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W. B. & E. RUNNION.
VALVE OPERATING MECHANISM.

APPLICATION FILED JUNE 22, 1907.

Attorney

UNITED STATES PATENT OFFICE.

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VALVE-OPERATING MECHANISM.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, WILSON B. RUNNION and EDWARD RUNNION, citizens of the United States, residing at Spencer, in the county of Roane and State of West Virginia, have invented a new and useful Valve-Operating Mechanism, of which the following is a specification.

The present invention relates more particularly to means for controlling the passage of gas through supply conduits or pipes. Under certain conditions, it is of the greatest importance to shut off the gas supply. For instance, the wall brackets are apt to be swung so that the flame from the burner will come into contact with the wall or adjacent combustible material, and cause a conflagration. Again it sometimes happens that the supply of gas through mains is shut off for some reason without warning. As a consequence, those burners which are in use are extinguished. When the supply of gas is again turned on, the gas will pass through the burners, and it is apt to cause explosions or asphyxiation.

The principal object of the present invention is to provide novel, simple and practical means for automatically cutting off the gas supply in such contingencies, thereby eliminating any danger of the above characters.

The preferred embodiment of the invention is illustrated in the accompanying drawing, which is a sectional view through the apparatus, showing portions of the same diagrammatically.

A gas supply conduit 1 includes a valve casing 2, across which extends a partition 3 having an opening 4 therein surrounded by a valve seat 5. A guiding sleeve 6, preferably of insulating material, is fitted in one wall of the casing in line with the opening, and a valve 7, which closes the opening, and is movable into and out of coaction with the valve seat 5, has a stem 8 provided with a head 9 that is slidable in the guideway or sleeve 6.

An electro-magnet 10 has a core 11 snugly fitted in the outer end of the sleeve or guideway and closing the same. This magnet is electrically connected, as shown at 12 with a suitable source of electrical energy 13. Another lead 14 from the said source of electrical energy, is connected to the magnet, thus producing a circuit. A switch 15 is located in this circuit. At 17 there is illus-

trated a swinging wall bracket burner, which is connected to the supply conduit, and located upon the wall so as to intersect the flame from the burner should the bracket be swung against the wall, is a fusible electrical conductor 18 located in the lead 14.

The valve casing 2 is provided with a boss 19 covered by a hood or cap 20 screwed thereon. Interposed between the boss and hood is a flexible diaphragm 21, and resting upon this diaphragm is the foot 22 of a stem 23 that projects through an opening 24 in the hood or cap 20. The upper end of this stem is movable into and out of engagement with spaced contact elements or arms 25 mounted on and insulated from the hood or cap 20, as shown at 26. The electric circuit above described includes the contact elements 25. The casing 2 is furthermore provided on the wall opposite the guide sleeve with a cap 27, or packing box in which is slidably mounted a reciprocatory stem 28 having an outer knob 29 and an inner enlarged head 30, this head being movable through the opening and into engagement with the valve stem 7.

The operation of the structure is substantially as follows: Assuming that there is pressure in the pipe 1, the diaphragm 21 will be raised so that the outer end of the stem 23 is in engagement with the arms 25. If therefore the switch 15 is closed, the circuit will be closed. Therefore the magnet will be energized, and if the head 9 of the valve is in coacting relation with the core 11, the valve 7 will be supported in open position, as shown. Assume now that the gas is burning at the bracket 17. If said bracket is swung to the wall, the flame will immediately fuse the conductor 18, and thereby break the circuit. As a consequence, the magnet will be deenergized, permitting the valve 7 to drop and close the opening 4, thus cutting off the supply of gas and extinguishing the flame before damage is done. Or with the parts, as shown in the drawing, assume that the supply of gas is cut off and that there are burners in operation, it will be evident that the pressure in the conduit 1 will be reduced, thereby permitting the diaphragm 21 to fall. The stem 23 will gravitate and disengage from the arms or contact elements 25, thus breaking the circuit, deenergizing the magnet, and permitting the valve 7 to close. If therefore the supply of gas is again turned on, it cannot pass through the valve casing

until the stem 28 is forced upwardly and the valve returned to open position with the head 9 in coacting relation to the electro-magnet. If in an emergency, it is desired to manually cut off the supply of gas, it is only necessary to open the switch 15. It will thus be evident that simple mechanism is employed, which materially reduces the dangers above described due to the use of gas.

From the foregoing, it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is:—

1. In apparatus of the character set forth, the combination with a conducting pipe, of a controlling valve therefor, an electro-magnet, means for energizing and deenergizing the magnet, an armature for the magnet constituting operating means for the valve, said armature being out of the range of magnetic action of the magnet when the valve is in one position, and means for moving the armature into the range of magnetic action of such magnet.

2. In apparatus of the character set forth, the combination with a conducting pipe having a valve casing therein, said casing being provided with a partition having an opening and a valve seat surrounding the opening, of a valve in the casing movable into and out of coaction with the seat, an electro-magnet mounted on the casing on one side of the seat for holding the valve out of coaction with said seat, and means movably mounted in the casing and projecting therefrom for manually moving the valve into coaction with the magnet.

3. In apparatus of the character set forth, the combination with a conducting pipe having a valve casing therein, said casing being provided with a partition having an opening and a valve seat surrounding the opening, of a valve in the casing movable into and out of coaction with the seat, an electro-magnet mounted on the casing on one side of the seat for holding the valve out of coaction with said seat, and a stem slidably mounted in the casing on the opposite side of the partition to the valve, said stem being movable through the opening to move the valve out of coaction with the seat and into coaction with the magnet.

4. In apparatus of the character set forth, the combination with a conduit, of a controlling valve therein, an electro-magnet for holding the valve in a predetermined posi-

tion, a source of electrical energy, a circuit including said source of electrical energy and the magnet, a circuit closer located in the circuit, and means operated by the pressure in the conduit for controlling the movement of the circuit closer.

5. In apparatus of the character set forth, the combination with a conduit, of a controlling valve therein, an electro-magnet for holding the valve in a predetermined position, a source of electrical energy, a circuit including said source of electrical energy and the magnet, a circuit closer located in the circuit and including a stem, and a diaphragm located in the conduit and operating against the stem.

6. In apparatus of the character set forth, the combination with a conduit including a valve casing having a partition, said partition being provided with an opening there-through and a valve seat surrounding the opening, a guideway located in the casing in line with the opening, an electro-magnet having a core fitted in the guideway, a valve controlling the opening and cooperating with the valve seat, said valve having a head slidably mounted in the guideway, a stem slidably passing through the opposite side of the valve casing to the electro-magnet and having its inner end adapted to pass through the opening to engage the valve and move it into cooperation with the magnet, and a source of electrical energy, a circuit including the source of electrical energy and electro-magnet, a hood mounted on the valve casing, a diaphragm casing mounted on the hood, spaced contact elements located in the circuit and mounted on the hood, and a stem bearing against the diaphragm and movable into engagement with the contact elements.

7. In apparatus of the character set forth, the combination with a conducting pipe having a valve casing therein, said casing having a valve seat, of a guideway of insulating material mounted in the casing in line with the seat, a valve movable into and out of coaction with the valve seat and having a stem secured thereto, said stem having one end slidable in the inner portion of the guideway, an electro-magnet having a core fitted in and closing the outer end of the guideway, said stem constituting an armature for the core, and means for energizing the magnet.

8. In apparatus of the character set forth, the combination with a conduit including a valve casing having a partition, said partition being provided with an opening there-through and a valve seat surrounding the opening, a guideway located in the casing in line with the opening, an electro-magnet having a core fitted in the guideway, a valve controlling the opening and cooperating with the valve seat, said valve having a head slidably mounted in the guideway, a stem slidably passing through the opposite side of the

valve casing to the electro-magnet and having its inner end adapted to pass through the opening to engage the valve and move it into coöperation with the magnet, a source of
5 electrical energy, and a circuit including the source of electrical energy and electro-magnet.

In testimony, that we claim the foregoing

as our own, we have hereto affixed our signatures in the presence of two witnesses.

WILSON B. RUNNION.
EDWARD RUNNION.

Witnesses:

RAYMOND DODSON,
O. J. CHAMBERS.