

DIRECTIONS FOR ERECTING

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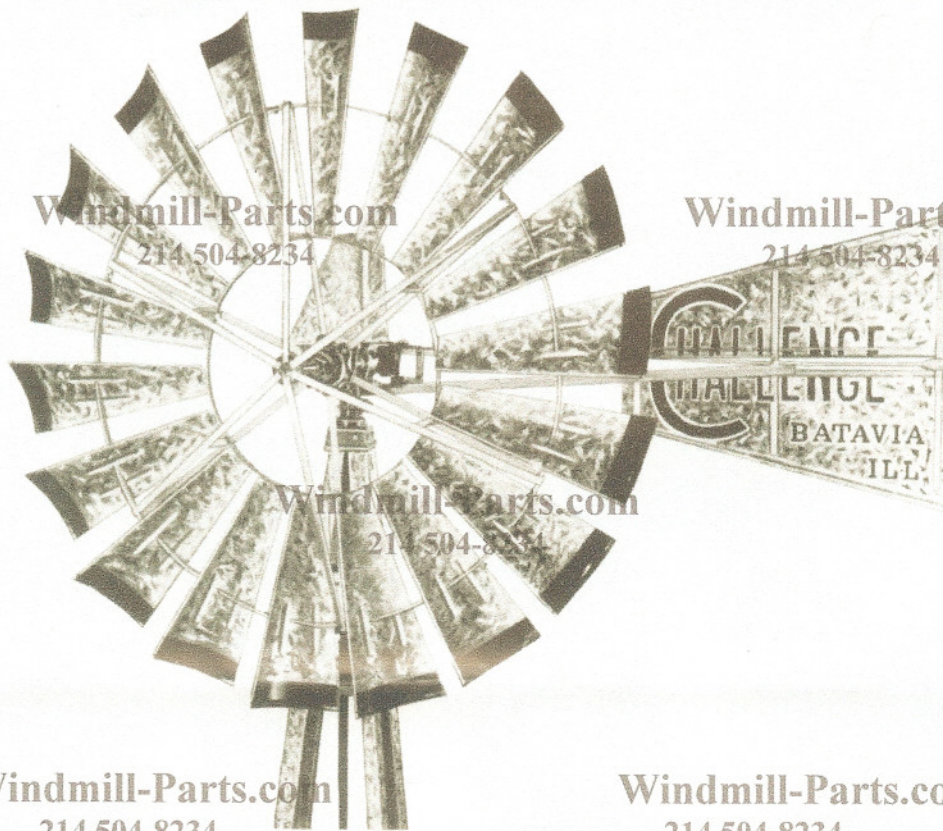
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CHALLENGE

NO. 27 WINDMILLS

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CHALLENGE

ESTABLISHED

BATAVIA



COMPANY

IN 1870

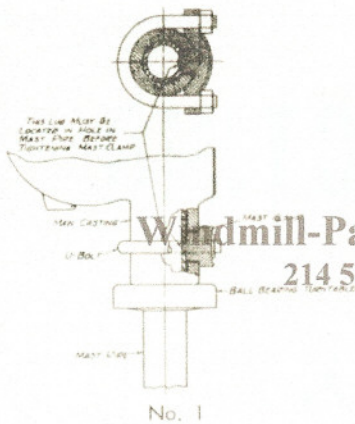
ILL., U.S.A.

112-114 THIRD AVE. NORTH,
MINNEAPOLIS, MINNESOTA

715 SOUTH NINTH ST.,
OMAHA, NEBRASKA

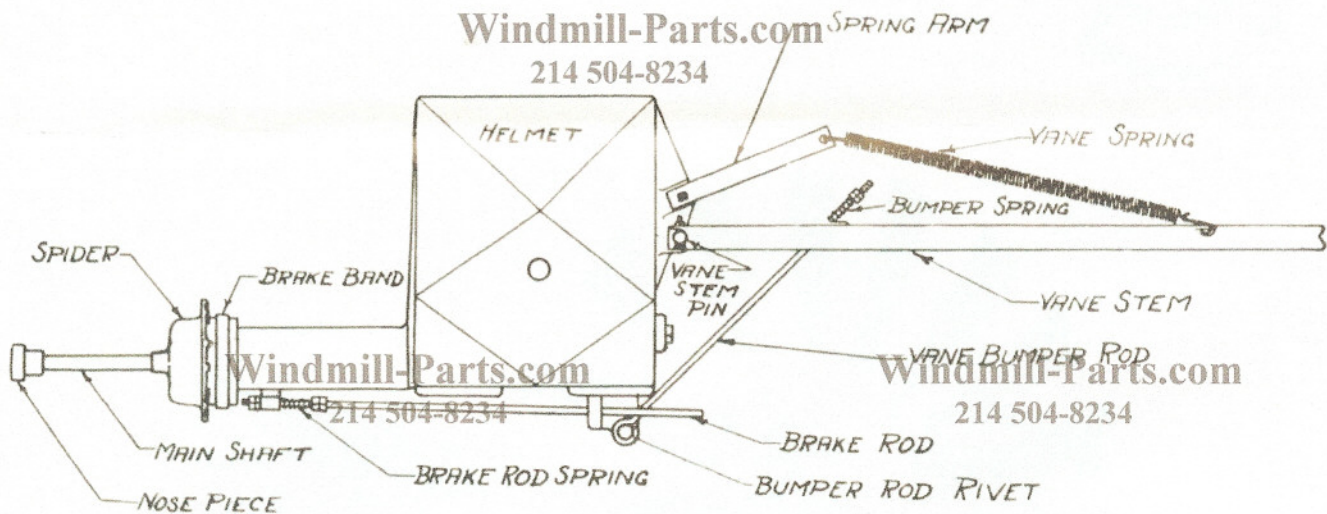
PLACING THE MAST PIPE

The mast pipe is fastened to the motor with a U-bolt and mast clamp. The projecting lug on the mast clamp must be located in the hole in the top of the mast pipe before U-bolt is tightened. See sketch No. 1.



PLACING THE VANE

The vane stem is attached to the motor with the vane stem pin. Remove this from the motor and pass it down the vane stem, through the two projections on the motor and then through the vane angle. Place bolt through vane stem angle and through vane stem pin and draw up tight. Now replace the lower cotter pin. Make sure that the lock pin on the upper end of the vane stem pin is in the small hole in the vane stem. Now bolt the vane sheet to the vane stem.



VANE ATTACHMENTS

Put the vane bumper rod through the top hole in the first vertical brace on the vane stem and fasten it to the main casting with the bumper rod bolt, passing the bolt through the eye in the rod then down through the hole in main casting next to the brake rod and then through the pulley guard and pulley. Adjust the bumper rod nuts so that when the vane is at right angles with the wheel, the vane spring is slightly compressed.

Bolt the spring arm to the motor (this spring arm has 2 holes in it, one closer to the end than the other. Bolt it to the motor through the one farthest from the end) and attach one end of spring to it, and the other end to one of the holes in the vane stem. Raise the motor to top of tower with block and tackle and just before lowering motor into the tower put the ball bearing turntable on the mast pipe flat side up, then pass the end of mast pipe down through the tower cap and guide ring.

PULLOUT ASSEMBLY

Use a light cord with a small weight, such as a nut on the end of it, and pass it over the small pulley in main casting, down through mast pipe and attach it to the end of the pullout chain. Pull the chain up

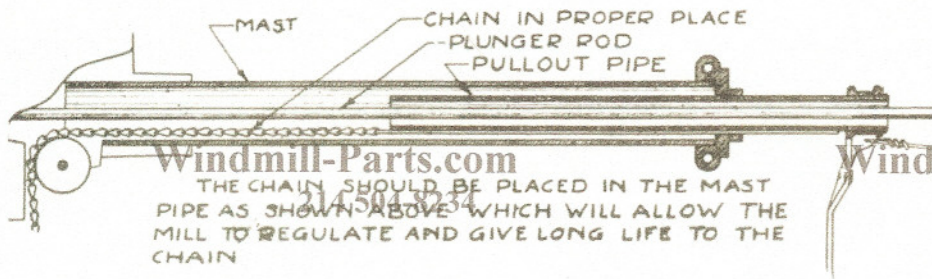
through the mast pipe, over one pulley and through the other pulley and attach the end of the chain to the first cross piece of the vane stem. Pass the first link of the chain through the oblong hole in the cross piece and insert cotter pin in link. The chain as furnished is the right length and should not be altered. Then replace the plunger rod guides on lower end of mast pipe. Have the pullout swivel between the two corner posts where girts will not interfere on the side the pullout wire will go down. Have the flat bar on the pullout pipe in line with the pulley in the main casting over which the chain passes.

PLUNGER ROD

Make sure that the pullout chain is not wrapped around the plunger rod, as it will cause the chain to wear out and the mill to pull out hard.

See "right" and "wrong" illustrations on next page. The plunger rod is screwed into the crosshead and locked with a nut and set screw. Remove the lock nut on upper end of plunger rod, then pass plunger rod through the pullout pipe, mast pipe and main casting. Replace the lock nut and screw the plunger rod into the crosshead far enough to pass through the crosshead. Draw the lock nut and then the set screw up tight. This is important. If left loose the oil may flow down the plunger rod.

THE RIGHT WAY TO PLACE PLUNGER ROD



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THE CHAIN SHOULD BE PLACED IN THE MAST PIPE AS SHOWN ABOVE WHICH WILL ALLOW THE MILL TO REGULATE AND GIVE LONG LIFE TO THE CHAIN

THE RIGHT WAY



CAUTION

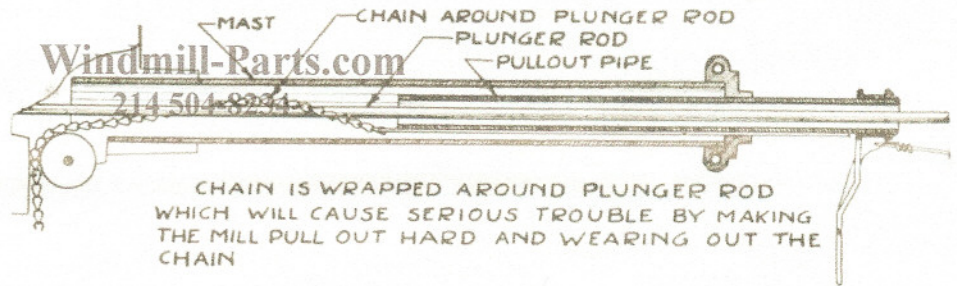
Some erectors have the habit of shortening the pullout chain. This is wrong. Chain is right length when leaving factory and should not be altered.

THE WRONG WAY



A little care will keep trouble away at this point.

THE WRONG WAY TO PLACE PLUNGER ROD



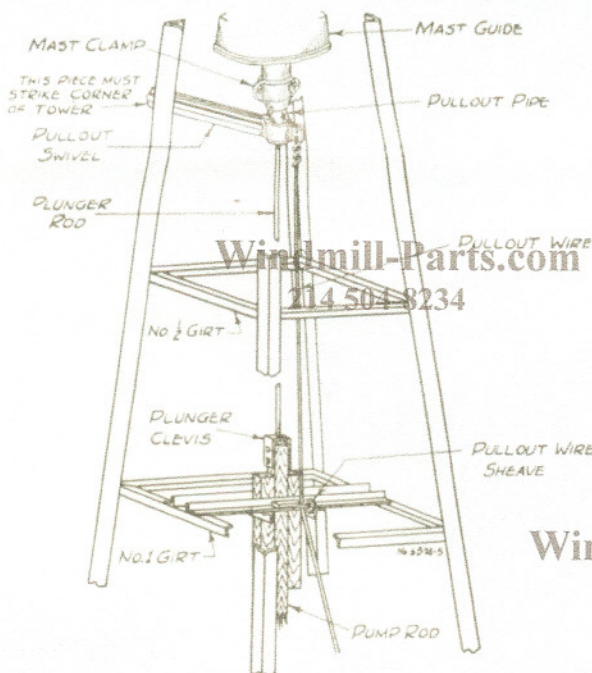
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CHAIN IS WRAPPED AROUND PLUNGER ROD WHICH WILL CAUSE SERIOUS TROUBLE BY MAKING THE MILL PULL OUT HARD AND WEARING OUT THE CHAIN

THE WHEEL

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Bolts and other connection pieces are in a box attached to the wheel crate. Bolt the wheel arms to the spider and nose piece and the wheel sections to the arms, putting both inside and outside bands of sections on INSIDE of arms. Put a lock washer on each bolt. Leave all nuts loose until all the sections are in place, then screw all nuts up tight. (Take a cold chisel and upset the threads back of each nut to prevent them from working loose.) Bolts in the spider should have bolt heads next to the brake band.

WOOD ROD AND PULLOUT CONNECTIONS

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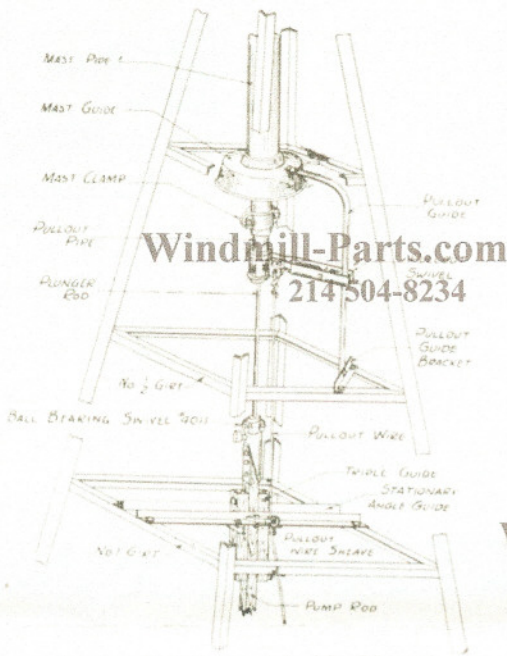


Pullout Device for 6 3/4, 8, 9, 10, 12 and 14-foot Challenge 27 Wind Mills

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It is extremely important that the stationary angle guide, with the triple wood rod working through it, and the pullout wire sheave, be properly lined up and secured to the tower girts. This triple guide and pullout wire roller has much to do with the efficient turning on and shutting off of the mill. It permits a straight "down pull" of the pullout wire and eliminates wear on the pullout assembly and plunger rod.

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The stationary pump rod guide for the 6 3/4, 8, 9 and 10-ft. mills is attached to the No. 1/2 girt. On 12 and 14 ft. mills it is attached to the No. 1 girt and on 16, 18, 20 and 22 ft. mills, it is attached to the No. 1 1/2 girt. (The girt marking on the sketch on next page shows girt No. 1. That is not correct. It should be girt No. 1 1/2.) Pass a length of wood rod up through the guide and bolt it to the plunger rod swivel. Now bolt the two short pieces of wood rod to the long wood rod, to form the triple guide as shown in illustrations. Allow for proper clearance at both top and bottom, then connect the balance of the wood rod by means of the splice irons. (Continued next page.)



Pullout Device for 16, 18, 20 and 22-foot Challenge 27 Wind Mills

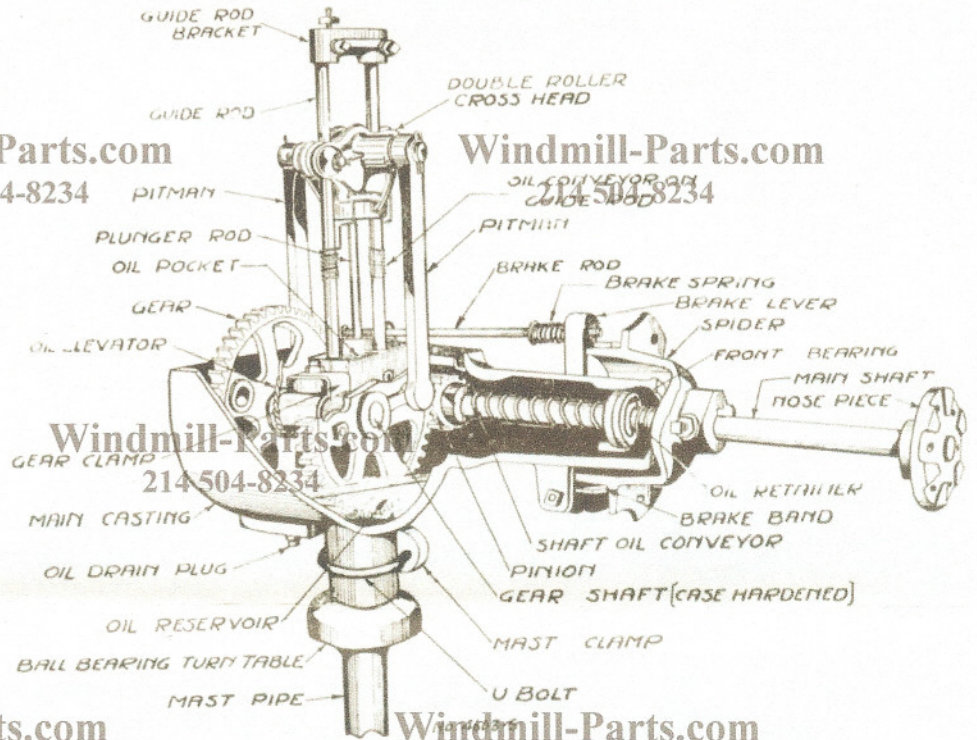
Let the wood pump rod pass down through the tower perpendicularly, and when connecting to the pump with the iron pump connection, have the mill at the TOP of the up stroke. Place the pump connection on the flat iron pump rod and put in the pump pin. Then draw up the well rod until the plunger of cylinder strikes the top of cylinder. Let it drop one-half inch and bolt the pump connection to the wooden rod at this point. The wood rod should have a guide every ten or twelve feet.

The pullout wire fastens in the hole in pullout swivel and should extend down to the pullout windlass which is attached to one corner post of the tower. (16', 18', and 22' mills have pullout cable.)

After mill is erected put a few drops of oil on the triple wood rod guide, pullout pipe, pullout chain, and vane stem pin.

OILING

It is recommended that in the Fall, and before cold weather that the windmill helmet be moved and all parts of the motor and wheel be examined to see that all bolts are tight and that everything is in good working order. Remove the plug underneath the motor and drain out the old oil. Replace the plug and be sure it is tight. Then refill the reservoir with new oil up to the oil line shown underneath the vane stem pin. When putting this oil in be sure and fill the small reservoir at the base of the guide rods. We recommend CHALLENGE ZERO OIL as it does not evaporate in hot weather or thicken in cold weather. Where this is not available use only a light high grade oil, an oil that will remain in liquid weather. This is important in



order that all parts of the mill will be properly lubricated. Where Zero windmill oil is not available use nothing heavier than No. 10W automobile oil, and for extreme cold thin it out with kerosene.

In replacing the helmet on the 6 3/4, 8, 9 and 10 foot mill be sure to place the leather washer under the helmet nut so as to prevent water passing under nut into the gear case.

The oil is picked up from the reservoir by the oil elevator, which is attached to the large gear, and deposited in the oil pocket at the base of the guide rods. From the oil pocket it is taken by the oil conveyors on the guide rods and piped to the cross head rollers and bearings on the cross head. On every stroke of the mill the rods and pitman bearings receive a good supply of oil.

The brake is equipped with spring to take up wear and is properly adjusted when it leaves the factory.