E. B. CROCKER.

SAFETY VALVE TESTING GAG.

APPLICATION FILED MAY 7, 1918.

1,290,520.

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Fig. 1

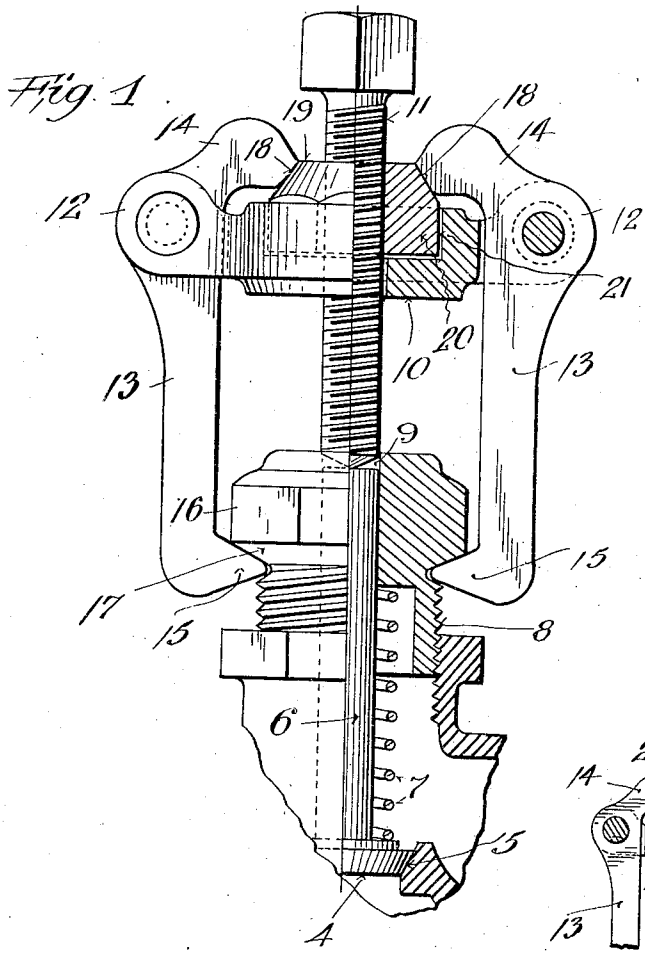


Fig. 3

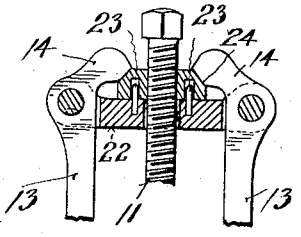
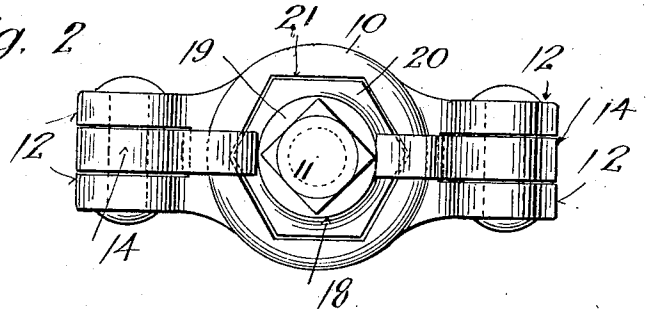


Fig. 2



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UNITED STATES PATENT OFFICE.

ERNEST B. CROCKER, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE ASHCROFT MANUFACTURING COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

SAFETY-VALVE-TESTING GAG.

1,290,520. Specification of Letters Patent. Patented Jan. 7, 1919.

Application filed May 7, 1918. Serial No. 233,184.

To all whom it may concern:

Be it known that I, ERNEST B. CROCKER, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have made a certain new and useful Invention in Safety-Valve-Testing Gag, of which the following is a specification.

This invention relates to safety valve testing gags.

The object of the invention is to provide a structure which is simple, sturdy and efficient for retaining safety and other valves employed in connection with boilers or other devices upon their seats, while the boilers or other device to which the safety or other valve is applied, is being subjected to pressure test.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawing, and finally pointed out in the appended claims.

Referring to the accompanying drawing,

Figure 1 is a view partly in elevation and partly in central logitudinal secton showing a safety valve testing gag structure embodying the principles of my invention.

Fig. 2 is a view in plan of the upper end of the structure shown in Fig. 1.

Fig. 3 is a broken detail view in section showing a slightly modified arrangement embodying the principles of my invention.

It is customary to retain safety and other valves yieldingly upon their seats by means of coiled springs. Where such valves are employed in connection with boilers, pressure tanks, or other devices within which pressure is developed, it is the practice to test the boiler, pressure tank, or the like for internal pressure from time to time.

During such tests, it is necessary that the safety or other valves referred to employed in connection with the boiler tank or the like be retained solidly upon their seats while the internal pressure test of the boiler or tank is being made. Where the valve is yieldingly retained by a spring upon its seat, it is objectionable to impose the necessary holding tension upon the spring to effect the retention of the valve seated during the pressure test for the reason that the tension required to be imposed upon the valve spring, must exceed that of the testing pressure and by imposing such a tension upon the spring it frequently results that the spring is given a permanent "set" in its compressed condition, which necessitates readjustment of the tension of the spring for the normal operation of the valve after the pressure test has been completed, or a permanent impairment of the tension of the spring. In order to avoid these and other objections, I propose to employ means independent of the valve spring for solidly retaining the valve seated during the pressure test of the boiler or tank, to which the test is to be applied.

In carrying out my invention, I employ a valve testing gag having arms for engaging the head of the valve spring compression screw and with which arms are associated a screw member to engage the end of the valve stem to force the valve, independently of its tension spring solidly against its seat by a pressure which is applied to the spring compression screw head through the arms engaging therewith. Associated with the screw member is a traveling nut, which controls the engagement of the arms with the head of the compression screw.

In the drawing, I have shown various arrangements of practical embodiments of a safety valve testing gag, as illustrative of the principles of my invention, and wherein 4 designates a valve, 5 a seat therefor, 6 a valve stem, 7 a valve spring, and 8 the compression screw member through which the desired tension is imposed upon the valve spring for the normal operation of the valve, the stem of the valve working through a central opening 9 in the compression screw member 8. These parts may be of the usual or any well known convenient and desired construction, and in the structure and details thereof form no part of my present invention.

The gag device constituting my invention and in the form thereof disclosed in Figs. 1 and 2, comprises a cross member 10 loosely through the center of which passes a set screw 11. Pivotally connected between ears 12 at the ends of the cross member 10, are arms 13 having angle arm portions or tail pieces 14 extending to one side of the pivotal axis of the arms 13, and toward each other.

The arms 13 are provided with engaging hook portions 15 at their free ends arranged, when in position for use, to engage the head of the compression screw 8. It is customary to form the heads of valve spring compression screw members 8 in the form of a hex nut, as indicated at 16 and the free ends or hook portions 15 of the gag levers 13 engage beneath the shoulder 17 of this hex nut head of the compression screw. Where the shoulder 17 is of inclined or tapering contour, as shown, the engaging portions of the hook ends 15 should be correspondingly shaped. The proximate ends of the angle arm extensions or tail pieces 14 of the levers 13 are formed with a bearing surface 18 to work against the inclined or tapering surface 19 of a nut 20 longitudinally through which the screw 11 is tapped. This nut is held from turning when the screw 11 is turned. This may be accomplished in different ways. In the form shown in Fig. 1, the cross member 10 is provided with a hex-shaped seat 21 in which the nut 20 is received and seated and thereby held against axial rotative movement and caused to travel along the screw 11 when the latter is turned, after it has forced the valve to its seat, as will be presently more fully explained.

It is obvious that other means may be employed to prevent the nut 20 from rotating. For example, as shown in Fig. 3, the cross member 22 may be provided with dowel pins 23 which are received within seats or sockets formed in the traveling nut 24.

In the practical application of the testing gag the hook members 15 of the levers 13 are engaged with the shoulder of the head of the valve spring compression screw. The screw 11 is turned up through the nut 20 until the end of the screw 11 entering the central opening 9 in the head of the compression screw 8 engages the end of the valve stem 6 and forces the valve 4 firmly to its seat 5. By further turning of the screw 11 after the valve has become seated the nut 20 will be caused to travel along the screw 11, the pressure now being applied to the head of the compression screw 8 through the engagement therewith of the hook ends 15 of the levers 13. As the nut 20 travels along screw 11, being itself restrained from axial rotation, the inclined surface 19 thereof engages the surface 18 on the ends of the lever tail pieces 14 thereby rocking said levers in a direction to cause the hook ends 15 thereof to efficiently engage and be retained in locking relation against the shoulder of the head of the compression screw 8. In this manner, the valve 4 is maintained upon its seat during the pressure test of the boiler or tank or other device to which the valve is applied during the pressure test of said boiler tank or device, and independently of the tension of the valve spring, and without danger of imposing an undue tension upon said spring or imparting an undesirable "set" to the spring or deranging the tension adjustment thereof.

It will be seen that I provide an exceedingly simple, strong, sturdy, valve testing gag, which is simple to manufacture and assemble, which contains no complications, and which may be easily and readily applied when required for use and detached and removed, if desired, when the purpose thereof has been accomplished, or sufficiently loosened up without permanent removal to permit the normal operation of the valve.

Having now set forth the objects and nature of my invention and constructions embodying the principles thereof, what I claim as new and useful and of my own invention and desire to secure by Letters Patent is:—

1. In a safety valve testing gag, and in combination with a valve and its stem, seat, tension spring and compression screw, a cross member, levers pivotally connected to the ends of the cross member and having hook ends to engage the head of said compression screw, said levers having angle arm tail pieces, a screw passing loosely through said cross member to impinge against the end of the valve stem to force the valve solidly to its seat, and a nut through which said screw is threaded, said nut having an inclined surface to be engaged by the angle arm tail pieces of the said levers, said nut engaged by said cross member to hold the same against axial rotation when said screw is turned.

2. In a safety valve testing gag, and in combination with a valve and its stem, seat, tension spring, and compression screw, a cross member, levers pivotally connected to the ends of the cross member and having hook ends to engage the head of said compression screw, said levers having angle arm tail pieces, a screw passing loosely through said cross member to impinge against the end of the valve stem to force the valve solidly to its seat, and a nut through which said screw is threaded, said nut having an inclined surface to be engaged by the angle arm tail pieces of the said levers, and a seat or socket formed in said cross member to receive said nut and hold the same against axial rotation when said screw is turned.

3. In a safety valve testing gag, and in combination with a valve and its stem, seat, tension spring and compression screw, a cross member, levers pivotally connected to the ends of the cross member and having hook ends to engage the head of the said compression screw, said levers having angle arm tail pieces, a screw passing loosely through said cross member to impinge against the end of the valve stem to force the valve solidly to its seat, and a nut through

which said screw is threaded, said nut having an inclined surface to be engaged by the angle arm tail pieces of the said levers, said nut having angular faces, and a correspondingly faced seat or socket formed in said cross member to receive said nut and hold the same against axial rotation when said screw is turned.

4. In a safety valve testing gag, a cross member, levers pivotally connected intermediate of their ends to the opposite ends of said cross members, said levers having tail pieces, on one side of their pivots, angularly deflected towards each other and provided with engaging surfaces at their extremities, the other ends of said levers having hook portions, a screw passing loosely through said cross member midway intermediate of said levers, a nut through which said screw is tapped, said nut having an inclined surface to coöperate with the engaging surfaces on said lever tail pieces, said nut having connection with said cross member to prevent axial rotation of the nut, in combination with a valve and its stem and compression nut, said screw adapted to impinge against the end of the valve stem and the hook portions of the said levers adapted to engage said compression nut.

5. In a safety valve testing gag, a cross member, levers pivotally connected intermediate of their ends to the opposite ends of said cross members, said levers having tail pieces on one side of their pivots, angularly deflected toward each other and provided with engaging surfaces at their extremities, the other ends of said levers having hook portions, a screw passing loosely through said cross member midway intermediate said levers, and a nut through which said screw is tapped, said nut having an inclined surface to coöperate with the engaging surfaces on said lever tail pieces, said nut having connection with said cross member to prevent axial rotation of the nut.

6. In a safety valve testing gag, a cross member, levers pivotally connected intermediate of their ends to the opposite ends of said cross members, said levers having tail pieces on one side of their pivots deflected toward each other and provided with engaging surfaces at their extremities, the other ends of said levers having hook portions, a screw passing loosely through said cross member midway intermediate said levers, and a nut through which said screw is tapped, said nut having an inclined surface to coöperate with the engaging surfaces on said lever tail pieces, said cross member having a hex seat or socket, said nut being exteriorly shaped to conform to and to be received in said seat, and held thereby against axial rotation.

In testimony whereof I have hereunto set my hand on this 2nd day of May, A. D. 1918.

ERNEST B. CROCKER.

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