March 6, 1934. H. L. IVINS 1,950,307

METHOD OF REPAIRING VALVES

Filed June 27, 1932

Fig. 2.

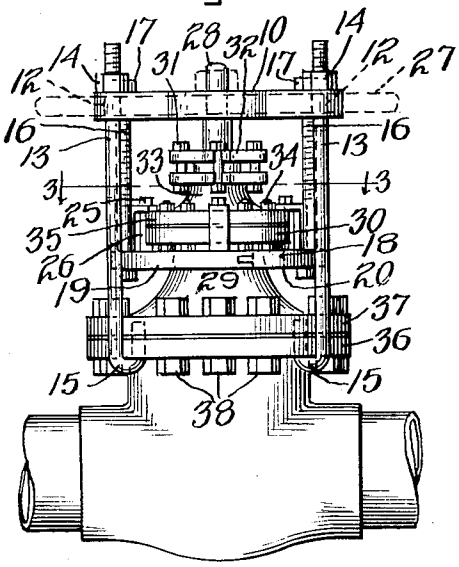


Fig. 1.

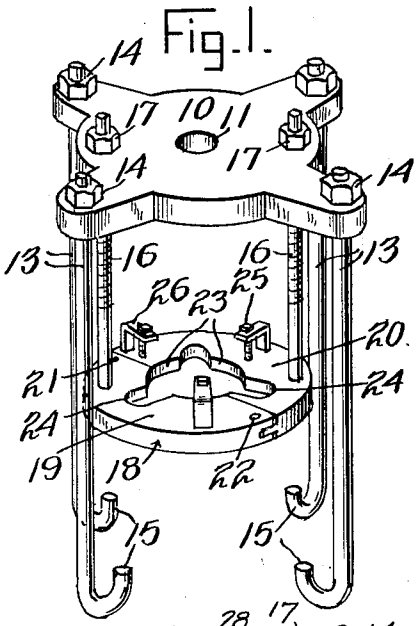


Fig. 4

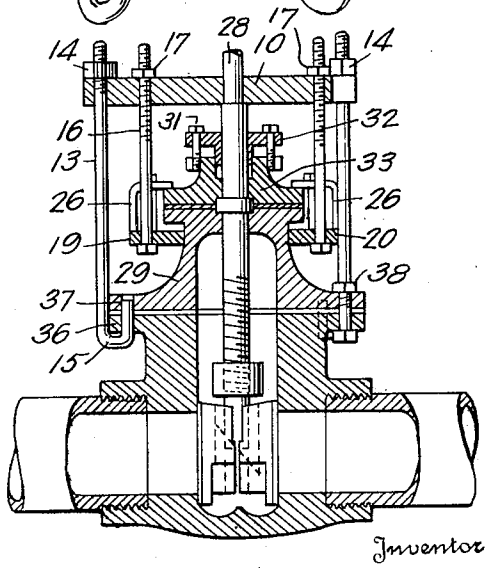
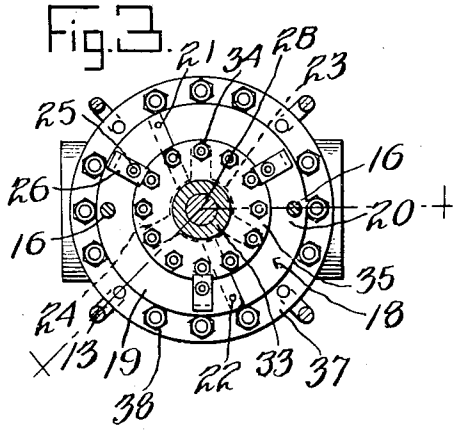


Fig. 3.



Inventor

Harvey L. Ivins

By

Attorney

Patented Mar. 6, 1934 1,950,307

UNITED STATES PATENT OFFICE

1,950,307

METHOD OF REPAIRING VALVES

Harvey L. Ivins, Bluffton, Ind., assignor of one-half to The George W. Grimes Company, Bluffton, Ind., a corporation of Indiana

Application June 27, 1932, Serial No. 619,596

2 Claims. (Cl. 29—84)

This invention relates to valve repair equipment and the object of the invention is to provide an attachment or device with means associated therewith adapted to be applied to a gate valve to hold it in assembled position while renewing the bolts in the bonnets and the stuffing boxes of such valves and for separating the flanges in order to renew the packing or gaskets between them without taking the pressure off the line, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawing, which is made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a perspective view of the device,

Figure 2, a view in elevation of the device as applied to a gate valve,

Figure 3, a section on line 3—3 of Figure 2, and

Figure 4, a vertical section of Figure 2 as indicated on line 4—4 of Figure 3.

In the drawing reference character 10 indicates a plate having an opening 11 at the center through which the stem of a valve may project. The plate is provided with openings 12 at the corners through which the rods 13 extend, the rods 13 being screw-threaded at their upper ends and provided with nuts 14 resting on the upper side of the plate. The lower ends of the rods 13 are bent inwardly to form hook portions 15 adapted to engage in the openings provided by removing appropriate bolts from the flanges of the valve to which it is applied. Intermediate the rods 13 and on opposite sides of the plate 10 are the rods 16 which extend through the plate and are provided with screw-threaded upper ends and nuts 17 resting on the upper side of the plate. A second plate 18 is connected to the lower end of the rods 16. This plate is preferably circular in shape and of smaller size than the plate 10 and is divided along its center in a tongue and groove fashion into two sections 19 and 20 hinged at 21 and held together at the other side by a pin 22. The center of the plate 18 is cut out to form off-sets 23 which tends to aid in centering the plate on the upper flange of the bonnet of a valve and is further provided with additional cut-out portions 24 which fit around and clear the bolts through the lower flange of the stuffing box so that they may be easily removed.

The plate 18 is further provided with the stud bolts 25 inserted on the top side and the small clamps 26 which may extend over the top of the lower flange of the stuffing box when the plate 18 is positioned below the top flange of the bonnet to hold them in place while removing and replacing the bolts which hold the flanges together.

The operation of the device is as follows:

For the purpose of explaining the operation of the device, a gate valve of the type to which the device is applicable is shown in Figures 2 and 4. The hand wheel 27 on the stem is rotated to move the valve to closed position and is then removed. The plate 10 is placed on the stem 28 of the valve, the opening 11 being of such a size as to seat on the reduced end of the stem. The plate 18 is placed around the bonnet 29 of the valve below the top flange 30. The two portions of the plate are then secured together by the pin 22. The plates 10 and 18 are connected together by the rods 16 after which the nuts 17 are tightened. This operation holds the stem in closed position against the upward pressure in the line tending to force the gate upward when the valve is closed. Without the device in place as described the pressure would blow the gate to open position and force the stem completely out of the bonnet and cause considerable damage. However with the device properly positioned, the stem will be held securely in position and the work of removing and replacing the bolts and gaskets may be safely carried out without removing the pressure from the lines. By using suitable tools to unloosen the bolts 31, the stuffing box gland 32 may be raised on the stem and new packing placed in the stuffing box 33. The bolts 34 which hold the stuffing box to the top flange 35 of the bonnet may be removed and replaced while in this position.

To replace the gasket between the top flange 36 of the body of the gate valve and the lower flange 37 of the bonnet either two or four of the bolts 38 are removed from the flanges and the hook portions 15 of the bolts 13 are inserted therein, the bolts 13 extending to the top plate 10. The nuts 14 on the top side of the plate 10 are then tightened to hold the stem down. The remainder of the bolts 38 can then be removed. The stem is then rotated clockwise by any suitable means such as a wrench, and the nuts 14 on the bolts are loosened a little at a time and in this manner the bonnet is raised high enough to insert a new gasket between the flanges. It may be well to note that the threads on the stem are left hand and the stem extends down into the center of the gate portion far enough that the bonnet can be raised and the gate still be held in place.

Should only the bolts 34 which hold the flange 35 of the stuffing box to the upper flange 30 of the bonnet need be replaced, the only operation

necessary would be to position the plate 18 below the flange 30. The stud bolts 25 fixed to the top side of the plate and the small clamps 26 will extend over the top side of the flange 35 and upon tightening the bolts 25 the two flanges will be held in fixed position so that the bolts 34 may be removed and renewed.

From the above description it may be clearly seen that the attachment is adaptable to valves of the general type described and by use of such equipment the bolts and packing may be renewed without taking the pressure off the line and such work may be done very efficiently and quickly. This, however, does not necessarily limit the use of the device to one particular type valve but it may be used on any type valve to which it might be applied.

It will be obvious to those skilled in the art that various changes may be made in my device without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the accompanying drawing and described in the specification, but only as indicated by the appended claims.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. The method of repairing a valve while under pressure said valve having a valve stem, a stuffing box, a hand wheel on said stem and a flanged bonnet which comprises replacing said hand wheel by a plate, positioning a second plate beneath said flange on the bonnet and securing said plates together to hold said valve stem in fixed position and thereafter removing the stuffing box to renew packing and fastening elements, substantially as set forth.

2. The method of repairing a gate valve while under pressure comprising removing the hand wheel from the valve stem, applying a member to the end of the valve stem, positioning a second member in engagement with a flange on the valve and connecting said members together thereby holding the valve stem down while replacements are being made, substantially as set forth.

HARVEY L. IVINS.