

May 19, 1925.

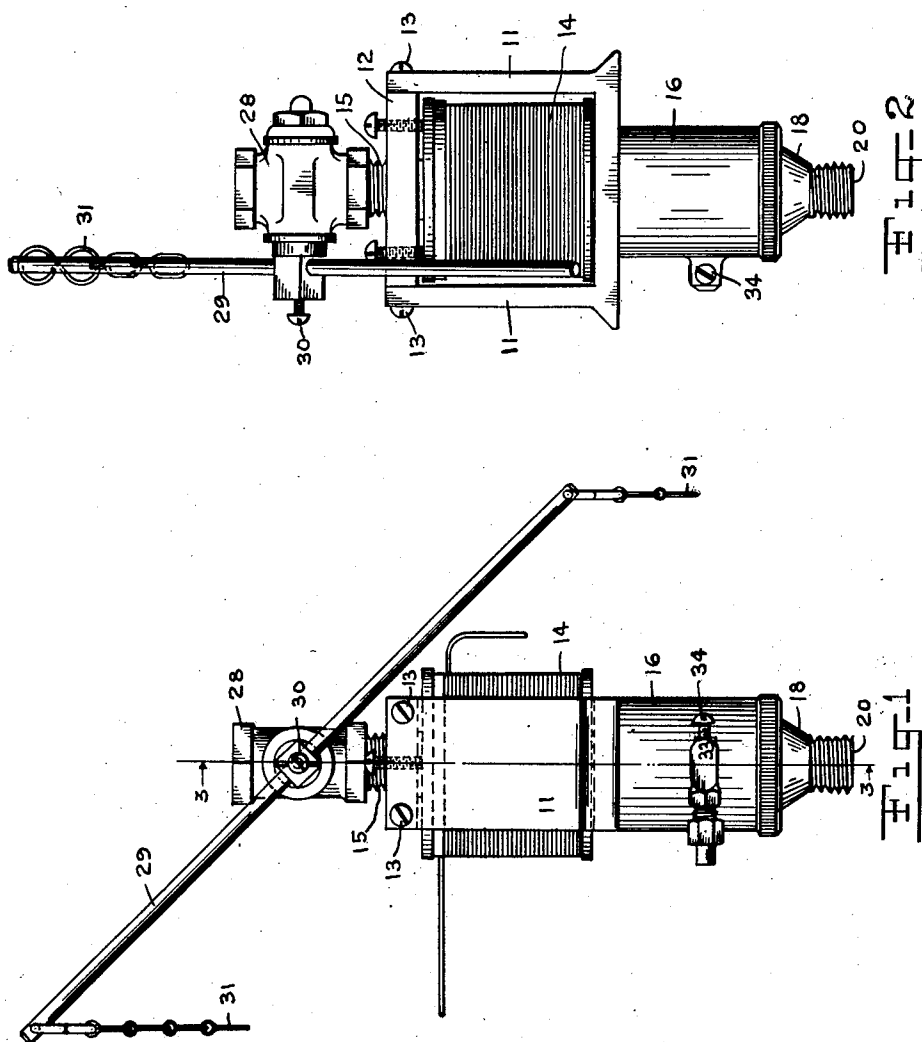
1,538,092

H. COHEN, NOW BY JUDICIAL CHANGE OF NAME H. COLE

VALVE

Filed June 21, 1922

3 Sheets-Sheet 1



Inventor:
Herbert Cohen
By his Attorney
Edmond Congar Brown

May 19, 1925.

1,538,092

H. COHEN, NOW BY JUDICIAL CHANGE OF NAME H. COLE

VALVE

Filed June 21, 1922

3 Sheets-Sheet 2

Fig-3

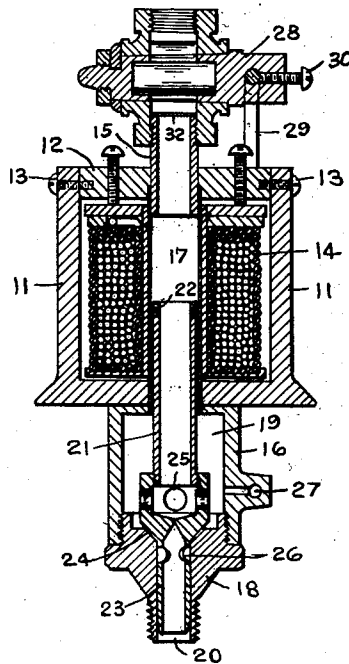


Fig-4

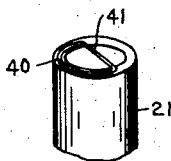
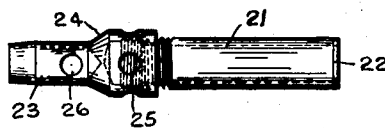


Fig-5

Herbert Cohen Inventor:

By his Attorney
Edmond Conger Brown

May 19, 1925.

1,538,092

H. COHEN, NOW BY JUDICIAL CHANGE OF NAME H. COLE

VALVE

Filed June 21, 1922

3 Sheets-Sheet 3

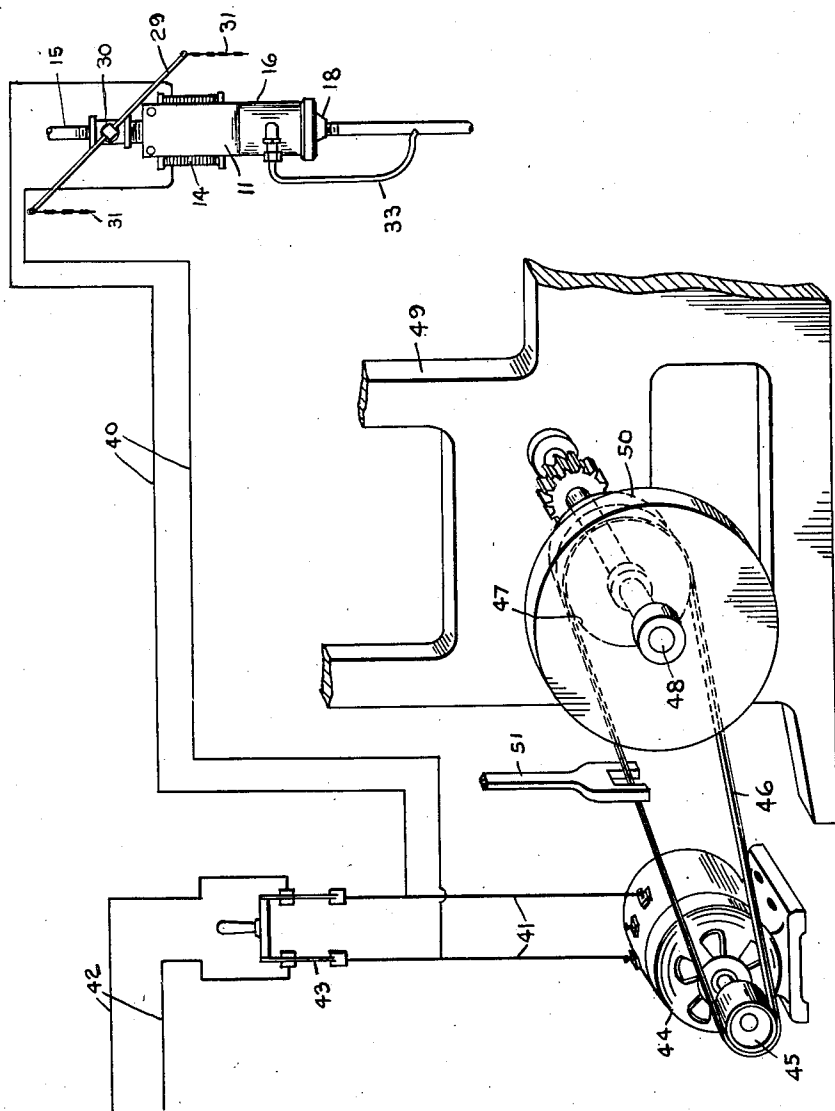


Fig-6

Inventor:
Herbert Cohen
By his Attorney
Edmond Conner Brown

Patented May 19, 1925.

1,538,092

UNITED STATES PATENT OFFICE.

HERBERT COHEN (NOW BY JUDICIAL CHANGE OF NAME HERBERT COLE), OF NEW YORK, N. Y.

VALVE.

Application filed June 21, 1922. Serial No. 569,798.

To all whom it may concern:

Be it known that I, HERBERT COHEN, a citizen of the United States, and a resident of the borough of Manhattan, in the city and State of New York, have invented certain new and useful Improvements in Valves, of which the following is a specification.

The invention relates to valves adapted to control the passage of gas or other fluids, and particularly to that type of such valves which is adapted to be operated by electromagnetic means. The object of the invention is to provide a simple, cheap, and efficient device of the kind mentioned, which shall be positive in action, and not liable to easily get out of order.

The invention consists in the novel construction, arrangement and combination of various elements and parts, as set forth in the claims hereof, one embodiment of which is shown in the accompanying drawings and described in this specification.

In the said drawings,

Fig. 1 is a front elevation of a valve constructed according to my invention;

Fig. 2 is a side view of the same;

Fig. 3 is a vertical section along the line 3—3 of Fig. 1;

Fig. 4 is a detail view showing the plunger forming part of the apparatus and hereinafter more fully described; and

Fig. 5 is a view showing a modification of a portion of the invention when used with alternating current.

Fig. 6 is a view showing in a diagrammatic way the relation of the valve hereinafter described with an operative mechanism and a source of power therefor.

One of the purposes for which my improved valve is intended to be used, is as an automatic gas-control for a burner used in connection with a printing press, for the purpose of removing static electricity from the paper passing through the press and also for drying the ink thereon. It is well known that when paper is operated upon in a printing press and thereby subjected to friction, particularly under dry and cold atmospheric conditions, it becomes charged with static electricity, which causes the sheets of paper to adhere together as they are delivered from the press, thus causing offsetting or smutting of the ink thereon, and it is also well known that the momen-

tary application of a gas or other flame to the paper quickly dissipates the static charge thereon, the heat of the flame also tending to dry the moist ink impressed upon the paper; it is not necessary that the flame actually touch the paper, as the current of hot air arising from the flame is likewise efficient, though in a less degree.

In order to accomplish this purpose, it is customary to provide in connection with a printing press, a gas pipe or burner extending transversely across the press, perforated with a number of openings to permit the egress of gas, which when lighted forms a series of small flames. This burner is located so that the row or series of small flames is sufficiently near to the paper coming from the press to heat the same and at least partially dry the ink thereon, at the same time removing any static electricity with which the paper may be charged, and in some cases the burner may be so adjusted as to permit the flames to actually touch the paper as it passes out of the press.

It is obvious, however, that even the application of the heated air from the flames of the burner, and much more the application of the flames themselves, to the paper, must be only momentary, otherwise the paper will catch fire. In the ordinary operation of a printing press, the paper issues therefrom very rapidly, and sweeps across the flames of the burner at such a high rate of speed that it is impossible for any fire to result. But should any accidental cause result in the stopping of the operation of the press and of the motion of the paper, while a sheet of paper is over the gas flame, the paper would certainly catch fire, and as even a small fire in a printing establishment is apt to rapidly extend owing to the presence of benzine, paper waste, and other highly inflammable material, the use of devices of the kind described in such establishments is attached with much danger, and is prohibited by the insurance companies, unless some absolutely positive automatic means are provided for immediately shutting off the flow of gas whenever the operation of the press ceases. In my invention I have provided such an absolutely positive automatic means, and the invention is primarily intended to be used in connection with such apparatus, although I do not limit myself to any such use, as it is ob-

vious that the invention is capable of being used in many other ways and in connection with various other types of apparatus.

In carrying my invention into effect in the embodiment thereof which I have selected for the purpose of illustration in the accompanying drawings and description in this specification, I provide a gas valve comprising a solenoid, a plunger controlled by said solenoid, and having a truncated-conical lower end, and a socket in the upper end of a gas pipe into which the lower end of the plunger seats itself for the purpose of checking the flow of gas. The winding of the solenoid is either in series or parallel with the power circuit which operates the printing press or other mechanism in connection with which the valve is employed. While the current is passing to the motor operating the press, current is also passing to the solenoid forming part of my improved valve, and the plunger is thereby drawn upward, opening the valve and allowing gas to pass to the burner, but upon current ceasing to pass to the power motor of the press, it also necessarily ceases to pass through the solenoid, thus allowing the plunger to drop and shut off the passage of gas to the burner, and thereby extinguishing the flames thereof, except, if desired, the flame of a small pilot light, which may be supplied by a by-pass not affected by the automatic cut-off. It will be seen that by this means an absolutely positive flame-control is provided, which renders it impossible for the paper on the press to catch fire when the press for any reason ceases operation.

The details of the mechanism comprising my invention are as follows: I provide a frame comprising a rectangular U-shaped member 11, the open upper end of which is adapted to be bridged by a horizontal member 12 which may be secured by screws 13 or in any suitable manner. Within this frame is located a solenoid of any suitable construction comprising coils 14 wound upon a spool in the ordinary or any suitable manner. A gas-supply pipe 15 enters through an opening in the plate 12 and extends down into the upper end of the bore of the solenoid, being formed there into a gas-tight joint.

To the bottom of the frame 11 is secured a cup-member 16, perforated so as to be in communication with the gas passage or bore 17 of the solenoid and constituting a gas chamber (see Fig. 3), and closed at the bottom by the valve-sheet member 18 which is screwed into the same and which comprises a gas passage 20.

Located inside of the apparatus is a plunger, which is shown more particularly in Fig. 4. This plunger comprises an upper cylinder 21 which slides in the bore 17 of

the solenoid. This cylinder is mainly of magnetic material but has a non-magnetic ring 22 at its upper end, the function of which is to prevent the sticking of the plunger to the pipe 15 due to residual magnetism. Secured to the lower end of the plunger is a member 23 of non-magnetic material having an enlarged upper portion and a smaller lower portion, the latter being adapted to enter the gas passage 20 of the member 18. The upper and lower portions are connected by a conical portion 24 which is adapted to be seated in a corresponding conical or flaring opening in the upper part of the member 18, as will be best seen in Fig. 3. In the upper portion of the member 23 are openings 25 which are adapted to permit gas to flow out into the gas chamber 19 from the bore of the member 21. The bore of the member 23 is closed below the openings 25, so that no gas can pass into the lower portion of this member. The lower portion, however, is provided with openings 26, which, when the plunger is raised so that the conical valve portion 24 is unseated and so that the gas in the chamber 19 can flow down and out therefrom, said gas passes in through the openings 26 into the bore of the lower part of the member 23 and thence out through the opening 20 (see Fig. 3).

In the gas chamber 19 is an opening or vent 27 adapted to be connected by a suitable by-pass 33, the opening in which is controlled by a regulating screw 34, with a pilot light which may be kept burning continuously, whether the plunger 21 is up or down.

To the upper end of the gas pipe 15 is secured a gas cock 28 of the usual or any suitable construction, provided with an actuating lever 29 secured by a set-screw 30 and which may if desired be provided with a chain or the like 31 for convenience in operating the same. The operation of this lever 29 and the plug with which it is connected controls the passage of gas into the apparatus, irrespective of the action of the plunger.

In the upper part of the pipe 15 may be located a gauze 32, which serves to prevent any scales or other foreign substance from dropping down and becoming lodged in the conical valve-seat in the lower part of the mechanism, thus preventing the valve from fitting tightly therein and allowing a leakage of gas.

In Fig. 6 I have shown in diagrammatic form the principle of the association of the valve with an operative mechanism such for instance as a printing press, and a source of power therefor. Referring more particularly to said Fig. 6, the valve itself will be seen in the upper right hand corner, the reference numerals applied thereto having been

already explained. The valve is shown connected with the source of power by the conducting wires 40, the same being in parallel with the wires 41 leading to the motor, both of which are extensions of the main circuit 42 in which is a switch 43 of the usual or any suitable form. The motor is designated 44, bearing on its rotor shaft a pulley 45 from which a belt 46 leads to a suitable pulley 47 on the main drive shaft 48 of the operative mechanism 49, which may be of any character suitable to be so driven, as for instance a printing press. On the shaft 48 may also be provided an idle pulley 50, and a belt-shift 51 may be provided if desired for shifting the belt from one pulley to the other.

The operation of my invention is as follows: The upper end of the gas pipe 15 is connected, through the cock 28, with a suitable source of gas supply, the lower end of the member 18 is connected by suitable piping with a gas burner, as for instance a burner used in connection with a printing press as before described for the purpose of removing static electricity from the paper and drying the ink thereon, and the by-pass 33 suitably connected with a pilot light adapted to light the said main burner. The solenoid is connected, either in series or parallel as circumstances may indicate, with the electric current which operates the motor of the printing press or other mechanism in connection with which the device is being used. Where the device is used in connection with a printing press, it will be obvious that while the current is passing the solenoid will be energized, the plunger therefore drawn up into the bore thereof, and the gas-valve in the lower part of the apparatus opened so that gas will flow to the main burner. Upon the stoppage of the press by accident or for any other reason, so that the paper passing therethrough becomes stationary over the gas flames in such a way that should the gas flames remain alight the paper would be set on fire, the solenoid is de-energized by the same failure of current which resulted in the stoppage of the press, and the plunger drops into place, automatically closing the valve and stopping the flow of gas into the main burner. The flow of gas into the chamber 19 is, however, not checked, and thus the pilot light is kept burning, ready to again light the main burner when the press is again set in operation, thereby energizing the solenoid.

A modified form of plunger is provided for use where an alternating current is employed. A portion of such a plunger is shown in Fig. 5. In this form the ring 22 of non-magnetic material is omitted, and a wire 41 of non-magnetic conducting material is provided, the curved part seated in a groove 40, and the straight part extending

across the open end of the plunger. In a device of this character used with alternating current, comprising a plunger located in a solenoid and tending to be depressed by gravity and to be elevated by the magnetic action of the solenoid, the plunger, due to the intermittent and irregular action of the magnetic pull, does not maintain an absolutely steady pressure against its limiting stop, but is subject to a fluttering motion, producing either a humming sound or a tapping in the apparatus, according to whether the alternations are frequent or infrequent. It is the purpose of the wire 41, which is of non-magnetic material, to obviate this annoying feature connected with the operation of the apparatus, and I have found in practice that it satisfactorily produces the desired effect.

The advantages of my invention will be obvious from what has been above said with regard to the disadvantages heretofore met with in apparatus of this kind, and with regard to the construction and operation of the present device. One important advantage is that the device is adapted to operate in a vertical position and as a part of a vertical gas supply pipe, the plunger and cut-off valve being operated into the closed position by means of gravity, thus eliminating springs and similar devices as previously employed.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. The combination with operative mechanism provided with an electric motor for operating the same, a source of electric energy for said motor and a fluid delivery device; of an automatic control for said fluid delivery device comprising in combination a fluid chamber, an inlet pipe into said chamber, an outlet pipe leading from said chamber to said fluid delivery device, a valve located in said chamber controlling the outlet therefrom and adapted to close said outlet by gravity, a solenoid, a plunger in said solenoid operatively connected with said valve and adapted when said solenoid is energized to be raised and thereby open said valve and when said solenoid is de-energized to fall by gravity and close said valve, and an electric circuit connecting the said solenoid with said motor, so that, when said motor is operating said solenoid shall be energized and when said motor ceases to operate said solenoid shall be de-energized.

2. The combination with operative mechanism, a power shaft, a belt operatively connecting said power shaft with said mechanism, a fixed pulley and an idle pulley on said mechanism adapted to receive said belt, means adapted to shift said belt from one of said pulleys to the other, and a fluid

delivery device; of an automatic control for said fluid delivery device comprising in combination a fluid chamber, an inlet pipe into said chamber, an outlet pipe leading from said chamber to said fluid delivery device, a valve located in said chamber controlling the outlet therefrom and adapted to close said outlet by gravity, a solenoid, a plunger in said solenoid operatively connected with said valve and adapted when said solenoid is energized to be raised and thereby open said valve and when said solenoid is de-energized to fall by gravity and close said valve, an electric circuit leading to said solenoid, a source of electric energy forming part of said circuit, a switch in said circuit, and devices operatively connecting said switch with said belt-shifting devices so that, when said belt is running upon said fixed pulley said switch shall be closed and said solenoid energized, but when said belt is running upon said idle pulley said switch shall be open and said solenoid de-energized.

In witness whereof I have hereunto signed my name this 12th day of June, 1922.

HERBERT COHEN.