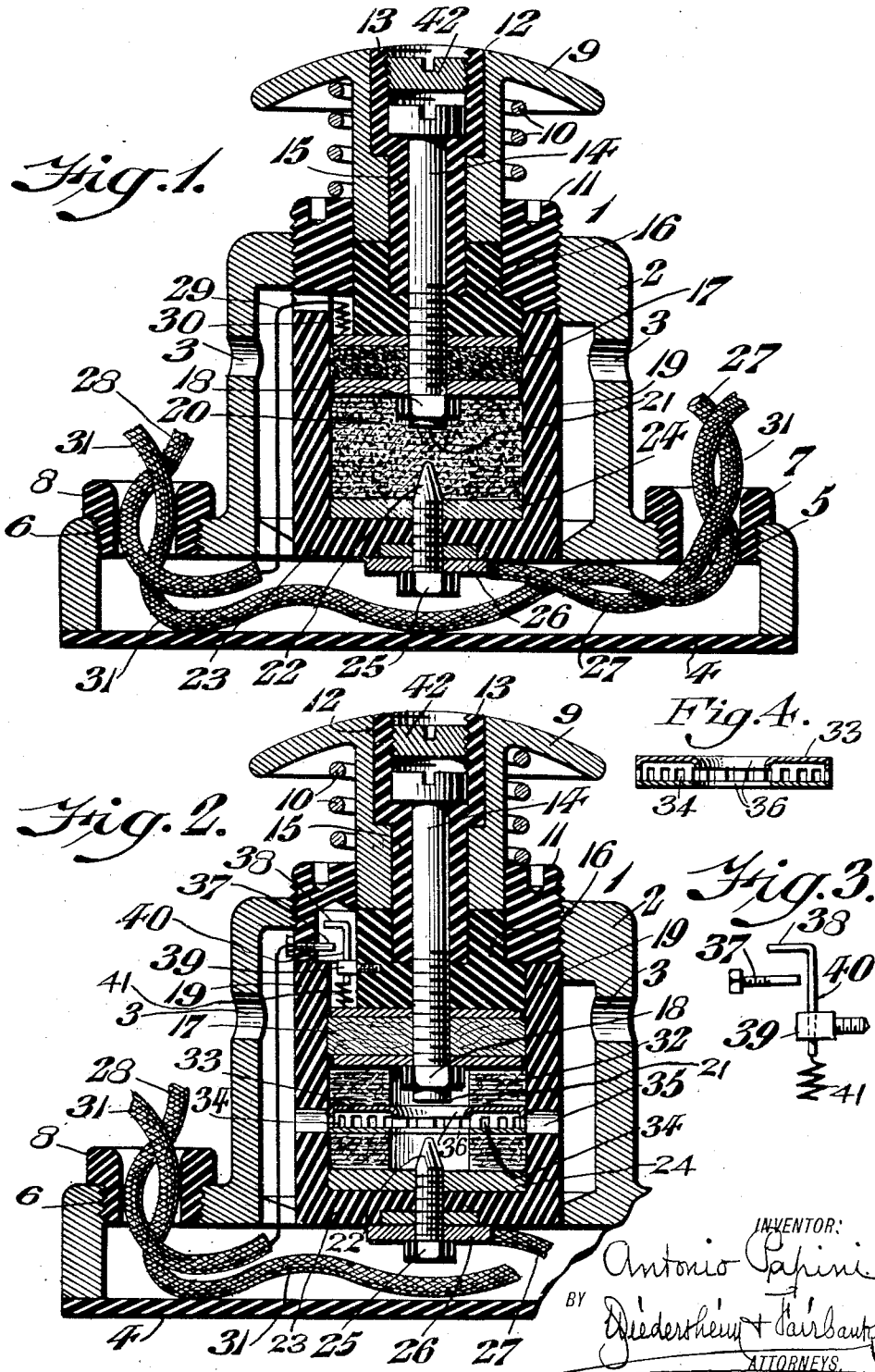


A. PAPINI.
CURRENT REGULATING FOOT SWITCH.
APPLICATION FILED AUG. 15, 1919.

1,335,019.

Patented Mar. 30, 1920.



UNITED STATES PATENT OFFICE.

ANTONIO PAPINI, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO A. MECKY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CURRENT-REGULATING FOOT-SWITCH.

1,335,019.

Specification of Letters Patent.

Patented Mar. 30, 1920.

Application filed August 15, 1919. Serial No. 317,827.

To all whom it may concern:

Be it known that I, ANTONIO PAPINI, a subject of the King of Italy, having resided in the United States one year last past and
5 having declared my intention of becoming a citizen thereof, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Current-Regulating Foot-Switch, of which the
10 following is a specification.

My invention consists of a novel construction of an electric regulator or current regulating foot switch, wherein the operator's foot is applied directly to a metallic spring-pressed foot actuated button, whereby novel
15 means are actuated for regulating the force of the current of electric dynamos, motors, lamps or any other apparatus or machines to which electricity is supplied from a suitable source, my invention comprising a suitable casing or receptacle adapted to be inserted in or form a part of the electric circuit, and said casing supporting or containing the novel devices to which my invention
20 particularly relates, whereby novel means are provided to open or close the circuit when desired, by the pressure of the operator's foot and the current is caused to diverge or pass through a suitable resistance material whose relatively low conductivity is increased or diminished, according to requirements, by compressing it more or less by the novel collocation of a piston, a piston rod which is connected in a novel manner to and suitably insulated from said
25 foot actuated button, said piston, piston rod, button and its adjuncts operating in unison as a unit and being normally retained in elevated position by a suitable tension device, during which period the circuit is open or broken, the circuit being closed or the flow of the current increased by a depression of said metallic spring-pressed button and its adjuncts, as will be herein-
30 after described.

My invention further consists of a novel manner of mounting and insulating the metallic spring-pressed button, piston rod, piston and their adjuncts.

35 To the above ends, my invention consists of a novel current regulating foot switch of the character described, wherein very small variations in current can be obtained with great accuracy, which can be
40 cheaply constructed, which is not liable to

get out of order, and which is readily accessible at all times for the purposes of inspection, replacement and repair.

For the purpose of illustrating my invention, I have shown in the accompanying
45 drawings, forms thereof which are at present preferred by me, since they will give in practice satisfactory and reliable results. It is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a vertical sectional view of a novel current regulating foot switch embodying my invention.

Fig. 2 represents a view similar to Fig. 1, but showing a different construction of resistance material employed.

Fig. 3 represents a detached view of the fixed and adjustable contact employed.

Fig. 4 represents a sectional view of the metallic air box in detached position.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:

1 designates my novel construction of electric regulator or current regulating foot
55 switch, the same comprising a suitable casing 2 having the ports 3 in the side walls thereof, which permit the egress of heated air, said casing being supported upon the insulating base 4 and having the holes 5 and
60 6 therein, which are provided with the insulating screwed bushings 7 and 8 respectively.

9 designates a metallic foot actuated button, which is normally retained in upward
65 position by the tension of the spring 10 interposed between the head or under side of said button and the top of the insulating bushing 11 which is screwed into the top of the casing 2. The interior of the spring-actuated button 9 is hollowed out or provided with a cavity as indicated at 12, and is provided with the insulating bushing 13 within which is contained the upper portion of the piston rod 14, which passes through the
70 lower sleeve-like portion 15 of said bushing and also through the lower follower or insulating bushing 16, said piston rod being threaded at its lower end and passing through said bushing 16 and being secured
75 80 85 90 95 100 105 110

to the piston 17, by means of the nut 18, said piston being contained in the cylinder or receptacle 19, which is filled with suitable resistance material 20, which is preferably flaked, powdered or granulated.

The lower end 21 of the piston rod serves as a contact point and is in alinement with the contact point 22, which in its simplest embodiment, comprises a bolt, which is screwed through a metal plate 24 in the bottom of said cylinder, the head 25 of said bolt serving to hold in position the conductor 26, from which leads the conductor 27. 28 designates another electrical conductor, which is connected to the conductor 29, which has a coiled terminal 30, as seen in Fig. 1, which is secured to the piston 17, the upper end of said conductor 29 and said coil 30 passing through and being located in suitable recesses in the insulating bushings 11 and 16.

31 designates the other electrical conductor, so that it will be apparent that the current flows in through the conductors 28 and 29 and the coil 30 to the piston, then passes through the resistance material 20, flowing out through the conductors 26 and 27, the current flowing back through the conductor 31.

It will be apparent to those skilled in the art, that as the operator depresses the metallic foot button 9, the bushing 16 and the piston 17 are depressed, the relatively low conductivity of the resistance material below said piston being increased or diminished, according to requirements, so that the current will be correspondingly regulated, it being apparent that when the operator removes his foot from the button 9, the tension of the spring 10 will cause said button, piston rod 14 and piston 17 to rise and assume their highest position seen in Fig. 1.

In the construction seen in Fig. 2, the parts 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 22, 23, 24, 25, 26, 27, 28 and 29, are all substantially the same as seen in Fig. 1, but in lieu of the flaked or granulated resistance material 20 seen in Fig. 1, I have shown in Fig. 2, a plurality of resistance disks 32 having a central hole therethrough, said disks being separated by the metallic air box 33 having the upper and lower centrally apertured plates and the side ports 34, which latter are located in proximity to the ports 35 in the cylinder 19, this construction and collocation of resistance disks 32 and the air box 33 being preferably employed in large switches, where considerable heat is generated, it being apparent that said heat is taken up by the metallic air boxes, whose upper and lower portions have central holes 36 therethrough, the heat being permitted to escape through the ports 35 and 3, so that the switch is effectively ventilated at all times.

In the embodiment of my invention shown

in Fig. 2, I have also shown a slightly different arrangement of the terminals at the upper left-hand portion of said figure, wherein the fixed terminal 37 is shown as being normally separated from the adjustable terminal 38, which latter has the vertical member 40 terminating in the coil 41, which is secured to the top of the piston 17, said vertical member 40 being vertically guided in the guide 39, which is stationary and is attached to or screwed into the insulating bushing 16, as will be understood from Figs. 2 and 3.

The position the parts normally assume will be understood from said Figs. 2 and 3, the circuit being broken when the spring pressed metallic button 9 is in its uppermost position, in which it is held by the spring 10, it being apparent that when the parts are in this position, no current will pass, until the circuit is closed by the depression of the button 9 by the operator's foot, so that as soon as the contact 38 moves downwardly and contacts with the fixed contact 37, the circuit will be closed and the current will flow through the apparatus, the relatively low conductivity of the resistance disks or washers 32 being increased or diminished according to the pressure exerted upon the foot button 9, as will be apparent to those skilled in the art, it being further apparent that when the button 9 is depressed, the piston rod 14, the piston 17, coil 41 and contact 38 will move downwardly as a unit, the parts being restored to the normal position seen in Fig. 2 by the tension of the spring 10 upon the operator removing the pressure of his foot from the button 9.

My novel construction of current regulating foot switch can be cheaply manufactured, is not readily liable to get out of order, and it will be apparent that when the closure 42 and the bushing 11 is removed, all the parts of the device are readily accessible for the purposes of inspection, replacement or repairs.

In the construction seen in Fig. 1, it will be apparent that a slight amount of current is always flowing through the device by reason of the connection of the terminal coil 30 directly to the piston 17, while in the construction seen in Figs. 2 and 3, the circuit is normally open or broken when the button 9 is in its elevated position, where it is retained by the spring 10, the circuit only being closed when the button and piston are depressed sufficiently to form the contact between the contacts 37 and 38, as is evident.

It will now be apparent that I have devised a new and useful current regulating foot switch which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present

instance, shown and described a preferred embodiment thereof which will give in practice satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

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

1. In a device of the character stated, a receptacle containing a resistance material, a compressing device for varying the pressure therein, said compressing device comprising a spring-pressed button normally retained in elevated position, a piston rod carried by said button, an insulating bushing intermediate said piston rod and button, another insulating bushing for the lower portion of said button, a piston contained in said receptacle, said piston, piston rod and button being adapted to be depressed in unison, and a spring engaging the under side of said button for normally retaining it in upward position.

2. In a device of the character stated, a body having an insulating base and ventilation ports in the side thereof, an insulating bushing in engagement with the top of said body, a foot actuated button having a lower extension mounted in said insulating bushing, said button being hollow, a piston rod contained in said button, an insulating bushing intermediate said piston rod and button, a piston in the upper portion of said receptacle, insulation intermediate said button and the top of said piston, a resistance material below said piston and adapted to be compressed thereby, and a spring exerting tension on the bottom of said button for normally retaining the latter in elevated position.

3. In a device of the character stated, a body portion having an insulating base and ports in the side thereof, an insulating bushing in engagement with the top of said body, a foot-actuated button having its depending portion mounted in said insulating bushing, said button being hollow, a piston rod contained in said button, an insulating bushing intermediate said piston rod and button, a piston in the upper portion of said receptacle, a cylinder for said piston having ports therein, insulation intermediate said button and the top of said piston, a spring intermediate said first mentioned bushing, and the bottom of said button for normally retaining the latter in elevated position, and a resistance material below said piston and adapted to be compressed thereby said resistance material comprising a plurality of resistance disks, and an apertured air box intermediate said disks and having ports in its sides, the ports of said

air box registering with ports in said cylinder, which discharge into the ports of said body.

4. In a device of the character stated, a body having an insulating base and ports in the side thereof, a cylinder supported in said body, an insulating bushing in the top of said body, a foot actuated button having a downward extension movable in said bushing, a piston rod contained in said button and insulated therefrom, a piston secured to said piston rod, insulation between the bottom of said button and the top of said piston, a spring exerting an upward tension on the underside of said button, a conductor having a fixed terminal located within said body, an adjustable terminal having a coil secured to said piston, a guide for said adjustable terminal, said latter terminal, piston and button moving as a unit, and a resistance material in said cylinder below said piston.

5. In a device of the character stated, a body having an insulating base and ports in the side thereof, a cylinder supported in said body, an insulating bushing in the top of said body, a foot actuated button having a downward extension movable in said bushing, a piston rod contained in said button and insulated therefrom, a piston secured to said piston rod, insulation between the bottom of said button and the top of said piston, a spring exerting an upward tension on the underside of said button, a conductor having a fixed terminal located within said body, an adjustable terminal having a coil secured to said piston, a guide for said adjustable terminal, said latter terminal, piston and button moving as a unit, and a resistance material in said cylinder below said piston, said resistance material comprising centrally apertured disks adapted to be compressed by said piston.

6. In a device of the character stated, a body having an insulating base and ports in the side thereof, a cylinder supported in said body, an insulating bushing in the top of said body, a foot actuated button having a downward extension movable in said bushing, a piston rod contained in said button and insulated therefrom, a piston secured to said piston rod, insulation between the bottom of said button and the top of said piston, a spring exerting an upward tension on the underside of said button, a conductor having a fixed terminal located within said body, an adjustable terminal having a coil secured to said piston, a guide for said adjustable terminal, said latter terminal, piston and button moving as a unit, and a resistance material in said cylinder below said piston, said resistance material comprising centrally apertured disks adapted to be compressed by said piston, and a metallic air box interposed between said disks

and having side exit ports for the exit of heated air.

7. In a device of the character stated, a body portion having an insulating base and 5 ports in the side thereof, a cylinder supported in said body, an insulating bushing in the top of said body, a foot actuated button having a downward extension movable in said bushing, a piston rod contained in 10 said button and insulated therefrom, a piston secured to said piston rod, insulation between the bottom of said button and the top of said piston, a spring exerting an upward tension on the underside of said button, a conductor having a fixed terminal 15 located within said body, an adjustable terminal having a coil secured to said piston, a guide for said adjustable terminal, said latter terminal, piston and button moving 20 as a unit and a resistance material in said cylinder below said piston, said resistance material, comprising centrally apertured disks adapted to be compressed by said pis-

ton, and a metallic air box interposed between said disks and having central top and 25 bottom ports alining with ports in the side of said cylinder, the heated air being discharged through the ports in said cylinder and body.

8. In a device of the character stated, a 30 body, a foot actuated button resiliently mounted thereon and insulated therefrom, a cylinder carried by said body, a vertically movable piston mounted within said cylinder and operable by the above mentioned 35 button, a fixed contact within said body and an adjustable contact mounted on said piston, said button, piston and adjustable contact being movable as a unit and adapted to close the circuit when said button is de- 40 pressed.

ANTONIO PAPINI.

Witnesses:

JOHN A. WIEDERSHEIM,
N. BUSSINGER.