To all whom it may concern:

Be it known that I, ARTEMAS H. HOBART, a citizen of the United States, and a resident of Duxbury, in the county of Plymouth and State of Massachusetts, have invented an Improvement in Safety Gas Cocks, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention aims to provide a novel and improved safety gas-cock having means automatically to shut off the gas when the user closes the cock beyond a predetermined point, and means automatically to shut off the gas when the conduit attached to the cock becomes detached accidentally.

The invention will be best understood by reference to the following description, when taken in connection with the accompanying drawings of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a side elevation of a safety gas-cock exemplifying the invention, showing the same in connection with two conduits, one of which is intended to be attached to and detached from the cock at will from time to time, as the exigencies of the situation may require;

Fig. 2 is a plan of the parts shown in Fig. 1, except that the handle of the cock is removed;

Figs. 3, 4 and 5, are diagrammatic views illustrative of the operation of the device, Fig. 3 showing the cock fully opened, Fig. 4 showing the same partially closed, and Fig. 5 showing the same fully closed; and

Fig. 6 is a detail elevation of the plug valve, the latch-releasing cam, and the lost-motion coupling device between the valve and the spring.

Referring to the drawings, and to the embodiment of my invention which is selected for exemplification, there is shown a gas-cock comprising a valve casing 8, in which is mounted a valve 9 (see Fig. 3), herein in the form of a tapered plug provided with a transverse passage 10 adapted to open and close communication between two ports 11 provided in the casing. The plug is held in place by a screw 12 and washer 13 (see Fig. 1). The valve is provided with a stem 14, to which is secured a handle 15, by which it is turned to and fro to open and close the ports. The gas-cock as thus far described is of usual construction.

In the use of gas-cocks, it frequently happens that the user either turns on the gas insufficiently, or turns it down to such an extent that the flame is likely to be extinguished easily, with the result that gas commences to escape into the room. To prevent either of these tendencies, I have provided means for automatically restoring the valve to its closed position, unless the user turns it to its fully opened position, and for automatically closing the valve when the user, in turning down the gas, reaches a predetermined point in the closing movement of the valve. To these ends, I have provided a valve-closing spring 16, one end of which is secured, as by a screw 17, to the valve casing, while its other end rests against an abutment, such as a pin 18, the latter being carried by one member 19, or a lost-motion coupling, which connects the spring with the valve, the other member 20 of the coupling being suitably formed on or affixed to the valve. The coupling member 19 is provided with a lug 21 (see Fig. 6), which is adapted to cooperate with a tooth 22 presented by the member 20. In the operation of this valve, this lug plays to and fro between the tooth and a stop, herein a pin 23, mounted in fixed position on the valve casing. On one end, the stop limits the opening of the valve by cooperation with a lug 21, and on the other hand the stop limits the closing movement of the valve by cooperation with a tooth 24 presented by the coupling member 20.

The spring, acting through the coupling, normally holds the valve in its closed position, and yieldingly resists opening movement thereof. At a predetermined point in the opening movement of the valve, herein its fully opened position, the spring is locked, and its action on the valve is nullified by locking means, herein comprising a latch or pawl 25, which is adapted to cooperate with a latch-like tooth 26, presented by the coupling member 19. This is urged toward the coupling member 19 by an appropriate spring 27, conveniently secured to the valve casing, as by screws 28. When, therefore, during the opening movement of the valve, the latter reaches its fully opened position, represented in Fig. 3, the latch snaps into
place behind the tooth 26, and locks the coupling member 19 against reverse rotation under the influence of the spring.

Thus it will be understood that the user must at first turn on the valve to its fully opened position; otherwise, it will be closed by the spring. After the valve is fully opened, however, it may be partially closed by the user, but when a predetermined safe point is reached in the closing movement of the valve, the latch is automatically disengaged by a cam 29 conveniently presented by the tooth 22. The point of release of the latch may be predetermined by appropriate adjusting means, herein a screw 30 threaded into the latch, and constituting a wiper, which cooperates with the cam. By comparison of Figs. 3 and 4, it should be apparent that, when during the manual closing of the valve the cam pushes the latch out of engagement with the tooth on the coupling member 19, the latter is thereby unlocked, and the spring being now unrestrained, rotates the coupling member forcibly towards its initial position. In the movement of the coupling member, its lug 21 engages the tooth 22 on the other coupling member, and thus carries the valve to its closed position, as will be evident from an examination of Fig. 5.

When desired, the described mechanism may be utilized to close the valve in the event of accidental disconnection of a conduit 31 from the valve casing. The conduit, in the present example, is provided with a sleeve-like terminal portion 32, usually made of rubber adapted to fit over and about a corrugated nipple 33 of usual form, attached to the valve casing. A suitable connection is provided between the sleeve and the latch whereby, when the sleeve is withdrawn beyond a predetermined point, the latch is tripped, thereby permitting the valve to be closed by the spring. In the present example, this is conveniently accomplished by the provision of a spring tongue 34, secured as by screws 35 to the valve casing, and resting against the rubber sleeve, under considerable tension. When, therefore, the sleeve is accidentally withdrawn from the position which it normally occupies, the spring tongue goes in the direction of the corrugated nipple, and acts through appropriate instrumentalities to disengage the latch, in the present example by providing the latter with what may be termed a tail 35, which is adapted to be engaged by a lug 36, presented by the tongue 34. In the present example, the latch is mounted on a fulcrum presented by a screw 37, threaded into the valve casing. To facilitate the reattachment of the rubber sleeve to the corrugated nipple, the tongue 34 is provided with an outwardly directed terminal portion 38 (see Fig. 2). The general operation of the device should be evident, without further description.

Having thus described one embodiment of the invention, but without limiting myself thereto, what I claim and desire by Letters Patent to secure is:

1. In a valve construction, the combination of a valve, a valve closing spring, a spring locking pawl and ratchet for rendering said spring ineffective to close said valve when said valve reaches a predetermined open position, and pawl disengaging means operable at a predetermined point in the manual closing movement of said valve, thereby to permit said valve to continue its closing movement under the influence of said spring.

2. In a valve construction, the combination of a valve, a valve closing spring, a spring locking pawl and ratchet for rendering said spring ineffective to close said valve when said valve reaches a predetermined open position, a pawl disengaging cam operable during the manual closing of said valve to disengage said pawl from said ratchet, and adjustable means cooperating with said cam to predetermine the point of disengagement of said pawl with reference to the closing movement of said valve.

3. In a valve construction, the combination of a valve, a spring to maintain said valve in its closed position and to restore said valve to such position, locking means automatically to lock said spring when said valve reaches its fully opened position and to prevent restoration of said valve from its fully opened position to its closed position under the influence of said spring, and means to cause said locking means to release said spring at a predetermined point in the manually operated closing movement of said valve, thereby to render said valve again subject to the closing influence of said spring.

4. In a valve construction, the combination of a valve, a spring normally resisting opening of said valve, means for nullifying the effect of said spring on said valve when said valve reaches a predetermined point in its opening movement in opposition to the resistance of said spring, and means for causing the restoration of said valve to the closing influence of said spring when said valve reaches a predetermined point in its closing movement.

5. In a valve construction, the combination of a valve casing, a valve mounted to turn therein to open and to close, a rotary member, a spring attached at one end to said casing and at its other end to said member and constantly tending to resist movement of said member from its initial position and to restore said member to such position when moved therefrom, means comprising a lost-motion coupling between said valve and said member to cause opening movement of
said valve to produce turning movement of said member in opposition to said spring, locking means for locking said member against movement toward its initial position when said valve reaches a predetermined open position, and means for causing said locking means to unlock and to release said member at a predetermined position in the manual closing of said valve, thereby to permit said spring to act through said member and said coupling to close said valve.

6. In a valve construction, the combination of a valve casing, a conduit attached thereto, a valve mounted in said casing to open and close communication with said conduit, a valve closing spring, locking means for locking said spring to prevent the same from closing said valve when said valve is opened to a predetermined point, and means operable by movement of said conduit relative to said valve casing to cause said locking means to unlock and to permit said spring to close said valve.

7. In a valve construction, the combination of a valve casing, a conduit attached thereto, a valve in said casing to open and close communication with said conduit, a valve closing spring, locking means including a latch for locking said spring to prevent the same from closing said valve when said valve is opened to a predetermined point, and means including a spring operable by movement of said conduit relative to said valve casing to cause said latch to release said valve closing spring and to permit the latter to close said valve.

In testimony whereof, I have signed my name to this specification.

ARTEMAS H. HOBART.