One-Man Universal Joint Mount

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If you have a new beam you have a problem —getting the monster up on the tower all in one piece. If you have burned out a trap, you have to replace it somehow. Well, fellows, at long last this problem has been solved. No more rounding up half the town, gin poles, bent elements or improperly tuned beams. With this "Universal Joint Mount," one man can now erect the largest 20 or 40-meter beam in 20 minutes time without any outside help. After a little practice you can do it in 15 minutes, or in 10 minutes with one helper. You can change all the element lengths in 5 minutes; with help, 3 minutes. How about that? This is very desirable, of course, if you have a new beam and want to compensate for surronding objects. Many a beam has gone untouched because it was just too much trouble to change it.

The mount permits the boom to tip down to the tower on both sides and also to twist. The twisting is desirable if you have guy wires or trees that would prevent the beam from being tipped all the way to the tower. To slip the elements in under a guy wire you simply twist the boom about 80°, then tip the boom down to the tower. First, an element end or a coil will be accessible from the tower or roof; then as you tip the boom further the center point of the director or reflector can be reached from the tower for change of spacing, removal or attachment.

The procedure for the erection of the beam by one man is shown as follows in the pictures. The mount can be made for 2, 3 or 4 inch booms with the special type clamp shown. Any size mast can be fitted by using different size muffler clamps available from auto supply houses. Water pipe (1¼ ID) is recommended for a mast supporting light 20 meter beams. It has the advantage of not denting or giving under the pressure of a U-bolt. To prepare the muffler clamps, take a hack saw and cut little grooves in the circular part that goes against the mast pipe. Do the same to the U-bolt. This produces teeth that will bite into the mast and prevent any twisting between the mount and mast. The clamp and U bolt will have to be cadmium plated or galvanized or they will rust. It will cost about $5.00 for either 2 or 20 clamps as $5.00 will be about the minimum charge. A 1½ inch clamp will fit perfectly around a 1¼ inch ID water pipe and a 2¼ inch clamp will fit a 2 inch ID water pipe.

The mount can be made for other size booms from 1 to 5 inch at ⅛ inch steps. A hose type clamp is used and is available from most heating or irrigation supply houses. This clamp is constructed differently but will work very well. They are a cast type clamp and seem to vary in size so pick them out carefully. Take a sample boom size with you and a pair of pliers and try a couple for size. Remember you want the two lips to be parallel or close to it when it is tightened around the boom.

General Construction

An aluminum plate 12 x 9¼ x ¼ inches is the back bone of the mount. The angle aluminum is 1½ x 2 x 9½ inches (two of them) and ⅛ inch thick. A 3/16 inch thickness plate can be used for small 20 meter beams. The pivot bolt hole is the most important to position. It must be so positioned so that when the boom is tipped either way the angle aluminum will not hit either of the muffler clamp bolts. It is drilled with a 17/64 inch drill and tapped with a 5/16-18 tap. A 5/16 –18 1 inch bolt is screwed in from the back side or the side the mast will be on. Holes 1, 2, 3 and 4 are drilled with the angle aluminum mounted on the pivot bolt, the clamp tightened around the 3 inch irrigation pipe and held in place with a couple vise grip pliers. This assures that the holes will all line up. Even though the holes will all line up it's a good idea to use a 17/64 inch bit for ¼ inch bolts. Holes 5 and 6 are 3/16. A 10/32 inch bolt holds the muffler clamps in place here.

There are two 10/32-9/16 inch (of thread) bolts per clamp that are very important. One is used as a spacer to prevent the clamp lips from bowing in when the large bolt is tightened. A 5/32 inch hole is drilled at the end of the clamp lip in the center and threaded with a 10/32 tap. It is screwed in the thickness of the clamp lip and a 10/32 nut is used to lock the screw in place. When the large bolt is tightened the clamp is compressed against the boom and the lips against the spacer. It can get only so tight and results in an absolutely rock solid mount. The second 10/32 bolt and nut bolts the top angle aluminum to the clamp. This holds the clamp lips horizontal when you loosen the large bolts to twist the boom. Without these bolts the weight of the beam tends to cant the lips and

Fig. 1—Clamp assembly for 4 inch boom.

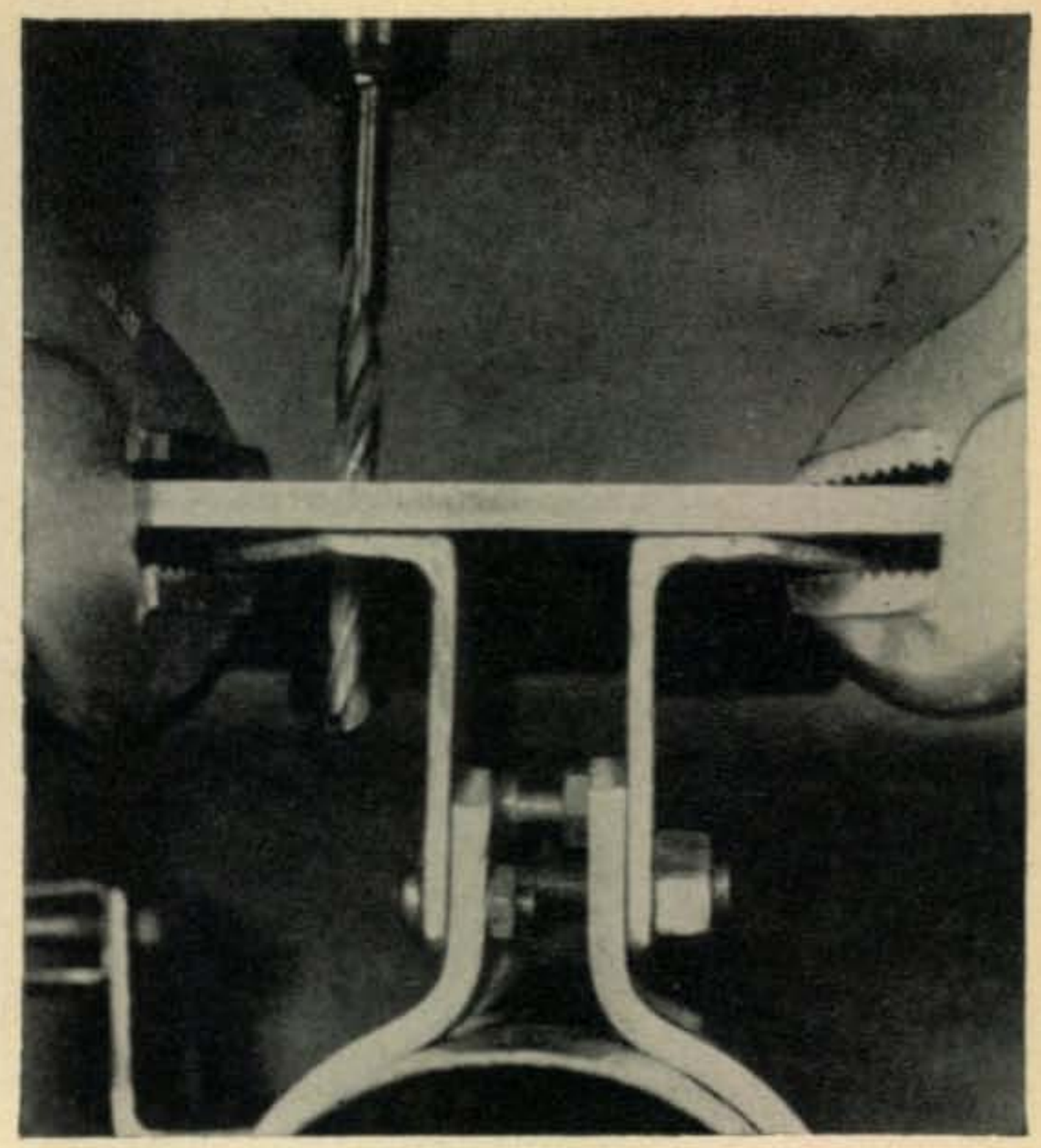


Fig. 3—Proper method of drilling holes.

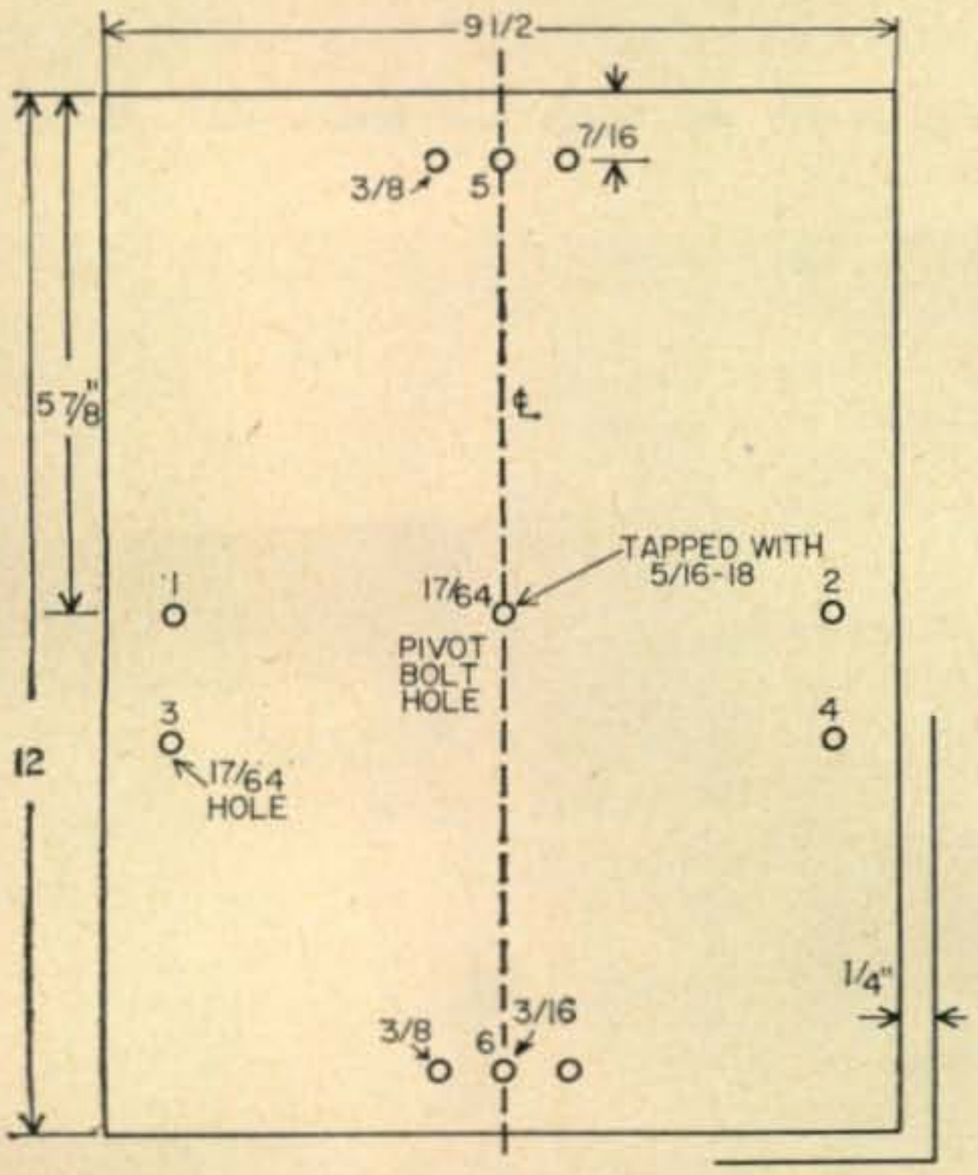


Fig. 2—Plate for full size 20 meter beam. Holes 1, 2, 3 and 4 (for ¼ x 1 inch bolts) are drilled with the clamp angle aluminum and boom assembly all tightened and mounted on the pivot bolt and clamped to the aluminum plate with a pair of vise grip pliers as shown in fig. 3. This assures that all four holes will always line up.

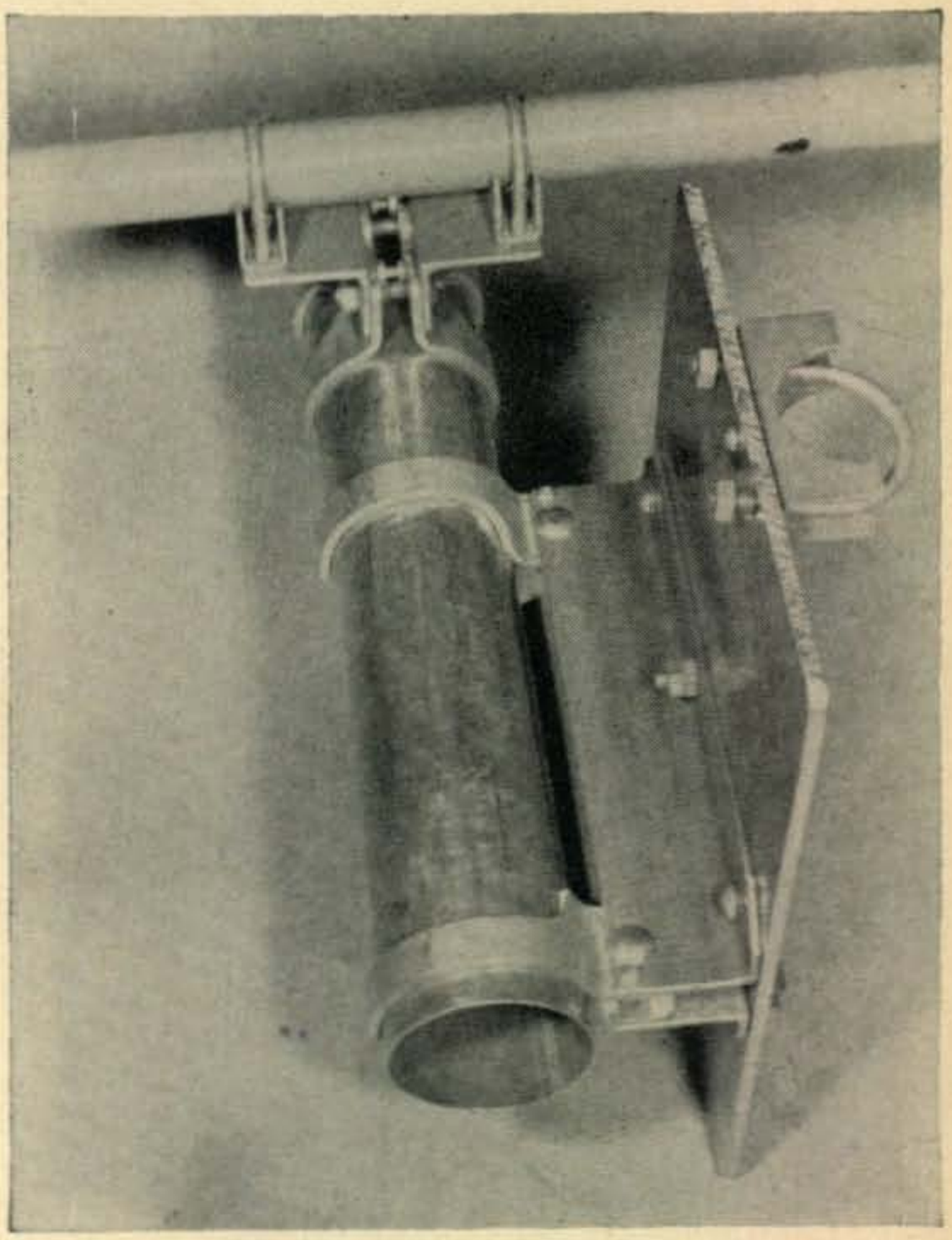


Fig. 4—The finished "Universal Mount."

as a result keeps tension on the clamp. With these two bolts (one in each clamp) it is only necessary to loosen the 2 large nuts a couple of turns. See photo for close up view.

If you use lock washers under the heads of the 4-¼ inch bolts that are used in holes 1, 2, 3 and 4 it is not necessary to use two hands (one holding a screw driver in the head and a wrench on the nuts) to tighten or loosen the nuts. You use one hand to hold on to the tower and one holding the wrench this way. The large bolts that secure the clamps are a carriage type, that is they require a square mounting hole for the head. This prevents the bolt from turning when tightening or loosening the nut and is again

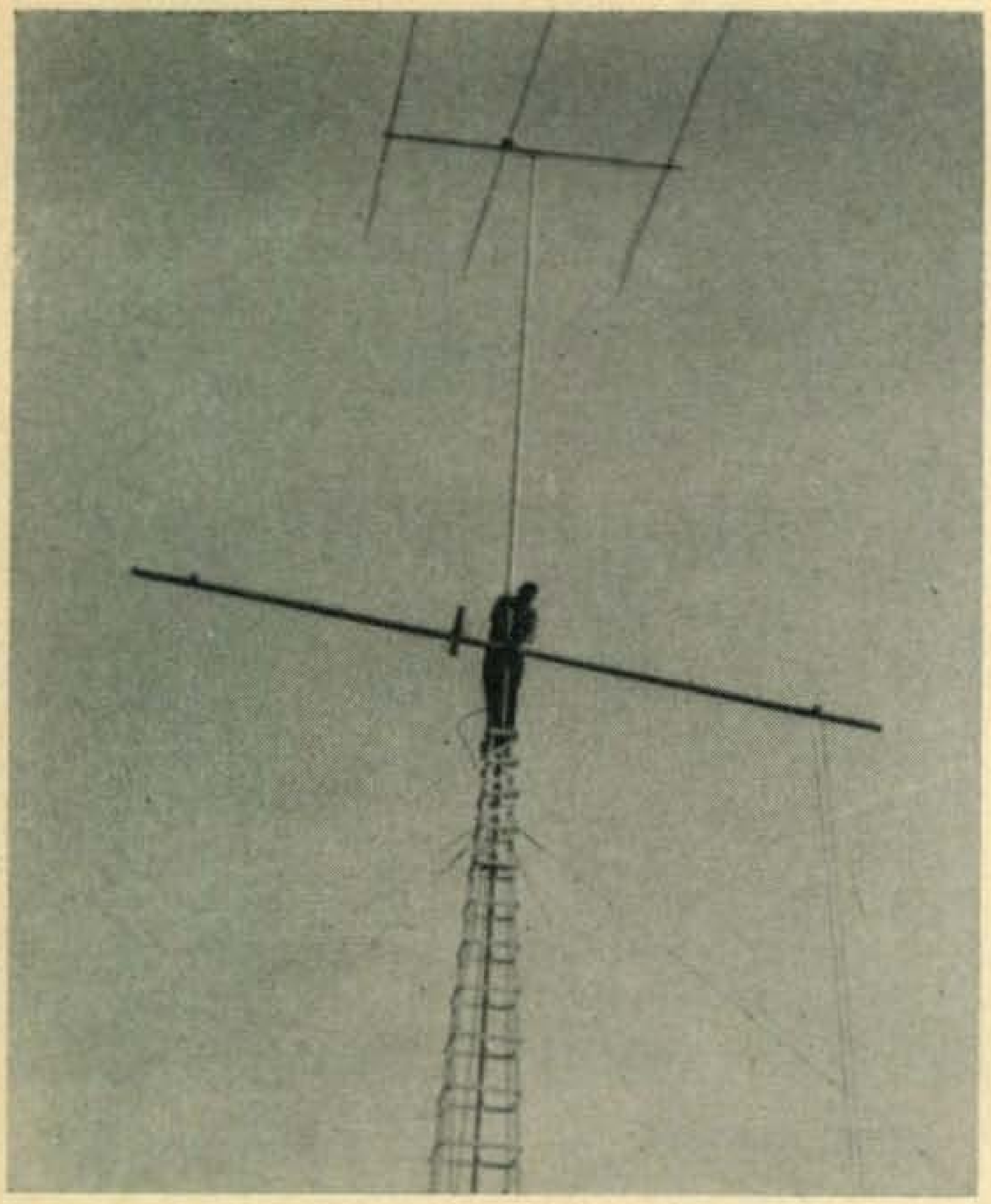


Fig. 5—The boom is first mounted to the mast.

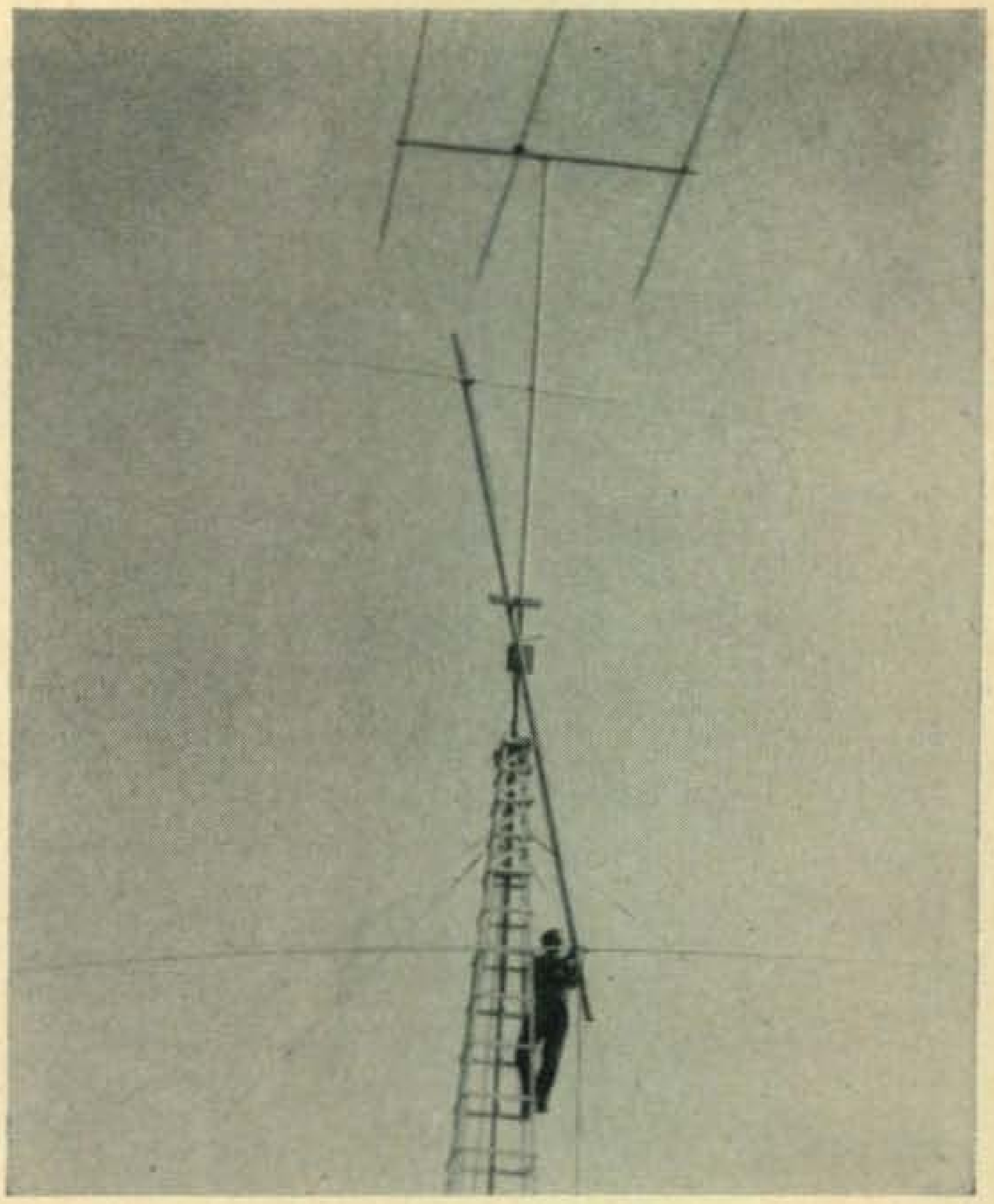


Fig. 7—Tilt the boom and attach the reflector.

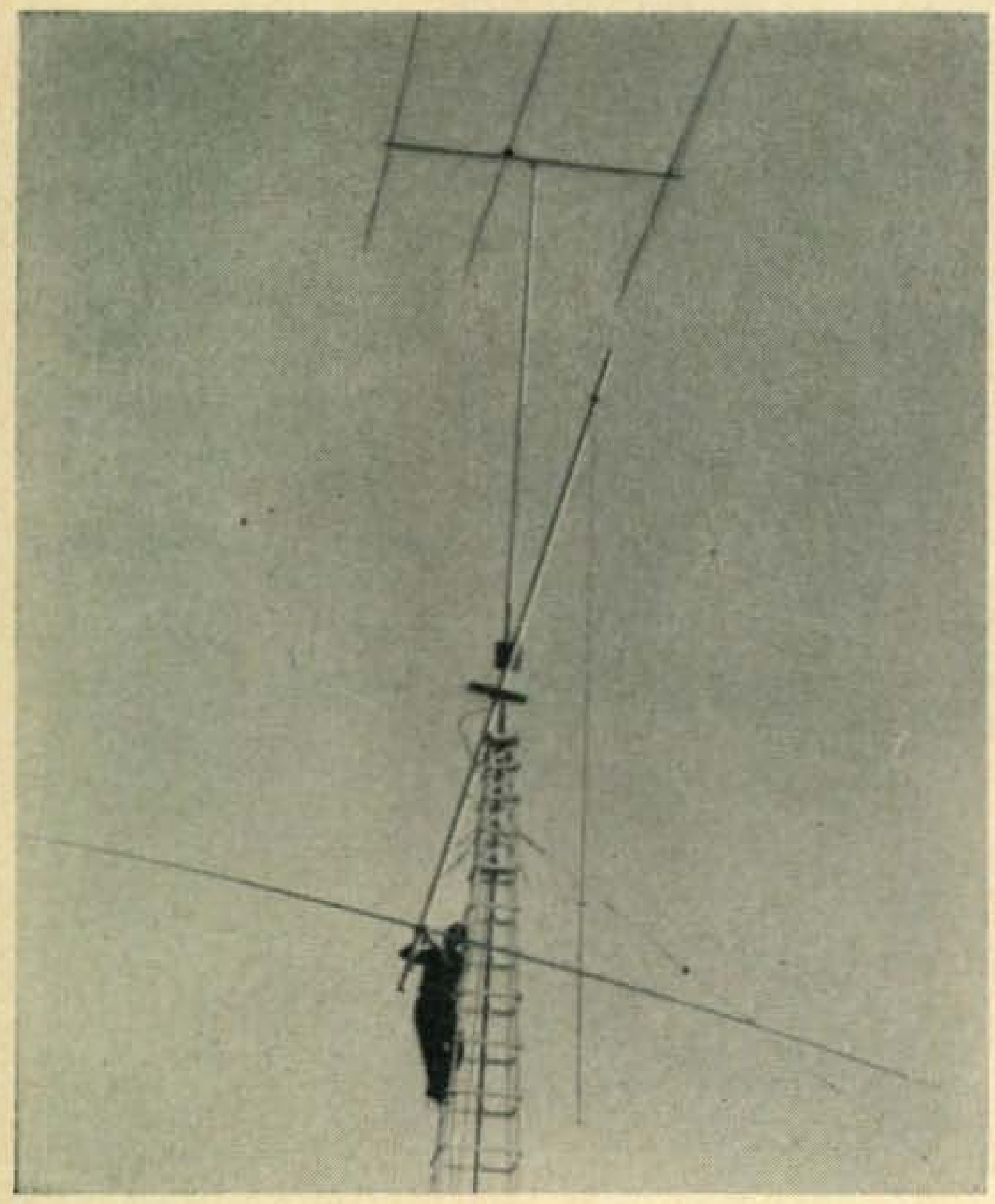


Fig. 6—The boom is then tilted and the director is attached to the end.

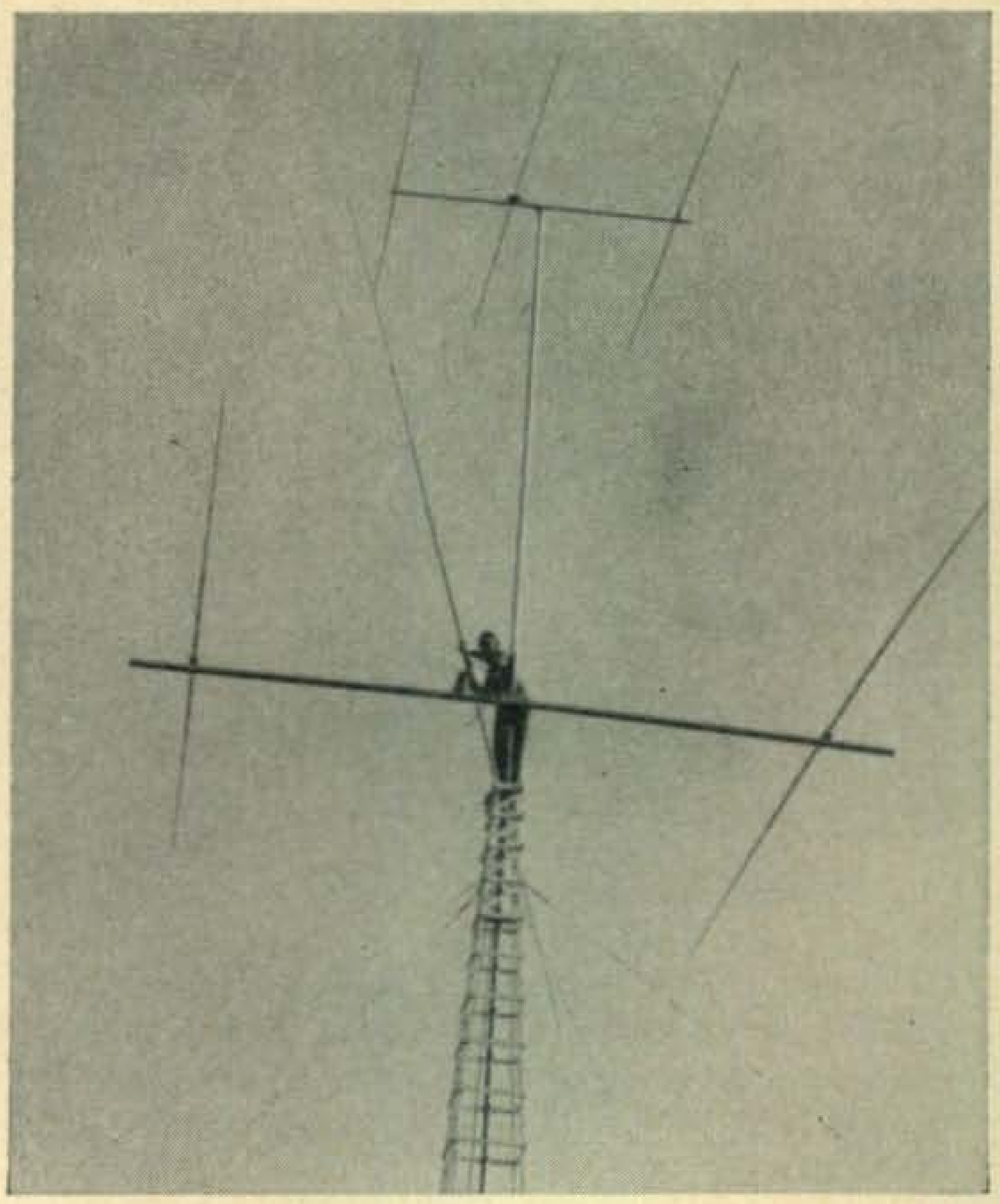


Fig. 8—Return the boom to a horizontal position and attach the driven element.

a one hand operation. Safety first you know. The holes for the carriage bolts are ¾ inch from the end of the angle aluminum and 9/32 inch from the long edge. Use a file to square the top holes. The bottom one remains round. Drill the two angle aluminum clamped back to back with a couple of vise grip pliers using a 5/16 inch bit.

Here's a tip I thought of after the pictures were taken. The ¼ inch bolts in holes 1, 2, 3 and 4 could be a 5/16 inch bolts also. This way only one size wrench is needed for the whole operation. The ¼ inch bolts are strong

[*Continued on page 122*]

The Deluxe and Command units come with the *ac* line cord only. The plug that connects to the transceiver must either be rewired for 6 or 12 volt operation or the cables for these voltages may be purchased separately. It is probably wise to obtain the cables as you may then operate under any condition, and with only the change of the power cord and plug.

The "Citizen Bander" is 8¾" wide x 12½" high x 5¾" deep. The Custom model weighs in at 10 pounds (less antenna) while the other models weigh just 4 pounds additional due to the more complex power supply.

Under the restricted range conditions imposed by the whip antennas, and operated indoors, you may still expect to communicate up to 1 mile with two "Citizen Banders." Considerably greater distances may be covered by mounting the antennas on the roof. With yagi-type antennas, minimum ranges of 6 to 10 miles may be expected.

For the OM who has all but despaired of getting the XYL "on-the-air," this could be the answer to communication with the "home office" while driving around town.

Countless other uses exist for these convenient units, and who can tell how many future hams will be attracted to the hobby by way of citizen's radio. If you would like to open the door to a new world of communications, start by getting a copy of the FCC Regulations, Part 19, at your local FCC office; or directly from the U. S. Government Printing Office, Washington 25, D. C. Enclose 10 cents.

See you on 11 meters! ■

UNIV. JOINT [*from page 40*]

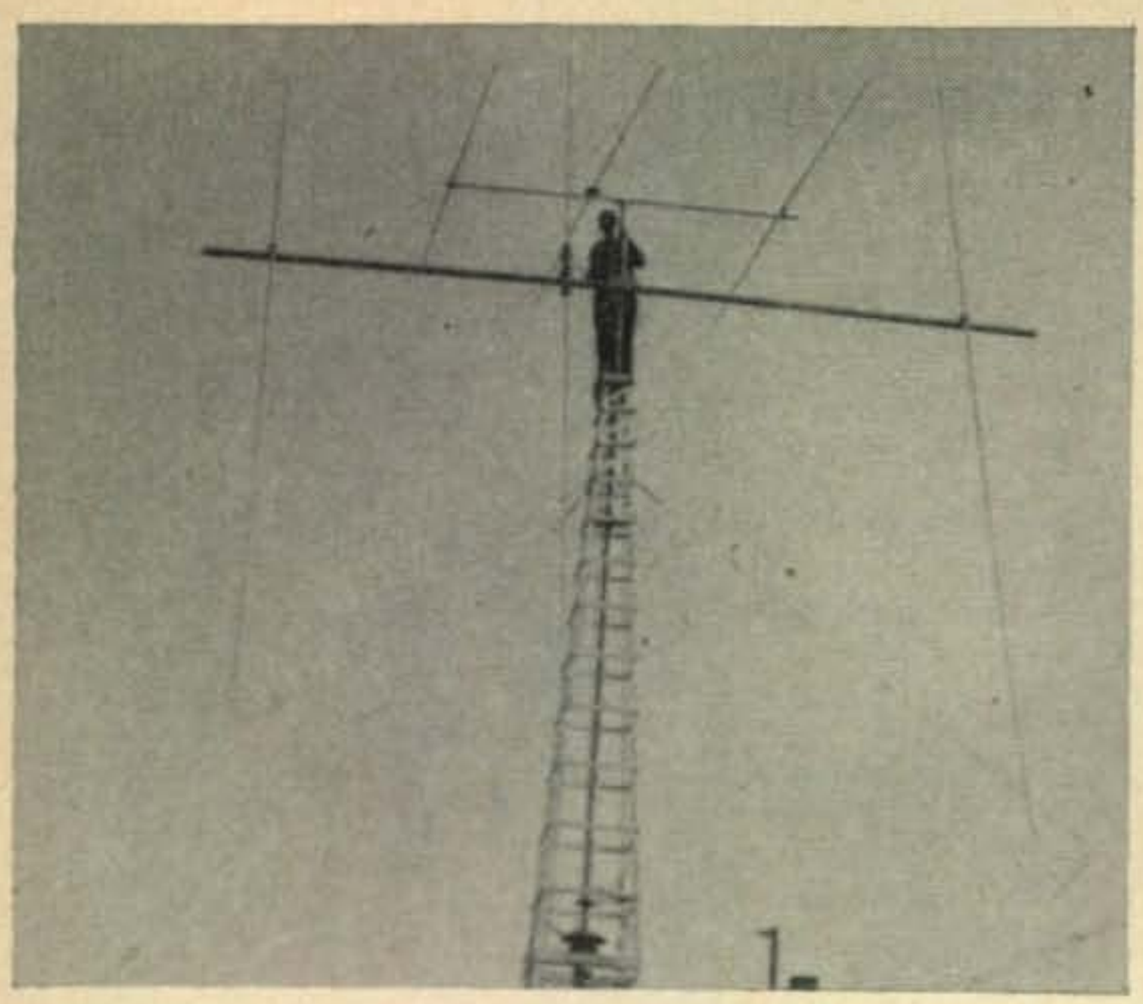
enough but then another wrench is required. A small but important item when your up on the tower.

Element Mounts

The element mounts are absolutely solid also. The pictures are self explanatory. When loosening the large bolts to change the spacing be sure to loosen one U bolt holding element so that the clamp can expand. This is one of the strongest and simplest element mounts. I have ever seen. All the bolts and joints should be coated with Penetrox A, an aluminum anti oxidation compound. If you use a small quanity under the clamps around the boom it will twist very easy.

For a large 30 foot, 3 inch boom, a 3rd clamp is suggested in the middle for easier handling and added strength. The 4 inch clamp is a double one so it is plenty strong and only two are needed per mount and one per element mount.

A 30 foot 3 inch boom only costs about $15 so to rebuild the beam is quite cheap and easy to construct and assemble with the



The beam can also be tilted for easy repair or adjustment of elements.

hardware described. The mount[1] is a must if you plan any experiments or tuning or if you have to replace or adjust a coil in your present beam. With this mount you won't have to take the whole beam down for each adjustment. ■

[1] The mount and element mounts are available from the author made to order.

432 MC AMP [*from page 35*]

high frequency idler tuning adjustments plus a liberal amount of profanity.

4. A terrific (several S points in the receiver with *avc* off) sudden noise increase indicates oscillation in the parametric amplifier at or near 432 *mc*. In this case switching the noise generator *dc* current on and off will make no change in the receiver noise reading.

5. The desired "noise increase is the one at a pump frequency slightly to one side of the sudden "loud" condition in most amplifiers. This noise increase should be gradual (after it starts) when the plate supply and pump oscillator output is very slowly changed. When you get this condition after a few days of testing and much black coffee, switching the noise generator on and off will show large changes in the radio receiver noise readings.

6. Then you can start over again with a signal generator, and then the actual antenna connected to the parametric amplifier! The adjustments then are fortunately much easier and are only necessary because the antenna (or signal generator) impedance is not the same as the noise generator impedance at 432 *mc*. However, these changes can seem to be severe enough to drive the optimistic experimenter one step closer to the nut house!

7. It's worth the trouble and added grey hairs when the weak signals that were down in the receiver noise on the old 432 *mc* receiver become readable! ■