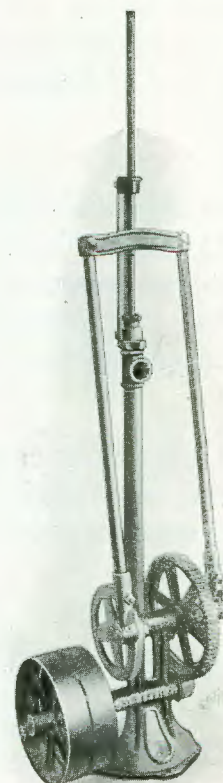
Length of Adjustable Strokes—6 in. and 9 in.

Fast and Loose Pulleys—12 in. diameter x $2\frac{1}{2}$ in. face.

Maximum Speed—25 Strokes per minute.

Weight as shown—3 qr. 0 lb.

List Price does not include pipe or tee. Stuffing Box, Guide and $\frac{5}{8}$ Steel Rod screwed $\frac{5}{8}$ W. extra.



Metters Nufrend Power Spray Pumps

Can be supplied for either direct geared or belt drive. All parts are standardised and of easy access.

Duplex plungers of brass tube which pass through graphite packing inside of pump cylinder, the plungers being free from contact with other metal. Packing held tight in position by an adjustable brass cage inside of brass cylinder cup and controlled by set screw on outer end of cylinder cup.

Valves are approved Mushroom or Poppet type encased in brass cage. Two valves control the pump suction, whilst the pressure is held by two delivery valves. Valves are interchangeable and easily removed by loosening steel set screw.

Airchamber of ample capacity. Pressure gauge, automatic pressure relief valve and provision for two hoses included.

12 x 3 Fast Pulley for Belt drive.

Gear Ratio, 7 to 1.

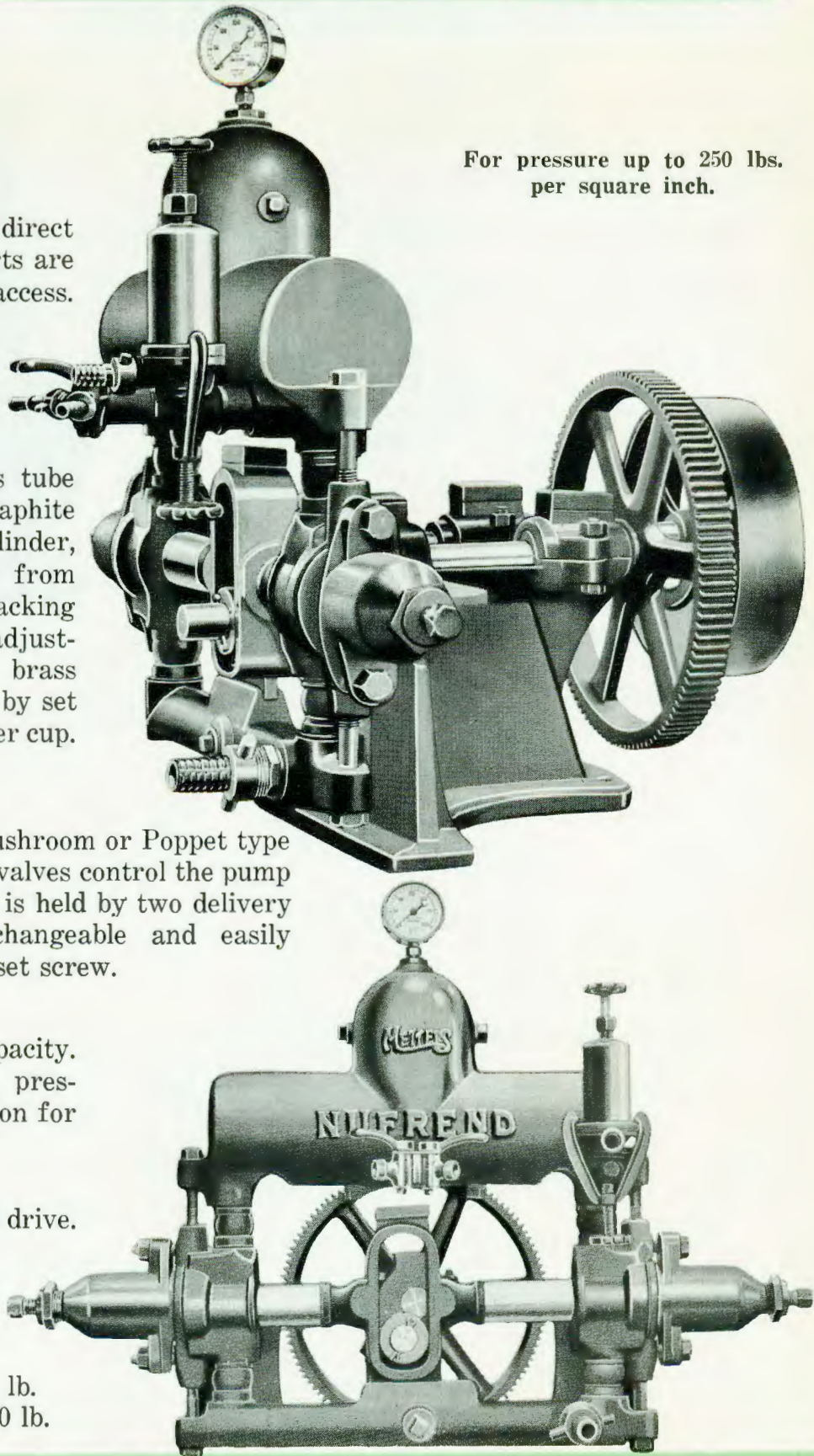
Strokes per minute, 70.

Weight:

Belt Driven, 2 cwt. 2 qr. 6 lb.

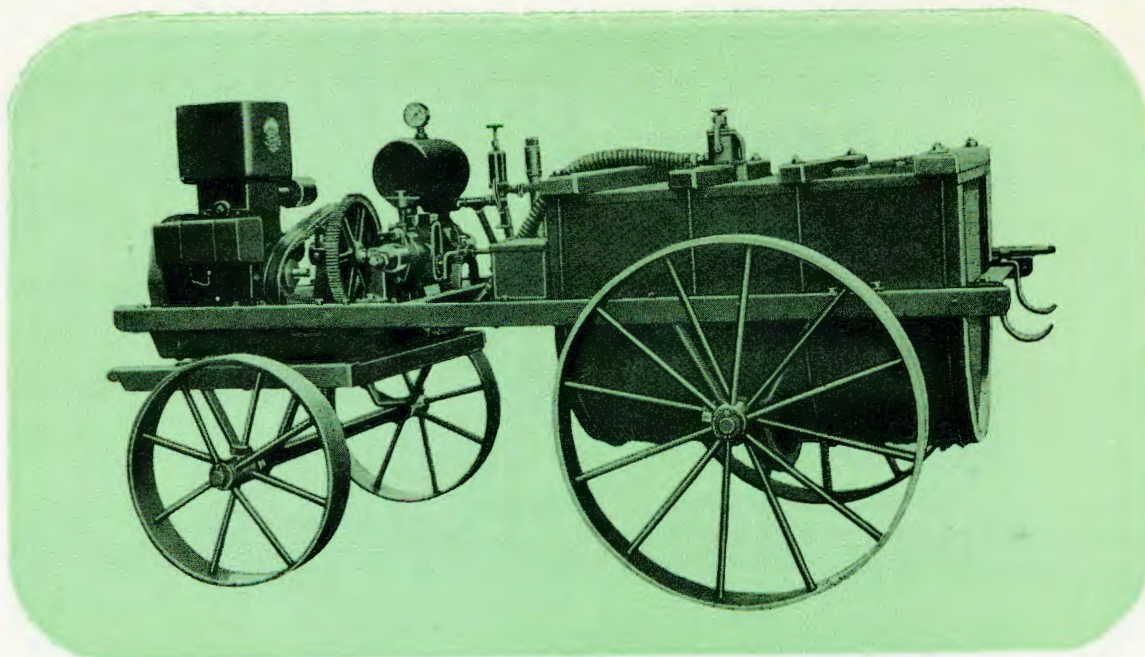
Gear Driven, 2 cwt. 1 qr. 0 lb.

For pressure up to 250 lbs.
per square inch.



Metters Nufrend Type E Power Sprayer

Mounted on Four-Wheel Steel Transport. Specially designed for Orchard Spraying, but can also be used for jetting sheep.



3 H.P. Petrol-Kero Engine direct coupled with chain drive to Nufrend Double Action Pressure Pump.

100 gallon Wood Vat under-slung between rear wheels. 5 inch tyres.

Automatic pressure relief valve, brass suction pot with removable strainer, Standard equipment includes: 2-30 ft. lengths of $\frac{1}{2}$ -in. special pressure hose, each with director rod and nozzle.

Rotary agitator.

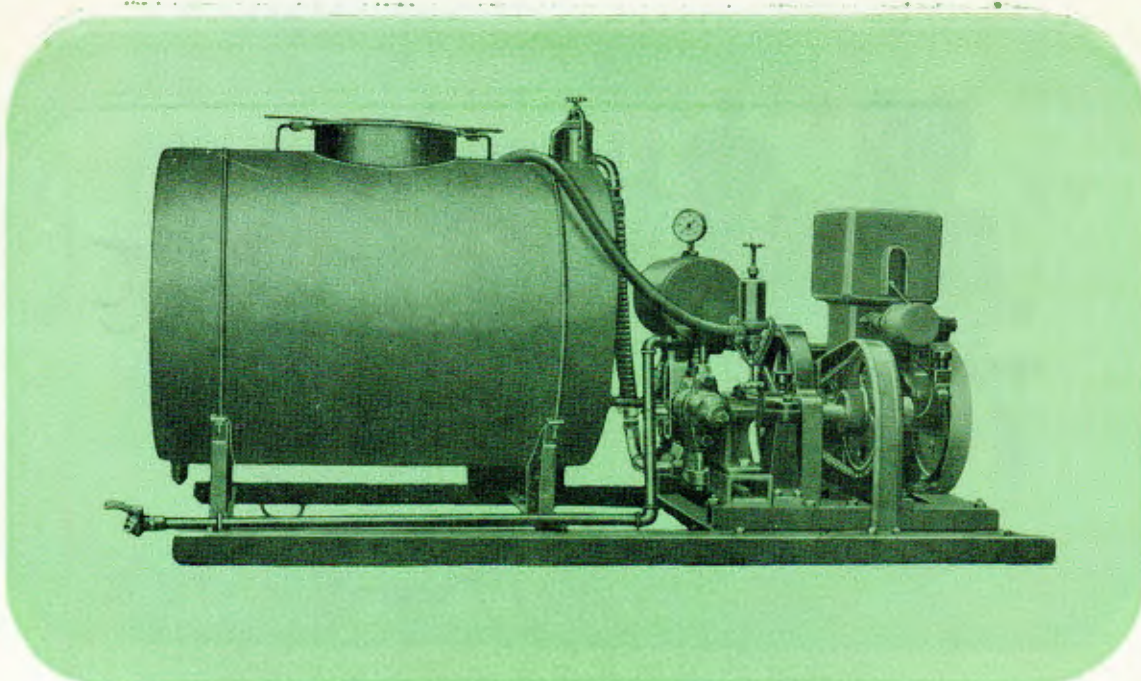
Pressure may be regulated and set as required up to 250 lbs. per sq. in.

Pump is capable of discharging 240 gallons of spray mixture per hour at a pressure of 200 lbs.

Weight—Approximately $15\frac{1}{2}$ cwt.

Metters Nufrend "Trojan" Power Sprayer

For Orchard Spraying, Fire Fighting, and Sheep Jetting



3 H.P. Petrol-Kero Engine, direct coupled with chain drive to Nufrend Double Action Pressure Pump.

Galvanised Vat of 80 gallons (approximate capacity) fitted with rotary agitator, and mounted on a welded steel frame.

Standard equipment includes: Automatic pressure relief valve, suction pot with removable strainer, double cock, 2-30 ft. lengths of $\frac{1}{2}$ -in. special pressure hose, directors, and nozzles.

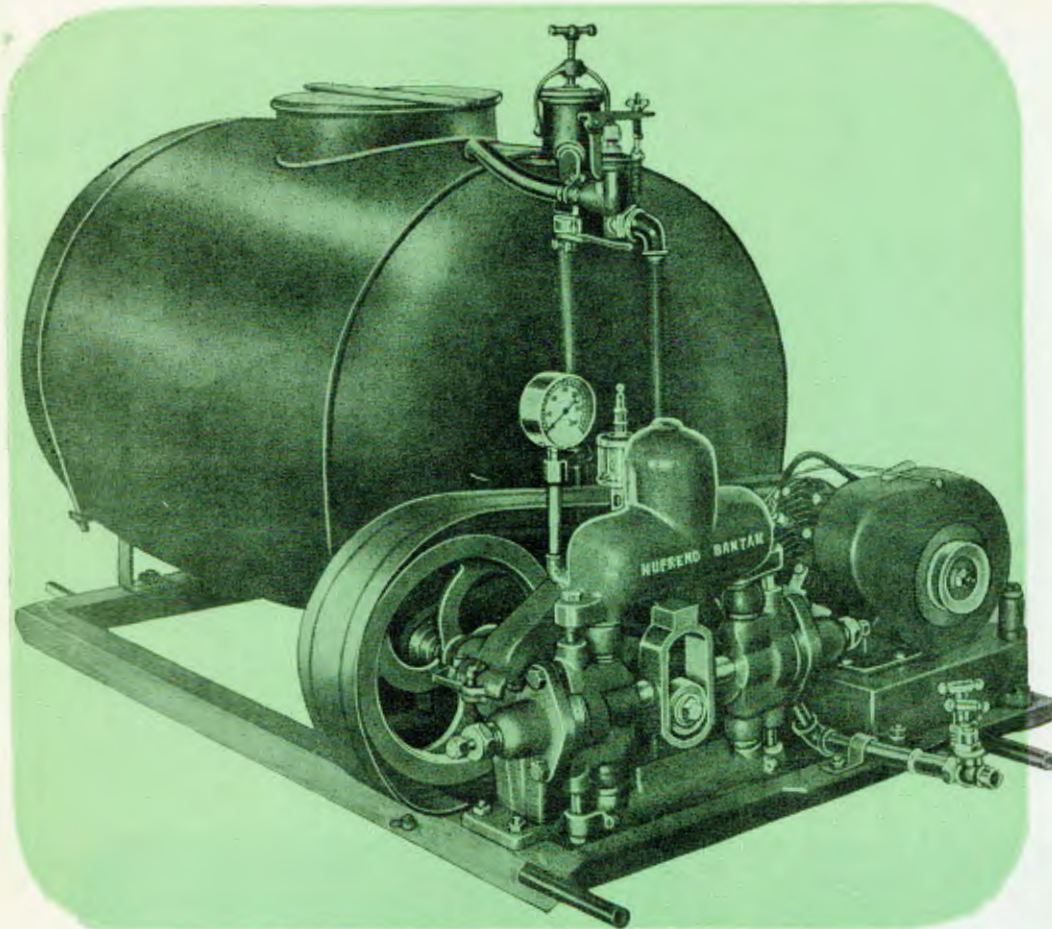
The pressure may be regulated and set as required up to 250 lbs. per sq. in.

Pump is capable of delivering 240 gallons of mixture per hour at a pressure of 200 lbs.

Weight—6 cwt.

Metters Nufrend "Bantam" Power Sprayer

A small outfit suitable for spraying fruit and vegetables



The Pump is a half-size model of the well-known Nufrend Spray Pump, which has an unrivalled reputation for general efficiency.

It is double action, fitted with four interchangeable Gunmetal Valves, Brass Automatic Pressure Relief Valve, Pressure Gauge, Brass Suction Strainer readily accessible for cleaning, Machine-cut Gears, running in oil bath with replaceable bearings, and protected by cast iron cover.

Pump Capacity—2 gallons per minute. Engine—1 h.p. 4 Cycle. Vee belt drive.

Pressure—May be regulated and set up to 200 lbs. per square inch.

Tank—80 gallons (approximately), galvanised after manufacture.

Mounted on steel frame, rotary agitator.

Standard Equipment—One 30 ft. length of $\frac{1}{4}$ in. x 4 ply special pressure hose with director and nozzle with tap for additional hose.

For Fire Fighting—Supplied with 4 ft. director and two sizes of solid jet nozzles.

For Sheep Jetting—Approved nozzle or pistol by arrangement.

Weight—Approximately 4 cwts.

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