J. F. SPAULDING.

ELECTRIC SWITCH.

APPLICATION FILED MAR. 16, 1917.

1,287,491. Patented Dec. 10, 1918.

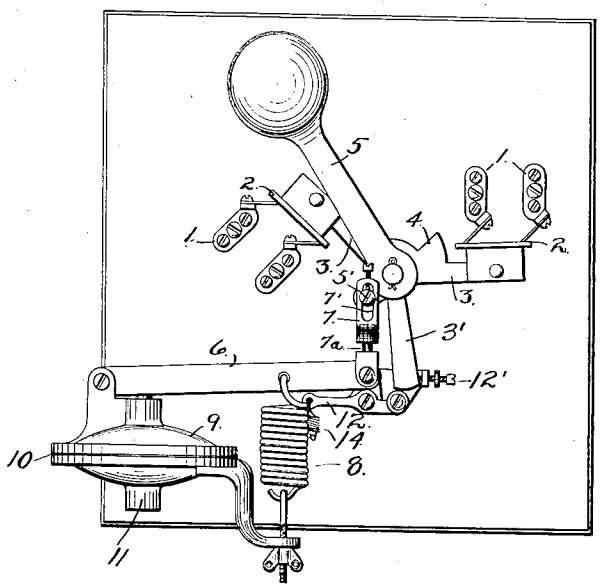


Fig. 1.

Fig. 3.

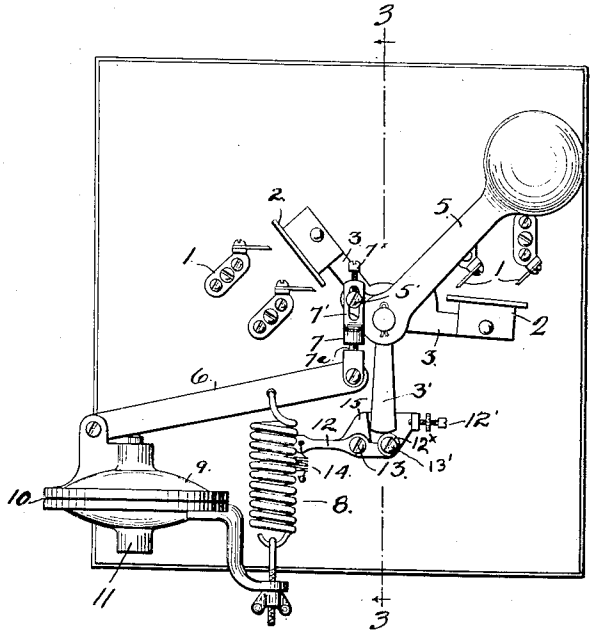
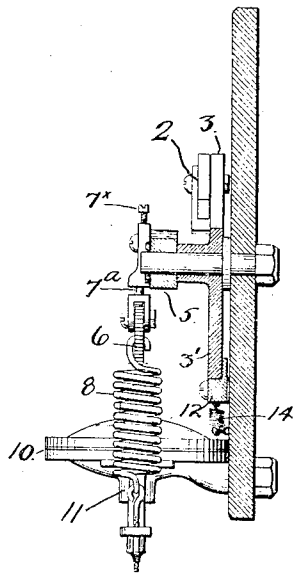


Fig. 2.



WITNESSES

Wm. F. Fay Jr.

L. B. Middleton

INVENTOR

John F. Spaulding.

BY Richard Edwards.

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN F. SPAULDING, OF MELROSE, MASSACHUSETTS.

ELECTRIC SWITCH.

1,287,491. Specification of Letters Patent. Patented Dec. 10, 1918.

Application filed March 16, 1917. Serial No. 155,299.

To all whom it may concern:

Be it known that I, JOHN F. SPAULDING, a citizen of the United States, residing at Melrose, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to electric switches, and the principal object of the invention is to improve the switches used for automatically starting and stopping motor operated pumps, compressors and the like, the switches being controlled by the water or air pressure in the receivers filled by the pumps.

Another object of the invention is to prevent all possibility of the contacts sticking, which has been the case with weight operated switches heretofore.

Another object of the invention is to provide means for allowing the free movement of the weight as it passes its center of movement.

Another object of the invention is to provide means for holding the contacts against movement after said weight has started back from the contact quadrant.

The invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described and specifically pointed out in the appended claims.

In describing my invention in detail, reference will be had to the accompanying drawings, wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a front view of the invention with the contacts in operative position.

Fig. 2 is a like view, with the contacts out of engagement.

Fig. 3 is a section on the line 3—3 of Fig. 2.

In these drawings, the stationary contacts are shown at 1 and the movable contacts at 2. The contacts 1 are made of copper brushes, so as to do away with all possibility of the contacts sticking. The contacts 2 are carried on arms 3, it being seen that there are two sets of contacts carried on the two arms.

4 is the quadrant secured to or forming part of the arms 3 and this quadrant is actuated by the weighted arm 5. This arm 5 is actuated by means of a lever 6 connected with the arm by the link 7 and normally held in its lowest position by the spring 8. Said lever 6 is raised by a projection in the housing 9, operated on by the diaphragm 10 in said housing, said diaphragm being raised by means of the pressure in the air or water receiver, to which the part 11 of the housing is connected. Thus, when the pressure in the receiver reaches a predetermined number of pounds, the diaphragm will raise the lever 6 against the tension of the spring 8 and this lever through the link 7 will raise the weighted arm 5 until the said arm reaches a position just beyond the vertical, when said arm will drop by gravity and, coming in contact with the quadrant 4, will cause the arms 3 to snap back and break the contact with the brushes 1. Thus, the electric connection is broken and the motor stopped.

After the pressure is reduced, the spring 8 will cause the lever to return to normal position and in doing this said lever will raise the said arm 5 to its vertical position, when it will again drop by gravity and draw the contacts into engagement again, so as to start up the motor. This part of the apparatus is well known, but by my invention I improve the operation of the switch, and in carrying the invention into effect I utilize the brushes shown at 1 in place of the blade switch hitherto used, and by such brushes I do away with all possibility of the contacts sticking, which is liable to happen on a switch of this character.

I also connect the lever 6 with the weighted arm 5 by the improved link 7 which is joined to the arm 5 by means of a slot 7′ controlled by the set screw 7^{x} and through which passes the screw 5′, connected with the arm 5. This link 7 can be adjusted in length by means of the turn screw arrangement 7^{a}.

This improved link has many advantages over the former way of connecting the link 6 with the arm 5, as by my arrangement there is no danger of the parts being caught in one another so as to move the arm 5 prematurely. Furthermore, said link is of less weight than the connection hitherto used.

My invention also consists in means for holding the contact quadrant against movement, while the weighted arm is being raised to vertical position before it drops by gravity. This part of my invention consists of an arm 3′ secured to the quadrant 4 and extending downwardly therefrom. A lever 12,

pivoted at 13 and engaged at one end by a spring 14 is adapted to swing the arm 3′ in the direction of the link 6. This lever 12 is provided with a turn screw 12′ for adjusting the position of the arm 3′ in relation to the lever 12 and said lever is also provided with an offset 15, between which and the end of the screw 12′ the lever 3′ is adapted to move. This movement is retarded by means of a washer 12× held in place by a screw 13′, said washer bearing against the end of the lever 3′.

It will thus be seen that the quadrant 4 is prevented from movement until it is struck by the weighted arm 5.

It is thought from the foregoing that the advantages and novel features of my invention will be readily apparent.

I desire it to be understood that I may make slight changes in the construction and in the arrangement and combination of the several parts, provided such changes fall within the scope of the appended claims.

I claim as my invention:

1. An electric switch, comprising a pivoted contact bearing member, a pivoted counter-balanced operating member therefor having a limited play in each direction, a pressure controlled member, a longitudinally slotted link pivotally and adjustably connected with the pressure controlled member, an element in the slot of the link and connected with the counter-balanced member, and means for varying the effective length of the slot with reference to the said element.

2. An electric switch, comprising a pivoted contact bearing member, a pivoted counter-balanced operating member therefor having a limited play in each direction, a pressure controlled member for operating the counter-balanced member, an arm extending from the pivoted contact bearing member, an element in contact with said arm, and means for varying the resistance offered by said element to the movement of the contact bearing member.

3. An electric switch, comprising a pivoted contact bearing member, a pivoted counter-balanced operating member therefor having a limited play in each direction, a pressure controlled member for operating the counter-balanced member, an arm extending from the pivoted contact bearing member, a pivoted retarding member having spaced portions between which the said arm has a limited movement, and means for varying the play of the arm between the said spaced portions of the retarding member.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN F. SPAULDING.

Witnesses:

EDWARD P. FORBES,

REUBEN D. WILMOT.