

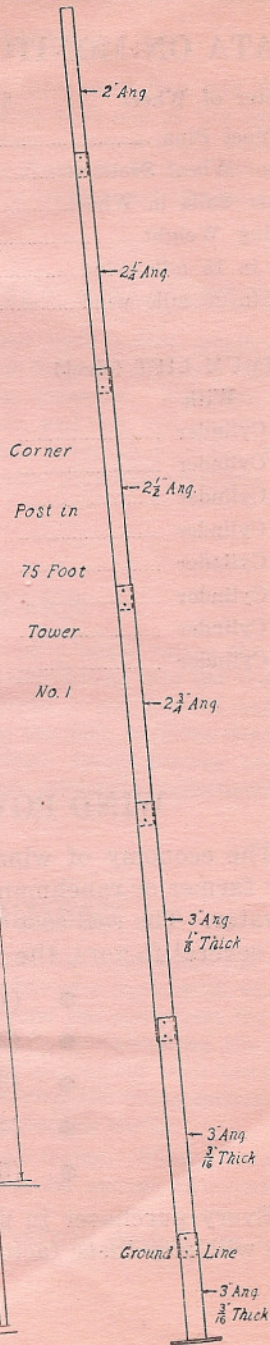
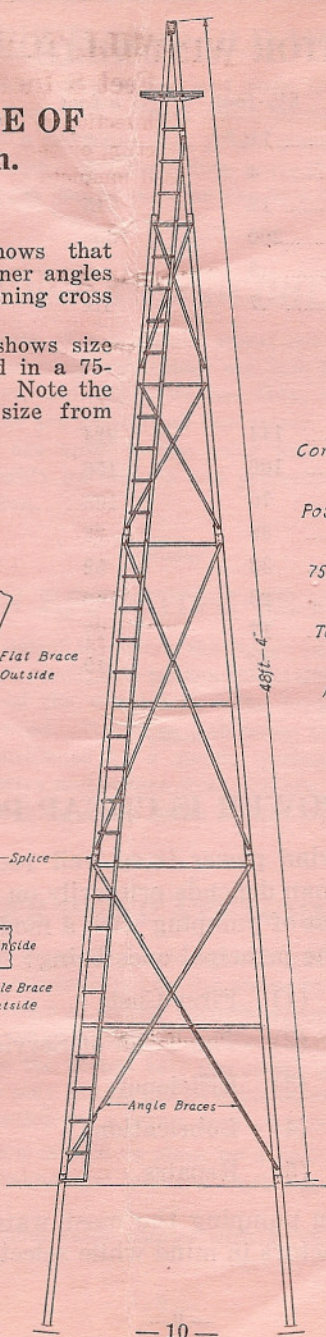
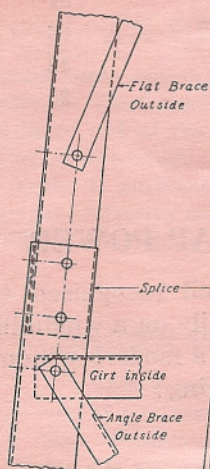
* OMIT IN 22 FT. TOWER
 ⊕ OMIT IN 35 FT. TOWER
 ‡ OMIT IN 48 FT. TOWER

Δ FOR USE ON 22 FT. TOWER ONLY
 † FOR USE ON 35 FT. TOWER ONLY
 ‡ FOR USE ON 48 FT. TOWER ONLY

LADDER SIDE OF 48 Ft. 4 in. TOWER

Drawing below shows that bolts for splice in corner angles are not used for fastening cross braces or girts.

Drawing at right shows size of corner angles used in a 75-foot tower Number 1. Note the regular increase in size from top to bottom.



MONITOR WINDMILL TOWERS

Girts Spaced 6 Feet 8 Inches

These towers are designed so that each section is a complete unit. They can be built up from the ground section by section, or they can be assembled on the ground in a horizontal position then raised complete to a vertical position.

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SIZE OF CORNER ANGLES

Many calculations and tests have been made to determine the forces that come on the various parts of these towers, and members of ample size are used to meet these forces.

The top ten-feet of a tower for an 8-foot mill has as much wind surface as such a mill when furled. Short towers have much more wind surface than the mills they carry; tall towers many times as much. If 2" or 2¼" angles are required for corner posts in a 20-foot tower, much stronger corner posts are needed in the bottom sections of 50 and 60-foot towers. This is why the corner angles of our towers increase in size and strength with the distance from the top. It, also, explains why our tall towers are heavier and higher in price than towers made by some of our competitors. They are not priced higher per pound. Unless tall towers have the heavier corner posts in the lower sections, they are likely to fail near the ground. A drawing on the opposite page shows the sizes of the corner angles used in the various sections of 75-foot towers No. 1.

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LENGTH OF CORNER ANGLES

The total lengths of the corner angles in the various towers, after splicing, are as follows: 21' 8"; 28' 4"; 35' 0"; 41' 8"; 55' 0"; 61' 8" and 75' 0". The top corner angles are either 8' 4" or 15' long. The latter length is used in 28' 4"; 41' 8" and 55' 0" towers. All other corner angles increase the height 13' 4".

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CROSS BRACES

Bottom cross braces are made of angle steel—all others are flats. The bottom ends of the braces bolt to the corner posts just above the splices. In building up from the ground, all bolts in a corner post splice can be tightened before putting on the braces.

The top of the braces bolt to the corner angles with the girt bolts. Short cross braces used in upper part of tower are riveted together where they cross. Long cross braces are bolted where they cross each other and where they cross girts.

Each section of the tower is a unit by itself, for each set of cross braces attaches to the corner angles of but one section of corner posts.

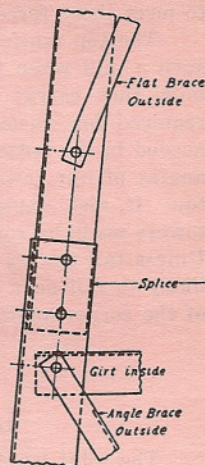
GIRTS SPACED 6 FT. 8 IN. APART

The lowest girt in each tower is about 7-feet above the ground. A tall person can enter the tower without bumping his head, and without stumbling over a girt. Each tower section, except the top, has two sets of girts—one set just below the middle, the other just below the splice at the upper end. As the girts are spaced 6' 8" apart, the corner posts of the tower are divided into columns only 6' 8" long. All girts have sufficient strength to carry a man of average weight and the necessary scaffolding for erecting.

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POSITION OF SPLICE IN CORNER POSTS

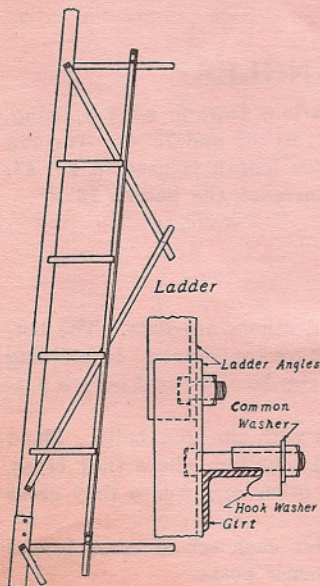
The drawing shows a splice in the corner angles and parts which attach near it. Splice bolts are used only for fastening two corner angles together. Another bolt is used for fastening the lower end of the cross brace to corner post just above the spread. The bolt is put in after splicing the corner angle with the erector standing on the girt just below the splice. A separate bolt is used for fastening the upper end of the cross brace, and one end of the girt to the corner post just below the splice. When building up the tower section by section this bolt is put in before splicing the corner angle and while the erector is standing on the girt 6 feet 8 inches below. There is no place on the tower where more than two members fasten to the corner post with a single bolt. Our construction makes towers easy to assemble whether they are put together on the ground or built up section by section.



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LADDER

A corner post is used for one side member of the ladder. The other side member is made of 1 inch angles furnished in 6 foot 8 inch length, which fasten to the girts. Ladder steps are pressed sheet metal having an inverted V section, except at the ends. The upper side is round with considerable surface to stand on. The ends are bent so they must be hooked into the slots supporting them. When the small side rail is bolted to the girts the steps are automatically locked into place.



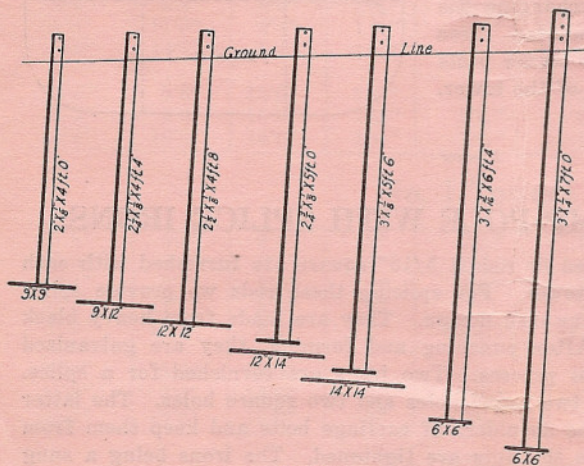
GALVANIZING

All steel parts of the towers are thoroughly galvanized by the hot process, after being cut and punched. There are no edges or small parts liable to rust. Galvanized bolts are used throughout.

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ANCHORS

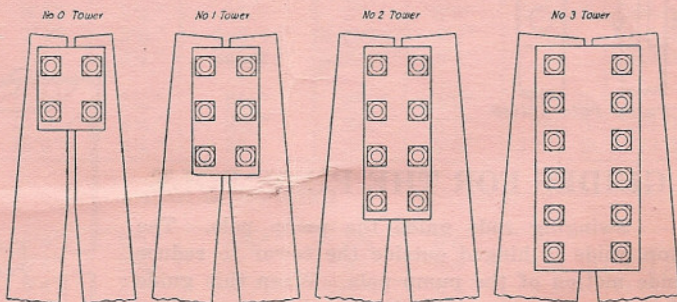
Anchor posts are the same size as the corner angles to which they bolt. Their length and the depth buried vary with the size. 2, 2¼ and 2½" posts have steel plates for setting in gravel. 2¾ x 1/8" and 3 x 1/8" posts have 6 x 6 bottom plates for setting in concrete. At an additional charge, extra steel plates 12 x 14 and 14 x 14" respectively are furnished for setting in gravel. 3 x 3/16" and 3 x 1/4" posts are furnished with 6x6 steel plates only. These anchors must be set in concrete. Anyone buying a 48' 4" tower No. 1 can have the 2¾" anchor posts with the small plates for setting in concrete, or with the extra 12 x 14 steel plates for setting in gravel.



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STEEL PLATES AT TOP OF CORNER POSTS

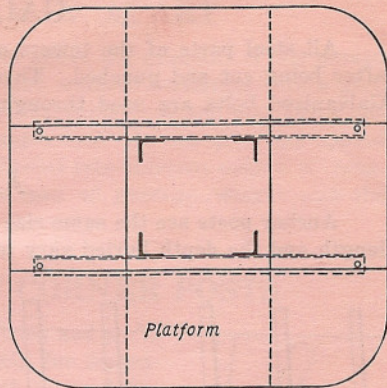
The top section of a windmill tower is materially strengthened by bringing the angles close together at the top, then making them rigid. In Monitor towers galvanized steel plates are



used to secure the needed strength plus a liberal margin of safety. Tower plates with six bolt holes are used on towers designed for 8-foot mills. A set of these plates with 24 bolts securely tightened makes a tower much stronger and more rigid at the top than bands of short girts near the top. Illustrations above show the tower plates used on No. 0, 1, 2, and 3 towers.

PLATFORM

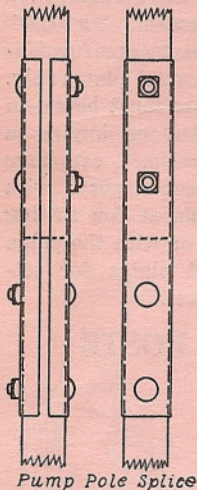
Tower platforms are made of $1\frac{1}{4}$ " white pine dressed to $1\frac{3}{8}$ ". After the four pieces are nailed together the platform is dipped in weather resisting paint to insure many years of service. Two galvanized angles extending nearly across the lower boards bolt to the corner posts of the tower. Platforms with 12" openings are furnished with No. 0 and No. 1 towers. By changing the position of the supporting angles these platforms can be bolted to the corner posts either 38 or 46" below the top of the tower.



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PUMP POLE WITH SPLICE IRONS

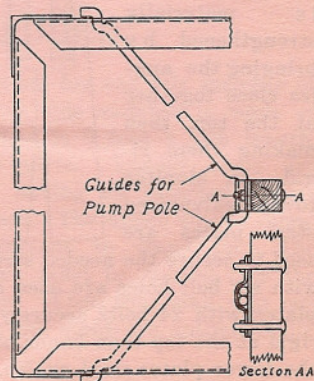
Painted fir rods $1\frac{5}{16}$ " square are furnished with each windmill tower. For splicing these rods we provide splice irons of our own design. They are made from heavy black sheets. After punching and forming, they are galvanized by the hot process. Two irons are furnished for a splice. Each has two round holes and two square holes. The latter fit over the shoulders of carriage bolts and keep them from turning as the nuts are tightened. The irons being a snug fit on rods $1\frac{5}{16}$ " square, make it easy to get a neat and straight splice.



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GUIDES FOR THE PUMP POLE

Swinging rods guide the pump pole. The top guide is hinged outside the tower to reduce side motion of the pump pole. When this guide is properly put on the piston rod cannot rub on the ball bearing step, mast pipe or any other part of the mill. Flat steel plates are used between the guide rods and the pump pole to prevent the rods from wearing into the wood.



DATA ON MONITOR WINDMILL TOWERS

Height	Spread at Ground	Length of Top Sec.	Size Corner Posts		Anchor Angles		Weight with Anchors	
			Top Sec.	Bott. Sec.	Size	Length	For Gravel	Concrete
No. 0 Towers								
21'8"	4'3"	8'4"	1 3/4"	2"	2 1/4"	4'4"	325 lb.	.....
35'0"	6'9"	8'4"	1 3/4"	2 1/4"	2 1/4"	4'4"	585 lb.	.....
48'4"	9'3"	8'4"	1 3/4"	2 1/2"	2 1/2"	4'8"	890 lb.	.....
61'8"	11'9"	8'4"	1 3/4"	2 3/4"	2 3/4"	5'0"	1320 lb.	1272 lb.
75'0"	14'3"	8'4"	1 3/4"	3"	3"	5'6"	1790 lb.	1734 lb.
28'4"	5'6"	15'0"	1 3/4"	2"	2 1/4"	4'4"	434 lb.	.....
41'8"	8'0"	15'0"	1 3/4"	2 1/4"	2 1/4"	4'4"	694 lb.	.....
55'0"	10'6"	15'0"	1 3/4"	2 1/2"	2 1/2"	4'8"	1037 lb.	.....

No. 1 Towers

21'8"	4'3"	8'4"	2"	2 1/4"	2 1/4"	4'4"	362 lb.	.....
35'0"	6'9"	8'4"	2"	2 1/2"	2 1/2"	4'8"	640 lb.	.....
48'4"	9'3"	8'4"	2"	2 3/4"	2 3/4"	5'0"	988 lb.	940 lb.
61'8"	11'9"	8'4"	2"	3"	3"	5'6"	1393 lb.	1336 lb.
75'0"	14'3"	8'4"	2"	3x3/16"	3x3/16"	6'4"	.....	1933 lb.
28'4"	5'6"	15'0"	2"	2 1/4"	2 1/4"	4'4"	482 lb.	.....
41'8"	8'0"	15'0"	2"	2 1/2"	2 1/2"	4'8"	754 lb.	.....
55'0"	10'6"	15'0"	2"	2 3/4"	2 3/4"	5'0"	1154 lb.	1106 lb.

No. 2 Towers

21'8"	4'3"	8'4"	2 1/4"	2 1/2"	2 1/2"	4'8"	.....	.....
35'0"	6'9"	8'4"	2 1/4"	2 3/4"	2 3/4"	5'0"	723 lb.	675 lb.
48'4"	9'3"	8'4"	2 1/4"	3"	3"	5'6"	1050 lb.	993 lb.
61'8"	11'9"	8'4"	2 1/4"	3x3/16"	3x3/16"	6'4"	.....	1488 lb.
75'0"	14'3"	8'4"	2 1/4"	3x3/16"	3x3/16"	6'4"	.....	2040 lb.
28'4"	5'6"	15'0"	2 1/4"	2 1/2"	2 1/2"	4'8"	531 lb.	.....
41'8"	8'0"	15'0"	2 1/4"	2 3/4"	2 3/4"	5'0"	846 lb.	798 lb.
55'0"	10'6"	15'0"	2 1/4"	3"	3"	5'6"	1229 lb.	1172 lb.

No. 3 Towers

21'8"	4'3"	8'4"	2 3/4"	2 3/4"	2 3/4"	5'0"	.....	.....
35'0"	6'9"	8'4"	2 3/4"	3"	3"	5'6"	784 lb.	727 lb.
48'4"	9'3"	8'4"	2 3/4"	3x3/16"	3x3/16"	6'4"	.....	1144 lb.
61'8"	11'9"	8'4"	2 3/4"	3x3/16"	3x3/16"	6'4"	.....	2040 lb.
75'0"	14'3"	8'4"	2 3/4"	3x 1/4"	3x 1/4"	7'0"	.....	2253 lb.
28'4"	5'6"	15'0"	2 3/4"	2 3/4"	2 3/4"	5'0"	617 lb.	569 lb.
41'8"	8'0"	15'0"	2 3/4"	3"	3"	5'6"	919 lb.	862 lb.
55'0"	10'6"	15'0"	2 3/4"	3x3/16"	3x3/16"	6'4"	.....	1327 lb.