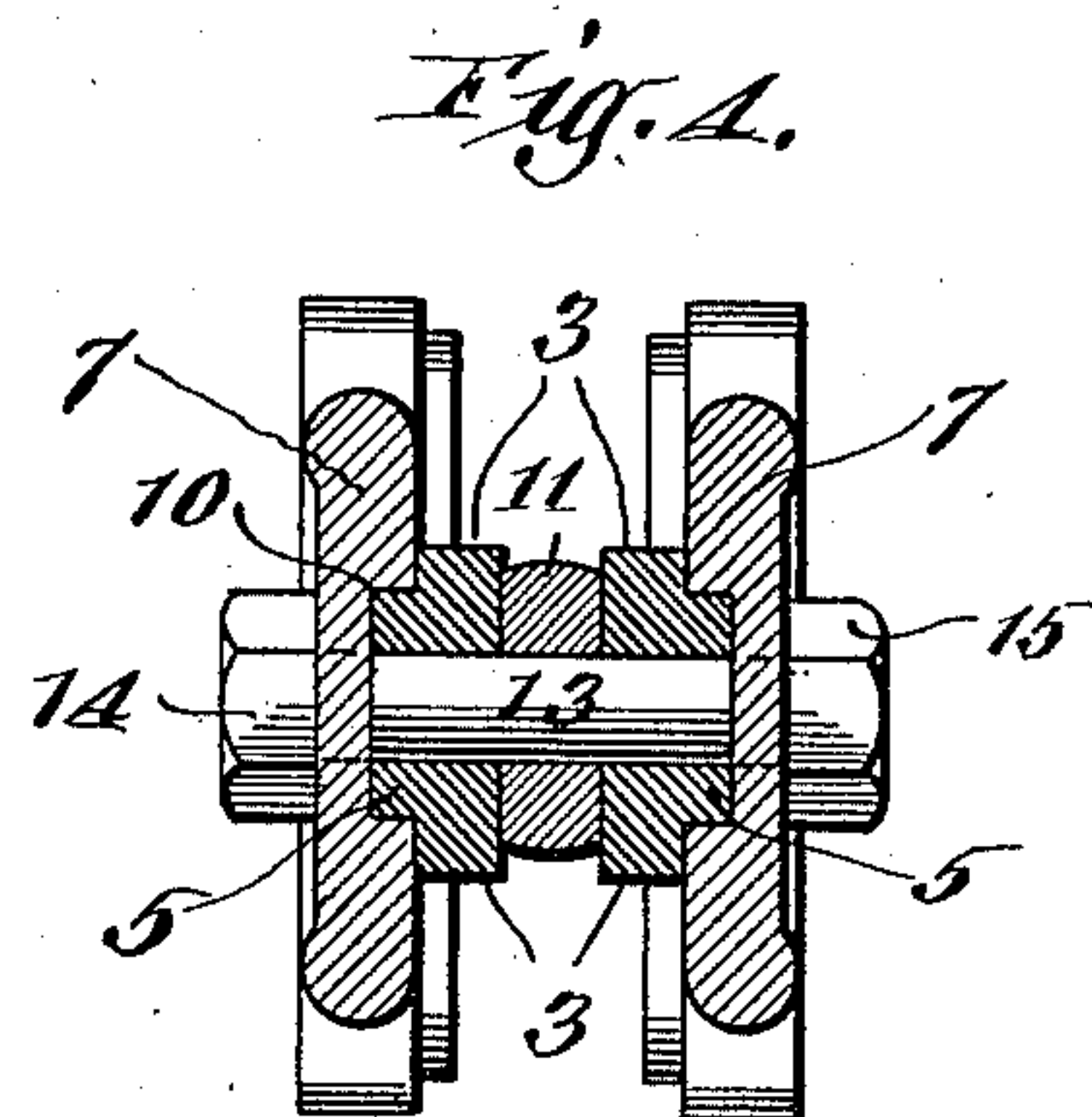
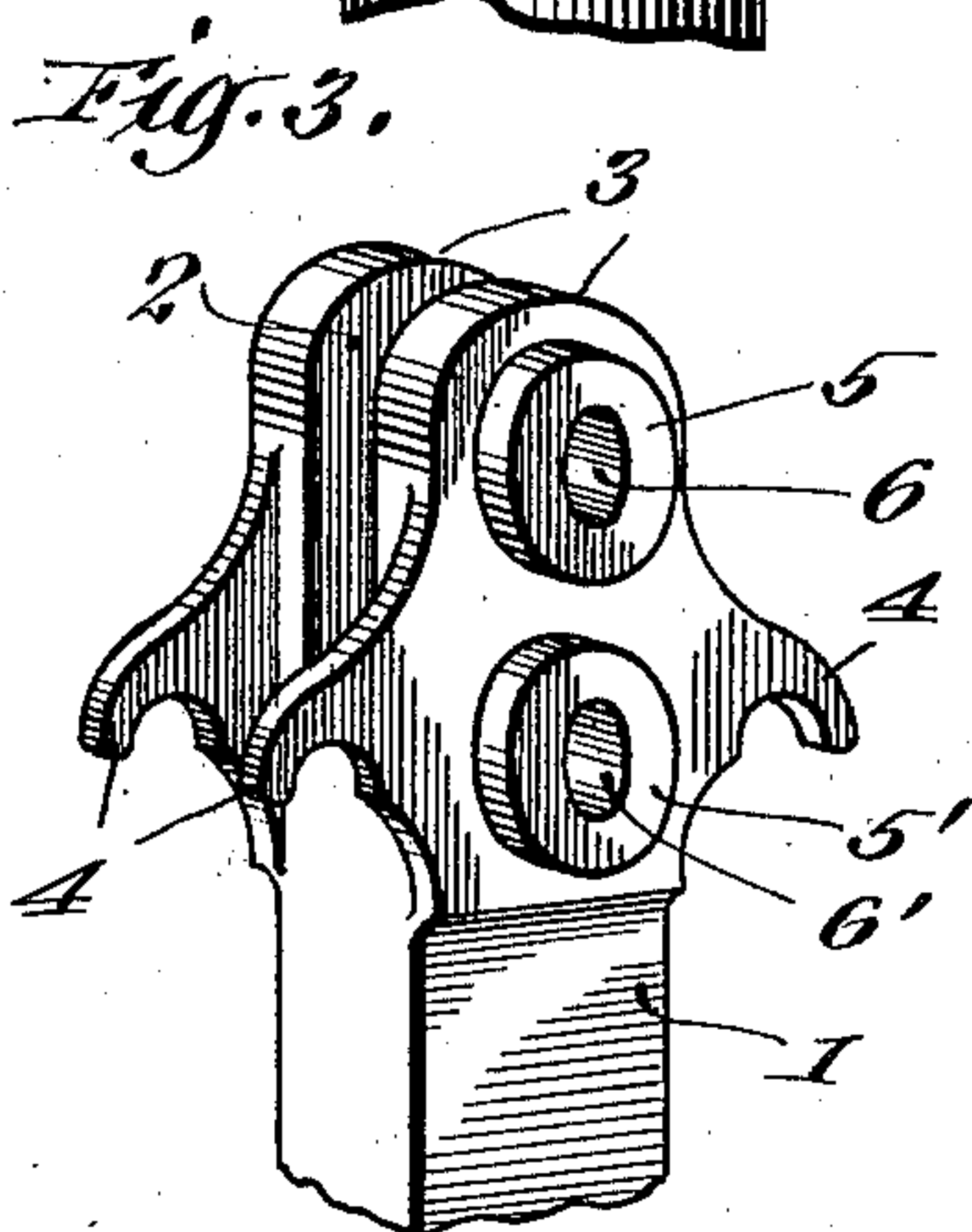
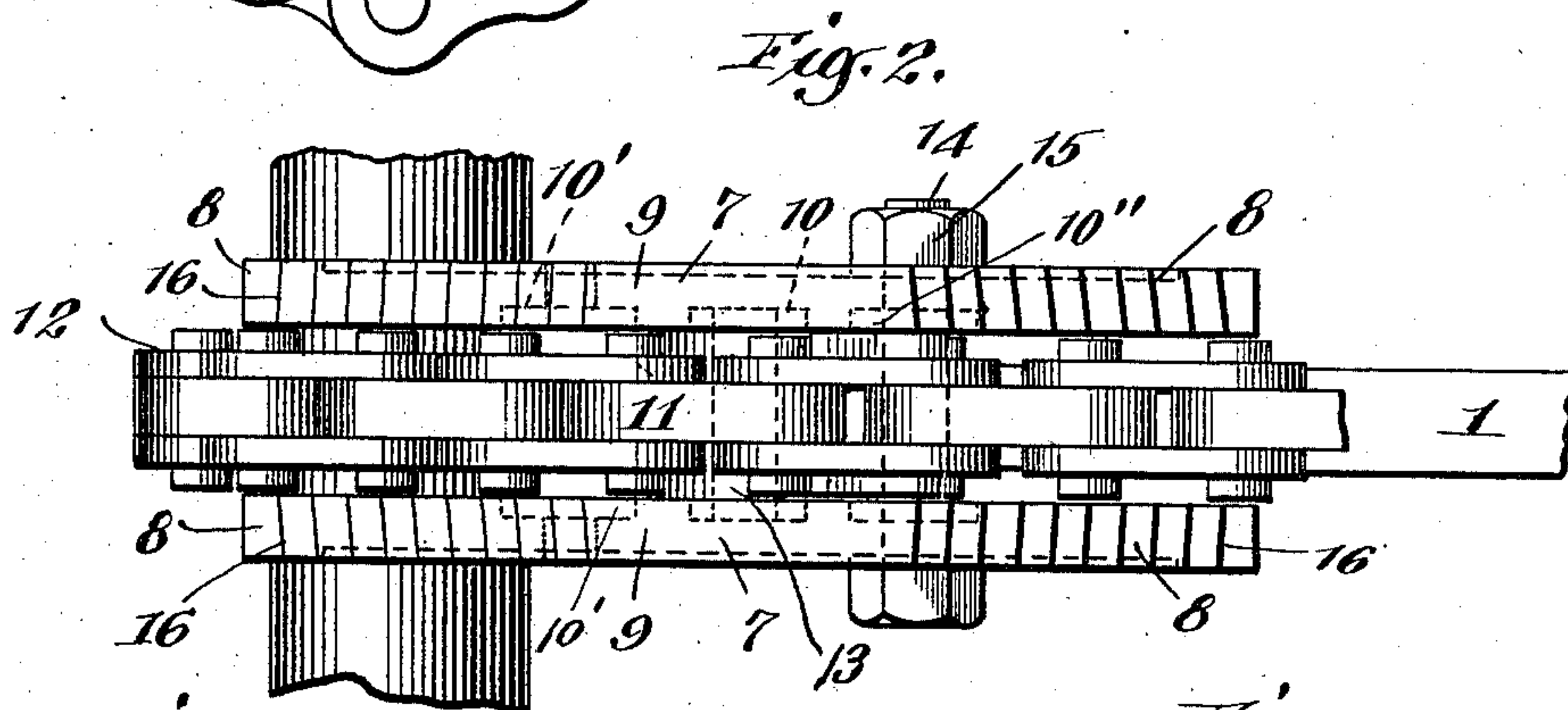
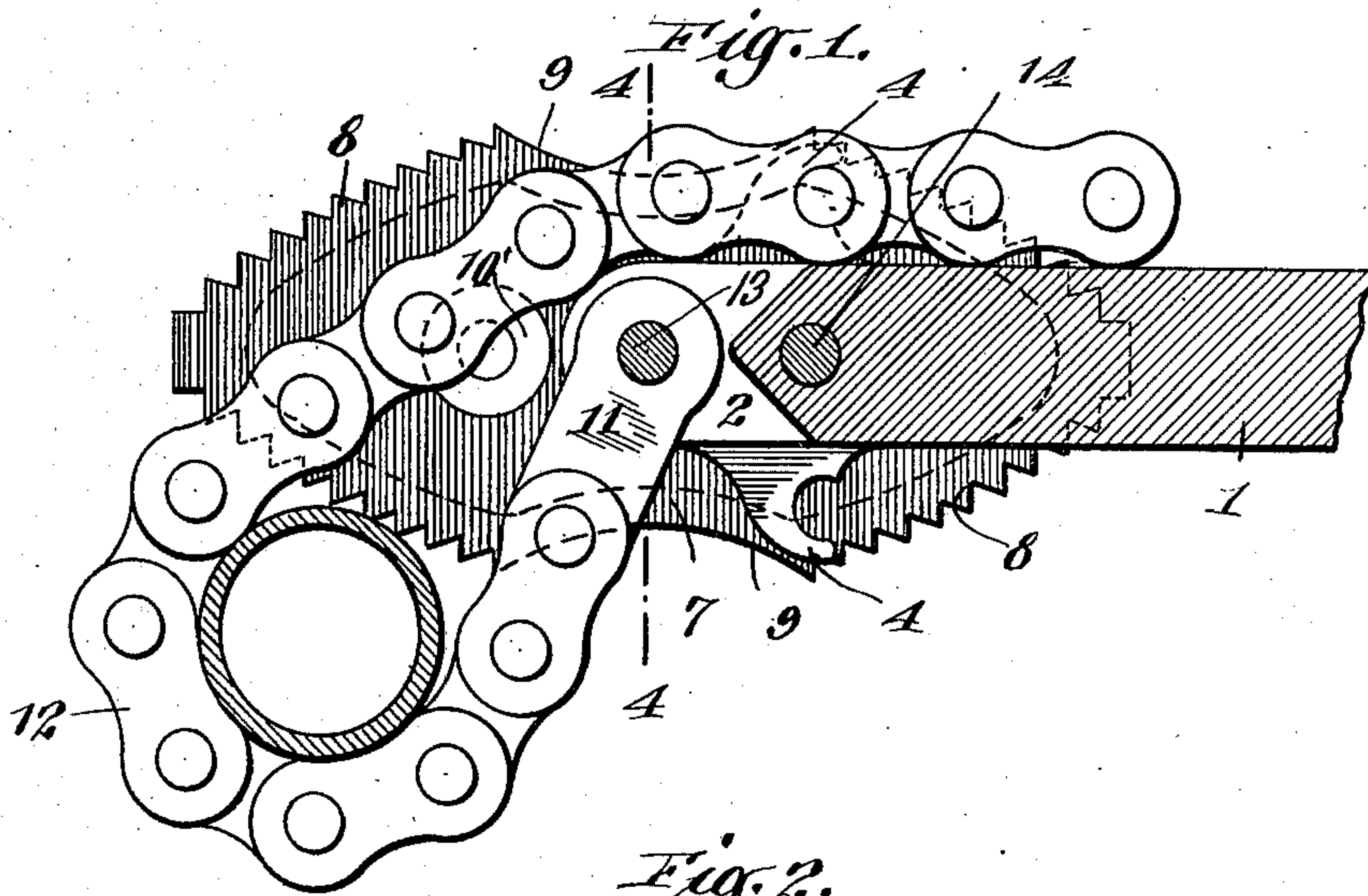


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CHAIN WRENCH.  
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996,684.

Patented July 4, 1911.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

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## CHAIN WRENCH.

996,684.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed March 9, 1910. Serial No. 548,167.

*To all whom it may concern:*

Be it known that I, ALBRO M. TILTON, a citizen of the United States of America, residing at 553<sup>a</sup> Monroe street, borough of Brooklyn, city and State of New York, have invented certain new and useful Improvements in Chain Wrenches, of which the following is a specification.

The present invention relates to the class of wrenches known as chain pipe-wrenches.

The invention relates primarily to an improved means for interlocking the jaw plates with the handle of the wrench; and to certain structural features which cooperate with the interlocking means so that the wrench combines great strength with simplicity of construction, and is otherwise peculiarly adapted to the uses for which it is intended.

Heretofore in the art it has been common to interlock the jaw plate with the handle by means of an elongated slot or cut lengthwise of the plate, into substantially the entire length of which slot the prong of the handle is fitted. It is also old in the art to interlock the handle and jaw plates by means of two bosses on the handle prong fitted within corresponding countersinks in the jaw plate. The boss and countersink interlocking means is advantageous both in the proper assembling of the parts, and because the resistance offered by the bosses to certain stresses to which the wrench is subject. As heretofore used, however, there have also been counteracting disadvantages associated with the boss and countersink as an interlocking means.

It is desirable to have the jaw plates as near together as possible in order to avoid certain objectionable strains on the plates and bolts. The handle prongs should therefore be as thin as is consistent with proper strength; because the thicker the handle prongs the greater the distance between the jaw plates. Comparing the form of wrench in which the prong lies within a slot in the jaw plate with the form in which a boss on the prong fits within a countersink in the jaw plate and assuming that in both instances the jaw plates are equally spaced apart, it will be seen that the prong, in the boss and countersink form, is thinner by the

height of the boss than the prong of the other form. If therefore the prongs in the boss and countersink form are to have the strength of those of the other form, without increased spacing of the jaw plates, some special strengthening means must be provided. No efficient strengthening means aside from mere increase in thickness of the prongs and consequent greater spacing of the jaw plates has heretofore been provided in the boss and countersink style of wrench. Previous forms of boss and countersink interlocking means have furthermore not been well adapted for use in conjunction with jaw plates of the double ended reversible type. As heretofore used, the number of the countersinks has been the same as that of the bosses, and all countersinks have been in use at the same time whatever the position of the reversible plate. When two bosses and countersinks have been thus employed with reversible plates, the countersinks have been disposed at equal distances from the center of the plate on a line parallel to the axis of the handle, and the handle has necessarily been extended well forward of the center of the plates in order to support the bosses in proper position to register with the countersinks. Unless, therefore, the jaw plates have been unduly long, the end of the handle has been comparatively close to the jaw teeth. To have the end of the handle near the jaw teeth is objectionable, because the effective length or swing of the chain is then restricted in such manner that a pipe of given diameter can ordinarily be engaged at but one point of the jaw, thus localizing the wear instead of permitting the distribution of the wear over a considerable extent of the gripping surface.

The object of the present invention is to construct a wrench, with a boss and countersink interlocking means for the jaw plates and handle, the jaw plates of which wrench may be close together, and the handle prongs of which are nevertheless of great strength. In the present invention the weakening of the handle prongs due to the formation of the bosses is counteracted by the forming of the chain hooks on the handle in the form of webs or strengthening means so positioned



as to reinforce the weakened parts of the handle prongs.

Another object of the invention is a boss and countersink interlocking means peculiarly adapted for use with jaw plates of the reversible type, the construction being such that the handle terminates at or near the center of the reversible plates, no matter what the position of the latter. The end of the handle is thus sufficiently far from the jaws or gripping surfaces to permit a pipe of given diameter to swing with the chain into engagement with any one of several of the jaw teeth, whereby localized wear is reduced to a minimum. In this form of interlocking means for reversible jaw plates, the countersinks are greater in number than the bosses, and all the countersinks are never in use at the same time. In the form shown there are three countersinks, and two bosses. One of the countersinks is located centrally of the plate and other two at equal distances therefrom on a line parallel to the axis of the handle. One of the bosses is at or near the end of the handle and the other at a distance therefrom equal to the distance from the central countersink to either of the other countersinks. The boss at the end of the handle engages the central countersink in both positions of the plate; and, according to the position of the plate, the other boss engages one of the other countersinks, the third countersink being idle. As the end of the handle lies opposite the central countersink, it is always well away from the jaw teeth. The jaws and the jaw plates are of shape that with the end of the handle positioned as stated, the pipe may be swung onto and into engagement with various points of the jaw after the chain is locked.

Another feature of the invention in certain forms of the same, is a pin or bolt, shouldered to form a bearing against the inner faces of the jaw plates to resist any stresses tending to press the handle prongs toward one another. The pin is hereinafter shown as the pivot pin, concentric with the boss at the end of the handle; and the shoulders thereof are shown as flush with the end faces of the bosses whereby the bosses are permitted to bear on the inner faces of the countersinks.

Other objects of the invention will presently appear in connection with the accompanying drawings in which—

Figure 1 is a view taken between the jaws with one jaw removed showing the chain and a jaw engaging a pipe. Fig. 2 is a top plan view of the apparatus shown in Fig. 1, both jaws being in place, however. Fig. 3 is a perspective view of the jaw engaging end of the handle. Fig. 4 is a view in cross section on the line 4—4 of Fig. 1.

Referring to the drawings, the wrench

handle 1 is shown as having a slot 2 at the jaw engaging end. Each of the prongs 3 of the fork formed by the slot carries two chain hooks 4, and also two cylindrical bosses 5 and 5'. Through the bosses 5 and 5' and concentric therewith, are bolt holes 6 and 6'. The chain hooks are in the form of webs which reinforce and strengthen the handle where the same is cut down to form the bosses.

The jaw plates 7 each carry four jaws 8, two at each end of the plate. The sides of the plates between the jaws are cut or curved inward at 9 in a well known fashion to form a rest for the pipe while the chain is being positioned. The plates 7 at the center thereof are bored or countersunk at 10 to receive the boss 5. In the plate 7, to each side of this countersink 10, and at a distance therefrom equal to the distance between the centers of the bosses 5 and 5' are countersinks 10' and 10'' of a size to receive the boss 5'. The bosses 5 and 5' on the handle are preferably of the same diameter. The three countersinks 10, 10' and 10'' on the jaw plates are likewise preferably of the same diameter; although the countersink 10 need not be of the diameter of the other two. The countersinks 10' and 10'' are, however, of the same diameter so that they may interchangeably engage the boss 5', according to which end of the jaw plate is to be used on the pipe.

In assembling the wrench, the end link 11 of the chain 12 is inserted between the prongs 3 of the handle (see Fig. 4), and a pin or bolt 13 passed through the hole 6 in the boss 5 and the hole in the link. The jaw plates are placed on either side of the handle in such a manner that the boss 5 enters the countersink 10, and the boss 5' enters one or the other of the countersinks 10' and 10''. A bolt 14 is then passed through bolt holes in the jaw plates concentric with the countersink 10' or 10'' and through the holes 6' in the handle. A nut 15 serves to hold the parts together. When the parts are thus in position, it will be noted, that the bosses 5 on the handle serve to prevent displacement of the jaw plates; and that the pin 13, which bears at either end on one of the jaw plates, serves as an effective spacing member to prevent the jaws from being forced together at the outer end because of strains due to the incline of the jaw teeth 16, or to other cause. When the jaw teeth are not so inclined, and when there might be a tendency to force the plates apart instead of together, then a bolt and nut, such as bolt 14 and nut 15, may be substituted for the pin 13 or the bolt might be made to combine the functions of both described forms. In such case, of course, bolt holes would have to be provided in the jaw plates



at the countersink 10' as well as at the countersinks 10' and 10''.

To reverse the jaw plates, it is simply necessary to remove the bolts, and turn the plates around to bring the countersinks at the other end of the same into engagement with the bosses 5'.

With countersinks 10' and 10'' in the plates as the means for interlocking the same with the handle, no obstructions are presented to the chain in its passage between the plates, and the plates need therefore be spaced only a distance equal substantially to the width of the chain. By this construction I obtain a wrench which is extremely compact and effective in operation.

I have described in detail a wrench embodying my invention, but it is apparent that modifications within the scope of the invention may be made in the wrench shown. The bosses may for instance be in the jaws, and the countersinks in the handle. This form is, however, less desirable, as the plates must then be further spaced to provide passage for the chains between the unemployed bosses on the plates. As heretofore indicated an elongated countersink of length to include the countersinks 10' and 10'', and of a width to engage the bosses 5 and 5' on the handle, may be substituted for the countersinks 10, 10' and 10''. In such case the bosses 5 and 5' may be included in a single boss.

What I claim is:

1. A chain wrench having a slotted handle, a jaw plate on each side of the handle, two bosses on each side of the handle fitted within corresponding countersinks in the inner faces of the opposing jaw plates, and chain hooks on the bossed section of the handle.

2. A chain wrench having a slotted handle, a double ended reversible jaw plate on each side of the handle, two bosses on each side of the handle at different distances from the end of the handle and fitted within corresponding countersinks in the inner faces of the opposing jaw plates, each jaw plate having in its inner face a third countersink to engage, when the jaw plate is reversed, the boss which is the more distant from the end of the opposing handle prong, and chain hooks on the bossed section of the handle.

3. A chain wrench having a slotted handle, a double ended reversible jaw plate on each side of the handle, two bosses on each side of the handle at different distances from the end of the handle and fitted within corresponding countersinks in the inner faces of the opposing jaw plates, each jaw plate having in its inner face a third countersink to engage, when the jaw plate is reversed, the boss which is the more distant from the end of the opposing handle prong, and chain

hooks on the bossed section of the handle, and a pivot pin for the chain arranged concentrically with the bosses which are the nearer to the end of the handle.

4. A chain wrench having a slotted handle, a double ended reversible jaw plate on each side of the handle, the jaws or gripping surfaces being curved, a pair of bosses on each side of the handle, one of the bosses of each pair being at or near the end of the handle and the other boss of each pair being farther from the end of the handle, each jaw plate having in its inner surface a pair of countersinks within which are fitted the bosses on the opposing side of the handle, and a third countersink in each jaw plate adapted, when the plate is reversed, to engage that boss on the opposing side of the handle which is the more distant from the end of the handle, the construction being such that in neither position of the plates does the handle extend appreciably forward of the center of the plates, whereby there is assured an effective length or swing of chain which when taken in conjunction with the curvature of the jaws or gripping surfaces permits a pipe of given diameter to be engaged by any one of several of the jaw teeth, said bosses and countersinks being shaped to resist pressure on the jaws in the direction of the axis of the handle as well as in directions transverse thereto.

5. In a chain wrench, a handle having a forked end, a jaw plate on each side of the handle, a pivot pin for the chain extending through the fork and having a bearing against the inside of each plate to prevent the plates and fork prongs from being pressed toward each other, and a bolt through the plates and handle for holding the same together.

6. In a chain wrench, a handle having a forked end, a jaw plate on each side of the handle, a pivot pin for the chain extending through the fork and having a bearing against the inside of each plate to prevent the plates and fork prongs from being pressed toward each other, and a bolt through the plates and handle below the pivot pin for holding the same together.

7. A chain wrench having a slotted handle, a double ended reversible jaw plate on each side of the handle, the gripping edges or jaw teeth being discontinued toward the central part of the plates so that the jaw at one end of the plate is appreciably separated from the jaw at the other end of the plate to permit the pipe to be passed from the central part of the plate onto the jaw teeth after the chain is locked, bosses on the handle arranged parallel to the axis thereof from a point at or near the end of the handle to a point farther down the handle, and being fitted within countersinks in the opposing



jaw plates, the countersinks extending over  
a distance sufficiently greater than that over  
which the bosses extend as to permit the end  
of the handle to be substantially opposite the  
5 center of the plates in either the original or  
reversed position of the latter, said bosses  
and countersinks being shaped to resist pres-  
sure on the jaws in the direction of the axis

of the handle as well as in directions trans-  
verse thereto.

Signed by me at New York, this 1st day  
of March, 1910.

ALBRO M. TILTON.

Witnesses:

EMMA W. RENNÉ,

CHAS. D. EDWARDS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."