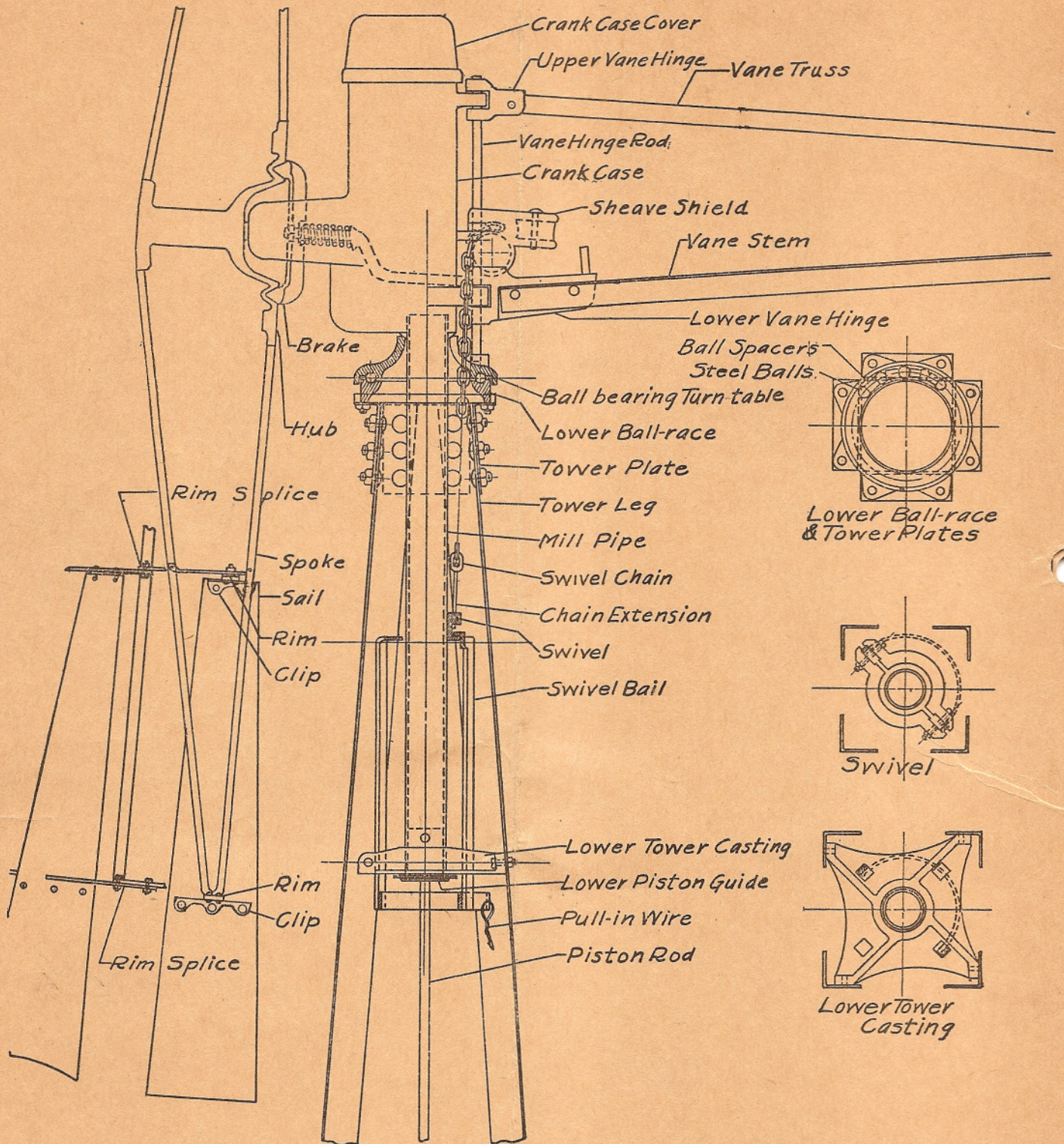


# CROSS SECTION VIEW W TYPE PULL-IN WINDMILLS



**IT PAYS TO BECOME ACQUAINTED WITH NAMES OF PARTS, AS SHOWN ABOVE, BEFORE READING ERECTION INSTRUCTIONS.**

# ERECTING INSTRUCTIONS for W PULL-IN WINDMILLS

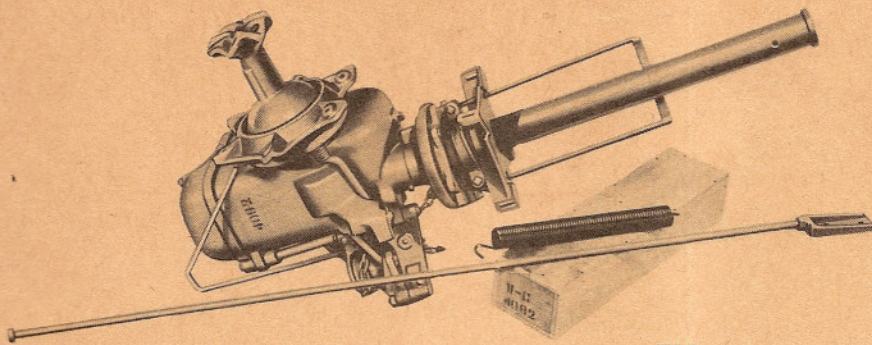


FIG. 1

1. Open the box and sort contents. Put each size and item by itself.

2. Remove all castings from the pipe, (Fig. 1), and proceed to attach the tower plates to the top of the tower with  $\frac{3}{8}$  inch x  $\frac{3}{4}$  inch carriage bolts. Before tightening, attach the lower ball race to the top of the plates with  $\frac{3}{8}$  inch x 1 inch machine bolts and tighten all nuts. (Fig. 2.) Next, attach lower tower casting to tower using  $\frac{3}{8}$  inch x  $1\frac{1}{4}$  inch bolts for  $6\frac{1}{2}$  foot and 8 foot mills and  $\frac{1}{2}$  inch x  $1\frac{1}{2}$  inch bolts for 10 foot mill.

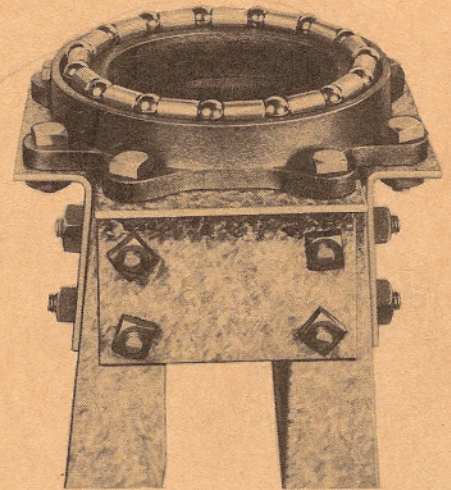


FIG. 2

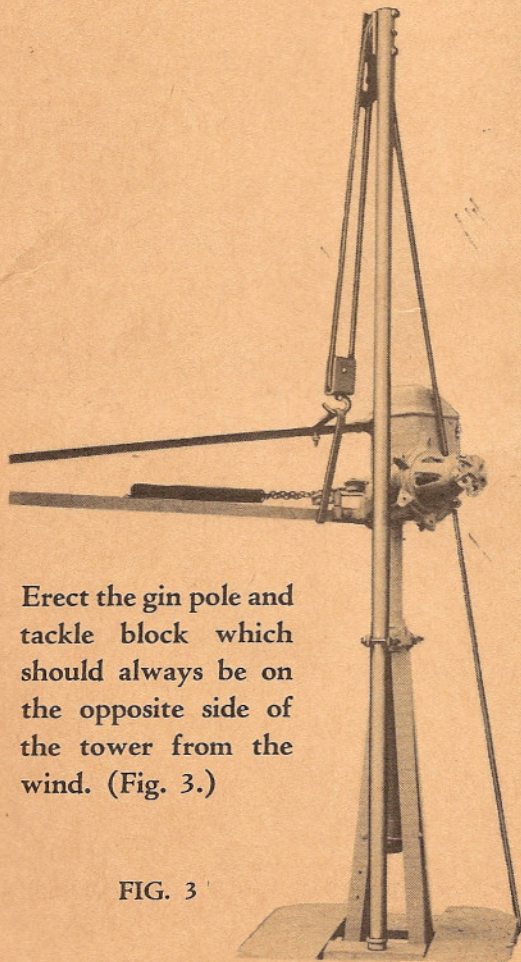


FIG. 3

3. Erect the gin pole and tackle block which should always be on the opposite side of the tower from the wind. (Fig. 3.)

4. To put together the vane stem, No. 63, vane truss, No. 64, and vane sheet, No. 72A: (a) Bolt the vane stem and vane truss together at the outer end with a  $\frac{3}{8}$  inch x  $\frac{3}{4}$  inch machine bolt. (b) Bolt the sheet to them with  $\frac{3}{8}$  inch x  $\frac{3}{4}$  inch machine bolts, using a flat washer under the nut on the sheet side. (Fig. 4.)

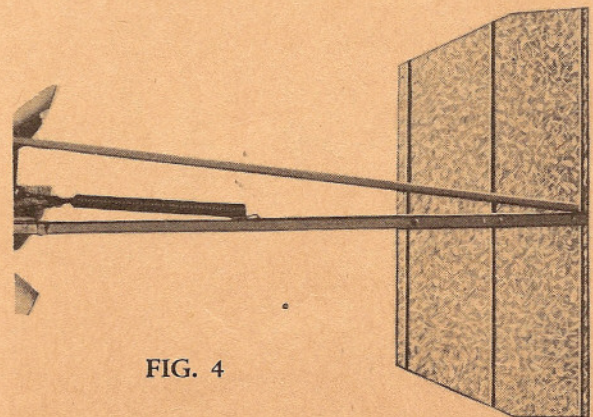


FIG. 4

## ERECTING INSTRUCTIONS for W PULL-IN WINDMILLS

5. On the 6 foot and 8 foot mills, bolt the assembled vane to the head. Use  $\frac{3}{8}$  inch x  $1\frac{1}{4}$  inch bolts to bolt vane stem to lower vane hinge, No. WB 12, and  $\frac{7}{16}$  inch x  $1\frac{1}{2}$  inch bolts for No. WC 12. (Use  $\frac{1}{2}$  inch x  $1\frac{3}{4}$  inch bolts for WD 12.) Then hook one end of the spring in the widened link of the chain and the other end in the middle hole in the vane stem. (Fig. 5.)

Next, attach the tackle block to the vane stem and vane truss with a piece of rope or chain in such a way that it will not slip and also hold the head in an upright position.

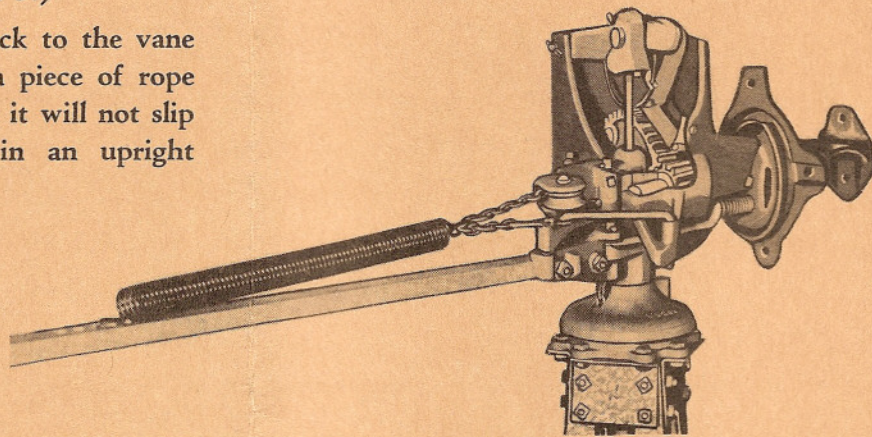


Fig. 5

6. Tie a guy rope to the head in such a way that the vane will be kept away from the tower. This rope should be at least as long as the tower is high. Pull the head up high enough to enter the pipe into the tower or stub. Before putting the balls and spacers in the race of the ball bearing turntable, **FILL THE RACE WITH GREASE**; otherwise the balls may drop out before the mill head is in place on the balls. Place the No. 5 casting on top of the balls, and turn to see that it works freely. Clamp in position to receive the mill with the notch in the right location to receive the chain; then lower the mill into the tower and put the No. 22 casting in the bottom of the pipe. After the mill is in place and resting on the balls in the ball bearing turntable, the **LOWER TOWER CASTING SHOULD BE LOWERED AGAINST THE FLANGE OF THE CASTING No. 22**, and raised  $\frac{1}{32}$  of an inch to  $\frac{1}{16}$  of an inch for clearance.

### Assembling the Wheel

7. Next, assemble the wheel on the ground, straightening all spokes or sails bent in shipping. In assembling the sections, fasten the inner rim outside the cross piece in the spoke with  $\frac{3}{8}$  inch x  $\frac{3}{4}$  inch machine bolts. When facing the front of the wheel and considering the lower sections, the  $\frac{3}{8}$  inch x  $1\frac{1}{4}$  inch machine bolt that goes through the outer end of the spoke also goes through the left end hole of the outer rim. (Use  $\frac{3}{8}$  inch x  $\frac{3}{4}$  inch bolts for the other splice holes in the outer rim.) Both inner and outer rims lap the same way all around the wheel. Keep the nuts loose until the wheel is assembled; then turn the spokes so the cross piece against the inner rim sets at right angles to the rim. Tighten all bolts. Now put a chain around the inner rim at a spoke on the inside of the wheel, hook on the tackle block and hoist the wheel up and bolt to the hub with

# ERECTING INSTRUCTIONS for W PULL-IN WINDMILLS

$\frac{3}{8}$  inch x  $1\frac{1}{4}$  inch bolts on  $6\frac{1}{2}$  foot and 8 foot mills, and  $\frac{3}{8}$  inch x  $1\frac{1}{2}$  inch bolts on 10 foot mills. Put the bolts in with the nuts toward the outside and tighten securely. Take down the gin pole and tackle block.

## Putting in Piston Rod

8. Next, remove the cover and after removing the upper pump pole casting, No. 17, and lock nut from the piston rod, put the piston rod through the steel plate furnished with the piston swivel eye, No. 16, and down through the mill pipe. Then put No. 16 in place on the rocker and bolt the steel plate up under No. 16 with machine bolts and a lock washer under the head of each bolt. Now see that the piston rod swivels in No. 16; if not, correct the trouble. Put the cotter pin through the rocker and spread to hold No. 16 in place. Turn the mill to the bottom of the stroke and with the pump piston  $\frac{3}{4}$  inch off bottom, cut the pump pole the right length to bolt to No. 17.

Then turn the mill to the center of the stroke and put on the upper swinging pump pole guide where the tower is  $19\frac{3}{4}$  inches wide. If it is necessary to punch holes in the tower corner angle, they should be  $1\frac{1}{4}$  inch from the back. Bolt on the flats found in the packing box with  $\frac{3}{8}$  inch x 1 inch bolts. Put in swinging guide and fasten in position with cotters. Then bolt to pump pole in level position with two  $1\frac{1}{4}$  inch x 2 inch carriage bolts and clip. (Fig. 6.)

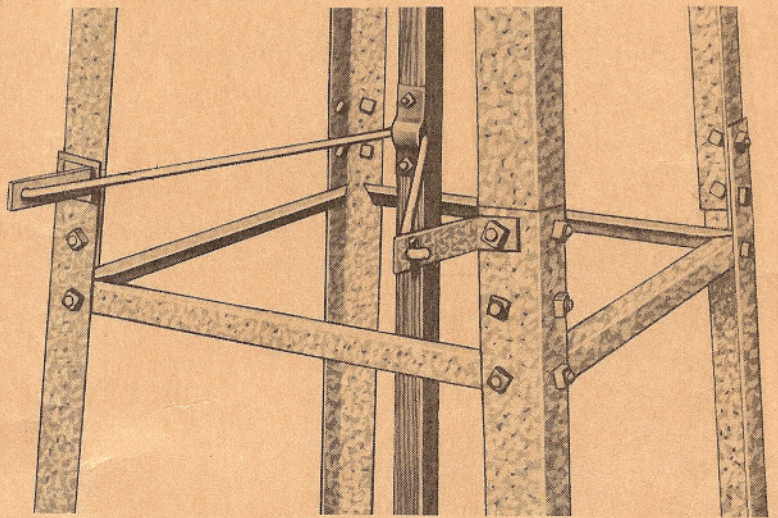


Fig. 6

If the tower has swinging pump pole guides, this top one should be on the same side as the others. Before leaving mill, oil vane hinge and latch pitman with a heavy oil and also instruct the customer to occasionally oil same.

If the mill does not go completely out-of-the-wind when the wire is released, oil all joints and see that nothing catches or binds. Observe carefully the swivel bail where it slides up between the tower legs. If, when everything is well oiled and works freely, the mill does not go out, increase the spring tension by hooking it further out on the vane stem.

# MONITOR WINDMILL INSTRUCTIONS

## SELF-OILING MILLS, PULL-IN TYPE

### General Information

Wheel Diameter—Feet	6½'	8'	10'	12'
Letters designating style of mill	WB	WC	WD	WE
Pumping Stroke—Inches	4¾	6	7½	9
Length Gin Pole above top of tower	6'	6'	7½'	9'
Shortest Practical Stroke for well cylinder	8"	8"	10"	12"
Weight mill head with vane—Pounds	100	170	320	540

### Maximum Pumping Lift (Feet) For Windmills

Diam. Windmill Wheel—feet	6½'	8'	10'	12'
Cylinder Diam. (Vertical distance water level to discharge)				
1.74 inches	144	224	384	500
2.08 inches	100	156	243	350
2.5 inches	70	108	169	243
3.0 inches	48	75	117	169
3.5 inches	33	52	81	117
4. inches	26	40	63	90
5. inches	17	27	42	61
6. inches	12	19	30	43

### Six Shipping Packages

The Mills are shipped in the following packages:

- Mill head with tower castings and wire swivel.
- Crate wheel sections with wire for 50-foot tower.
- Bundle wheel spokes.
- Vane sheet with upper pump pole guide.
- Vane stem, truss, spring, lever and piston with pump pole casting.
- Box bolts, can oil and small parts—Contents listed below:

(With the 10 and 12-foot mills only, the can of MONITOR Alweather Oil makes the seventh package.)

	6' Mill WB-Style	8' Mill WC-Style	10' Mill WD-Style	12' Mill WE-STYLE
Pump Attachment—Symbol	K-20	K-20	K-20	
Lever V-Bolt for Corner Post, size	2½"	2½"	3"	3"
Ball Cup—New Symbol	WB-5	WC-5	WD-5	WE-5
Piston Eye	WB-16	WC-16		
Piston Eye Plate	WB-54½	WC-54½		
¾" Blk. M. Bolts (Plate to Piston Eye)	2—2½"	2—3"		
¾" Lock Washers (Plate to Piston Eye)	2—	2—		
¾" Spring Cotter (Piston Eye to Cross Hd.)	1—1¼"			
¾" Spring Cotter (Piston Eye to Cross Hd.)		1—1½"		
¾" Blk. C. Bolts—Pump Pole Castings	4—2"	4—2"	4—2"	4—2¼"
¾" Galv. M. Bolts—Outer Rim Splice	4—¾"	6—1"	6—1"	
¾" Galv. M. Bolts—Outer Rim Splice				6—1"
¾" Galv. M. Bolts—Inner Rim	4—1"	6—1"	6—1"	6—1¼"
¾" Galv. M. Bolts—Spokes to Outer Rim	4—1¼"	6—1¼"	6—1¼"	
¾" Galv. M. Bolts—Spokes to Outer Rim				6—1½"
¾" Galv. M. Bolts—Spokes to Hub	8—1¼"	12—1¼"	18—1¼"	
¾" Galv. M. Bolts—Spokes to Hub				
¾" Galv. M. Bolts—Pipe Center Casting	4—1¼"	4—1¼"		
¾" Galv. M. Bolts—Pipe Center Casting			4—½"	18—1½"
¾" Galv. M. Bolts—Pipe Center Casting				4—1½"
¾" Galv. M. Bolts—Ball Cup	4—1½"	4—1¼"		
¾" Galv. M. Bolts—Ball Cup			4—1¼"	
¾" Galv. M. Bolts—Ball Cup				4—2½"
¾" Galv. M. Bolts—Vane	3—¾"	4—1"	4—1"	4—1"
¾" Galv. M. Bolts—Upper Vane Hinge	1—1"	1—1"	1—1"	
¾" Galv. M. Bolts—Upper Vane Hinge				1—1½"
¾" Galv. M. Bolts—Lower Vane Hinge	2—1¼"	2—1¼"		
¾" Galv. M. Bolts—Lower Vane Hinge			2—1½"	
¾" Galv. M. Bolts—Lower Vane Hinge				2—2¼"
¾" Lock Washers—Spoke Bolts		34	36	0
¾" Lock Washers—Vane Hinge Bolts		2	2	0
¾" Steel Balls—Ball Cup	10	13	16	20
No. 1 Grease Cup Top Tower Casting		1	1	2
No. 00 Grease Cups—Tower Castings	2	2	2	1
Pump Pole Guide Extensions—On Tower	1	1	1	1

\* First figure tells number of bolts used, second figure gives their length.

Note—In case of shortage in packing indicate the error on this sheet and return it promptly to Baker Manufacturing Co. Evansville, Wis., U. S. A.

No. of Packing ..... Packed by .....

Open box and check contents to see that nothing is missing.

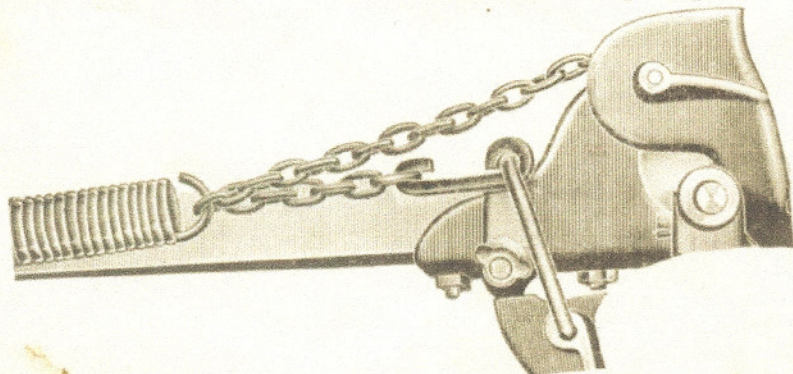
These instructions are for putting mills on towers already erected.

For new towers less than 50-feet high we recommend assembling tower and mill in a horizontal position then raising to a vertical position. For taller towers, we recommend building them from the ground up. First, fix up the tower to receive the mill according to tower instructions, or instructions for putting these mills on old towers.

### Vane

The outer end of the vane truss bolts near middle of the vane and to the short vane rib. Assemble the vane sheet between the stem and truss and bolt vane angles to the vane hinges. Tighten all bolts very securely. When using an old vane on a new mill head shorten the upper vane angle  $\frac{5}{8}$ " , otherwise the vane hinges will cramp on the vane pin.

### Governor Spring



With the vane in the furled position, hook one end of the spring in the middle hole on the vane stem, and the other end into the widened chain link, (seventh), as shown in the cut. There should be no twist in either portion of the chain.

### Baker Hitch

For fastening the hoisting block to the vane angles of the eight foot mills, we make a special hook. This hitch causes the head to hang in a vertical position while raising.

### Rope Hitch

For an 8-foot mill take a good piece of one-half inch rope, not shorter than seven feet long. Make a two foot loop by tying both ends to the vane stem near the lower hinge (12). Bring the loop up parallel to the pipe between the vane truss and wheel. Wrap the loop once around the truss and hook the hoisting tackle into it. The loop should come above the stem only sufficient to hook in the tackles. To aid in getting the wheel hub past the platform, use a tall gin pole (See table at top of page 1) and a guy rope at least twice as long as the height of the tower. Hitch this rope on the vane stem close to the lower vane hinge (12).

### Locations

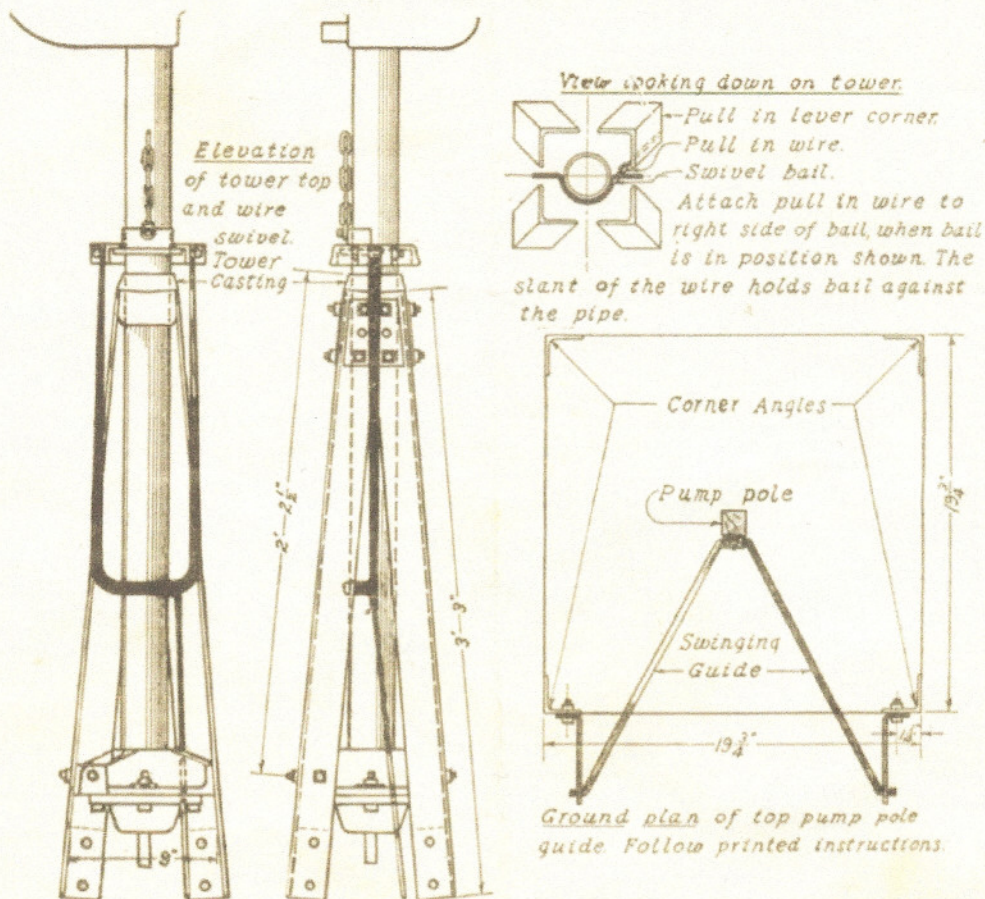
Put up the gin pole and get ready to hoist the head. If the wind is from the north, place the pole vertical on the south side of the tower, so the center of the hoisting tackle for the 8' mill will be 10-inches south of the tower center. The men doing the hoisting should be about a rod east of the tower. The mill should go up on the west of the tower with the vane pointing south. The guy rope should extend to the west, with a man on the end to hold the mill out from the tower. The wheel should go up on the east side of the tower.

For other wind directions keep the same relative positions.

### Assembling Wheel

Straighten any spokes or sails bent in shipping. In assembling the sections fasten the inner rim outside the cross piece in the spoke. When facing the front of the wheel and considering the lower sections, the bolt that goes through the end of the spoke also goes through the left end hole of the outer rim. Both inner and outer rims lap the same way all around the wheel. Leave the nuts loose until the wheel is assembled and bolted to the hub. If the mill is to go on the tower before the tower is raised, it is better to leave the wheel until the last thing before raising and assemble the spokes on the hub before bolting the sections to the spokes.

## Furling Lever and Swivel Bail



(Drawings on left of page apply to 8-foot mill)

Before hoisting the head remove the cap screw in the bottom of the pipe, and the swivel ring, leaving the bronze flange dangling on the chain. The swivel bail should be placed in the proper position in the tower before putting the mill in. Determine the most convenient corner for the pull-in lever and put the bail in the tower, so it will be in the proper relation to the pull-in lever. See drawing of swivel looking down on the tower. Do not remove the pipe from the head.

Now hoist the head with vane.

Do not have anyone on the tower until you are ready to lower the head into the tower.

## Ball Bearings

When the head is down in the tower so the pipe projects a little below the pipe centering casting (2) put the ball cone in place in the bottom of the pipe and fasten in with the cap screw. It also holds the mill from coming up out of the tower.

Now raise the head until this cap screw hits the bottom of the pipe centering casting (2). With cup grease, stick the required number of one-half inch steel balls in the race of the cup (5). Bolt this cup securely on the under-side of the pipe centering casting (2). The balls will now support the head and you can unhook the tackle.

## Hoisting Wheel

Hoist the wheel and bolt it to the wheel hub. Take down gin pole and tackle. Tighten every wheel bolt very securely. Be sure all spoke ends are pulled securely into the corner of the hub ears. Hammer spoke ends lightly as bolts are tightened. The hub bolts should have their nuts bearing on the hub and their heads on the spokes.

## Piston

The piston is round steel with a forged head on one end and a lock nut on the other. It should be perfectly straight.

Remove the crank case cover, the swivel (16) from the rocker, the plate from the underside of the swivel, and the lock nut from the bottom of the piston.

Put the piston through the plate and down through the mill pipe. Place the swivel (16) back on the rocker and fasten the plate to the underside of the swivel. Use lock washers under the bolt heads to keep bolts from turning.

Attach the piston to the pump pole and lock it securely with the lock nut. They should be straightened if not in perfect alignment.

### Top Pump Pole Guide

It is made of  $\frac{3}{8}$ -inch round steel bent to a V shape, each leg being about 15-inches long. The guide hinges are bolted to the tower where it is  $19\frac{3}{4}$ -inches square from corner to corner (See cut). On our towers with girts 5'-6" or 6'-8" they come  $4\frac{1}{2}$ -inches above the top girt. If there is a corner splice there, they attach with the top splice bolt. All towers except those girted 6'-8" will have to be punched for them. The holes come  $1\frac{1}{4}$ -inches from the corner of the angle.

If the tower has swinging pump pole guides, this top one must be on the same side as the others.

The guide should be fastened to the pump pole with clips furnished for the purpose. All the guides should be level when the mill piston is exactly half way up.

When the mill rocker pin is on the same side of the tower as the pump pole guides, and parallel to their hinges, then the piston should not touch the ball bearing cone in the bottom of the pipe as the wheel rotates. If the piston touches, it should either be straightened, the guide hinges blocked, or the attachment to the pump pole blocked, so that the piston will not touch in any point of the stroke. If piston does not touch in the above position of the wheel, it will not touch in any position of the wheel.

Replace the cover.

### Lubricating

Put the grease cups in tower castings 1 and 2. Force grease onto the pipe and with a paddle put grease all around on top of both of these castings next to the pipe.

Oil the vane hinges, sheaves, latch joints and pump pole guides with steam cylinder or auto shackle oil.

Remove the slanting plug from the fill hole in the crank case and pour into the crank case, all the oil it will take through this opening. Use only **MONITOR ALWEATHER OIL**.

### Furling (Going out of the Wind)

When the wire is released the governor spring should pull the wheel around parallel to the vane, set the brake and swing the latch pitman (60) against the stop on the latch lever (13). In this position there should be only a very small distance, if any, between the lower vane hinge (12) and the out-of-wind stop on the main casting (3).

If the mill does not go completely out-of-the-wind when the wire is released, oil all joints and see that nothing catches or binds. Observe carefully the swivel bail where it slides up between the tower legs. If, when everything is well oiled and works freely the mill does not go out, then increase the spring tension by hooking it further out on the vane stem.

By tying the wheel and vane together and pulling down on the furl lever it is easy to unhook the short chain from the latch pitman. Then it is easy to hook the spring in another hole in the vane stem.

If the mill runs too fast, when in the wind, and goes out-of-the-wind with a jar decrease the tension of the governor spring.

### Care of the Mill

(1) After three months try all the bolts with a wrench and see that all nuts are good and tight.

(2) Grease the two tower bearings that the mill pipe turns in.

(3) Oil with steam cylinder or auto shackle oil the two vane hinges, latch joints, sheaves, chain, wire swivel and pump pole guides.

(4) Put into gear case all the **MONITOR ALWEATHER OIL** it will take through the fill hole.

Repeat 2, 3, and 4 once a year.

Once in five years drain gear case and refill.

**BAKER MANUFACTURING CO.**  
**Evansville, Wis.**