No. 679,543. Patented July 30, 1901.

E. S. ROOT & C. S. DEMAREST.

VALVE FOR GAS OR OTHER PIPES.

(Application filed Mar. 20, 1901.)

(No Model.)

Fig. 1.

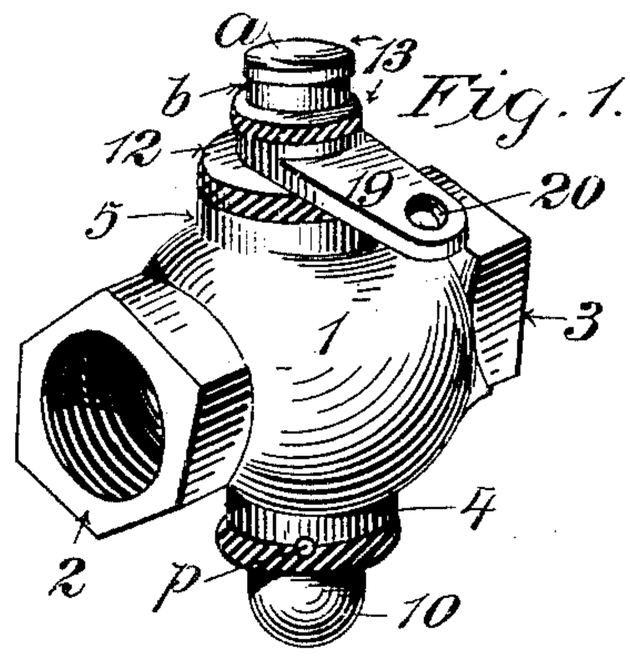


Fig. 2.

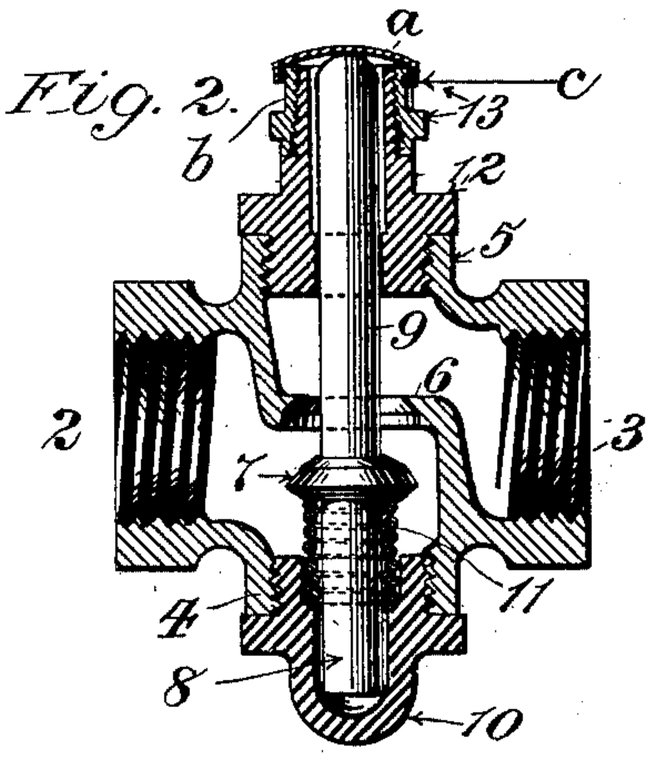


Fig. 3.

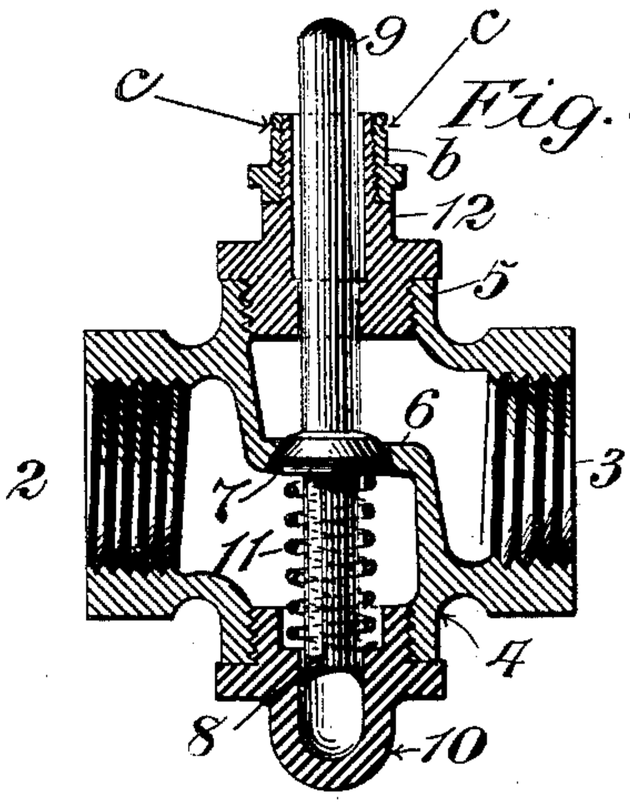


Fig. 4.

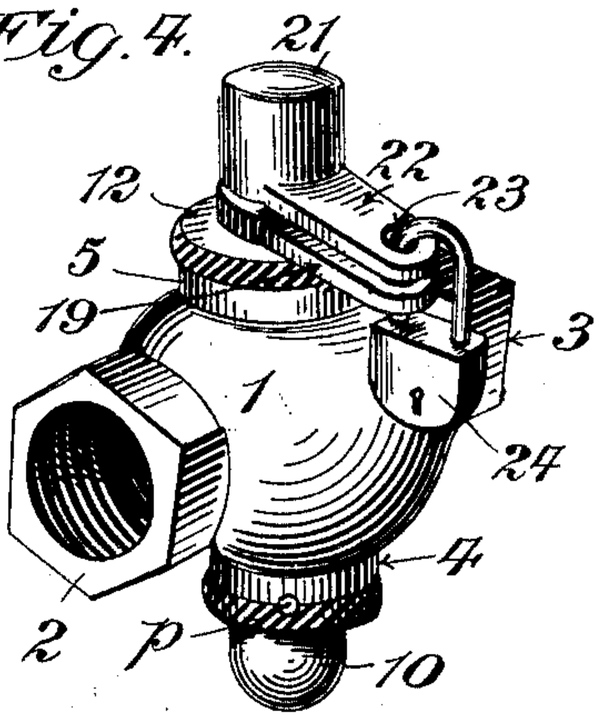


Fig. 5.

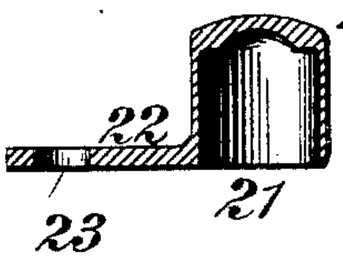


Fig. 6.

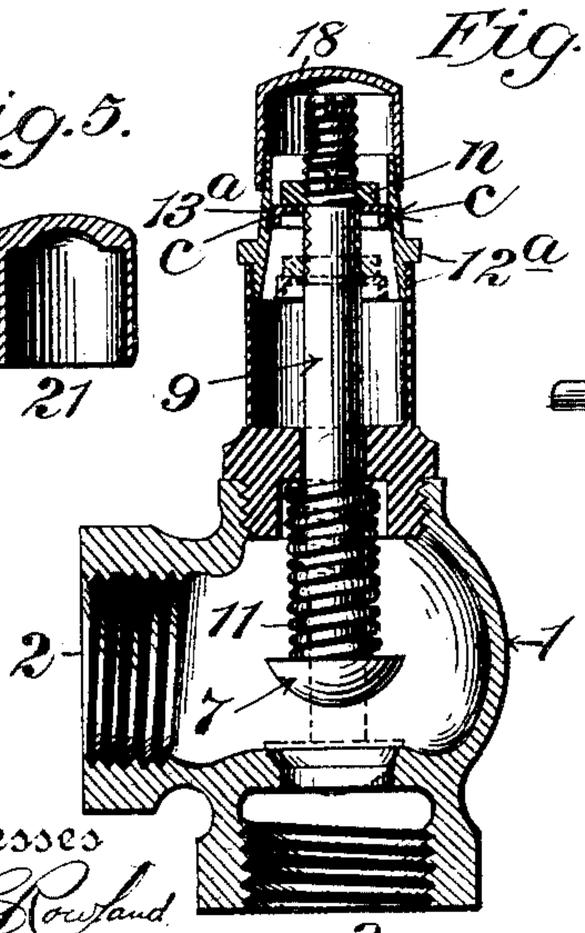
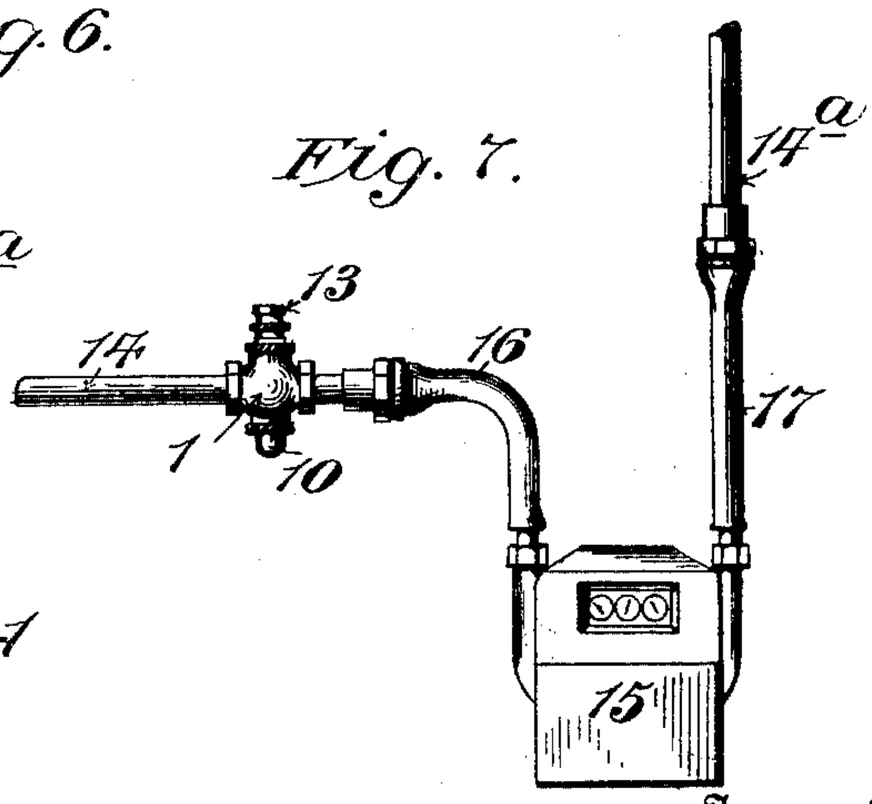


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD S. ROOT AND CHARLES S. DEMAREST, OF NEW YORK, N. Y.

VALVE FOR GAS OR OTHER PIPES.

SPECIFICATION forming part of Letters Patent No. 679,543, dated July 30, 1901.

Application filed March 20, 1901. Serial No. 52,018. (No model.)

To all whom it may concern:

Be it known that we, EDWARD S. ROOT and CHARLES S. DEMAREST, of the borough of Manhattan, in the city, county, and State of New York, have invented a new and useful Improvement in Valves for Gas or other Pipes, which invention is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to provide a simple and efficient valve for use in gas-pipes (or other pipes conveying fluids) which will automatically cut off the supply of gas from a building when a fire occurs therein and which will also be adapted to serve as a locked valve for a gas-meter when it is desired for any reason to shut off the supply to such meter.

When a fire occurs in a building, and particularly if it occurs in the cellar, where gas-meters are usually located, it frequently happens that the heat of the fire is sufficient to damage the meter or to melt the lead-pipe connections between such meter and the supply-pipes, with the result that the full volume of gas entering from the street supply-pipe escapes into the building and not only adds fuel to the fire, but also charges the atmosphere (perhaps already smoke-laden) with gas, greatly endangering the safety of firemen who enter the cellar to fight the fire, many instances being on record where gas asphyxiation under these circumstances has resulted fatally.

The automatic valve herein described is adapted to automatically shut off the gas from a building when the temperature is raised to an unusual degree by the breaking out of a fire. It is also adapted to be operated by hand and locked in a closed position when it is desired to shut off the supply of gas to a meter, thus dispensing with the hand-operated cock or valve usually employed for this purpose.

The invention will first be described in detail and then set forth in the claims.

In the accompanying drawings, Figure 1 is a view in perspective, showing the external appearance of our improved valve as it is applied to a pipe, the valve being in its open position. Fig. 2 is a longitudinal vertical section of Fig. 1. Fig. 3 is a view similar to Fig. 2, showing the valve in its closed position. Fig. 4 is a view similar to Fig. 1, showing the fusible cap replaced by a locking-cap hereinafter described. Fig. 5 is a view in section of the locking-cap shown in Fig. 4. Fig. 6 illustrates a modification of our device hereinafter described. Fig. 7 is a view in side elevation, showing the usual arrangement of gas pipes and meter with our valve in position.

In said figures the several parts are respectively indicated by reference characters as follows:

The number 1 indicates the valve-casing provided with two threaded sockets 2 3 for connection, respectively, with inlet and outlet pipes, said casing being also provided with two threaded sockets or shoulders 4 5. Formed within the casing 1 is a valve-seat 6, adapted to receive a valve 7. The valve 7 is provided with two valve stems or rods 8 9, one on each side. The shorter valve-stem 8 extends below the valve into a bonnet or casing 10, screwed to the shoulder 4, and said stem is surrounded by a spiral spring 11, which bears against the valve 7 and also against the bonnet 10. The longer valve-stem 9 extends upward above the valve through a casing 12, screwed to the shoulder 5, and its upper end (when the valve is open, as shown in Fig. 2) rests against a bearing-plate *a*, forming part of a cap 13, which is screwed to the casing 12. The cap 13, as shown in Figs. 1, 2, and 3, is made in two parts *a b*, which are secured together at the point *c* by solder fusible at a temperature of, say, 140° to 150° Fahrenheit or any other suitable temperature. In order to make a more satisfactory joint, the part *b* may be provided, as shown in Figs. 2 and 3, with a small groove into which the solder will flow, the edges of the part *a* being then turned over upon this groove and the soldering effected.

The various parts are preferably assembled in the following manner: The casing 1 having been cast or otherwise formed with the valve-seat 6 and sockets 2 3 4 5 therein, the valve 7 is inserted through the socket 4, with the spiral spring 11 surrounding the shorter valve-stem 8, and the bonnet 10 is then screwed into place, thus slightly compressing the spring 11 between the valve 7 and the

bonnet 10 and closing the valve in its seat. The longer valve-stem 9 will thus project into and above the casing 12, screwed to the socket 5, and by then screwing into place the fusible cap 13, composed of the parts *a b*, the contact between the part *a* of said cap and the valve-stem 9 will, as the cap is screwed into place, force said stem and the valve 7 downward, fully compressing the spring 11 and opening the valve 7. The casings 10 12 may, if desired, be secured rigidly to the casing 1 by pins or screws *p*. The device is then ready for operation. It is preferably placed, as shown in Fig. 7, in a gas-supply pipe 14, leading from the street gas-main to a gas-meter 15. The numbers 16 17 indicate the lead pipes which are usually employed to connect the street-pipe 14 and the house supply-pipe 14ª with the meter 15.

The operation of the valve is as follows: Upon the breaking out of a fire and the rising of the temperature to the melting-point of the solder employed in the fusible cap 13 said solder will fuse and the part *a* of said cap in contact with the valve-stem 9 will be forced off the part *b* by reason of the spring 11 being released from compression. Said spring will thus instantaneously force the valve 7 into its seat 6 and cut off all supply of gas. If, therefore, the valve be placed in the street supply-pipe 14 at a point near the meter 15, as shown in Fig. 7, the valve will have automatically closed before the heat has arisen to a point sufficient to melt either the meter or any of its lead-pipe connections, and no subsequent destruction of such connections or of the meter or of any of the house service-pipes will permit the escape of gas into the building. In order to reset the valve after it has operated automatically, as above described, it is only necessary to screw into place a new cap 13, and the device is then ready for another operation.

In Fig. 6 a modified form of automatic valve is shown, the principle of operation being the same. In this form of our invention the valve 7 is provided with a single valve-stem 9, which extends upward through a casing 12ª and is surrounded by the spiral spring 11 above the valve. Within the casing 12ª is a metal plate 13ª, which is soldered to said casing at the point *c* by solder fusible at a low temperature. The plate 13ª is provided with an opening through which the valve-stem 9 passes. Said valve-stem is threaded at its upper end, as shown, and is provided with a nut *n*, adapted to be screwed upon said stem by a small wrench or other device. Assuming the valve to be held in its seat by the spring 11, it is evident that if the nut *n* be rotated the valve 7 and its stem 9 will be moved upward, compressing the spring 11 and opening the valve. The valve will then be held open by the contact of the nut *n* with the plate 13ª, which forms a bearing-plate or support therefor. A screw-cap or cover 18 is then screwed upon the casing 12ª to make the valve gas-tight and the valve is ready for operation. When the heat of a fire rises to a point sufficient to melt the solder at the point *c*, the valve-stem 9 will be deprived of its support by the falling of the plate 13ª and the spring 11 will instantly force the valve 7 into its seat, cutting off the supply of gas, as hereinbefore fully described. It will be observed that the plate 13ª in Fig. 6 and the part *a* of the cap 13 in Fig. 2 perform the same function—that is, each acts as a bearing-plate or support for holding the valve open.

Having thus described the automatic feature of our improved valve, we will now describe its adaptation for use as a locked hand-valve.

It is very often desirable to cut off the supply of gas to a gas-meter, and for this purpose a plug-cock is usually provided near the meter and locked by various means when closed. Our automatic valve is provided, as shown in Fig. 1, with a lug 19, preferably cast on the casing 12 and provided with a hole 20. When it is desired for any reason to close the valve by hand, and thus shut off the gas from the meter, the screw-cap 13 is unscrewed from the casing 12, thus allowing the spring 11 to force the valve 7 into its seat. A locking-cap 21, Fig. 5, provided with a lug 22 and hole 23, is then put in place over the valve-stem 9, so that the hole 23 in the lug 22 will register with the hole 20 in the lug 19. The lugs 19 and 21 are then secured together by a padlock 24, and the device appears as shown in Fig. 4. The valve is thus locked in its closed position, cutting off supply to the meter, and it can only be opened by the possessor of the key of the lock 24, thus preventing interference with the valve. The modified form of valve shown in Fig. 6 may be locked in the same manner by providing the casing 12ª with a locking-lug and putting the locking-cap 20 over the screw-cap 18, the valve 7 being first closed by backing off the nut *n* from the stem 9. It is obvious that if the spring 11 be omitted from the valve shown in Fig. 6 the valve will close by gravity when the solder *c* fuses and that if said spring be omitted from the valve shown in Fig. 2 and the valve reversed this valve will also close by gravity when the solder fuses; but we prefer to employ the spring in order to insure certainty of operation.

From the above description it will be apparent that our improved valve presents many advantages. It is of simple construction and can be economically manufactured. It will cut off the gas automatically upon the outbreak of a fire. It can be closed by hand and securely locked in its closed position to prevent tampering with the valve. All hand-operated cocks near the meter may be dispensed with. The valve-casing is fluid-tight, and no gas or other fluid can escape whether the valve be open or closed. The pressure of the gas entering through the open-

ing 1 tends to hold the valve to its seat when closed. The spring 11 is entirely within the body of the valve-casing and is not liable to be weakened by heat, which might happen if it were in a bonnet of the valve, and the fusible solder is so located that it is readily affected by the temperature at which it melts.

Having thus fully described our invention, we claim—

1. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a valve, within said casing, provided with a stem; and a bearing-plate, for holding said valve open, secured in place by fusible metal.

2. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a valve within said casing, provided with a stem; a spring surrounding said stem; and a bearing-plate, for holding said valve open against the pressure of the spring, secured in place by fusible metal.

3. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a valve, within said casing, provided with a stem; a casing for said valve-stem; and a cap for said stem-casing provided with a bearing-plate for said valve-stem, said bearing-plate being secured in place by fusible metal.

4. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a valve, within said casing, provided with a stem; a casing for said valve-stem; a spring surrounding said stem; and a cap for said stem-casing, provided with a bearing-plate for said valve-stem, said bearing-plate being secured in place by fusible metal.

5. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a valve, within said casing, provided with a stem; a casing for said valve-stem; and a removable cap for said valve-stem casing, made of two parts, secured together by fusible metal.

6. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a valve within said casing provided with a valve-stem on each side; a spring surrounding one of the said stems and tending to hold the valve to its seat; and a bearing-plate on the other side of the valve for engaging the other valve-stem and holding the valve open against the pressure of the said spring, said bearing-plate being secured in place by fusible metal.

7. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a valve within said casing provided with a valve-stem on each side; a spring surrounding one of the said stems and tending to hold the valve to its seat; a casing for the other valve-stem, and a cap for said valve-stem casing provided with a bearing-plate, secured in place by fusible metal, for engaging the valve-stem and holding the valve open against the pressure of the spring.

8. The combination of a valve-casing provided with inlet and outlet openings, and with a valve-seat; a valve within said casing provided with upper and lower valve-stems; a spring surrounding the lower valve-stem; casings for said stems; and a removable cap for the upper casing composed of two parts secured together by fusible metal.

9. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a single lifting-valve within said casing provided with a stem; means for engaging said stem and holding said valve open; fusible means for releasing said valve automatically; and means for releasing said valve by hand.

10. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a single lifting-valve within said casing provided with a stem; means for engaging said stem and holding said valve open; fusible means for releasing said valve automatically; means for releasing said valve by hand; and means for locking said valve in its closed position.

11. The combination of a valve-casing provided with inlet and outlet openings and with a valve-seat; a valve within said casing held normally open and provided with a stem; means for closing said valve; a locking-lug on said valve-casing; a removable locking-cap for said stem; and a lock, for the purposes set forth.

12. The combination of a gas-meter; a supply-pipe leading to said meter; a distributing-pipe leading from said meter; a single lifting-valve located in said supply-pipe and provided with a stem; means for engaging said stem and holding said valve open; fusible means for releasing said valve automatically; and means for releasing said valve by hand.

13. The combination of a gas-meter; a supply-pipe leading to said meter; a distributing-pipe leading from said meter; a single lifting-valve located in said supply-pipe and provided with a stem; means for engaging said stem and holding said valve open; fusible means for releasing said valve automatically; means for releasing said valve by hand; and means for locking said valve in its closed position.

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