Jan. 4, 1938. G. A. HUGHES 2,104,561

SUPPORTING APPARATUS FOR WELDING OPERATION

Filed March 9, 1936

Fig. 1.

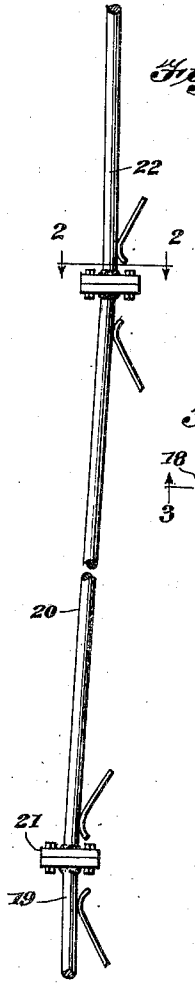


Fig. 3.

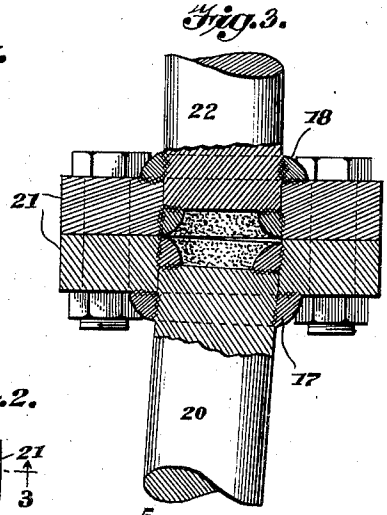


Fig. 5.

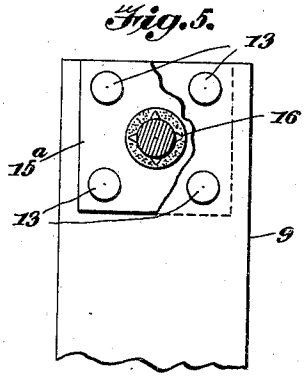


Fig. 2.

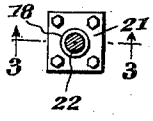


Fig. 4.

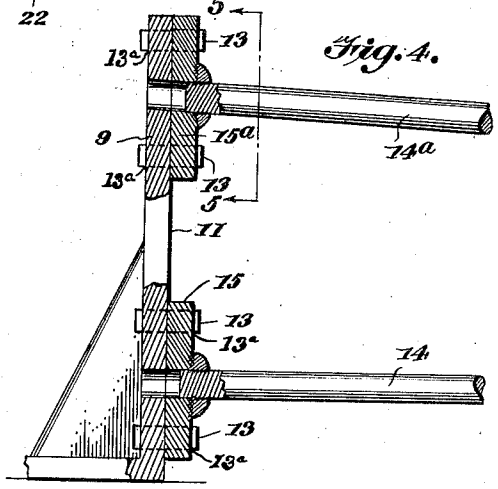


Fig. 6.

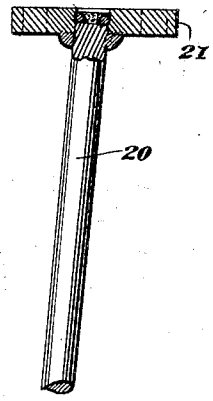
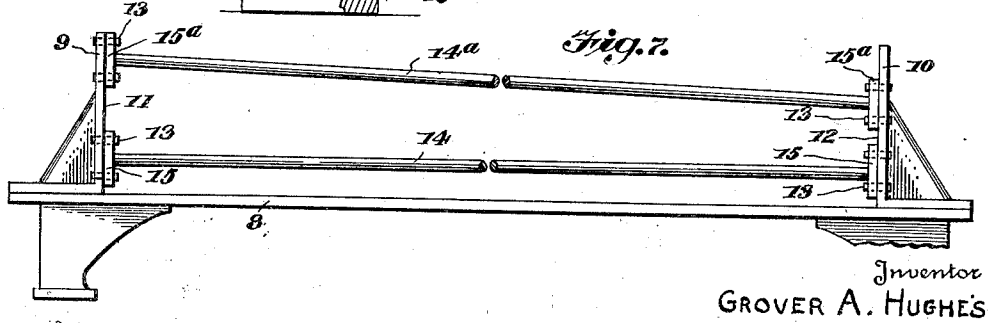


Fig. 7.



Inventor
GROVER A. HUGHES

By Grover A. Foster
Attorney

Patented Jan. 4, 1938

2,104,561

UNITED STATES PATENT OFFICE

2,104,561

SUPPORTING APPARATUS FOR WELDING OPERATION

Grover A. Hughes, Youngstown, Ohio, assignor to Truscon Steel Company, Youngstown, Ohio, a corporation of Michigan

Application March 9, 1936, Serial No. 67,953

2 Claims. (Cl. 29—89)

The present invention relates to supporting means by which a plurality of structural members which are to be secured together may be supported and positioned in proper relation to each other. It is more particularly designed for use in fabricating structural parts, such as are used in the erection of skeleton towers, for example, antenna towers. The invention is disclosed for use in the welding of bolting flanges to relatively long and usually round rods or bars.

In certain types of towers, it is necessary in order to obtain proper strength and rigidity, combined with relatively little weight, to use a combination of tapered and straight sided elements or panels. These elements are ordinarily made up of a plurality of substantially vertical members or rods with web members extending between them. The sections are connected together by means of bolting flanges secured to the rods, those of one section being bolted to the corresponding flange of the adjacent section. In order to permit the erection of a tower from a combination of tapered and straight sided elements, it is necessary that the bolting flanges be secured to the rods at proper angles so that the relative angles of the vertically adjacent rods may be fixed.

The object of the present invention is to provide novel means whereby the bolting flanges may be set at the absolutely definite and correct angle to the rods or bars and held so until they are secured together.

In the accompanying drawing:

Figure 1 is an elevation of a corner of a tower.

Figure 2 is a sectional view on the line 2—2 of Figure 1.

Figure 3 is an enlarged sectional view on the line 3—3 of Figure 2.

Figure 4 is an elevation partly in section of one end of the supporting and positioning device.

Figure 5 is a view on the line 5—5 of Figure 4.

Figure 6 is a view of one of the bolting flanges and a portion of the rod to which it is secured.

Figure 7 is an elevation of the positioning and supporting apparatus.

Describing the drawing more particularly, the apparatus is mounted on a suitable table or base 8. Suitably spaced a distance slightly greater than the length of the rods to be operated upon, are two upstanding members 9 and 10 having inwardly disposed faces 11 and 12 respectively, which in this case are parallel to each other, but which may be set at an angle, depending upon the angle that is required between the flanges and rod and between the faces of the flanges.

Each of the members 9 and 10 has upon it a plurality of sets of outstanding pins 13. These sets of pins are removably mounted in holes 13*a* in the members 9 and 10, and are arranged in pairs, each set on the member 9 cooperating with a certain set on the member 10. Each set on each of the supporting members bears a definite angular relation with the corresponding set on the other member. Thus in Figure 7 the lower sets of pins support a rod 14 and its corresponding flanges 15, with the rod in substantially horizontal position and the flanges at right angles thereto, and it will be readily understood that as the surfaces of the members 9 and 10 are parallel, the adjacent surfaces of the flanges are also parallel.

The upper sets are arranged with the set on the member 10 a slight distance below those on the member 9, this being for the purpose of adjusting the flanges 15*a* at a definite angle to the rod 14*a*. When the rods are supported as shown in Figure 7, they may be welded together by means of tack welds, as shown in Figures 5 to 6, and afterwards removed from the supporting mechanism by removing the pins from the holes 13*a*. They may then be welded in any suitable manner to produce a joint, as shown in Figure 3 at 17 and 18, having the required strength and rigidity.

The device has many advantages. It is very simple and fixes with absolute certainty the angles at which the flanges are fixed to a rod member. It permits the construction of a tower such as shown in Figure 1, in which a lowermost section 19 is substantially vertical with straight sides. The next section 20 tapers inwardly, the side rods thereof being at an angle to those of the section 19. This angle is fixed by the angle at which the bolting flange 21 is fixed to the rod. The next highest section is again straight sided with substantially vertical rods.

It will be seen that the angles are always definitely fixed due to the spacing of the sets of pins 13 upon the side members and that these angles are unchangeable.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim, is:

1. An apparatus for relatively positioning spaced flanges and a rod extending between them and fixing the angles which the flanges and rod bear to one another, the said apparatus comprising a base, spaced supports upstanding rigidly from the base and having inner faces of extensively greater area than the area of the flanges, the said supports being fixed at a definite angle to each other, and a plurality of spaced holding devices mounted in fixed spaced relation upon the inner face of each of the supports for holding the flanges with their faces parallel to the respective inner faces of the supports and thereby fixing the angle that the flanges bear to each other, each holding device upon one of the supports being arranged to cooperate with a holding device upon the other support for fixing the angular relation between the flanges and the rod, and the holding devices being so spaced upon the supports that cooperating holding devices will hold flanges at an angle to a rod supported between them that is different from the angles between a rod and flanges supported between other cooperating holding devices.

2. An apparatus for supporting and relatively positioning an axially spaced pair of bolting flanges in a definite laterally spaced relation, the said flanges having sockets and bolt holes, and a rod extending between the flanges with its end engaged in the sockets, and with the flanges arranged at a definite angle to each other and to the rod, during a welding operation, the said apparatus comprising a base, a pair of spaced rigid supports upstanding from the base and having fixed parallel innner faces at greater area than the area of the flanges, and a plurality of spaced sets of inwardly extending pins removably mounted upon the supports for engaging in the bolt openings of the flanges and supporting the flanges parallel to the inner faces of the supports, each set of pins upon one support being arranged in a definite relation to a set upon the other face, to fix the angle which the flanges supported by the pins bear to a rod supported between the flanges and the lateral relation of the flanges to each other, the various sets of pins being so spaced as to provide different angular relations between flanges and rods supported by the respective cooperating sets of pins.

GROVER A. HUGHES.