March 19, 1929. P. JACKSON 1,705,864

PIPE CLOSURE FORMING DEVICE

Filed May 16, 1927

FIG. 2.

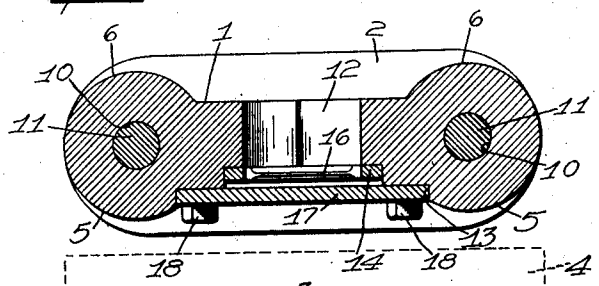


FIG. 3.

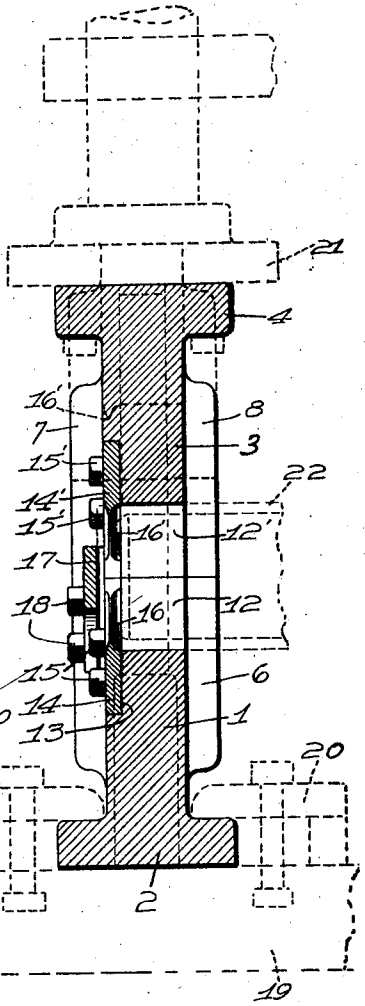


FIG. 1.

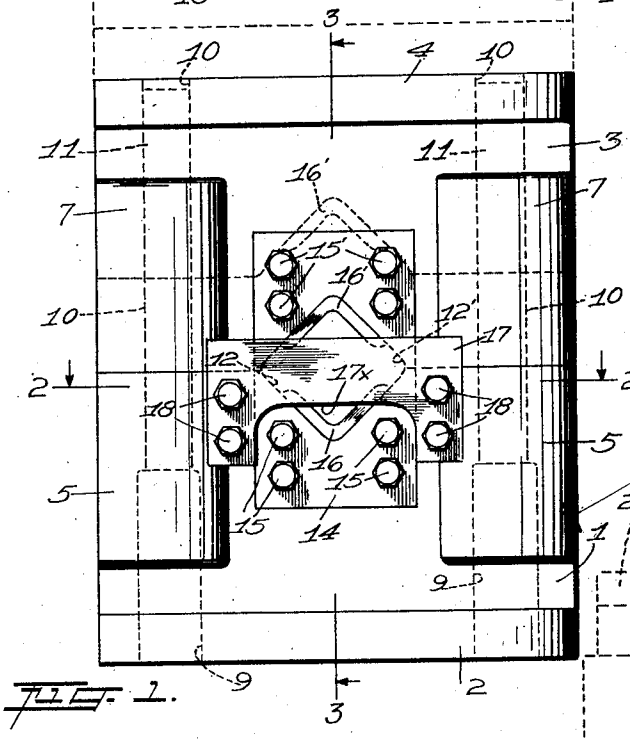


FIG. 4.

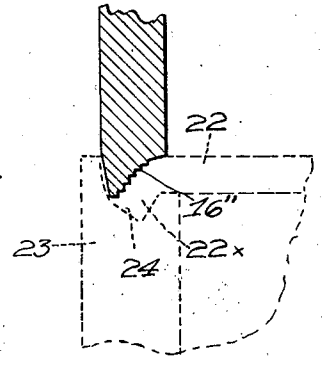
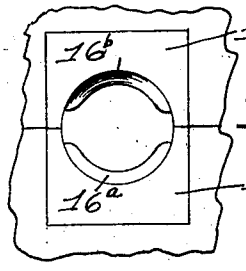


FIG. 5.



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UNITED STATES PATENT OFFICE.

PERCY JACKSON, OF CHICAGO, ILLINOIS.

PIPE-CLOSURE-FORMING DEVICE.

Application filed May 16, 1927. Serial No. 191,907.

My invention relates to improvements in devices for forming closures on metal pipes, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide a device, by means of which closures may be quickly and economically formed at the end of a pipe without the necessity of depending upon welding to give the required strength to the joint.

A further object of the invention is to provide a simple device, by means of which a closure plug may be secured in position at the end of a pipe so as to effectually close the pipe and to withstand any pressure to which the pipe would ordinarily be subjected.

A further object of the invention is to provide a closure forming device which is simple in construction, having few parts, and which, therefore, is not easily gotten out of order.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which

Figure 1 is a face view of one embodiment of my invention,

Figure 2 is a section along the line 2—2 of Figure 1, looking in the direction of the arrows,

Figure 3 is a section along the line 3—3 of Figure 1, looking in the direction of the arrows,

Figure 4 is an enlarged sectional view of a portion of the device showing its relation to the pipe end and plug, and

Figure 5 is a view of a modified form of the device.

In carrying out my invention, I provide a lower plate 1, which may be made of cast metal or other suitable material, having a base flange 2, and an upper plate 3 having a flange 4 similar to the base flange. Integral with the lower plate 1 are enlarged portions 5 and 6, respectively, near the edges of the plate, the enlarged portions 5 and 6 forming strengthening members for the plate. The upper plate has similar enlarged portions 7 and 8, corresponding to the portions 5 and 6, respectively.

As will be seen from Figure 1, the base plate 2, the plate 1 and a portion of the extensions 5 and 6 have bores 9 extending from the bottom upwardly. These bores communicate with other bores 10 which extend to the opposite end; i. e., through the plate 4. In that portion of the bore 10 which is in the lower plate 1, rods 11 are secured, these rods being firmly held in position and the upper plate, together with its extensions, being slidable on the rods.

Referring now particularly to Figure 2, it will be seen that the plates 1 and 2 have registering recesses 12 and 12′, respectively, each recess in this particular instance being triangular shaped so that when the plates are together as shown in Figure 1, the effective opening is substantially rectangular. The plate 1 is recessed, as shown at 13, and a plate 14 is countersunk in this recess and is held therein by means of bolts 15. The plate 14 is recessed on its upper edge to register with the recess 12′, and bordering the recess in the plate 14 is a forming edge 16, the purpose of which will be explained later. The upper plate 3 is provided with a countersunk plate 14′, bolts 15′ for holding the same, and a forming edge 16′ corresponding to the members 14, 15 and 16 on the lower plate.

The extensions 5 are recessed to admit a plate 17 which is held by bolts 18, this plate 17 being spaced from the plates 14 and 14′, as shown in Figure 2. The plate 17 has a cutaway portion 17× on the lower edge thereof to permit access to the bolts 15 of the plate 14. The extensions 7 of the upper plate 3 are recessed to permit the upper end of the plate 17 to enter therein when the upper and lower plates are together, as shown in Figure 1.

The device is designed to be used in connection with an ordinary hydraulic press. In Figure 3 I have indicated the manner in which the base 2 is secured to the platen 19, as shown in dotted lines, by the clamping means indicated in general at 20. The upper portion 4 is designed to be bolted to the ram 21 of the hydraulic press.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood.

Figures 1 and 3 of the drawings show the device at the limit of its closing movement in forming a flange on the pipe. At the beginning of the operation, the plates 1 and 3 are drawn apart so that the recesses 12 and

12′ and also the forming edges 16 and 16′ are moved away to admit the end of the pipe. The pipe I have shown in dotted lines at 22 in Figure 3. In this particular instance, the pipe has a rectangular cross section, but it will be obvious that a pipe of any suitable shape, such as a cylindrical pipe, might have flanges formed thereon without departing from the invention. The device being for the purpose of forming a closure on the end of a pipe, use is made of a plug 23, see Figure 4, having a circumferential groove 24. A portion of this plug enters the end of the pipe 22 and the present device is for the purpose of bending the edges of the pipe and forcing them into the groove. To this end, the forming edges 16 and 16′ are preferably serrated as shown at 16″ in Figure 4. The pipe is thrust into the lower recess 12 until the end thereof meets the stop plate 17. The ram of the press is caused to descend and carries with it the plate 3, together with the plate 14′ bearing the forming edges. As the latter meet the edge of the pipe, they bend the edges down into the groove, thus forming a flange such as that indicated at 22^{x} in Figure 4. On the next upward stroke, the pipe is turned 90° and then thrust in until it reaches the stop plate 17 and on the succeeding downward movement the remaining corners of the pipe, together with the edges adjacent thereto, are bent, thus clamping the plug 23 securely. In order to complete the closure, a fillet of metal is made use of in the recess left by the withdrawn forming edge. This, however, is no part of the present invention, the invention in this instance lying in the means for turning the flange into the groove in the plug.

As has been stated, Figures 1 and 3 show the position of the device at the end of the operation. As soon as the operation has been completed on one pipe, it is withdrawn and another one is placed in position. The forming of the flanges on the pipes and the locking of the closure members or plugs 23 is quickly and effectively accomplished by the apparatus.

In Figure 5 I have shown a modified form of the device, in which the lower plate 14^{a} is provided with a semicircular recess having a flange forming edge 16^{a}, and the upper plate 14^{b} has a similar edge 16^{b}, these edges being designed to turn the flanges of ordinary cylindrical pipes instead of the pipes of square cross section, as shown in Figures 1 and 3. Substantially the same operation of turning the pipe is carried out in this instance as in the one previously described. The auxiliary plates 14^{a} and 14^{b}, by means of their flange forming edges, bend or crowd the flange into the groove in the plug, thus securely holding the latter in position. Obviously, the device could be made with openings of either shape or other shapes, without departing from the spirit of the invention.

I claim:

1. A pipe closure forming device, comprising a lower stationary plate, said plate having a pipe receiving recess, an auxiliary plate carried by said lower plate and having a pipe receiving recess, and a flange forming edge bordering the recess, an upper plate movable toward and away from said lower plate and having a pipe receiving recess, and an auxiliary plate carried by said upper plate and having a pipe receiving recess, and a flange forming edge arranged to register with said first-named flange forming edge.

2. A pipe closure forming device, comprising a lower stationary plate, said plate having a pipe receiving recess, an auxiliary plate carried by said lower plate and having a pipe receiving recess, and a flange forming edge bordering the recess, an upper plate movable toward and away from said lower plate and having a pipe receiving recess, and an auxiliary plate carried by said upper plate and having a pipe receiving recess, a flange forming edge arranged to register with said first-named flange forming edge, and a stop plate carried by said stationary plate for determining the position of the end of the pipe with respect to the flange forming edges.

3. A pipe closure forming device comprising a lower stationary plate having enlarged portions and a pipe-receiving recess, an upper plate having enlarged portions and a pipe-receiving recess, said upper plate being movable toward and away from said lower plate, the enlarged portions associated with the upper plate being provided with openings, means supported by said first named enlarged portions and slidably disposed within the openings in said last named enlarged portions for guiding the upper plate, and a flange forming edge carried by said lower plate and said upper plate.

4. A pipe closure forming device comprising a lower stationary plate having enlarged portions and a pipe-receiving recess, an upper plate having enlarged portions and a pipe-receiving recess, said upper plate being movable toward and away from said lower plate, the enlarged portions associated with the upper plate being provided with openings, means supported by said first named enlarged portions and slidably disposed within the openings in said last named enlarged portions for guiding the upper plate, and a flange forming edge carried by said lower plate and said upper plate, said flange forming edges being serrated.

5. A pipe closure forming device comprising a lower stationary plate having enlarged portions and a pipe-receiving recess, an upper plate having enlarged portions and a

pipe-receiving recess, said upper plate being movable toward and away from said lower plate, the enlarged portions associated with the upper plate being provided with openings, means supported by said first named enlarged portions and slidably disposed within the openings in said last named enlarged portions for guiding the upper plate, a flange forming edge carried by said lower plate and said upper plate, said flange forming edges being serrated, and a stop plate carried by said stationary plate for determining the position of the end of a pipe with respect to the flange forming edges.

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