J. J. SULLIVAN.

EMERGENCY SHUT-OFF APPARATUS FOR GAS OR OTHER FLUIDS.

APPLICATION FILED JAN. 20, 1913.

1,165,554.

Patented Dec. 28, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

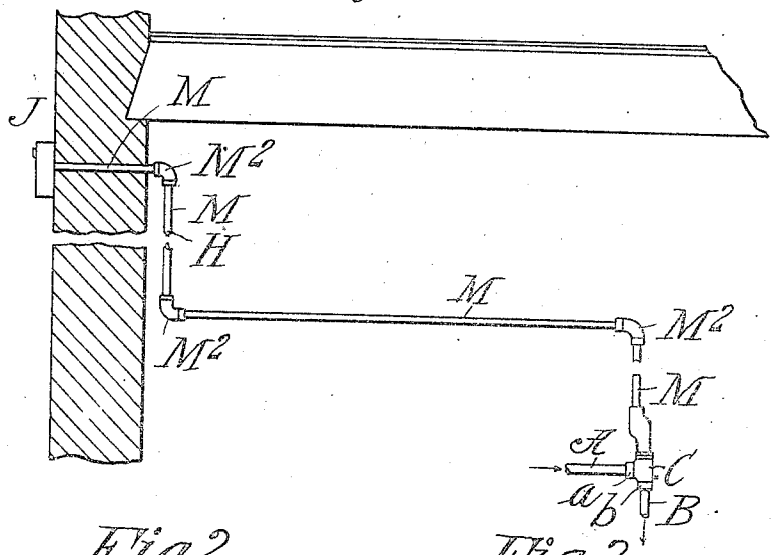


Fig. 2.

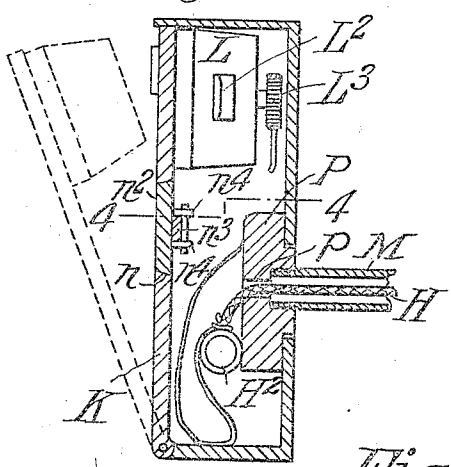


Fig. 3.

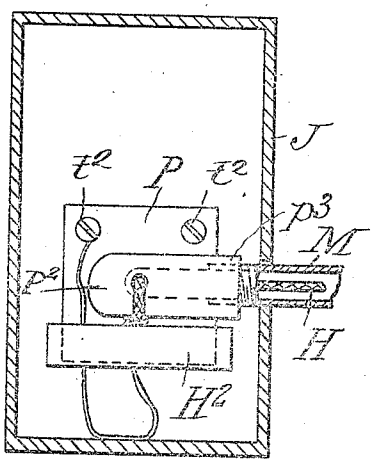
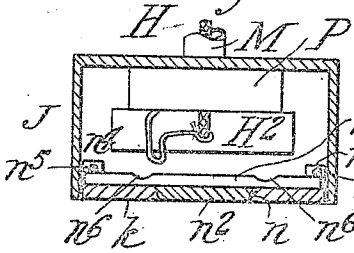


Fig. 4.



WITNESSES:

H. L. Sprague

W. P. Noble

INVENTOR,

John J. Sullivan,

BY

Wm. J. Bellamy

ATTORNEY.

J. J. SULLIVAN.

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2 SHEETS—SHEET 2.

Fig. 5.

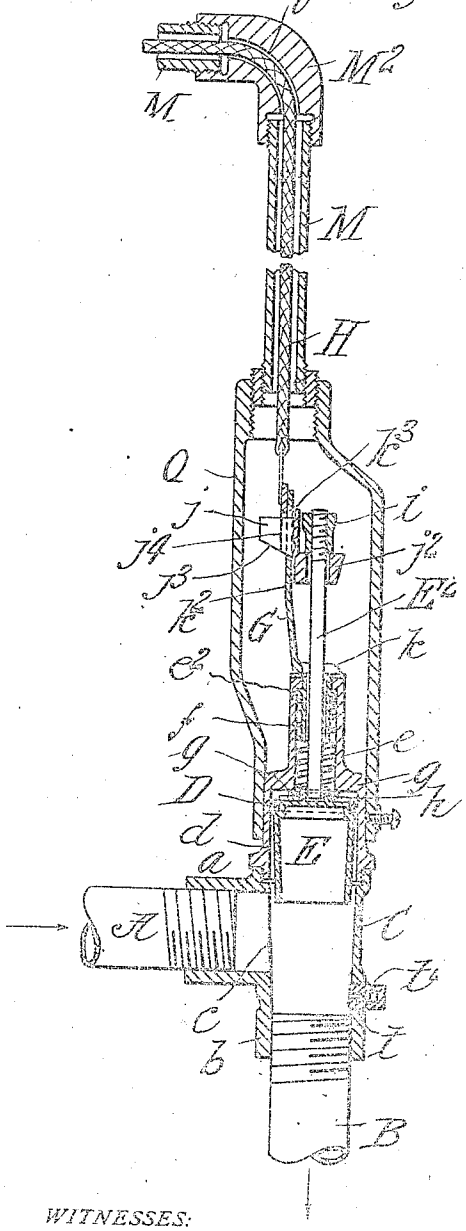


Fig. 6.

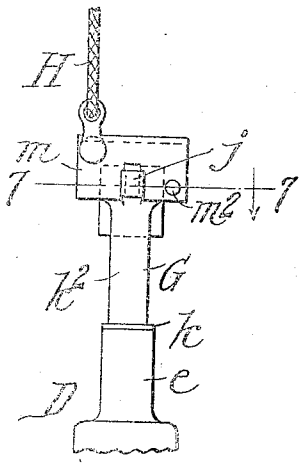


Fig. 7.

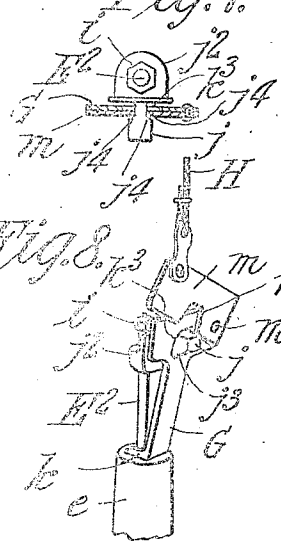


Fig. 8.

WITNESSES:

H. L. Sprague

W. P. Noble

INVENTOR,

John J. Sullivan,

BY

Jno. J. Bellows

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN J. SULLIVAN, OF HOLYOKE, MASSACHUSETTS.

EMERGENCY SHUT-OFF APPARATUS FOR GAS OR OTHER FLUIDS.

1,165,554. Specification of Letters Patent. Patented Dec. 28, 1915.

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To all whom it may concern:

Be it known that I, JOHN J. SULLIVAN, a citizen of the United States of America, and resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Emergency Shut-Off Apparatus for Gas or other Fluids, of which the following is a full, clear, and exact description.

This invention pertains to an apparatus available in emergency such as in case of fire or other calamity in a building for securing a shutting off of the connection between the gas main and the pipe for the distribution of the gas in or throughout the building.

The invention contemplates the provision of a valve movably mounted and for closing connection between said pipes and provided with a stem and adapted to be closed under spring force, but having a stop for the prevention of its closing under normal conditions, a cord or like medium of connection operatively controlling said stop and guided from its portion adjacent the latter to a key locked box and having at its terminal a handle so that a fireman or authorized person on the opening of the box may secure an immediate operation of the device for the shutting off of the gas.

The invention furthermore contemplates provisions whereby in case the key of the aforementioned box is not at hand a person may effect entrance to the box for the operation of the shut-off devices.

A further object of the invention is to provide means whereby under normal conditions and when the valve is open, there may be no leakage of gas from either of the supply or distributing pipes at the place of their valve inclosing coupling to the otuer air.

The invention, furthermore, contemplates the provision of means whereby in case of a fire, any gas remaining in the distributing pipe after the safety shut-off has been operated, will issue in jet form and be consumed in the same manner as by a gas burner. And other objects of the invention are to simplify the apparatus and contribute to its certainty and efficiency of operation.

The invention is described in conjunction with the accompanying drawings and is set forth in the claims.

In the drawings:—Figure 1 is a diagrammatic view showing the manner of installation of the emergency shut-off apparatus. Fig. 2 is a sectional view showing a portion of the apparatus comprising the box and parts located therein and appurtenant thereto. Fig. 3 is a sectional elevation of a modification of Fig. 2. Fig. 4 is a horizontal sectional view on line 4—4, Fig. 2. Fig. 5 is a sectional view of the portion of the apparatus which comprises and is combined with the uniting coupling for the supply and distributing pipes. Fig. 6 is an elevation of parts of the device in which the stop for the retention of the valve in open position is shown. Fig. 7 is a horizontal sectional view on line 7—7; and Fig. 8 is a perspective view of the last referred to portion of the device.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents a main or supply pipe; and B a distributing pipe for gas or other fluid, such pipes being united by the coupling C, which latter also constitutes a valve body.

The coupling as shown is made with the limbs *a* and *b* for receiving connection therewith of the pipe aforementioned, and in the screw threaded opening in its upper end is engaged the lower portion of a bonnet D in the downwardly opening chamber *d* in which the valve E when opened has its disposition. The bonnet is provided with an upwardly extending tubular hub *e* having a shoulder or spring stop e^2 at its upper end; and through and beyond this hub *e* the stem E^2 of the valve is extended.

The spiral spring *f* in compression as confined between the spring stop and the upper end of the valve exerts a downward and closing force to the valve,—such valve here being shown as of slightly tapered plug form and when permitted to be forced to its lowermost position closing the valve seat opening *c*. The valve when moved to and restrained in its open position as shown in Fig. 5 is in proximity to an annular rib *g* in the upper wall of the bonnet chamber, it being noted that a disk or washer of compressible or suitable packing material is provided on the top of the valve so that there may be no leakage of gas upwardly through the bonnet under normal conditions, that is while the connection is open between the gas main and the distributing pipe.

The upper end of the valve stem is screw threaded and has a nut *i* thereon, below which is a collar f^2 provided with a laterally

extending projection j formed with a cam incline j^2 on its under edge; said projection is also formed with vertical shoulders j^4 on its opposite sides. The collar having the cam inclined and shouldered projection j, as shown in Fig. 5, is loose on the valve stem, and its position thereon may be adjusted by the nut i.

G represents an appliance herein termed a "stop", the same comprising a bifurcated foot piece k, an upright member k^2, suitably widened at its upper portion and having an aperture k^3 therein, through which aperture the cam inclined projection j protrudes, the incline having impingement against the lower boundary of the aperture.

On the widened and apertured portion of the stop G, a flat metal latch plate m is pivoted as shown at m^2.

When the parts are assembled and engaged or "set", the opposite edges of the recess m^3 in the latch plate m engaged behind the shoulders j^4 of the projections j and hold the stop G, as a whole, in its vertical position.

H represents a cord connected to the latch plate. Under the draft in an upward direction of the cord, the latch plate will be swung upwardly more or less as shown in Fig. 8, disengaging itself from behind the shoulders j^4, leaving the stop G free to be crowded outwardly and displaced as an obstruction to the closing of the valve under the force of its spring f,—it being understood that so soon as the projection j becomes unlatched, the downward crowding force on the valve stem is effective also for a crowding force, by the cam incline, against the edge of the aperture k^3 of the stop, camming the latter in a lateral direction and sufficiently to tilt it so far that the stop is entirely outside of and beyond the outer end of the cam inclined projection j.

The construction and arrangement of the parts last described permit of an adjustability of the cam inclined projection j on the valve stem so that always when the device is set the packing material h on the upper end of the valve will tightly close, and prevent gas escape through the passage upwardly through the bonnet.

The cord H suitably guided extends to any place remote from the location of the valve and as sufficiently indicated in Fig. 1, its terminal entering a box J within which the pull handle connected to the end of the cord is inclosed. The box J has a hinged door K for which a lock L is provided. Such lock may be a spring latch lock of a most usual kind mounted on the door and having the latch or bolt L^2 adapted to engage with and disengage from a bolt socket provided in the wall of the box. The lock is adapted to be externally key operated, and it has an internally located manually operable member such as the knob L^3 which when manually turned will cause the unlocking of the door so that it may be swung open to give access to the pull handle, H^2.

In cases of emergency the custodian of the key may not be at hand and to provide for this circumstance the door is made with an aperture n therein, provided with a closing section n^2, as shown in Figs. 2 and 4. This section is confined in its aperture closing place by the bar n^3, the ends of which enter between paired lugs n^4 carried by the door proper and are retained by the pins n^5, the bar is breakable under sufficient force exerted thereagainst; and in Fig. 4, it has recesses n^6 extending part way through its thickness so that two great a force or blow will not be necessary for its fracture.

The draft cord H for effecting the displacement of the stop G and insuring the release of the valve for its automatic closing action to shut off the gas from the supply to the distributing pipe is disposed and guided within a tubular inclosure comprising pipe sections M M, the passages in which are of considerable greater diameter than that of the cord, and elbow couplings M^2 which unite pipe sections which are angularly related one to another.

The elbow couplings have passages o therein which are of arc shape, connecting the passage in the pipes M, such arc shaped passages o being of diameter but slightly greater than that of the cord, as shown in Fig. 5 to form cord guides which in use are as efficient as would be guide sheaves or rollers.

Where one of the pipe sections M enters the box, a block P is provided at the back of the box into which the adjacent end of the pipe has a screw thread connection as shown in Figs. 2 and 4,—a suitable aperture p being formed through the block to make a continuation of the cord inclosing passage opening into the box.

In some cases, a slight modification of the form of the box P such as shown in Fig. 3 may be advantageously used,—the block here being indicated as having a boss P^2 on its front suitably bored to form a cord passage therein and being especially adapted for the connection of a cord inclosing pipe at either side or top and bottom of the box as occasion may require, it being only necessary to detach the block by the unfastening of the screws t^2 and reset the fitting with the connection end p^3 of its boss P^2 at either side or at top or bottom.

The bonnet D supports the casing Q which incloses the upper portion of the valve stem and its appurtenances, the stop G and its latch and a portion of the cord connected to the latch,—screw connection at the upper end of this casing of one of the pipe sections M being made as shown in Fig. 5.

As manifest from the description and drawings, all of the operative parts of this appartus are inclosed and concealed, protected from moisture, etc., and safeguarded against being tampered with; and in the manufacture of the devices comprised in the apparatus, proper selection of material is made,—it being especially noted that the employment of aluminum alloy for the elbow couplings is advantageous as it is a metal of non-corrosive character, and the draft cord H will slip easily in its guidance along the arc shaped passages *o* therein.

As shown in Fig. 5, the connection member *b* of the valve inclosing coupling C has a passage *t* of restricted character leading outwardly from the interior of the coupling at a place below where the valve would be when closed. This passage is to be closed by a fusible metal, and provides in case of fire that any gas issuing through such restricted passage will be slowly consumed in the manner of a gas jet, preventing accumulation of gas which might result in explosion.

I claim:—

1. In an apparatus of the character described, a coupling having limbs for the connection therewith of a fluid supply pipe and a fluid distributing pipe, and having a valve therein for closing connection through the coupling from the supply to the distributing pipe, said valve being provided with an axial stem, a bonnet connected with said coupling and within which said valve may be positioned provided with an axially extended tubular hub of reduced diameter opening to the valve accommodating bonnet chamber and having a spring stop at its outer portion, a spring in compression between said stop and the valve and a packing material on the head of the valve and operative when the latter is opened to close the passage from the bonnet chamber through its tubular hub, a displaceable stop for engaging the stem of the valve and normally holding the latter open, and means for, in emergency, effecting the displacement of the stop.

2. In an apparatus of the character described, a supply pipe and a distributing pipe coupled thereto, a valve movably mounted and for closing connection between said pipes and provided with a stem, a spring for exerting a closing force to the valve, a member to serve as a stop to normally hold the valve in its open position, a cam provided on the valve stem and coacting with the stop so that under the force of the spring the cam moving with the valve stem will cause a displacement of said stop from its valve restraining position, a latch carried by the stop and temporarily locking the latter in its restraining relation to the cam provided valve stem, and a cord connected to said latch and means located remote from the valve connected with and for operating said cord.

3. In an apparatus of the character described, a supply pipe and a distributing pipe coupled thereto, a valve movably mounted and for closing connection between said pipes and having an affixed axial stem, a bonnet having a chamber therein in which the valve, opened, may be disposed and provided with an upwardly extending tubular hub having a shoulder at its upper end and through and beyond which hub the valve stem is extended, a spring normally in compression between said shoulder and the upper end of the valve, a member provided at an upper portion of the valve stem formed with a cam incline, a stop comprising a foot piece to rest on the top of the bonnet hub and provided at its upper portion with an aperture through which the cam incline projection of the valve stem normally engages, a latch plate pivoted to an upper portion of the stop and having a downwardly opening recess for engagement behind shoulders at opposite sides of said projection to normally hold the cam inclined projection in engagement with the stop, and a cord connected to and under draft thereon for securing a swinging motion of said latch plate.

4. In an apparatus of the character described, a supply pipe and a distributing pipe, and a coupling having separate limbs for connection therewith of said pipes, a valve movably mounted and for closing connection between said pipes and provided with a stem, a spring exerting a closing force to the valve, a stop for holding the valve normally in its opening position, and means for displacing said stop,—the distributing-pipe connection-member of said coupling having a passage of restricted character leading from the valve chamber therein to the atmosphere, said passage having a closure therefor composed of fusible material.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

JOHN J. SULLIVAN.

Witnesses:
G. R. Driscoll,
Wm. S. Bellows.