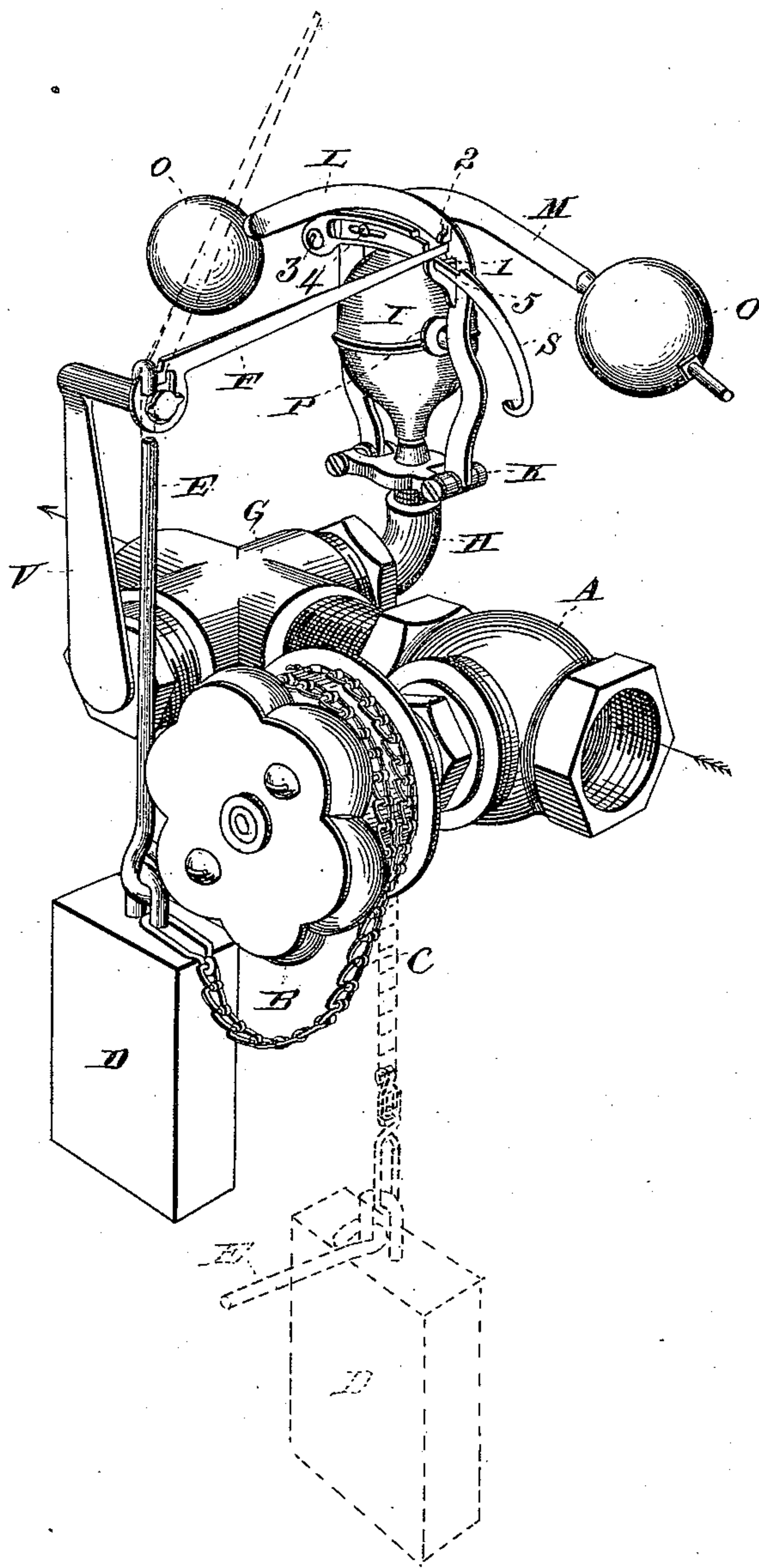


(No Model.)

E. C. WALDURFF.
AUTOMATIC CUT-OFF.

No. 464,112.

Patented Dec. 1, 1891.



Witnesses:
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UNITED STATES PATENT OFFICE.

EUGENE C. WALDURFF, OF BUFFALO, NEW YORK.

AUTOMATIC CUT-OFF.

SPECIFICATION forming part of Letters Patent No. 464,112, dated December 1, 1891.

Application filed January 21, 1889. Serial No. 297,073. (No model.)

To all whom it may concern:

Be it known that I, EUGENE C. WALDURFF, a citizen of the United States, residing at the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Automatic Cut-Offs, of which the following is a specification.

My invention relates to cut-offs, and is an automatic cut-off designed for use upon the mains and service-pipes of a natural-gas plant.

The object of my invention is to provide an economical, convenient, and efficient device to prevent undue pressure in the service-pipes or upon the meter of the consumer of natural gas.

I attain the objects of my invention by providing an extremely sensitive device, to be acted upon by the pressure in the pipes without coming in contact with it, thereby shielding it from any deleterious effects which the gas might exert upon it, and so arranged that any abnormal pressure in the pipes will operate to immediately cut off the supply from the meter and service-pipes beyond it.

In the accompanying drawings I have shown a perspective view of a section of service-pipe provided with my device.

A represents the ordinary globe-valve connection in a service-pipe, and B represents a spool secured to the valve-stem, upon which is wound a chain C, supporting a weight D, to which is also attached a supporting-rod E, terminating in a hook designed to engage with a toe upon the heel of trip-lever F, and thereby sustain the weight D until needed for operating the valve-stem.

G represents a T connection in the service-pipe, and H a nozzle secured thereto, and upon which is drawn the neck of a rubber bulb I of ordinary construction. K represents a sort of bracket, also secured to the nozzle and designed to support the governor-arms L M, hinged thereto in the usual manner. These arms, as will be seen, are in effect L-shaped levers terminating in a screw, upon which is screwed the weight O. Each arm is also provided with a disk P, rigidly secured to it and designed to make contact with and rest upon the rubber bulb I, as shown. The arm L is also provided with a bracket 1 and teat 2, as shown. The bracket is designed to

serve as a rest for the gage S, pivoted upon arm *m*, as shown, by means of screw 3. This gage is a two-part arm of crescent-like shape, joined by means of a set-screw 4, and provided with suitable slots for lengthening and shortening it in the usual manner, and a depression 5 in its edge designed for the reception without contact of the end of the trip-lever F in the manner shown in the drawings. V is a suitable support for the trip-lever, and is secured to G upon the side opposite to the nozzle H. The arrow-head *a* leads from the supply and the arrow-head *b* leads to the meter and through it to the burners.

The weight D is represented in two positions—viz., before and after the lever is tripped.

As has been remarked, the gage is a two-part arm so arranged that it may be lengthened or shortened by means of slots and a set-screw in the usual manner, and the depression 5 may be made longer or shorter, according to the range of pressure it is desired to permit, as the arm S may move back and forth beneath it without touching it—that is to say, the arm S is supported by the bracket 1 and does not come in direct contact with the trip-lever F until it is forced to the extreme limit of the notch or depression 5. If forced beyond this point, the arm S engages the lever F, forces or trips its end from beneath the teat 2, the end flies up, and thereby releases the hook at the end of rod E, and the weight thus released falls and unwinds the chain upon spool B, thereby revolving the stem of the valve until the valve is closed and the supply cut off, and thus it will remain until again adjusted. Now if the device shown in the accompanying drawings be inserted into a service-pipe, it is obvious that the rubber bulb will be filled with atmospheric air, not gas, and any extra pressure of gas in the pipe will only serve to force the air from the nozzle into the bulb, and that under no circumstances will the air in the bulb be displaced by gas. Hence the rubber is not affected by it. It is also obvious that an extra pressure in the pipe will have a tendency to force more air into the bulb, and thereby expand it, and that this pressure will be exerted upon the disks P through the bulb; also, that the force or pressure necessary to expand or fill the bulb and separate the disks will vary accord-

ing as the weights O are farther from or nearer to the ends of the arms, thereby enabling one to so set the device that it will act upon the pressure attaining a given point
5 either above or below the normal.

The operation, therefore, of the device is as follows, viz: If a pressure of from one ounce to seven ounces is desired, the cut-off is set to that gage by means of the weights O and set-
10 screw 4 and side notch 5. The gas is turned on by revolving the spool B, and this winds the chain C upon the spool, and when thus wound up the weight is "hung up" or supported by means of rod E. When thus ad-
15 justed, a varying pressure in the pipes of from one ounce to seven ounces will not operate the device except to expand and contract the bulb without disturbing the trip-lever; but a pressure of less than one ounce or more than
20 seven ounces will cause the bulb to expand or contract beyond the limits prescribed and bring the gage S in contact with the end of arm F and force it from beneath the teat 2. This has the effect of releasing the weight D, and
25 it falls by gravity, throwing its weight upon the chain C with a jerk. This unwinds the chain, and in unwinding revolves the valve-stem and closes the valve, thereby shutting off the supply. This operation of closing the
30 valve is almost instantaneous and keeps the supply shut off until the weight is again wound up and the trip-lever adjusted. Then, too, the fact that the weight falls a certain distance before acting on the chain, thereby adding
35 force or momentum to its own weight, is an important element in favor of the certainty of action of the device, as the momentum ac-

quired would tend to overcome any tendency to stick upon the part of the valve-stem. I may also remark that the device may be placed
40 in a horizontal pipe or in an upright one.

What I claim, therefore, and desire to secure by Letters Patent of the United States, is—

1. The combination, in automatic cut-offs
45 provided with a bulb I, connected to the supply-pipe and designed to automatically operate the arms L and M and trip-lever F, of the cut-off valve A, provided with revolving valve-
50 stem operated by means of spool B and slack chain C, one end of which chain is attached to the spool and the other to a weight D, suspended from one arm of said trip-lever F, all
as and for the purpose set forth.

2. In gas cut-offs, the combination, with the
55 valve A, provided with spool B, chain C, and weight D, of the T connection G, having nozzle H and bulb I, connected therewith and designed to automatically operate arms L and M and trip-lever F, all as and for the purpose
60 set forth.

3. The herein shown and described automatic cut-off, consisting of the combination, with a gas-supply pipe provided with a cut-off valve, of the connection G, provided with
65 nozzle H and bulb I, connected with and designed to automatically operate governor-arms L and M and trip-lever F, all as and for the purpose set forth.

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