

A. F. FURBUSH.
ELECTRICAL SWITCH.
APPLICATION FILED JULY 7, 1910.

974,106.

Patented Oct. 25, 1910.

Fig. 1.

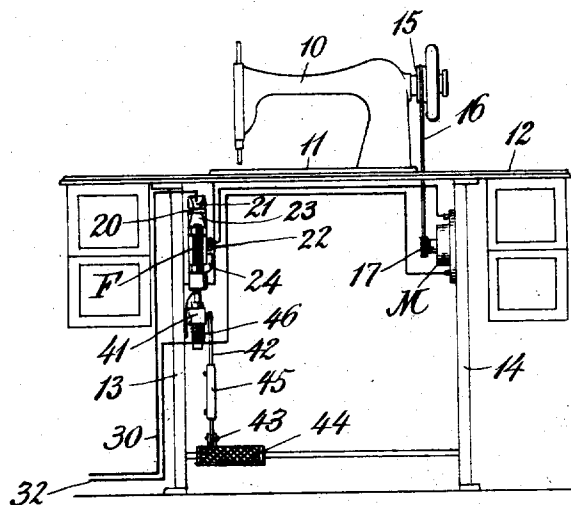


Fig. 2.

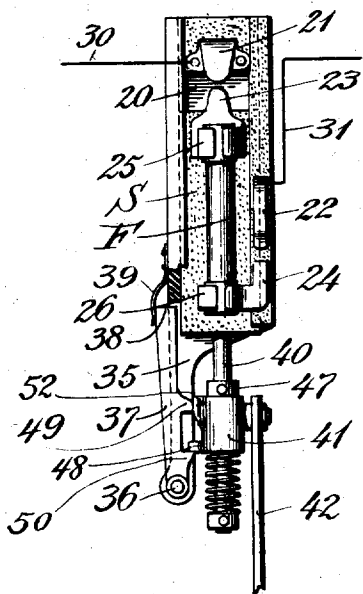


Fig. 3.

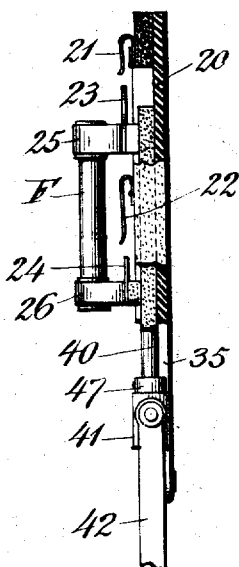
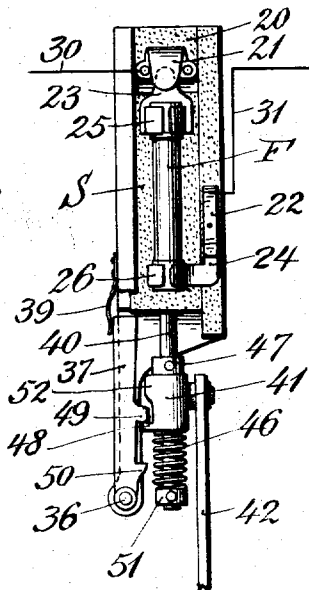


Fig. 4.



WITNESSES:
J. V. Biggby
C. A. Claus.

INVENTOR.
A. F. Furbush,
BY
Chas. F. Furbush
ATTORNEY.

UNITED STATES PATENT OFFICE.

ALBOURNE F. FURBUSH, OF CLIFTONDALE, MASSACHUSETTS, ASSIGNOR TO HIMSELF,
AND CHARLES W. HALE, OF HARTFORD, CONNECTICUT.

ELECTRICAL SWITCH.

974,106.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed July 7, 1910. Serial No. 570,752.

To all whom it may concern:

Be it known that I, ALBOURNE F. FURBUSH, a citizen of the United States, and resident of Cliftondale, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Electric Switches, of which the following is a full, clear, and exact specification.

This invention relates to electric switches and more especially to that class thereof which are adapted to control the flow of a power-current whereby a motor may be driven, such motor being in the present instance utilized for the purpose of actuating a sewing-machine.

The invention has for one of its objects the provision of such a switch which may be operated by a treadle, the back and forward motion of which shifts the movable switch-member into and out of coöperation with the proper terminals of the device.

The invention has, furthermore, for its object the provision of a fuse or similar safety-device which is carried on the movable switch-member and may be readily replaced after an overload has resulted in burning out the fuse.

The invention has also for its object the combination with the treadle operated switch-member, of means whereby the current will be interrupted by the movement of the switch-member only after the treadle has been moved for some distance, after which the movement of the switch-member takes place very rapidly so as to break the current without liability of sparking at the contact points.

The invention has been clearly illustrated in the accompanying drawings, in which similar characters denote similar parts, and in which—

Figure 1 is a side view of a sewing-machine illustrating the general organization of the switch and driving mechanism. Fig. 2 is a front view of my improved switch. Fig. 3 is an edge view thereof partially broken away to disclose the construction, and Fig. 4 is a front view of the switch member in the position which it assumes when current is allowed to flow to the motor. In the drawings, the numeral 10 denotes the head of a sewing-machine mounted on a base 11 which is seated within the top leaf or table 12 of the machine, the latter being

supported by legs 13 and 14 in any desired manner. The head of the sewing-machine comprises a needle-shaft on which is mounted a pulley 15 which is connected by a belt 16 to the driving pulley 17 mounted on the shaft of a motor M.

Secured to the leg 13, is a plate 20 which should be made of insulating material adapted to support the stationary contact points 21, 22, and provided with a dove-tailed groove to support for reciprocatory movement therein a slide S also made of insulating material and carrying the movable contact points 23, and 24. The latter are adapted to coöperate with the contact points, 21, 22, respectively, above referred to, the organization being such that when the slide S is in its lowermost position as shown in Fig. 2 both sets of contact-points are clear from each other; while on the other hand, when the slide S is in its uppermost position, as shown in Fig. 4, both sets of contact-points are coöperatively connected with each other, respectively.

In order to guard the motor against injury by an overload of current, especially when the sewing-machine is standing still, I have deemed it advisable to provide a fuse F of any desired and well-known construction, whereby the movable contact-points 23, 24, may be electrically connected, and which may be readily inserted into, or removed from, its place in said contact-points by virtue of the resilient construction of the latter which includes spring-clips 25, 26, formed on the contact-members 23, 24, respectively. It should be understood, however, that I do not confine myself to the use of this particular form of fuse, since any other well-known form of plug or similar article may be employed in lieu thereof.

Electric circuit to the motor is established as follows:—The main line 30 is connected to the stationary terminal 21, and the current passes thence through the movable terminal 23, the fuse F, movable terminal 24, the stationary terminal 22, to the motor line 31, the motor M, and to the return line 32. In order to prevent sparking at the terminals when the slide S is moved downward from the position shown in Fig. 4 to that shown in Fig. 2, means are provided for holding the slide S in its upward position until the treadle has been depressed sufficiently.

ciently to tension a spring which, when the slide S is finally released, will rapidly move the latter downward to break the circuit. To this end, I provide the base-plate 20 with
 5 an extension 35, to the lower end of which (as at 36) is pivoted a dog 37 having a top face 38 adapted to project under the lower edge of the slide somewhat after the manner shown in Fig. 4, the dog being normally
 10 held in its position by a spring 39 attached to the side of the base-plate 20.

The slide is provided at its lower end with an extension rod 40, on the lower end of which is slidably supported a collar 41 to
 15 which is articulated the upper end of a connecting-rod 42, the lower end of which is fastened to the ear 43 of a treadle 44. If desired, the connecting-rod 42 may be made in two sections which are joined by a connect-
 20 ing-sleeve 45 (see Fig. 1) which permits the rod-sections to be adjusted relatively to each other so as to bring the treadle into the desired position when the slide S is in its normal condition. Referring to Fig. 4, in
 25 which the slide S is illustrated as being in its uppermost position, it will be noted that a spring 46 surrounds the rod 40 and normally holds the collar 41 against a collar 47 which is stationary on the rod 40. The
 30 collar 41 has also a side-extension 48 adapted to engage a lug 49 provided on the dog 37, so that in this manner the upward movement of the slide S, or more particularly speaking that of the collar 41, will be limited. In a similar manner, the downward
 35 movement of the collar 41 is limited by a lug 50 also formed on the dog 37 and adapted to be engaged by the projection 48 of the collar 41 during the downward travel thereof. Now it will be seen that when the
 40 treadle 44 is moved to pull the connecting-rod 42 downward, the collar 41 will also move downward and thus compress the spring 46 the lower end of which rests
 45 against a collar 51 which is rigidly secured to the lower end of the rod 40. During the first portion of the travel of the collar 41, however, the slide S is held stationary by the dog 37, which will remain in its engag-
 50 ing position until the lug 49 thereof is engaged by a cam-plate 52 forming a part of the collar 41. By the time this engagement takes place, the spring 46 will be under tension, so that, as the collar 41 continues in
 55 its downward movement, the cam-plate 52 will swing the dog 37 around its pivot 36 and away from under the slide S, which will thus be set at liberty and be rapidly pulled downward by virtue of the compression of
 60 the spring 46, this position being clearly shown in Fig. 2. When the slide S is to be raised to bring the contact-points thereof into coöperation with the stationary contact-points of the base-plate 20, such move-
 65 ment can readily be accomplished by mov-

ing the treadle 44 which will immediately raise the slide by virtue of its contact with the collar 47.

Many changes may be made in the particular construction and organization of the
 70 several component elements of the device without departing from the spirit or gist of the invention, and I wish it to be distinctly understood that I do not confine my-
 75 self to the particular form of the fuse-holding clips herein shown and described, or to the particular construction and organiza-
 80 tion of the slide-retaining and propelling means above referred to as long as such elements come within the scope of the appended claims.

I claim:—

1. The combination with a base-plate, a pair of contact-points stationary thereon and insulated from each other, a slide mov-
 85 able on the base-plate, and a pair of contact-points carried by said slide and insulated from each other, of a fuse-member connecting the contact-points of the slide, means for reciprocating said slide, and
 90 a device normally locking said slide against movement and operable to release such slide during and by the final movement of the reciprocating means.
2. The combination with a base-plate, a pair of contact-points stationary thereon and insulated from each other, a movable switch-member, and a pair of contact-points
 95 carried thereby and insulated from each other, of a fuse-member connecting the contact-points of the movable switch-member, means for reciprocating the switch-member, a mechanism for locking said
 100 switch-member against movement during the initial movement of the actuating mechanism and for releasing said movable switch member near the end of the movement of said actuating mechanism.
3. The combination with a base-plate, a
 110 pair of contact-points stationary thereon and insulated from each other, a movable switch-member, a pair of contact-points carried thereby and insulated from each other, of a fuse-member connecting the contact-
 115 points of the movable switch-member, means for reciprocating the switch-member, a mechanism for locking said switch-member against movement during the initial movement of the actuating mechanism and for
 120 releasing said movable switch member near the end of the movement of said actuating mechanism, and a spring for moving said switch-member subsequent to the release thereof.
4. The combination with a base-plate, a pair of contact-points stationary thereon and insulated from each other, a movable
 125 switch-member, a pair of contact-points carried thereby and insulated from each other,

of a fuse-member connecting the contact-points of the movable switch-member, means for reciprocating the switch-member, a dog pivoted on the base-plate for normally locking said switch-member against movement, a collar having a cam-projection adapted to engage said dog to release the movable switch member during the end of the collar

movement, a spring interposed between said collar and slide, and means for actuating 10 said collar.

ALBOURNE F. FURBUSH.

Witnesses:

C. WARREN HALE,
C. F. SCHMELZ.