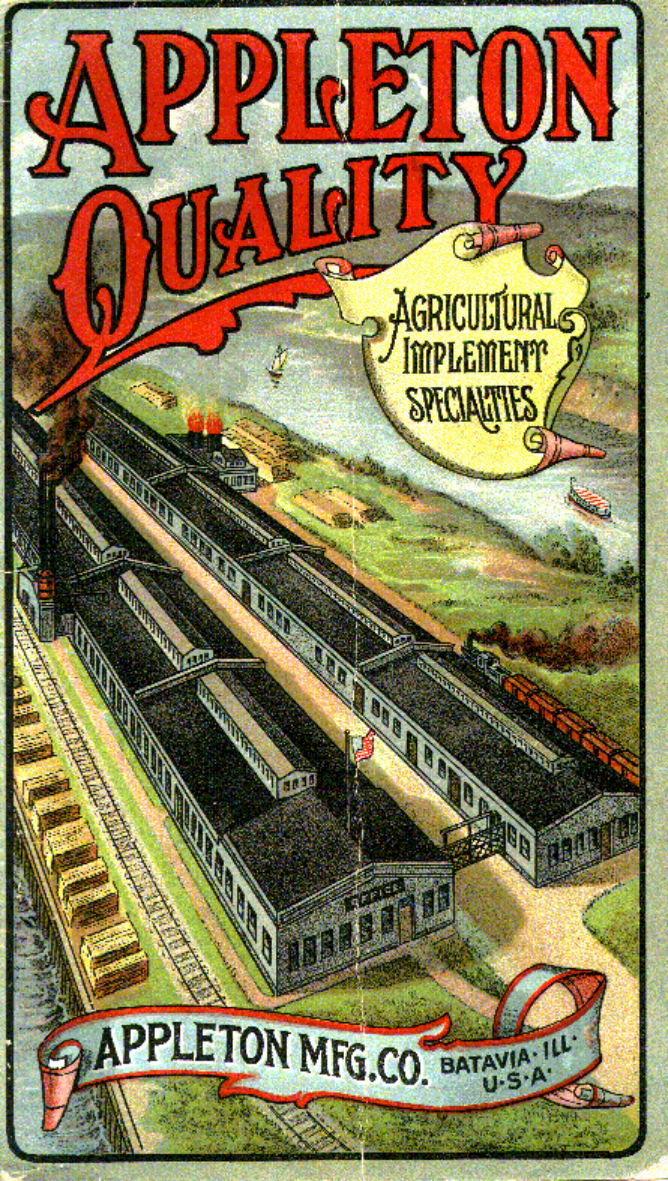
APPLETON QUALITY

AGRICULTURAL IMPLEMENT SPECIALTIES



APPLETON MFG. CO. BATAVIA · ILL · U·S·A·

ESTABLISHED IN 1872

JOHN S. VAN NORTWICK, President
WM. M. VAN NORTWICK, V-Pres't — D. E. REESE, Sec'y
JOHN VAN NORTWICK, Treas. — CHAS. P. HOBLER, Gen'l Agt.
EDWARD G. HOBLER, GEN'L MGR.

1906

ILLUSTRATED CATALOGUE

OF

Farm Machinery

Appleton Manufacturing Co.

Main Office and Factory

BATAVIA, ILLINOIS, U. S. A.

Branch House: Minneapolis, Minn.

GENERAL AGENCIES

Griffith & Turner Co., 205 215 N. Paca St., Baltimore, Md.
Lunt, Moss & Co., 43 S. Market Street, Boston, Mass.
Pioneer Implement Co., Council Bluffs, Ia.
Emerson-Newton Co., Kansas City, Mo.

THE APPLETON-GOODHUE PUMPING WINDMILL

SIZE AND STYLE	NO. OF FANS	LENGTH OF STROKE	WEIGHT	LIST PRICE
BACK GEARED, GALVANIZED STEEL:				
6-ft.	16	4, 5 and 7 in.	255 lbs.	$ 30.00
8-ft. Special	18	4, 5 and 7 in.	320 lbs.	40.00
8-ft. Standard	24	4, 7 and 8 in.	380 lbs.	44.00
10-ft. Standard	30	5, 7 and 9 in.	490 lbs.	55.00
11-ft. Standard	30	5, 7 and 9 in.	548 lbs.	65.00
13-ft. Standard	30	8, 10 and 12 in.	1,082 lbs.	100.00
14-ft. Standard	30	8, 10 and 12 in.	1,191 lbs.	120.00
DIRECT STROKE, GALVANIZED STEEL:				
8-ft.	18	4, 5 and 6 in.	297 lbs.	40.00
10-ft. B	30	4, 5, 7 and 8 in.	434 lbs.	50.00
DIRECT STROKE, WOOD:				
10-ft. F		4, 5, 7 and 8 in.	434 lbs.	40.00
12-ft. I		4, 5, 7 and 9 in.	710 lbs.	55.00
TRIANGLE TRANSMITTER for connecting windmill pump rod to pump at a distance not exceeding 20 feet from tower			80 lbs.	7.00

THE FANS on the 8-ft. Special Mill are wider than on the 8-ft. Standard Mill, so as to give practically the same wind service. The fans on the larger steel mills are wider than on the smaller steel mills. Illustrations and descriptions of these mills will be found on the following pages. We furnish with each mill, without extra charge, tower irons for 3-post or 4-post steel tower, for 4-post wooden tower or for single timber, and a pull-out reel, or windlass, with crank (*see page 71*), for pulling the mill out of the wind. When mill and tower are ordered at the same time sufficient wooden pump rod is furnished to make connection with pump. When height of tower is not specified we furnish about 40 feet of wooden pump rod with each mill. For list prices and weights of 3-post and 4-post galvanized steel towers see pages 77 to 85.

Suggestions in Regard to Size and Style of Pumping Windmill to Use

SOME people claim that a wooden wind mill will outlast a steel mill, but in our judgment the relative durability of steel and wooden mills is an open question. We make both styles and guarantee each to be the best in its class Some of our steel mills

have been in use over sixteen years and are still doing good work.

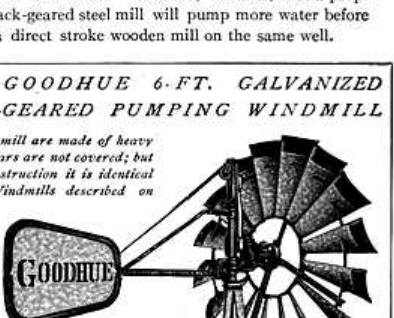
STEEL OR WOOD?

On the other hand some of our wooden mills have been in use over twenty-five years, *but steel mills were not made when these wooden mills were first put on the market.* We know, however, that a properly constructed back-geared steel mill will pump more water before it wears out than a direct stroke wooden mill on the same well.

APPLETON-GOODHUE 6-FT. GALVANIZED STEEL BACK-GEARED PUMPING WINDMILL

THE arms of this mill are made of heavy angle steel; the gears are not covered; but in other details of construction it is identical with our Standard Windmills described on pages 67 to 74, having our engine-way top, improved brake, self-oiling boxes, the same style of governing device, etc. For shallow wells, up to 15 or 20 feet deep, provided the proper size cylinder is used, it is as good a mill as any amount of money will buy.

See pages 64 to 67 for size mill to use, height tower required, etc., and page 74 for tables of guaranteed capacities and size cylinder and length of stroke to use on any given lift.



SEE PAGE 64 FOR TABLE OF WEIGHTS AND PRICES

In order to get the most power out of the wind it is necessary to set the fans of the windmill at a certain angle, and with the right space between them, but when the fans are so set the mill will run the pump too fast unless the wheel is back-geared so as to make two or three, sometimes more, revolutions to one stroke of the pump. If the wheel is not back-geared the fans are set at a different angle so as to keep the speed down and not run the pump too fast. Because a back-geared wheel does not have to do as much work at each revolution it will run in a much lighter wind, and will average more work than a direct stroke mill of the same size

BACK-GEARED OR DIRECT STROKE?

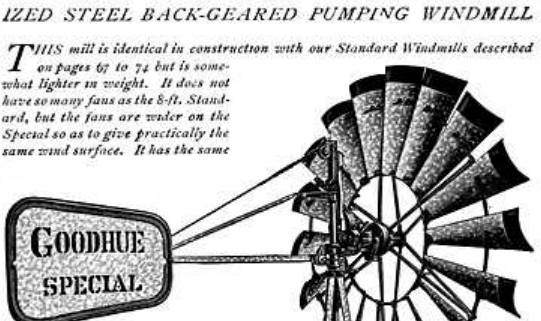
To determine the size mill it is best to use, ascertain the vertical distance from low water mark in well to the highest point to which the water is to be delivered. If the well is 30 feet deep and the vertical distance from low water mark to the surface of the ground is 20 feet, the elevation, or lift, is 20 feet only. If the water is to be lifted from the same well and dis-

WHICH SIZE?

charged into a tank 40-ft. above ground, the elevation to be considered is 20-ft. from low water mark to surface of ground. plus 40-ft. from surface of ground to the tank, or 60-ft. in all. The elevation, or lift, being known the next point to consider is the average daily consumption of water. These two points being determined, the tables on page 74 of this catalogue should enable anyone to readily select the size mill and the size cylinder required to do the work. Smaller cylinders than we specify may be used and proportionate capacities obtained. Our estimates are based on a ten mile wind. In higher winds the mills will do more.

APPLETON-GOODHUE 8-FT. "SPECIAL" GALVANIZED STEEL BACK-GEARED PUMPING WINDMILL

THIS mill is identical in construction with our Standard Windmills described on pages 67 to 74 but is somewhat lighter in weight. It does not have so many fans as the 8-ft. Standard, but the fans are wider on the Special so as to give practically the same wind surface. It has the same style of engine-way top, absolutely reliable governing device, double arms of channel steel, improved brake, etc., and the gears are protected by a neat cast casing. It is our leader and unquestionably the biggest bargain in the windmill line ever offered.



See pages 64 to 67 for size mill to buy, height tower required, etc., and page 74 for tables of guaranteed capacities and size cylinder and length of stroke to use on any given lift.

SEE PAGE 64 FOR TABLE OF WEIGHTS AND LIST PRICES

Excellent judgment may be used in selecting the mill and cylinder, but if the tower is not high enough to give the wind a clean sweep at the mill the job will not be satisfactory. *It is absolutely essential that the tower be of ample height to bring the center of the wheel at least 10 to 15 feet above all trees, hills, buildings, or anything else within several hundred feet* which is liable to prevent a free current of air to the wheel.

HEIGHT OF TOWER

The tower is generally erected directly over the pump, but it is not always possible or convenient to do this. If the tower is erected at a distance from the pump not greater than 20 feet, the TRIANGLE TRANSMITTER, page 64, may be used to connect the windmill pump rod to the pump. If the distance is more than 20-ft. the TRANSMITTER listed on page 75 should be used.

SPECIAL JOBS

Parties desiring an estimate of the cost of a complete pumping rig, to include windmill, tower, pump, cylinder, pipe, fittings, etc., should let us know (1) the depth of the well; (2) the vertical distance from low water mark in well to pump platform; (3) the vertical distance from pump platform to the highest point to which water has to be delivered; (4) the lateral distance water has to be forced underground from the well; (5) whether tubular, dug or driven well; (6) the average daily consumption of water; (7) the height tower required to bring the center of the wheel at least 10 to 15 feet above all wind obstructions within several hundred feet; and (8) any other information which may help us to a clear understanding of the special requirements of the job.

Description of the Appleton-Goodhue Standard Galvanized Steel Back-Geared Pumping Wind Mills

A PRACTICAL man likes a piece of machinery in which he can see the reason for everything. He has a decided preference for the simplest construction, but is quick to appreciate points which mean better service, increased durability and few repairs. An impartial consideration of the features plainly described and illustrated in the following pages will, we believe, prove that the APPLETON-GOODHUE STANDARD GALVANIZED STEEL BACK-GEARED WIND MILLS are not only the simplest, and therefore the easiest to understand and the least liable to get out of order, but are also the strongest and most effective in use.

THE WHEEL

In all Appleton-Goodhue Standard Galvanized Steel Back Geared Windmills the fans of the wheel are given the right curvature and are set at the right angle, with the right space between them, to get the most power out of the wind, these points having been accurately determined by countless experiments. If the space between the fans should be too narrow, the wind, getting through past one fan, would strike the back of the next one and retard the motion of the wheel, thus losing power. The fans, and the clips which are used to fasten the fans to the circles, are

made by machinery, specially designed for the work, which insures absolute accuracy in size and shape. We know of no mill in which heavier material is used for the fans, but we do know that most manufacturers use lighter material than we do. We fasten the fans to the inner and outer circles by clips which are pressed to the exact shape of the curve of the fans and securely riveted to the fans and circles, *and we run the outer circle through each fan.* By this method the fans are held both by the clips and the outer circle and so firmly that they will not strain nor twist in any wind.

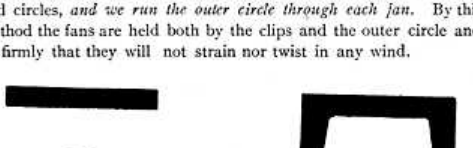


Fig. 117

The arms which hold the sections of fans to the hub are the most important part of the wheel, because there is more strain on them than on any other part. In all Appleton-Goodhue Standard Steel Mills we use a *double set* of arms made of heavy channel steel, each pair of arms being trussed through the center at different points. Fig. 117 shows a sectional view, natural size, of one of our channel steel arms and of the round rod and flat band used by other manufacturers. Our material is easily five or six times as strong.

The illustration on page 69 shows the style of main iron and motor parts used on all our standard mills. We use only one-third to one-half as many working parts as are used on other back-geared mills; hence our mills have the fewest possible places to wear, are the easiest to understand, and we can make *every part of extra weight and strength.* The gears are from 25 to 100 per cent heavier than are used on most other back geared mills and are protected against dirt, rain and sleet by a neat cast casing. We have never been asked to replace a gear broken in proper usage. The shafts are of cold rolled steel and run in long, heavy, split, babbit-metal boxes having large, wick-feed, self-oiling boxes. These boxes will last an ordinary lifetime without renewal, provided the oil cups are filled about once a month, and they can be easily taken apart for rebabbitting without taking down the mill or disturbing any other part. Fig. 172 shows how the oil cups are made. They have a hinged cover and are divided into two sections by a partition which does not run quite to the top. One section holds the oil while the other section has a hole in the bottom. A strip of waste runs from the oil, over the partition, into the other section, and through the hole to the bearing. This is our

MOTOR PARTS

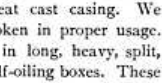
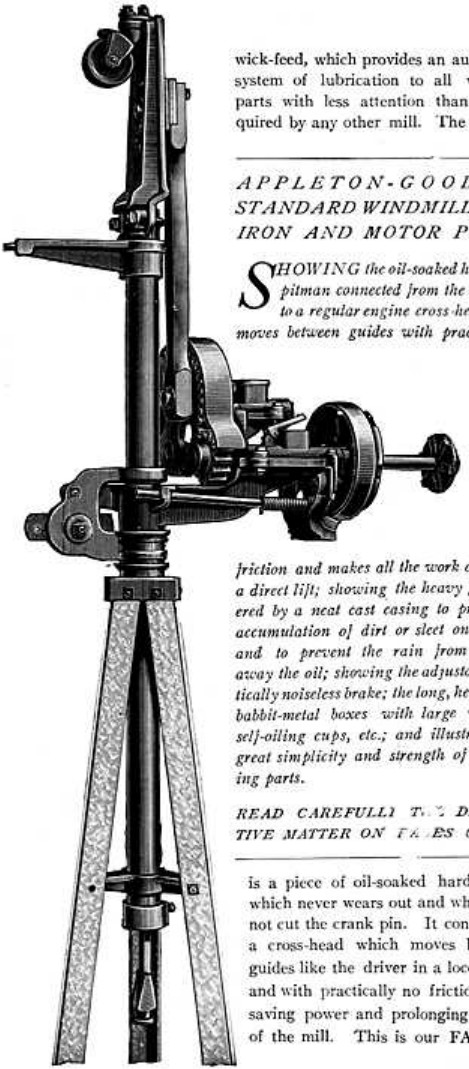


Fig. 172



wick-feed, which provides an automatic system of lubrication to all working parts with less attention than is required by any other mill. The pitman

APPLETON-GOODHUE STANDARD WINDMILL MAIN IRON AND MOTOR PARTS

SHOWING the oil-soaked hard maple pitman connected from the crank pin to a regular engine cross-head, which moves between guides with practically no friction and makes all the work of the mill a direct lift; showing the heavy gears covered by a neat cast casing to prevent the accumulation of dirt or sleet on the cogs, and to prevent the rain from washing away the oil; showing the adjustable, practically noiseless brake; the long, heavy, split, babbit-metal boxes with large wick-feed, self-oiling cups, etc.; and illustrating the great simplicity and strength of all working parts.

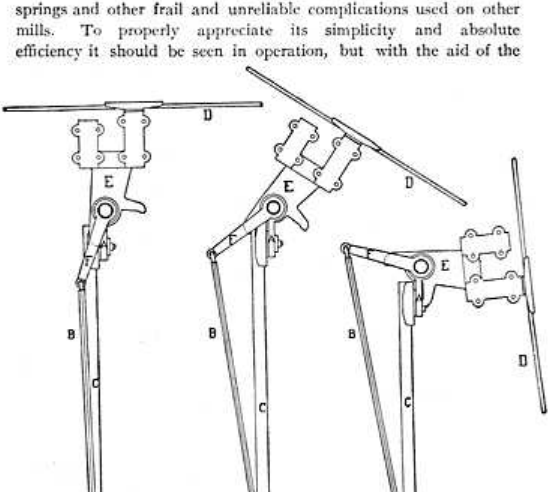
READ CAREFULLY THE DESCRIPTIVE MATTER ON PAGES 67 TO 74

is a piece of oil-soaked hard maple which never wears out and which will not cut the crank pin. It connects to a cross-head which moves between guides like the driver in a locomotive and with practically no friction, thus saving power and prolonging the life of the mill. This is our FAMOUS

ENGINE-WAY TOP, which makes the work of the mill a direct lift.

Proper governing is one of the most important features of any windmill. No matter how hard the wind blows the pump must not make more than so many strokes a minute. The perfect governor should respond instantly to the slightest variation of the wind without jerking or racking the mill. It should govern out of the wind and back again with equal smoothness. This style of governing is one of the strongest features of all Appleton-Goodhue Windmills, yet we do away entirely with the weights, levers, springs and other frail and unreliable complications used on other mills. To properly appreciate its simplicity and absolute efficiency it should be seen in operation, but with the aid of the

PERFECT GOVERNING



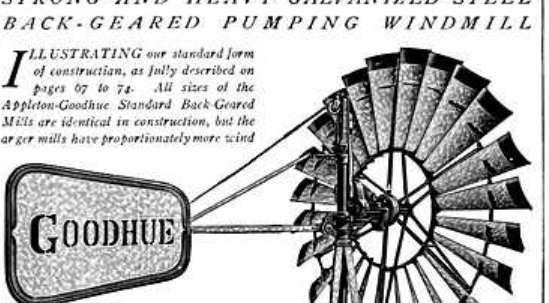
drawings on this page we believe we can give a good general idea of how it works. These drawings show three different positions of the governing parts as you look down on them from a point straight above the center of the mill. **A** is the vane hinge; **C** is the vane stem, **F** is the rod arm, and **B** is the hook rod which connects them; **E** is the main casting of the mill; and **D** represents a part of the wheel. Position (1) is before governing commences; (2) is when

the mill has governed partly out of the wind; and (3) is when the mill has been pulled out of the wind and the brake applied.

The weight of the vane does the governing. The leverage it gives is so adjusted that it holds the mill in the wind until the wind

APPLETON-GOODHUE 8-FT. "STANDARD" EXTRA STRONG AND HEAVY GALVANIZED STEEL BACK-GEARED PUMPING WINDMILL

ILLUSTRATING our standard form of construction, as fully described on pages 67 to 74. All sizes of the Appleton-Goodhue Standard Back-Geared Mills are identical in construction, but the larger mills have proportionately more wind surface and are proportionately heavier and more powerful.



See pages 63 to 67 for size mill to use, height tower required, etc., and page 74 for tables of guaranteed capacities and size cylinder and length of stroke to use on any given lift.

SEE PAGE 64 FOR TABLE OF WEIGHTS AND PRICES

gets to a certain velocity. The pressure of a strong wind against the wheel overcomes the weight of the vane and turns the wheel towards the vane and partly out of the wind. The rod arm **F** turns with the wheel, pulling the vane upwards, swinging on the vane hinge **A**. The strength of the wind keeps the vane in line with the wind and, as the wheel turns more and more out of the wind, the rod arm **F**, which turns with it, gives an increased leverage, so that the weight of the vane offers a greater resistance to the force of the wind on the wheel. *No matter how hard the wind blows the mill will never turn entirely out of the wind and stop pumping*, and, as the wind gets weaker, the leverage of the vane brings the mill more and more into the wind until the wind gets below the governing point. *We positively guarantee, under the same circumstances, less variations in number of strokes a minute than any other mill.*

Fig. 82

Pull Out Windlass

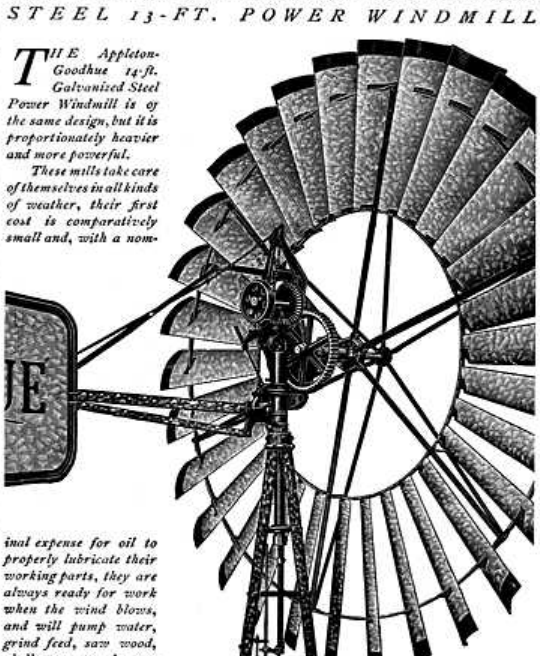
the strongest gears of any steel power windmill made, the main gear on our 13-ft size being 20 inches in diameter. Our mill is entirely

THE APPLETON-GOODHUE GALVANIZED STEEL 13-FT. POWER WINDMILL

THE Appleton-Goodhue 14-ft. Galvanized Steel Power Windmill is of the same design, but it is proportionately heavier and more powerful.

These mills take care of themselves in all kinds of weather, their first cost is comparatively small and, with a nominal expense for oil to properly lubricate their working parts, they are always ready for work when the wind blows, and will pump water, grind feed, saw wood, shell corn or do any other work usually done by horse power.

For description and list prices of extra heavy 4-post galvanized steel towers for supporting these mills see page 83.



SEE PAGE 75 FOR TABLE OF WEIGHTS AND LIST PRICES

free from the defect, common to other mills, of turning out of line with the wind by creeping around on the gear and upright shaft.

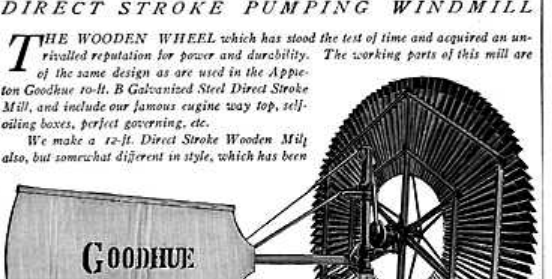
Good galvanizing is very important. When properly done it becomes a part of the metal itself. Our galvanizing is done in our own plant, under our own careful inspection. It is done after all parts have been shaped and punched, leaving no rough edges where the rust can get in its work. Afterwards we give the mills the most handsome finish of any made. After the sections of fans have come from the galvanizing room, they are tipped in a handsome red, and the border of the vane is painted the same color. The iron work is painted a rich blue color. This makes a job which is as nice looking as it is strong and useful.

COOD GALVANIZING AND HANDSOME FINISH

APPLETON-GOODHUE 10-FT. "F" WOOD DIRECT STROKE PUMPING WINDMILL

THE WOODEN WHEEL which has stood the test of time and acquired an unrivalled reputation for power and durability. The working parts of this mill are of the same design as are used in the Appleton Goodhue 10-ft. B Galvanized Steel Direct Stroke Mill, and include our famous eugine way top, self-oiling boxes, perfect governing, etc.

We make a 12-ft. Direct Stroke Wooden Mill also, but somewhat different in style, which has been



favorably known in this and foreign countries for over twenty-five years on account of its superiority in all essential features.

See pages 64 to 67 for size mill to use, height tower required, etc., and page 74 for tables of guaranteed capacities and size cylinder and length of stroke to use on any given lift.

SEE PAGE 64 FOR TABLE OF WEIGHTS AND PRICES

One of our Illinois dealers recently reported that he had put up something over sixty of our mills in about seven or eight years and in all that time had bought only sixty cents worth of repairs! We question if this record can be duplicated on any other mill. A conservative estimate, based on our repair business for a number of years past, proves that the average annual expense of keeping an Appleton-Goodhue windmill outfit in repair is less than four cents! Our goods are built for long service with the minimum amount of trouble to the owner.

FEW REPAIRS

TABLES SHOWING GUARANTEED CAPACITIES OF PUMPING WINDMILLS IN A 10-MILE WIND, AND THE SIZE CYLINDER TO USE FOR A GIVEN ELEVATION

6-Ft. Back-Geared or 8-Ft. Direct Stroke Mill

Elevation	4-inch stroke		5-inch stroke		7-inch stroke	
	Diameter of Cylinder	Gallons per Hour	Diameter of Cylinder	Gallons per Hour	Diameter of Cylinder	Gallons per Hour
10 ft.	3 inch	300	2¾ inch	260	2½ inch	300
25 ft.	2½ inch	175	2¼ inch	180	1¾ inch	150
40 ft.	2 inch	115	1¾ inch	110	1½ inch	110

8-Ft. Back-Geared or 10-Ft. Direct Stroke Mill

Elevation	5-inch stroke		7-inch stroke		8-inch stroke	
	Diameter of Cylinder	Gallons per Hour	Diameter of Cylinder	Gallons per Hour	Diameter of Cylinder	Gallons per Hour
10 ft.	6 inch	1080	5 inch	1190	4½ inch	1090
20 ft.	4½ inch	710	4 inch	750	3½ inch	660
30 ft.	3½ inch	435	3¼ inch	530	3 inch	490
40 ft.	3¼ inch	380	3 inch	430	2¾ inch	425
50 ft.	3 inch	320	2¾ inch	360	2½ inch	300
75 ft.	2¾ inch	260	2½ inch	300	2¼ inch	275
100 ft.	2½ inch	210	2 inch	190	2 inch	210
125 ft.	2¼ inch	170	1¾ inch	145	1¾ inch	160
150 ft.	2 inch	135	1½ inch	110	1½ inch	120
175 ft.	1¾ inch	100				
200 ft.	1½ inch	75				

10-Ft. Back-Geared or 12 Ft. Direct Stroke Mill

Elevation	5-inch stroke		7-inch stroke		8-inch stroke	
	Diameter of Cylinder	Gallons per Hour	Diameter of Cylinder	Gallons per Hour	Diameter of Cylinder	Gallons per Hour
20 ft.	8 inch	2000	6½ inch	2000	6 inch	1940
30 ft.	5½ inch	1020	4½ inch	960	4¼ inch	960
40 ft.	5 inch	850	4¼ inch	840	4 inch	860
50 ft.	4 inch	540	3½ inch	580	3¼ inch	575
60 ft.	3½ inch	420	3 inch	430	2¾ inch	410
80 ft.	3 inch	300	2¾ inch	360	2½ inch	300
100 ft.	2¾ inch	260	2½ inch	300	2¼ inch	275
125 ft.	2¼ inch	210	2 inch	190	2 inch	210
150 ft.	2¼ inch	170	1¾ inch	145	1¾ inch	160
175 ft.	2 inch	135	1½ inch	110	1½ inch	120
200 ft.	1¾ inch	100				
250 ft.	1½ inch					

13-Ft. Back-Geared Windmill

Elevation	Diameter of Cylinder	Gallons per Hour	Elevation	Diameter of Cylinder	Gallons per Hour
15 ft.	12 inch	8000	150 ft.	3½ inch	700
25 ft.	10 inch	6000	175 ft.	3 inch	500
40 ft.	8 inch	4000	200 ft.	2¾ inch	425
60 ft.	6 inch	2000	250 ft.	2½ inch	350
80 ft.	5 inch	1500	300 ft.	2¼ inch	200
100 ft.	4½ inch	1200	350 ft.	2 inch	175
120 ft.	4 inch	900	400 ft.	2 inch	175

THE APPLETON-GOODHUE POWER WINDMILLS

SIZE	NUMBER OF FANS	REVOLUTIONS OF LINE SHAFT PER MINUTE	WEIGHT	LIST PRICE
GALVANIZED STEEL:				
13-ft.	30	350 to 400	1,322 lbs.	$135.00
14-ft.	30	350 to 400	1,431 lbs.	150.00
EXTRA LINE SHAFT, per foot			3¼ lbs.	.33
EXTRA LINE SHAFT BOXES, each			5 lbs.	1.25
PUMPING ATTACHMENT, with not to exceed 8-ft of pumping shaft, extra			168 to 190 lbs.	15.00
EXTRA PUMPING SHAFT, per foot			3¼ lbs.	.33
TRANSMITTER, to connect Pumping Attachment to pump at a distance from tower			120 lbs.	10.00

WITH our power windmills we furnish, without extra charge, sufficient 15-16-in. cold rolled steel upright shaft, with couplings, for a 50-ft. tower, or a 50-ft mast job; not to exceed 10-ft. of 1 3-16 in. line shaft with boxes; foot gears, one 12-in. pulley, one 18-in. pulley, and tower irons for either wooden or steel tower, or for mast job. The standard length of shaft furnished with our Pumping Attachment is such as to bring the pump just outside the tower, reserving the inside of tower for other purposes. When required we will furnish not to exceed 8-ft. of pumping shaft without extra charge. This shaft may be extended, with shaft bearings every 8-ft., to connect with pump at a distance not exceeding 30-ft. or 40-ft. from center of tower. If the pump is more than 40-ft. away the better plan is to use the Pumping Attachment with standard length of shaft and make connection with the pump by means of the Transmitter.

The 13-ft. Mill is guaranteed to be capable of running a suitable grinder so as to grind from 5 to 10 bushels an hour, the 14-ft. to grind from 6 to 12 bushels an hour, depending on the velocity of the wind and the fineness of grinding, or to run any machine which is of a size and style adapted to the power developed.

We build an honest machine, of uniform strength throughout, capable of giving as good service after ten or fifteen years use as when first erected. The wheel is of the same style as used in our steel pumping mills, which is a guarantee of easily double the strength of any other power wheel. The shafts are of cold rolled steel and run in the same style boxes as are used in our steel pumping mills. The motor parts are exceedingly simple in design, which enables us to make all parts of extra weight and strength. We use

With each mill we furnish a Pull Out Windlass, with crank, and a length of chain to connect it with the pull out wire. The mill is pulled out ofthe wind by turning the crank and is then firmly locked in place by a dog and ratchet on the windlass. See Fig. 82, page 71.

APPLETON-GOODHUE 8-FT. GALVANIZED STEEL DIRECT STROKE PUMPING WINDMILL

THE latest addition to our windmill line, representing the acme of perfection in the construction of a durable and efficient 8-ft. direct stroke galvanized steel pumping windmill, embodying all the features, applicable to a direct stroke mill,

which have made the Appleton-Goodhue line famous, such as the engine-way top, self-oiling boxes, improved brake, good governing, etc., as described on pages 67 to 74.

See pages 64 to 67 for size mill to use, height tower required, etc., and page 74 for tables of guaranteed capacities and size cylinder and length stroke to use on any given lift.

SEE PAGE 64 FOR TABLE OF WEIGHTS AND PRICES

On all other windmills the brake is one of the greatest sources of complaint, because it wears off by friction, is a constant source of trouble and expense, will not hold the mill when out of the wind, makes a disagreeable noise, etc. These complaints cannot be made of the style of brake used on the Appleton-Goodhue Windmills. Our brake is adjustable, is practically noiseless, and will not allow the mill to budge even in a gale. The construction of this brake will be readily understood by reference to the illustration on page 69. The shoe on the brake, where it goes against the brake wheel, is a piece of hard maple which, of course, takes a firmer hold on an iron casting than would one iron casting on another. All the friction and wear is on this piece of wood, which can be easily taken off and another put in its place whenever necessary. However, it is rarely necessary to replace the wooden shoe, because the brake is adjustable, having several notches in which it can be set to compensate for any wear on the wooden shoe.

THE BRAKE

THE APPLETON-GOODHUE WINDMILL TOWERS

THE MAN who designs a windmill tower, and does it right, has to be the same kind of a mechanic as the man who designs a steel bridge. Careful consideration has to be given to every detail so as to insure uniformity of strength and wind resistance in proportion to the strain to which the different parts are subjected. There is no guess work in the construction of Appleton-Goodhue Windmill Towers. The design and weight of each part has been scientifically and accurately determined with a view to overcoming just the kind of strain to which it is subjected. The materials used are the best and of ample size and weight for the purpose. The result is that we have a tower which is practically indestructible, "easy to erect, but hard for the wind to down," and we prove our confidence in their strength and durability by guaranteeing them against all winds, CYCLONES AND TORNADOES. Read our Official Warranty on page 3.

Galvanized Steel Towers for 6-ft., 8-ft., 10-ft. or 11-ft. Mill

3-POST			4-POST		
HEIGHT	WEIGHT	LIST PRICE	HEIGHT	WEIGHT	LIST PRICE
20-ft.	284 lbs.	$30.00	20-ft.	364 lbs.	$ 34.00
30-ft.	389 lbs.	40.00	30 ft.	519 lbs.	44.00
40-ft.	497 lbs.	54.00	40-ft.	685 lbs.	58.00
50-ft.	623 lbs.	66.00	50-ft.	886 lbs.	77.00
60-ft.	768 lbs.	84.00	60-ft.	1,112 lbs.	100.00
			70-ft.	1,467 lbs.	125.00
			80-ft.	1,789 lbs.	150.00

THESE towers are furnished complete with corner ladder, galvanized steel anchor posts, heavy cast iron anchor plates and underground steel girts. If side ladders are preferred we furnish them at a small extra charge per foot.

THE CORNER POSTS

The material used for the corner posts is 2½-in. by ¼-in. *all the way up*. This is the heaviest material anybody uses for an ordinary 8-ft. or 10-ft. windmill tower and most manufacturers use lighter material, especially in the upper part of the tower. On one side of a windmill tower the strain is a direct pull on the corner posts, and on the other side a direct push. The purpose of

The girts and braces is to keep the corner posts in a straight line so they will take all the strain that is produced by the wind.

THE GIRTS

The strain on the girts is a direct push endwise and, in order to resist this kind of a strain, an 8-ft. girt must be heavier in proportion to its length than a 2-ft. girt. If the strain were a pull instead of a push the girts would not need to be so heavy, because there would then be no tendency for them to bend in the center. In all our steel towers *the girts are made of heavier material the nearer the bottom they are.* On the 4-post towers they are only five feet apart, except at the extreme top, where it would be wasting material to put in more girts than we do. On the 3-post towers, which are much cheaper, but make a serviceable low-priced job, the girts are 10-ft. apart.

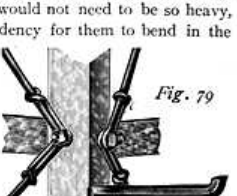


Fig. 79

THE BRACES

The strain on the diagonal braces is a direct pull, and it is very important that they be so attached to the tower as to secure their full strength. We make the braces of round steel rod, looped at the end, and we twist the end around the rod itself, as shown in Fig. 79. They are forged while hot and are tested to resist a pull of 3000 lbs. weight, the test being put on the loop, where it gets the strain when on the tower.

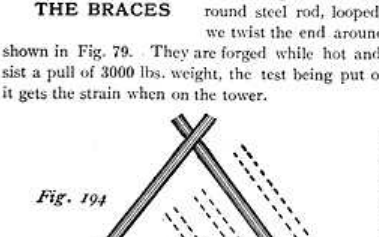


Fig. 194

Of course, the braces in any windmill tower will, in time, get loose and shaky, and their value is lost unless the tower is provided with an efficient system of brace tighteners. Fig. 194 illustrates how the braces are tightened on our 4-post towers. In the 4-post tower the braces always cross each other just a little above one of the girts and they are held on that girt by the tighteners. Each of these tighteners will hold the brace on either side of the bolt which runs through it, and there are two different places where each of the tighteners can be set on the girt. Thus there are four different changes which can be made in the location of the braces, making it possible to keep them always drawn up perfectly tight, so that the tower will always

be just as strong as the day it is first set up. The dotted lines in Fig. 194 show the four positions in which the braces may be clamped by using the two sets of holes and the two sides of the bolt. In our 3-post towers we use a similar system of tighteners, but as there is no girt where the braces cross in a 3-post tower, the braces are tightened by pulling the tightener down on one brace, then down on the other, and tightening it when the braces are drawn up.

Our device for guiding the wooden pump rod of the mill and for keeping it in line, is the most efficient in use. Fig. 155 shows our pump rod as seen from directly above it. Fig. 153 shows it as seen from the side. The hinged castings in which it sets, where it is fastened to the girt, are so made as to allow the right amount of play. There never can be any binding, and, as it has a wide base where it attaches to the girt, it guides the pump rod properly and overcomes any tendency of the pump rod to swing from side to side. Some manufacturers use a strip running straight across the tower with a hole in the middle for the pump rod to work through. This is by no means a satisfactory arrangement, because should the rain and sleet freeze on the pump rod it would, most likely, be frozen fast to the guide so that the latter would go up and down with the pump rod and pull and bend the girt to which it is fastened. The same thing would happen if, for any other reason, the pump rod sticks to the guide. There is no possibility of such an accident with the style of pump rod guide used on our towers.

PUMP ROD GUIDE

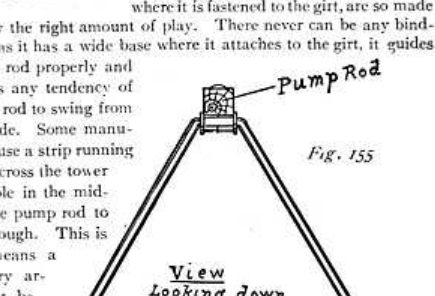


Fig. 155

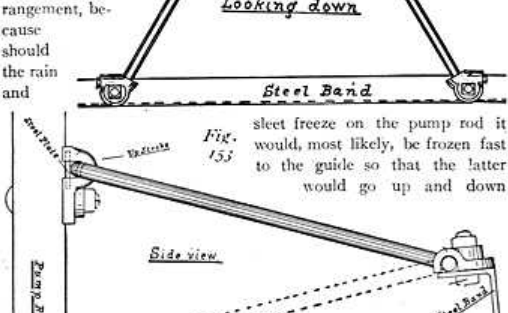


Fig. 153

Appleton-Goodhue 4-Post Galvanized Steel Tower

Appleton-Goodhue 3-Post Galvanized Steel Tower

Our standard ladder consists of a series of heavy iron steps bolted to one of the corner bolts with steel bolts (*see Fig. 79, page 78*), each step being capable of holding 800 lbs. weight without giving in the least. It is much easier to climb than a side ladder, because there is more of a slant than is possible with a side ladder—it is more like walking up stairs.

OTHER DETAILS

Our platform is of ample size and strength to safely hold as many people as wish to get on it.

Every corner post, brace rod and girt is carefully galvanized

after all punching and forge work is done. There are no rough edges where the rust can get in its work.

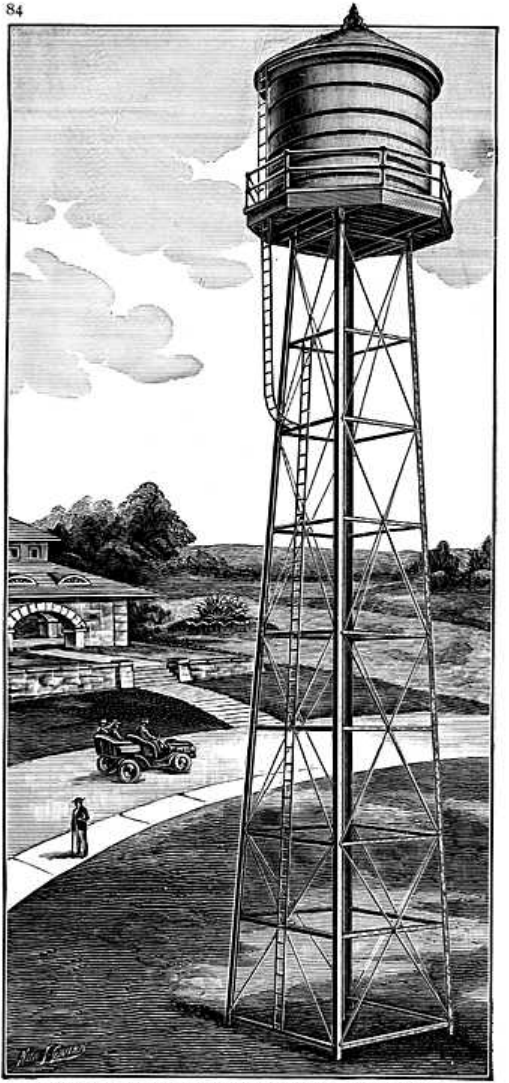
We have now described all the tower which shows above ground, but there remains an important feature to be considered, viz., the anchorage. It is essentially important to have a strong anchorage, because there is a big strain on a windmill tower trying to pull it out of the ground.

Fig. 62

STRONGEST ANCHORAGE

The tower should have a strong anchor post with something at the bottom of it which will make it impossible for any strain to pull the tower up out of the ground. Appleton-Goodhue Steel Windmill towers have the strongest anchorage of any towers made. In the first place the spread of the towers, both 3-post and 4-post, is one-fifth the height. We use heavy galvanized steel anchor posts bolted to heavy cast iron anchor plates, as shown in Fig. 62. Our anchor plates are very strong and heavy and should not be classed with the unreliable sheet iron anchor plates used by some manufacturers. Each plate is marked at two points. One point is called the 4-post center mark and the other the 3-post center mark. To properly set the anchor posts in the ground a plumb bob is used as shown in the illustration. If the plumb bob touches the 4-post center mark the anchor posts will be in exact line with the corners of a 4-post tower; if it touches the 3-post center mark the anchor posts are properly set for a 3-post tower. There is no guess work, neither in the designing nor in the erection of our windmill towers.

The anchor posts are held in position, so they will never get out of line, by a set of underground steel girts. When the holes are dug for the posts a shallow trench is also dug, connecting the post holes, and the underground girts go into this trench and are bolted to the posts, after which the trench is filled up. Fig. 62 shows a small casting bolted to the post in the third hole from the top. There is one of these on each anchor post. They are called foot rests and they are used only when raising the tower, the ends of the corner posts resting on these castings.



40-ft. Trestle Supporting 8 x 8 Tank. *See page 85.*

Extra Heavy 4-Post Galvanized Steel Towers for 13-ft. or 14-ft. Mill

HEIGHT	FOR PUMPING MILLS		FOR POWER MILLS	
	WEIGHT IN LBS.	LIST PRICE	WEIGHT IN LBS.	LIST PRICE
20-ft.	465	$ 44.00	450	$ 44.00
30-ft.	660	58.00	700	66.00
40-ft.	870	75.00	1,110	84.00
50-ft.	1,125	96.00	1,460	104.00
60-ft.	1,415	125.00	1,800	130.00
70-ft.	1,730	166.00	2,215	175.00
80-ft.	2,075	208.00	2,675	216.00

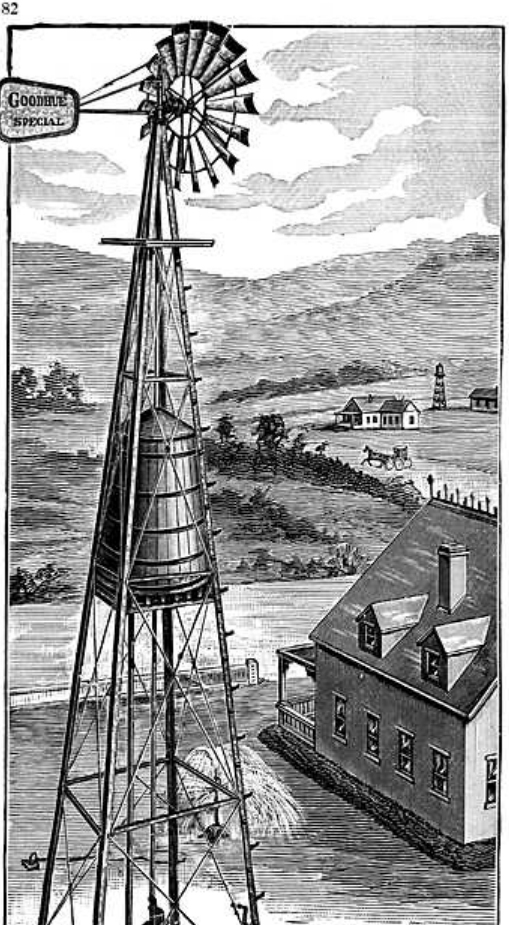
WITH the towers for power windmills we furnish timbers for supporting the gears and shafting. 20-ft. and 30-ft. power windmill towers are for use on top of buildings only and are furnished with timber plates to secure them to timbers in top of buildings. All others have anchor posts, anchor plates, and underground steel girts.

These towers are of the same general style as our 4-post steel towers for 6-ft., 8-ft., 10-ft. and 11-ft. Mills except that the spread is one-fourth the height with girts 10-ft. apart. They are built of extra heavy material so as to insure ample strength and durability.

Special Extra Heavy 4-Post Galvanized Steel Towers for Supporting an 8-ft. or 10-ft. Pumping Mill and a Taper Tower Tank

HEIGHT OF TOWER	FOR 19 OR 20 BBL. TANK			FOR 40 BBL. TANK			FOR 54 OR 60 BBL. TANK		
	Height to Base of Tank	Weight in lbs.	List Price	Height to Base of Tank	Weight in lbs.	List Price	Height to Base of Tank	Weight in lbs.	List Price
30-ft.	10-ft.	650	$ 66.00	.....	.....	.....	.....	.....	.....
40-ft.	20-ft.	900	80.00	10-ft.	1,050	$ 91.00	10-ft.	1,200	$108.00
50-ft.	30-ft.	1,200	116.00	20-ft.	1,375	132.00	20-ft.	1,650	155.00
60-ft.	40-ft.	1,525	150.00	30-ft.	1,770	184.00	30-ft.	2,125	222.00
70-ft.	50-ft.	1,890	192.00	40-ft.	2,150	216.00	40-ft.	2,640	262.00
80-ft.	60-ft.	2,275	216.00	50-ft.	2,590	234.00	50-ft.	3,200	280.00

THE illustration on page 82 shows an outfit the broad utility of which is apparent at a glance. One of these outfits, to quote a satisfied customer, "meets every requirement, and affords all the conveniences that can be obtained from connection with city water works." These towers are of the same general style as our 4-post towers for supporting 8-ft. or 10-ft. mill, but they are built of extra heavy material to base of tank and are furnished with heavy channel steel beams to support the wooden joists on which the tank sets. The spread is one-fourth the height with girts 10-feet apart, except that towers for 54 or 60 bbl. tanks have girts 5-ft. apart to base of tank



Suburban Water Works Outfit. *See page 83.*

TAPER TOWER TANKS, INCLUDING GALVANIZED CENTER TUBE WITH FLANGE CONNECTION, BUT NO COVER

CAPACITY	2-IN. PINE OR 1½-IN. CYPRESS		2-IN. CYPRESS		GALVANIZED STEEL	
	LIST PRICE	APPROXIMATE WEIGHT	LIST PRICE	APPROXIMATE WEIGHT	LIST PRICE	APPROXIMATE WEIGHT
19 bbl.	$50.00	715 lbs.	$50.00	823 lbs.	.....	.....
20 bbl.	.....	.....	.....	.....	$33.00	233 lbs.
40 bbl.	71.00	875 lbs.	71.00	985 lbs.	50.00	322 lbs.
54 bbl.	89.00	1,250 lbs.	89.00	1,335 lbs.	.....	.....
60 bbl.	.....	.....	.....	.....	91.00	700 lbs.

20-bbl. and 40-bbl. steel tanks are made of No. 20 gauge material, and 60-bbl. steel tanks are made of No. 18 gauge.

WOODEN JOISTS:

	WEIGHT	PRICE
For 19-bbl. wooden tank, extra	200 lbs.	$ 7.25
For 20-bbl. steel tank, extra	150 lbs.	6.25
For 40-bbl. or 54-bbl. wooden tank, extra	700 lbs.	18.75
For 40-bbl. or 60-bbl. steel tank, extra	550 lbs.	12.50

Galvanized Steel Tank Trestles

See illustration on page 84.

HEIGHT	FOR 6-FT. DIAMETER BY 6-FT. HIGH TANK		FOR 8-FT. DIAMETER BY 8-FT. HIGH TANK		FOR 10-FT. DIAMETER BY 10-FT. HIGH TANK	
	WEIGHT	PRICE	WEIGHT	PRICE	WEIGHT	PRICE
10-ft.	480 lbs.	$ 40.00	800 lbs.	$ 60.00	685 lbs.	$ 62.00
20-ft.	745 lbs.	62.00	1,200 lbs.	93.00	1,275 lbs.	100.00
30-ft.	1,025 lbs.	84.00	1,625 lbs.	123.00	1,800 lbs.	139.00
40-ft.	1,300 lbs.	100.00	2,065 lbs.	154.00	2,350 lbs.	185.00
50-ft.	1,600 lbs.	124.00	2,550 lbs.	193.00	2,930 lbs.	230.00
60-ft.	1,900 lbs.	147.00	3,000 lbs.	231.00	3,500 lbs.	275.00

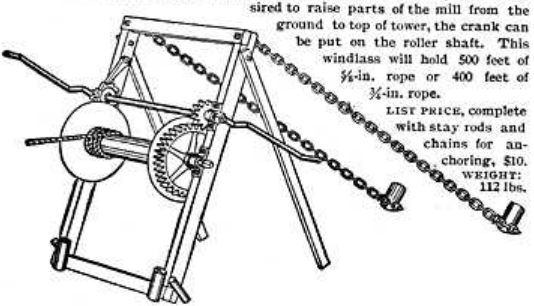
THESE TRESTLES are made of extra heavy material and are of the same general style as our 4-post towers, except that the spread is one-fourth the height. The trestles for 6-ft. and 8-ft. diameter tanks are furnished with galvanized steel anchor posts, heavy cast iron anchor plates and underground steel girts. The trestles for 10-ft. diameter tanks have cast anchor lugs and anchor rods for concrete or masonry foundation.

	WEIGHT	PRICE
WOODEN JOISTS—		
For supporting 6-ft. diameter steel tank, extra	150 lbs.	$ 7.00
For supporting 6-ft. diameter wooden tank, extra	225 lbs.	8.00
For supporting 8-ft. diameter steel tank, extra	350 lbs.	14.00
For supporting 8-ft. diameter wooden tank, extra	550 lbs.	18.00
For supporting 10-ft. diameter steel tank, extra	900 lbs.	34.00
For supporting 10-ft. diameter wooden tank, extra	1,100 lbs.	45.00
DECK, BALCONY AND RAILING, COMPLETE—		
For 6-ft. diameter steel or wooden tank, extra	825 lbs.	51.00
For 8-ft. diameter steel or wooden tank, extra	1,600 lbs.	85.00
For 10-ft. diameter steel or wooden tank, extra	2,000 lbs.	113.00
RAILING ONLY—		
For 6-ft. diameter tank, extra	200 lbs.	22.00
For 8-ft. diameter tank, extra	215 lbs.	32.00
For 10-ft. diameter tank, extra	235 lbs.	36.00

GRANT WINDLASS

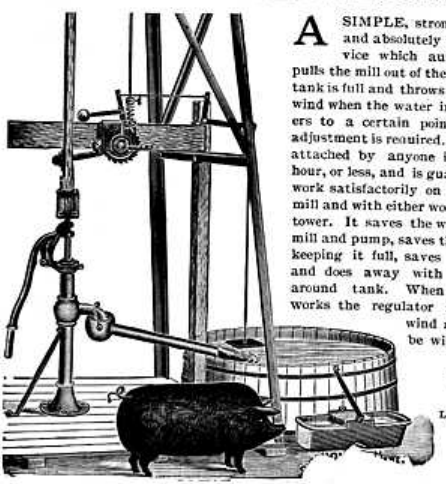
FOR ERECTING WINDMILLS AND WINDMILL TOWERS

OUR illustration shows this windlass staked in right position to raise tower, the rope extending to pulley block as indicated. It is geared as shown in illustration. The shafts are of cold rolled steel and the frame of hard, thoroughly seasoned lumber. For faster motion, if it is desired to raise parts of the mill from the ground to top of tower, the crank can be put on the roller shaft. This windlass will hold 500 feet of ⅝-in. rope or 400 feet of ¾-in. rope.



LIST PRICE, complete with stay rods and chains for anchoring, $10.
WEIGHT: 112 lbs.

ACME WINDMILL REGULATOR



A SIMPLE, strong, durable and absolutely reliable device which automatically pulls the mill out of the wind when tank is full and throws it into the wind when the water in tank lowers to a certain point. No fine adjustment is required. It can be attached by anyone in half an hour, or less, and is guaranteed to work satisfactorily on any windmill and with either wood or steel tower. It saves the wear on the mill and pump, saves the tank by keeping it full, saves the water and does away with mud hole around tank. When the mill works the regulator rests. No wind mill should be without one.

WEIGHT 20 lbs.
LIST PRICE $5.00.

EDWARDS & DEUTSCH LITH. CO. CHICAGO.