(No Model.)

F. SCHREIDT.

AUTOMATIC RELIEF VALVE.

No. 479,724. Patented July 26, 1892.

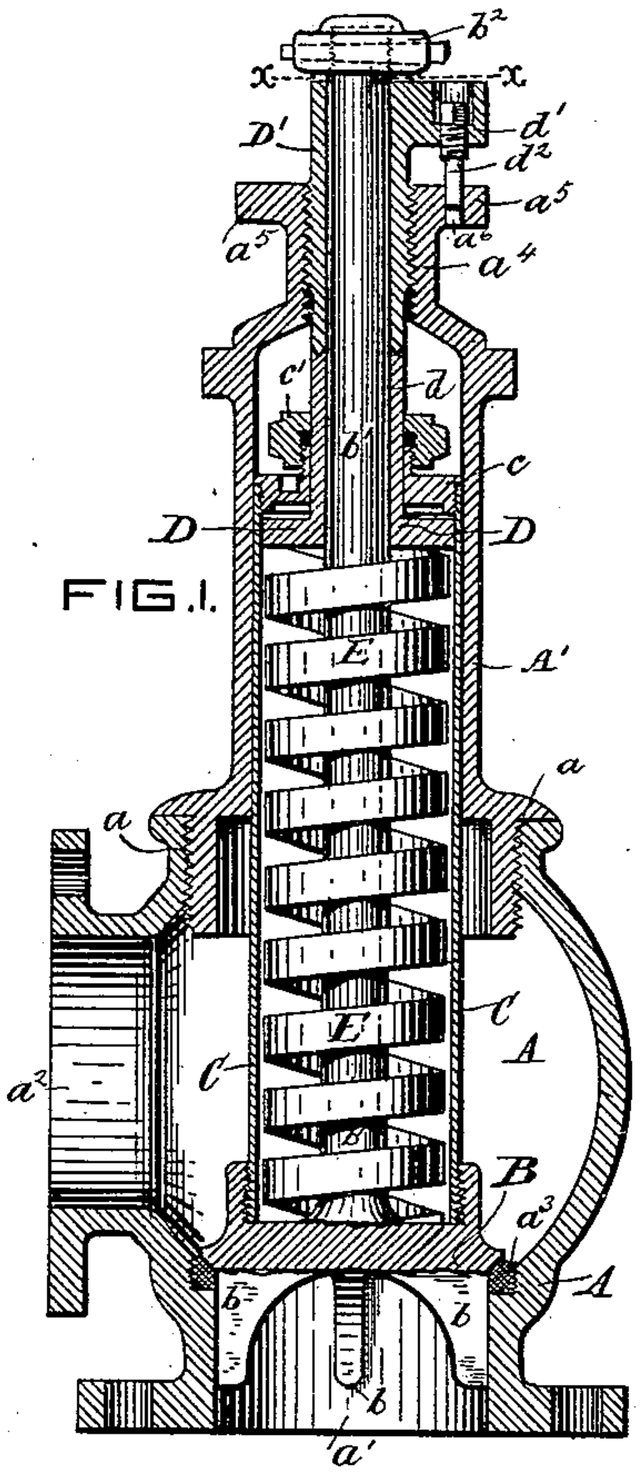

FIG. 1.

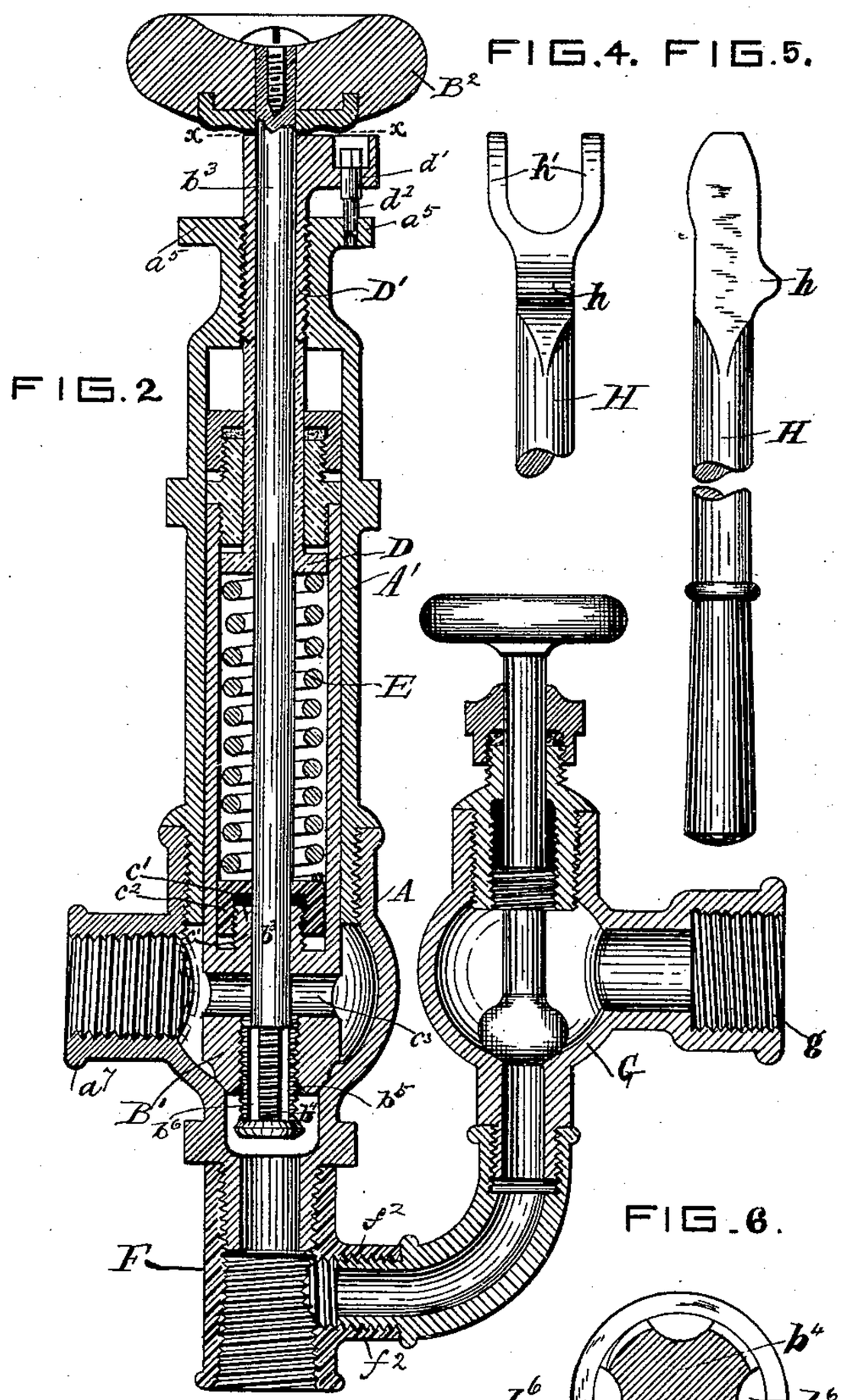

FIG. 2

FIG. 4.

FIG. 5.

FIG. 6.

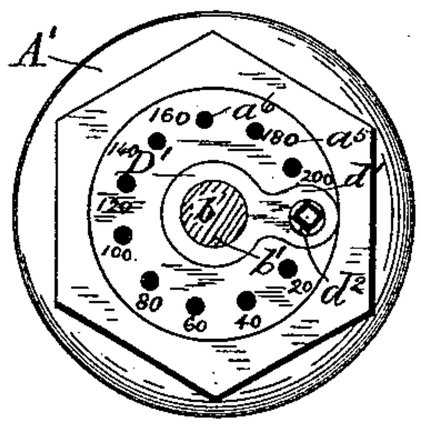

FIG. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

FRANK SCHREIDT, OF MANSFIELD, OHIO, ASSIGNOR TO THE SAFETY CYLINDER VALVE COMPANY, OF SAME PLACE.

AUTOMATIC RELIEF-VALVE.

SPECIFICATION forming part of Letters Patent No. 479,724, dated July 26, 1892.

Application filed August 1, 1891. Serial No. 401,391. (No model.)

To all whom it may concern:

Be it known that I, FRANK SCHREIDT, a citizen of the United States, and a resident of Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Automatic Relief-Valves, of which the following is a specification.

My invention relates to combined cylinder-cocks and automatic relief-valves, and is an improvement upon the invention for which Letters Patent No. 433,543 were granted to me August 5, 1890.

The objects of my invention are to provide means to prevent steam from coming in contact with the spring; to provide means to adjust the springs to any desired pressure; to provide an index to indicate the pressure upon the valve and lock them after adjustment, so that the valves may be removed for overhauling and when replaced the adjustment will not be changed; to provide means to quickly relieve the cylinder independently of the relief-valve and for attachment of an indicator in direct communication with the live steam in the cylinder; to provide means to temporarily move the relief-valve and testing it to be sure that it does not stick to its seat or its action is not impeded from any cause, and finally to so form the parts that they may be readily combined in a strong effective device that requires little attention and is not liable to get out of order.

The invention will be first fully described in connection with the accompanying drawings, in which like parts are indicated by similar reference-letters wherever they occur throughout the various views, after which it will be particularly referred to and pointed out in the claims.

Referring to the drawings, Figure 1 is a vertical diametrical sectional view of my improved valve arranged to be applied to a horizontal engine. Fig. 2 is a modified form adapted to be applied to a vertical engine. Fig. 3 is a plan view of the cap and case, taken through lines x x of Figs. 1 and 2. Figs. 4 and 5 are respectively front and edge elevations of the wrench for temporarily actuating the valve by hand. Fig. 6 is a transverse sectional view of the auxiliary hand relief-valve shown in Fig. 2 upon an enlarged scale.

Referring first to the form shown in Fig. 1, the outer case is composed of two parts A A′, united together by screw-threaded connection at a. The hollow globular part A of the valve-case has a flanged branch a' to connect with the cylinder and a similar branch a^2 to connect with the waste, drain, or bilge pipe. The valve B, which is provided with wings b, which fit loosely within branch a', as well as the valve-seat a^3, is preferably formed of nickel or some non-corrosive metal, the seat being for economy made in the form of a ring and screwed into the casing A. The valve B is screwed into the lower end of a tube C, which is fitted to slide freely in the upper part of the outer casing or shell A′, and within the tube C follower D, which is centrally perforated and has a tubular stem d, which extends through the cap c of tube C and a packing-nut c', is fitted to slide freely. The upper edge of the tubular extension d has a V-shaped groove, into which fits correspondingly-shaped edge of tube D′, which has an exterior screw-threaded portion to engage a thread tapped in the neck a^4 of the case portion A′. The V-shaped joint is ground to prevent water or steam from coming in contact with the spring. The follower D is forced downwardly within the tube C by screwing down the tubular piece D′. A spiral spring E is compressed between the follower D and the valve B within the tube C. The stem b' of the valve B extends through the coils of the spring E, tubular extensions d and D′, and is fitted on its upper end with a cap-nut b^2.

On the upper end of the valve-casing A′ is a circular flange a^5, which is provided with a series of perforations a^6, and laterally extending from the tube D′ is a lug d', which is countersunk upon the top and perforated to receive a screw-pin d^2, the lower tapering end of which is adapted to enter any one of the perforations in the flange a^5 and lock the tube D′ and case A′ together. The purpose of this arrangement is to regulate the tension of the spring E and lock the parts together, so that the tension of the spring will always remain the same. The top of the disk or flange a^5 is indexed opposite the perforations a^6 to indicate what hole the pin d^2, should be placed in in order to give any desired tension to the

spring, so as to hold the valve B to its seat with the requisite pressure. In order to secure this result, after the valve has once been pressed to its seat with its lightest pressure, the pin d^2 is retracted by a suitable key and the pin turned with the tube D′ until the pin is brought successively into each one of the holes a^6. The pressure necessary to force the valve from its seat is tested while the pin is in each one of the holes and the pressure stamped upon the disk a^5 opposite the holes, so that the engineer may readily adjust the valve to any pressure desired by rotating the tube D′ until the pin d^2 comes opposite the holes in the index marked with the requisite pressure—for instance, for high-pressure cylinder-valves the pin is placed in the hole marked "180," for low-pressure valves it is placed in the hole marked "40," and for intermediate-pressure valves in the hole marked "80," which means, respectively, one hundred and eighty pounds pressure, eighty pounds pressure, and forty pounds pressure. Now it will be seen that the spring which regulates the valve and holds it to its seat is entirely incased from contact with the steam and that, once the pressure is regulated after the casings A A′ are secured together, the valve, with the upper part of the casing A′, may be removed for overhauling, and when replaced the tension of the spring will not be disturbed nor the pressure of the valve to its seat varied.

It frequently happens that it is necessary to relieve or free the cylinder from water even when the pressure within the cylinder is insufficient to lift the valve B from its seat. I have therefore provided a forked lever H. (Shown in Figs. 4 and 5.) The fulcrum h of the lever is placed upon the flange a^5, with the forks h' under the cap-nut b^2. By pressing down the lever H the stem b' is elevated, carrying with it the valve B, thus providing temporary relief for the cylinder and for testing the valve to see that it does not stick from deposits of scale that may accumulate from the water.

In the form shown in Fig. 2 the valve-case A A′, spring-casing C, and the spring-pressed main valve B′ are substantially the same as shown in the preceding figure, excepting that the valve B′ is integral with the spring-casing C, being a downward extension of it. From the inside of the spring-casing bottom is an upwardly-extending nipple c', which is screw-threaded to receive the packing-nut c^2, between which and the plunger D the spring E is compressed to hold the valve to its seat. The lower extension of the casing C is chambered at c^3 and transversely perforated to communicate with the branch a^7 of the outer casing A. The lower part of the spring-casing and valve B′ is centrally perforated to receive the stem b^3 and the screw-threaded portion of the valve b^4, which is an upwardly-closing valve having its seat b^5 in the body of the valve B′. The screw-threaded portion of the valve b^4 is cut away or longitudinally grooved at b^6, as clearly shown in enlarged transverse section, Fig. 6. The upper end of the stem b^3 is fitted with a hand-wheel B^2, by which the valve b^4 is lowered to afford temporary relief through the branch a^7 and brought back to its seat to lock the temporary relief-valve b^4 and the valve B′ as one piece.

The lower end of the valve-case A has a screw-threaded branch to secure the valve-case in a T-coupling F, which communicates with the cylinder. The coupling has a horizontal branch f^2, in which is secured a hand-valve G, which is of ordinary construction, by which the cylinder may be quickly relieved, if desired. This valve is also intended to open communication direct with the live steam in the cylinder and an indicator which may be attached at any time to the branch g, thus avoiding the necessity of attaching a globe-valve to the cylinder for indicating purposes.

It is obvious to those skilled in the art to which my invention relates that many mere mechanical changes may be made in the parts without departing from the spirit or scope of my invention, and hence I would have it understood that I do not limit myself to the precise details shown and described.

What I claim is—

1. The combination of the valve-case, a spring-pressed relief-valve within said case, a housing for the valve-spring, rigidly secured to and movable with the valve, and means, such as shown, for adjusting the tension of the spring and locking the tension when adjusted, substantially as shown and described.

2. The combination of the outer case, the valve, and the valve-spring housing connected together and fitted to slide within said case, the follower D within the housing and having a stem extending to the outside, the tube D′, screw-threaded through the case and forming part of the plunger-stem, whereby the follower is moved within the spring-housing, the spring compressed between the follower and the valve, and means to lock the adjustment of the spring for the purpose of holding it to the desired tension, substantially as shown and described.

3. The combination of the two-part outer case A A′, the spring-housing C, and attached valve B, fitted to slide therein, the follower D, having divided hollow stem d D′, the part D′ being screw-threaded through the neck of the part A′ and having laterally-extending lug d', the screw-pin d^2, tapped into said lug and adapted to interlock with the case, and the stem b, extending to the outside of the case and provided with cap-nut b^2, substantially as shown and described.

4. The combination of the valve-case, a spring-pressed relief-valve within said case, a housing for the spring and follower, provided with a screw-threaded stem to compress or relax the spring, a supplemental valve, as b^4, forming part of the spring-pressed valve, but movable independent of it, and the stem b^3 and

hand-wheel B^2 to move said supplemental valve independent of the main valve, substantially as and for the purpose set forth.

5. The combination of the outer case, the spring-pressed relief-valve therein, means for adjusting the spring and locking the tension when adjusted, and a graduated index to indicate the pressure with which the relief-valve is held to its seat, substantially as shown and described.

6. The combination of the valve-case, a spring-pressed relief-valve within it, and an auxiliary relief and indicator valve, as G, adapted to connect directly with the cylinder and having a screw-threaded exhaust branch, as *g*, for attaching an indicator, said auxiliary valve being arranged to act independently of the spring-pressed relief-valve, substantially as shown and described.

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