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Patented Jan. 28, 1902.

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AUTOMATIC SAFETY GAS VALVE.

(Application filed May 13, 1901.)

(No Model.)

Fig. 1.

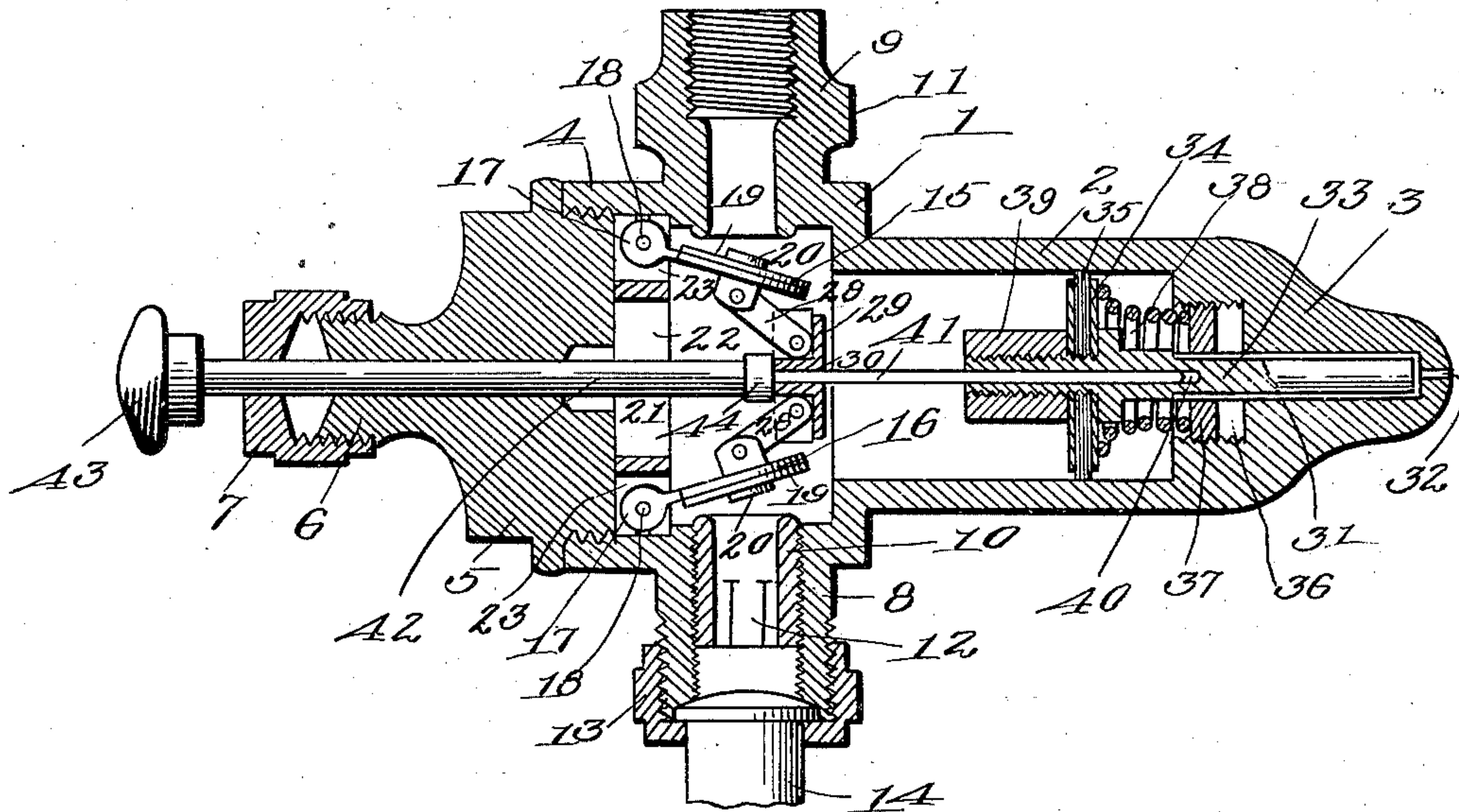


Fig. 2.

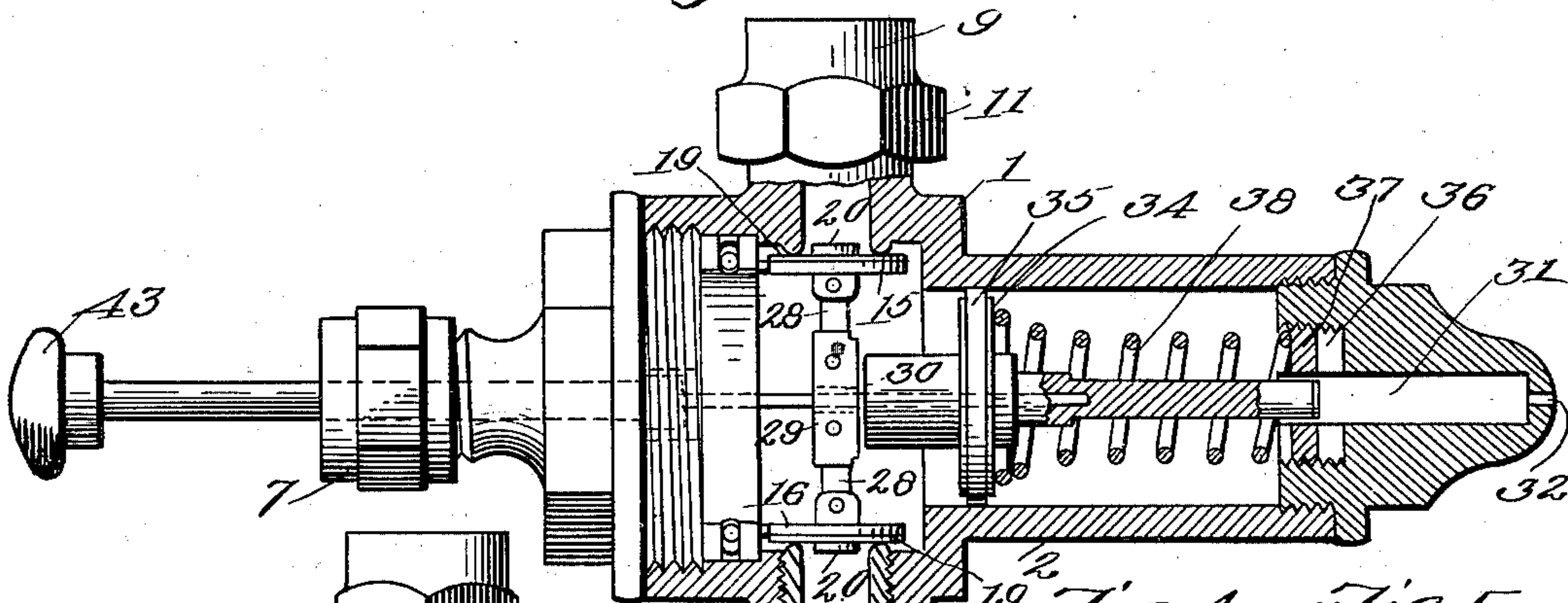


Fig. 3.

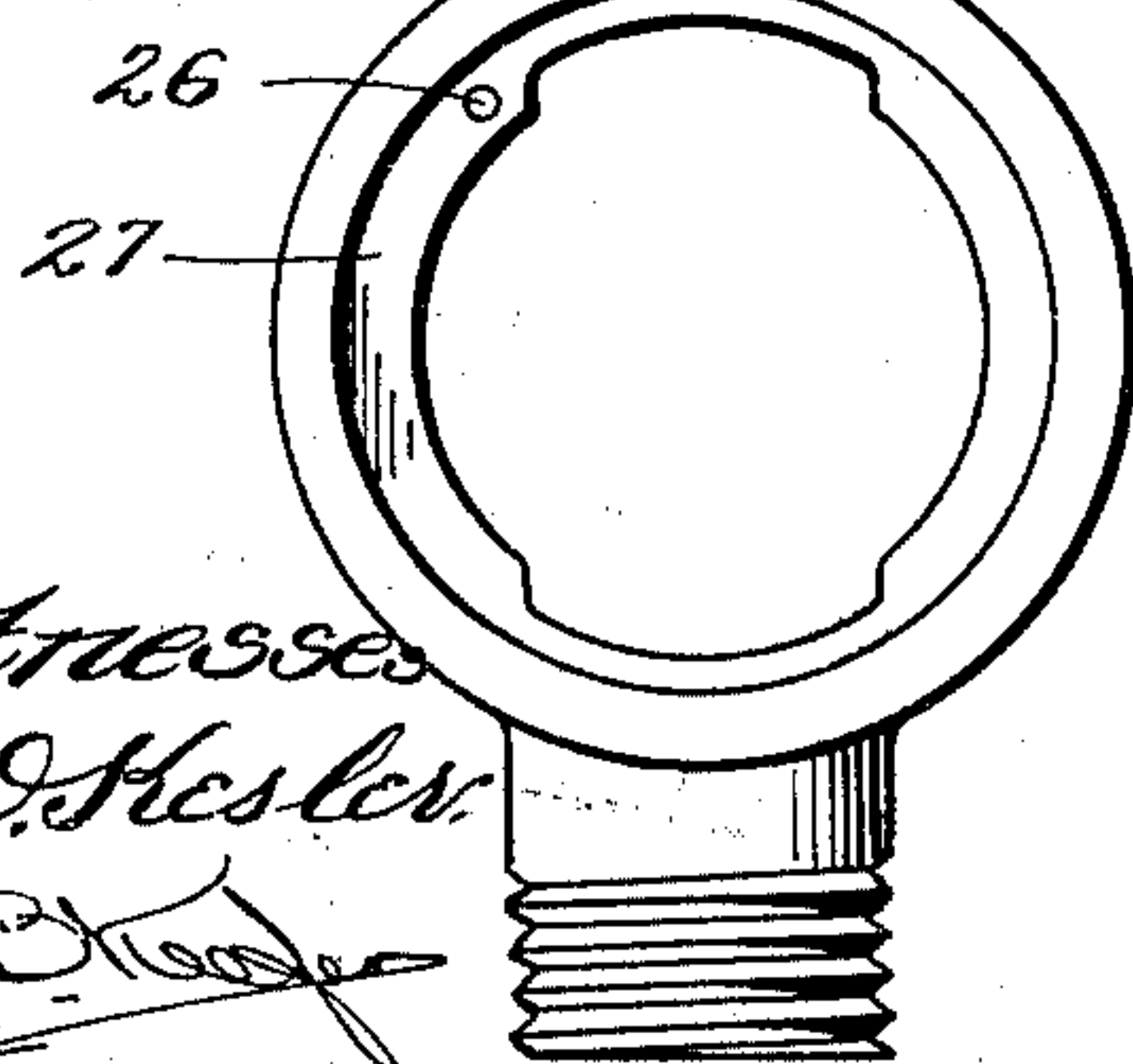


Fig. 4. Fig. 5.

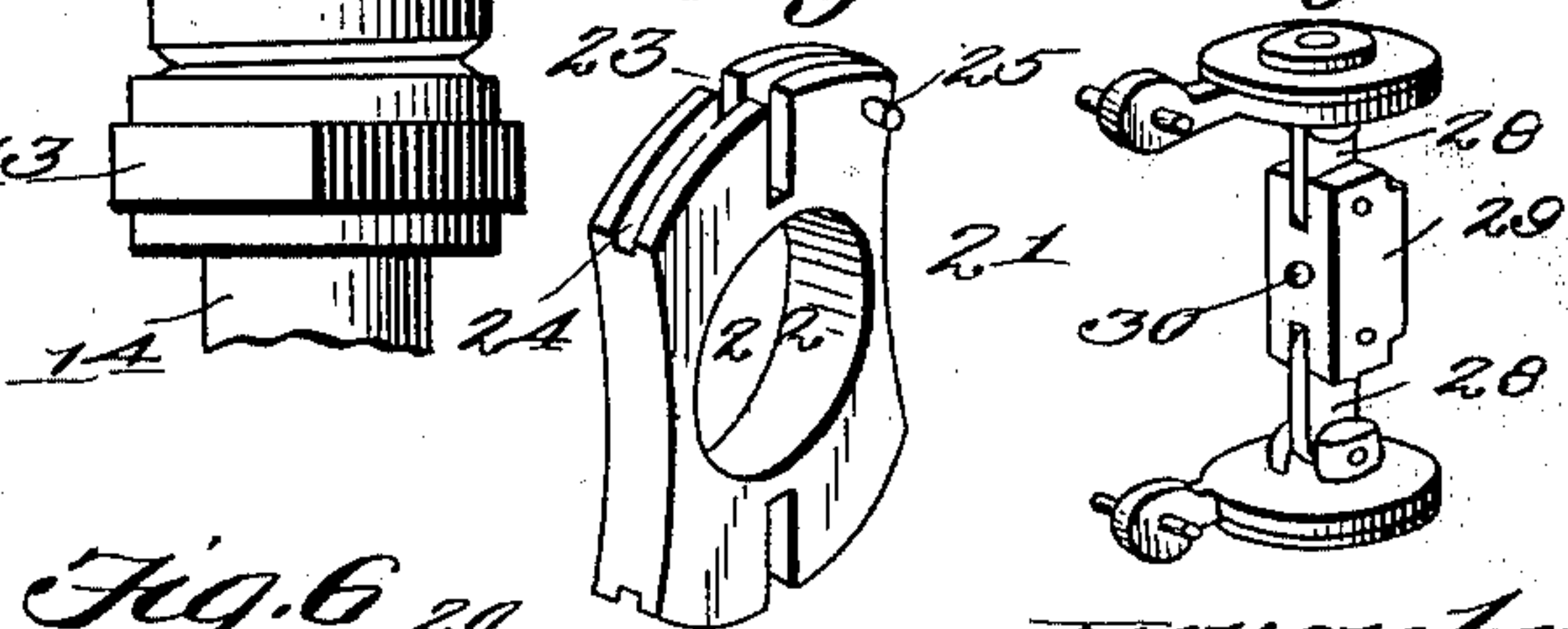
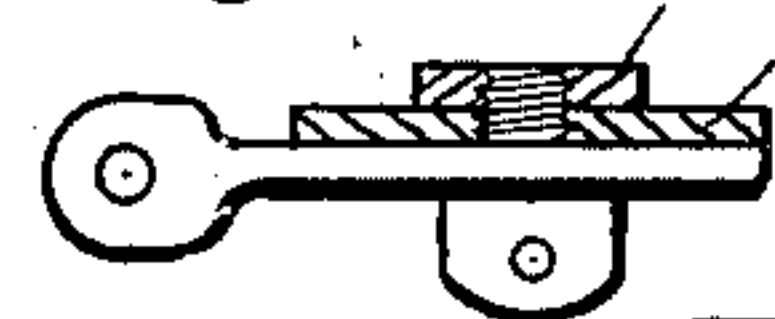


Fig. 6.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY GAS-VALVE.

SPECIFICATION forming part of Letters Patent No. 692,172, dated January 28, 1902.

Application filed May 13, 1901. Serial No. 60,070. (No model.)

To all whom it may concern:

Be it known that we, JAMES M. WESCOTT, residing at Hornellsville, and CHARLES B. SMITH, residing at Prattsburg, in the county of Steuben and State of New York, citizens of the United States, have invented new and useful Improvements in Automatic Safety Gas-Valves, of which the following is a specification.

Our invention relates to an improved automatic safety gas-valve, more particularly an improvement upon the automatic safety gas-valve set forth in our application filed October 20, 1900, Serial No. 33,779, which merges into Letters Patent bearing date of May 14, 1901.

The invention aims to construct an automatic safety gas-valve especially adapted for use in connection with pipes for conducting natural gas to a burner or burners, and in which the several parts of the valve are so constructed and arranged as to automatically shut off the passage or passages leading to the burner, when from any cause the pressure of gas is decreased below the normal average or when an accident or break occurs in the main or supply pipe, the automatic closing of the valve being provided to prevent any escape of the gas at that time in case the stop-cock at the burner has been left open.

The principal object of the invention is to provide means for adjusting the tension of the spring operating the actuating mechanism for seating the inlet and outlet valves.

A further object of the invention consists in providing means which can be adjusted so that the inlet and outlet valves will be seated in such a manner as to completely close the inlet and outlet to the valve-casing.

A further object of the invention is to construct the supporting means to which the valves are connected in such manner as to enable the interior of the valve-casing to be examined, so that if the operation of the valves is unsatisfactory the cause for the same can be determined.

The invention further aims to provide a valve for the inlet to the valve-casing and another for the outlet from said casing and to connect said valves by toggle mechanism to be actuated by a piston for closing both of

said valves when the gas in the valve-casing falls below normal pressure.

Another object of the invention is the provision of means for indicating that the said valves have been closed by a fall of pressure in the valve-casing and to permit resetting of said valves or opening of the same from the outside of the valve-casing, so that a flow of gas to the burner or burners is resumed.

The invention consists in certain novel features in the construction, combination, and arrangement of the several parts in our improved safety gas-valve, as will be hereinafter more fully set forth.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a centrally longitudinal section of our improved safety gas-valve, showing the valves open. Fig. 2 is a part sectional elevation of the same with a modified form of valve-casing and showing the valves closed. Fig. 3 is an end elevation with the plug at one end of the valve-casing removed. Fig. 4 is a perspective view of the plate to which the valves are pivoted. Fig. 5 is a perspective of the toggle-connected valves detached. Fig. 6 is a cross-section of one of the valves.

Referring to the drawings for details of construction, the reference-numeral 1 designates a substantially cylindrical valve-casing having one end provided with a tubular or cylindrical extension 2, the latter closed at its outer end by an integral casting 3. The extension 2 may be of reduced diameter as compared with the main body of said valve-casing. The other end of said valve-casing has a somewhat-extended portion 4, which is internally screw-threaded for reception of a centrally-perforated screw-plug 5, having a reduced and externally-screw-threaded extension or neck 6 for engagement of a centrally-perforated screw-cap 7, Figs. 1 and 2.

On opposite sides and intermediate the valve-casing extensions 2 and 4 the main portion or body 1 of the valve-casing is constructed with a tubular inlet-nozzle 8 and a tubular outlet-nozzle 9, both the nozzles 8 and 9 being internally screw-threaded, the former to receive an externally-screw-threaded adjustable valve-seat 10 and the latter to re-

ceive a delivery-pipe connection or union for connecting up the valve-casing. The nozzle 9 is formed with an integral squared portion 11 to permit of the gripping of a wrench there-
 5 to for screwing up the valve-casing to the union or pipe connection. The valve-seat 10 is suitably notched or recessed at its lower end, as at 12, to permit of the engagement of a tool therewith for adjustment. The nozzle
 10 8 is also externally screw-threaded for engaging with the screw-threaded coupling 13, through which the valve-casing obtains a union or connection with a gas-supply pipe 14.

The inlet-nozzle 8 and the outlet-nozzle 9
 15 are controlled, respectively, by valves 15 and 16, arranged within the main body 1 of the valve-casing. Each valve 15 and 16 is provided on one edge with a partly-circular lug 17, arranged at right angles to the valve-disks,
 20 as shown in Figs. 1 and 5, and these lugs 17 are provided on their opposite sides with pintles 18, through which the respective valves are hinged within the valve-casing. Each valve 15 and 16 has its engaging face pro-
 25 vided with a washer or packing 19 of leather or other suitable material and which is removably secured to each valve by the screw 20 or other suitable means. By securing the washer in the manner set forth to each of the
 30 valves when it becomes worn it can readily be removed and a new one secured in position.

There is arranged in one end of the main valve-body 1 a plate 21, with the sides cut
 35 away in a semi-elliptical manner, Figs. 1, 2, and 4. This plate 21 has a central perforation 22, and its rim or body portion is provided at opposite points with radial slots 23 for receiving the lugs 17 of the two hinged
 40 valves. In the periphery of this plate 21 there are provided grooves or kerfs 24, that intersect the slots 23 at right angles, and in these grooves 24 are received the pintles 18 on the lugs 17 of the two hinged valves. One
 45 side of the ring or annular plate 21 has projecting therefrom a pin or dowel 25, Fig. 5, to enter a recess 26, Fig. 3, in a shouldered or internal web portion 27 of the central or body portion of the valve-casing. By means of
 50 the pin 25 and recess 26 the plate 21 is prevented from turning, and thus the valves 15 and 16 are maintained in the required position for controlling the inlet and outlet nozzles of the valve-casing. The construction
 55 and arrangement of the slots 23 and grooves 24 of this plate 21 are such as to permit a sufficient play of the valves 15 and 16 to insure accurate seating of said valves when closed.

60 The inner face of each valve 15 and 16 has pivotally connected therewith one end of a toggle-link 28, and the other end of each toggle-link is pivotally connected with a slide-block 29, Figs. 1, 2, and 5, having a central
 65 perforation 30 in line with the longitudinal axis of the valve-casing.

The casting 3, closing the outer end of the

valve-casing extension 2, is provided with a central longitudinal bore 31, terminating in a vent-opening 32 at the outer end of said cast-
 70 ing 3. The bore 31 of the casting 3 receives one end portion of the stem 33 of a piston 34, that is arranged to operate in the reduced cylindrical portion or extension 2 of the valve-casing. A packing 35 on the outer end of the
 75 piston-stem 34 will insure closing the vent 32 when the piston is in its outermost position. The inner face or end of the casting 3 is constructed with a recess 36, in which is arranged the adjusting-nut 37, through which operates
 80 the stem 33. The walls of the recess 36 are screw-threaded and are engaged by the external screw-threads of the adjusting-nut 37 for retaining the latter in the desired position. The adjusting-nut 37 not only forms a bear-
 85 ing for one end of the coiled tension-spring 38, but also forms a means to permit of adjusting the latter. The outer end of the spring 38 bears against one face of the piston-head. On its other face the piston-head 34
 90 carries a somewhat-elongated hub portion 39, through which the slide-block 29 is actuated for closing the valves 15 and 16 when the pressure of gas within the valve-casing falls below the pressure to which the spring 38 may
 95 have been adjusted by means of the nut 37. The passage of gas to the burner or burners will thus be automatically cut off whenever the gas falls below normal, as by any accident to the gas-main or service-pipe or any serious
 100 interruption to the flow of gas, so that should the gas cock or valve at the burner have been left open there will be no escape of gas at that point when the normal flow of gas is resumed.

The inner end portion of the piston-stem 33
 105 is constructed with an axial recess or bore 40, Fig. 1, to receive an elongated and circumferentially-reduced portion or extension 41 of a rod 42, having a knob or head 43 on its other end outside the valve-casing. On this rod 42
 110 there is formed a collar 44, which is so located as to be capable of being brought into bearing contact with one face of the slide-block 29 opposite that face of said block against which the hub portion of the piston is designed to act.
 115

In the modified form shown in Fig. 2 the construction is the same as that set forth in Fig. 1, the same reference-numerals being applied thereto, with the exception that the extension 2 is not closed by the integral cast-
 120 ing 3, but is closed by the externally-screw-threaded plug 45. This plug is similarly constructed as the casting 3, with the exception that it is separable from the extension 2.

In setting the parts of this safety-valve
 125 mechanism into operative position for permitting the flow of gas at a usual or an ordinary pressure to the burner or burners it is only necessary to push inward the head 43 of the rod 42, as shown in Fig. 1, thereby bring-
 130 ing the collar 44 of said rod against the slide-block 29, so as to force the toggle-links 28 into an inclined position, thus opening the valves 15 and 16, which control the flow of gas through

the valve-casing. When the valves are in the open position shown in Fig. 1, the packing 35 on the end of the piston-stem 34 will close the vent 32 and prevent any escape of gas in that direction. The act of opening the valves 15 and 16 will at the same time compress the spring 38 in readiness for action in closing said valves when the normal pressure of gas within the valve-casing falls as a result of accident or otherwise. At this time the compressed spring 38 will expand, thereby forcing the piston 34 in an inward direction and causing its hub 39 to bear against the slide-block 29, consequently extending the toggle-links 28, and through them forcing the valves 15 and 16 to their seats. All flow of gas through the valve-casing is thus automatically cut off, and consequently there can be no escape of gas at a burner or burners should the accident be repaired or the flow of gas resumed before the valves 15 and 16 are reset. It will also be seen that the movement of the slide-block 29 in closing the valves 15 and 16 will cause said slide-block to bear against the collar 44 of the rod 42, thereby forcing outward the head 43 of said rod. The outwardly-extended position of the rod 42 as thus produced will at once indicate that the valves 15 and 16 are closed and that no flow of gas can be obtained at the burner without resetting said valves 15 and 16 by pushing said rod 42 inward, as already described. It will also be seen that by the employment of the nut 37 the tension of the spring 38 can be adjusted as desired. The valve-seat 10 can also be adjusted, so that it will secure the accurate seating of the valves 15 and 16 for securely closing the inlet and outlet nozzles 8 and 9 of the valve-casing, there being a sufficient play of the rod 42 for such purpose. It will also be evident that by constructing the plate 21 with substantially semi-elliptical-shaped sides the interior of the valve-casing can be seen.

The construction and arrangement of the several parts of the valve mechanism are such as to insure reliable automatic action for shutting off a flow of gas to a burner or burners when the pressure of gas falls below normal, as by accident or otherwise, and the position of the rod 42 and its head 43 will always indicate whether the valves 15 and 16 are open or closed.

What we claim as our invention is—

1. In an automatic safety gas-valve, the combination with the valve-casing and its inlet and outlet, of a pair of valves for controlling said inlet and outlet, a plate in said casing having its sides cut away for the purpose specified and suitably connected with said valves, a slide-block having toggle-link connections with said valves, means for moving said slide-block by hand to open said valves, and an adjustable automatically-actuated piston for moving said slide-block in an opposite direction to close said valves on fall of gas-pressure below normal, substantially as described.

2. In an automatic safety gas-valve, the combination with the valve-casing and its inlet and outlet, of a plate in said casing having its sides cut away for the purpose specified, a pair of valves hinged to said plate and having a packing removably secured to their engaging face and adapted to control said inlet and outlet, a slide-block having toggle-link connections with said valves, a longitudinally-movable rod for moving said block in one direction to open said valves, one end portion of said rod being extended outside the valve-casing and serving to indicate whether the valves are open or closed, and an adjustable spring-pressed piston for automatically moving said slide-block in the opposite direction to close said valves on fall of gas-pressure below normal, substantially as described.

3. In an automatic safety gas-valve, the combination with the valve-casing and its inlet and outlet, of a plate in said casing having its sides cut away for the purpose specified, a pair of valves hinged to said plate for controlling said inlet and outlet, an adjustable valve-seat for one of said valves, a slide-block supported in the valve-casing between said valves and having a toggle-link connection with each, a longitudinally-movable rod for moving said slide-block in one direction to break extension of the toggles and thereby open said valves, and an adjustable spring-pressed piston for automatically moving said slide-block in the opposite direction to close said valves on fall of gas-pressure below normal, substantially as described.

4. In an automatic safety gas-valve, the combination with the valve-casing and its inlet and outlet, of an adjustable valve-seat in said inlet, a pair of valves for controlling said inlet and outlet, packing suitably connected to the engaging face of said valves, a plate having the sides thereof suitably cut away for the purpose specified and suitably supported in the valve-casing, means for hinging the valves to said plate, a slide-block supported in the valve-casing and having toggle-link connections with said valves, a longitudinally-movable rod projecting from the valve-casing, for moving said slide-block in one direction to open said valves, and an adjustable spring-pressed piston for automatically moving said slide-block in the opposite direction to close said valves on fall of gas-pressure below normal, substantially as described.

5. In an automatic safety gas-valve, the combination with the valve-casing and its inlet and outlet, said valve-casing being further provided in one end with a screw-plug and at its opposite end with an integral casting, said plug and casting having axial perforations one of which constitutes a vent, of a plate in said casing having its sides cut away for the purpose specified, valves hinged to said plate for controlling the inlet and the outlet of said valve-casing, an adjustable valve-seat for one of said valves, a slide-block

supported in the valve-casing between said
valves and having a toggle-link connection
with each, a rod extended through the perfor-
ation of said plug for moving said slide-block
5 in one direction by hand from the outside of
the valve-casing to set the valves in open po-
sition, and an adjustable automatically-actu-
ated mechanism mounted in the valve-casing
to control the gas-vent and to close the valves
10 at the inlet and outlet of the valve-casing on
fall of gas-pressure below normal, substan-
tially as described.

6. In an automatic safety gas - valve, the
combination with the valve-casing and its in-
15 let and outlet, of a plate secured in the casing
and having its side cut away for the purpose
specified, a pair of valves hinged to said plate

for controlling said inlet and outlet, an ad-
justable valve-seat arranged in said inlet for
one of said valves, a slide-block connected 20
with said valves for closing the same, a rod
engaging said block for opening the said
valves, a piston adapted to engage said block
for operating the same, a spring engaging said
piston for actuating it, and means for adjust- 25
ing the tension of said spring.

In testimony whereof we have hereunto set
our hands in presence of two subscribing wit-
nesses.

JAMES M. WESCOTT.
CHARLES B. SMITH.

Witnesses:

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