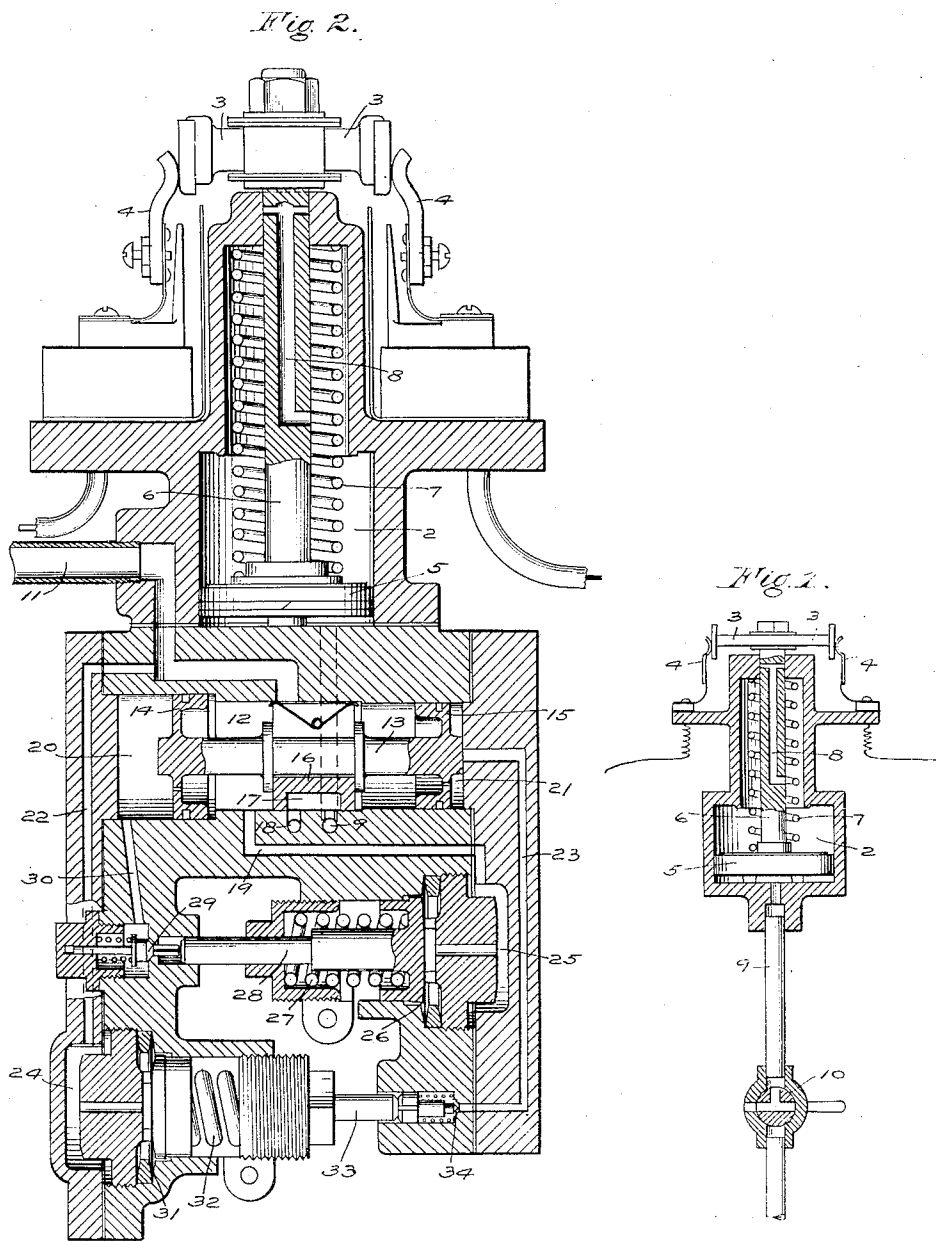


E. H. DEWSON.
PNEUMATIC BLOW-OUT FOR ELECTRIC SWITCHES.
APPLICATION FILED OCT. 13, 1905.

1,039,264.

Patented Sept. 24, 1912.



WITNESSES

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UNITED STATES PATENT OFFICE.

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PNEUMATIC BLOW-OUT FOR ELECTRIC SWITCHES.

1,039,264.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed October 13, 1905. Serial No. 282,553.

To all whom it may concern:

Be it known that I, EDWARD H. DEWSON, a citizen of the United States, residing in New York city, county and State of New York, have invented a certain new and useful Improvement in Pneumatic Blow-Outs for Electric Switches, of which the following is a specification.

This invention relates to pressure operated electric switches, and has for its object to provide an improved pneumatic blow-out device adapted to discharge a jet of air across the contact points and extinguish the arc at the time of throwing the switch to open the circuit.

According to my improvement, the piston to which fluid under pressure is admitted for throwing the switch operates in a closed chamber, so that in moving out it compresses the air in the chamber on its outer side. From this chamber or space ducts or passages lead into close proximity to the switch contact points and discharge across the same, whereby the air which is compressed by the movement of the piston is directed in a stream or jet across the arc at the time the switch is opened and thereby prevents injurious burning of the contact points.

While my invention, broadly considered, is adapted for use in connection with electric switches generally, it is especially applicable to the switch of an electric pump governor, in which a piston is employed for positively and quickly throwing the switch to open the circuit and stop the motor driven compressor when the pressure reaches a predetermined point.

In the accompanying drawing, Figure 1 is a diagrammatic section showing my improvement applied to any pressure operated electric switch, and Fig. 2 a sectional view of an electric pump governor with my improved pneumatic blow-out applied thereto.

As shown in the drawing, the construction comprises an electric switch having a movable member or contact bar 3 connected with rod 6 of a piston or movable plunger 5 which operates in a substantially closed chamber 2 and upon its outward stroke is

adapted to compress the air in chamber 2. A duct or passage 8 leads from said chamber and has its outlet so disposed as to discharge a jet or blast of air transversely across the line of the separating contact points 3 and 4 of the electric circuit as the switch is thrown to its open position. Although this air passage 8 may be arranged in any desired manner, it is preferably formed in the piston rod 6 and at its outer end is provided with one or more jet openings according to the number of stationary contact fingers 4 at which the circuit is opened. Any desired means may be employed for operating the switch, such as a spring 7 normally tending to close the switch and a three-way cock 10 adapted to supply fluid under pressure to and release the same from the face of the piston through a pipe or passage 9. When it is desired to throw the switch to open the circuit, the cock 10 may be turned to admit pressure to the piston 5, thereby forcing the same outward to separate the contact points of the switch and at the same time compressing the air in chamber 2 to such an extent as to cause a jet or jets of air to be discharged through the port or passage 8 directly across the line of the opening contact points. In this manner the arcs are effectually extinguished and all injurious burning out of the switch contact points prevented.

In Fig. 2 I have illustrated my invention applied to an electric pump governor, in which valve mechanism controlled by the pressure of the pump or reservoir connected to pipe 11 is employed for supplying and releasing fluid under pressure to and from the actuating piston 5 of the switch. A preferred form of such valve mechanism may comprise a main valve 13 operating in chamber 12 by stem 13 and piston heads 14 and 15 working in chambers 20 and 21. The regulating chamber 25 communicates with the source of air pressure through port 19 and has a diaphragm 26, which is subject to the high pressure adjustable spring 27, the stem 28 operating the valve 29 for venting air from piston chamber 20 through port 30 to the atmosphere when the pump pressure

rises to the predetermined cutting out point. Air under pressure from the pump or reservoir may also be supplied through pipe 11 and passage 22 to another regulating chamber 24 having diaphragm 31 with stem 33 for operating the regulating valve 34, which vents the pressure from piston chamber 21 through port 23 to the atmosphere when the pump pressure diminishes below the cutting in point at which the low pressure spring 32 is adjusted. With the switch closed and the pump working as indicated in the drawing, the pressure rises in chamber 24 on diaphragm 31 and closes the regulating valve 34. The pressure also continues to increase in chamber 25 on diaphragm 26 until it reaches the desired cutting out point at which the spring 27 is adjusted, whereupon it opens the regulating valve 29 and releases the pressure from chamber 20 back of piston head 14, which, being of a larger area than piston head 15, immediately travels to the left, carrying with it the valve 16 to open the port 9 leading to the switch actuating piston 5. Air under pressure then flows rapidly through port 9 to the face of piston 5 and forces the same outward with a strong quick movement, thereby compressing the air in chamber 2 on the opposite side and causing the air to discharge in a jet or blast through the outlet passage 8 and across the line of the separating contact points 3 and 4 of the switch, thereby effectually extinguishing the arc. With the valve 16 in its left position the chamber 25 is open to the atmosphere through port 19, cavity 17 and exhaust port 18, so that the regulating valve 29 is closed and the pressure of the valve chamber 12 equalizes around the two piston heads into chambers 20 and 21. As the circuit is then open and the pump stopped, the pressure diminishes in chamber 24 until it reaches the cutting in point at which the spring 32 operates to open the regulating valve 34 and vents the pressure from piston chamber 21 to the atmosphere. This causes the piston heads and valve 16 to move to the right to the position shown in the drawing, in which the port 9 is open to the atmosphere through cavity 17 and exhaust port 18, whereupon the pressure is released from the face of actuating piston 5 and the spring 7 returns the same to its inner position, thereby again closing the switch and starting the pump.

It is important that the actuating piston should move outward with a quick positive movement sufficient to compress the air in chamber 2 and produce a comparatively strong jet or blast across the contact points to extinguish the arcs. Any valve mechanism governed by the pump pressure and which operates to give a prompt and full opening of the supply port 9 may be employed for this purpose, and I lay no claim

to the specific form of valve mechanism shown, since the same is not my invention, but is covered by Patent No. 879,699, issued February 18, 1908.

By means of my improvement all blow-out magnets, or other devices which have heretofore been employed for preventing injurious effects of arcing at the switch contact points may be dispensed with, thereby greatly reducing the cost of manufacture, while at the same time providing a simple inexpensive and efficient means for extinguishing the arcs and preserving the contact points.

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

1. A pressure operated electric switch mechanism comprising a movable switch member, a piston for operating the same, means for suddenly admitting fluid under pressure to said piston to cause the quick movement thereof, a chamber on the opposite side of said piston and a duct or passage leading from said chamber to the switch contact points, communication through said passage being controlled by the movement of the piston.

2. A pressure operated electric switch mechanism comprising a movable switch member, a cylinder and piston for operating said switch, means for controlling the supply of fluid under pressure to and the release from the cylinder on one side of said actuating piston, and a duct or passage leading from the cylinder on the opposite side of said piston and directly controlled by said piston for discharging the air compressed by the movement of the piston upon the switch contact points.

3. A pressure operated electric switch mechanism, comprising a piston and rod carrying the movable switch member, a chamber on one side of said piston, and a passage leading from said chamber through the piston rod for directing an air jet upon the switch contact points.

4. A pressure operated electric switch mechanism comprising a movable switch member, a cylinder and piston for operating said switch, a pressure controlled valve device for supplying fluid to actuate said piston to open the circuit, and a duct or passage directly controlled by said piston and leading from the cylinder on the opposite side of the piston to a point near the switch contacts for discharging thereon the air compressed by the movement of the piston in opening the switch, communication through said duct being cut off in the closed position of the switch.

5. An electric pump governor comprising a switch having a movable contact point, a piston for operating said switch to open the circuit, means subject to the pump pressure

for controlling the action of said piston and adapted to cause a quick positive movement of said piston, a chamber in which the air is compressed by the movement of the piston, and a duct or passage for discharging a blast of air from said chamber to the switch contact points when the circuit is opened.

In testimony whereof I have hereunto set my hand.

EDWARD H. DEWSON.

Witnesses:

R. F. EMERY,

J. B. MACDONALD.