(No Model.)

F. A. WELLER.

SWITCH BAR.

No. 513,745. Patented Jan. 30, 1894.

Fig. 3.

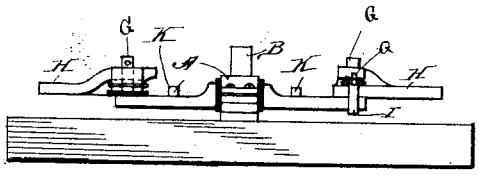


Fig. 4.

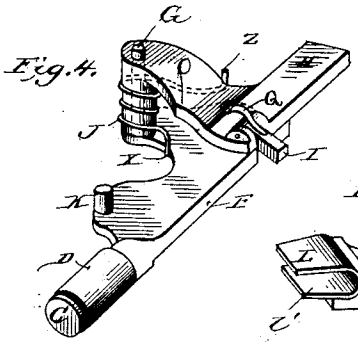


Fig. 5.

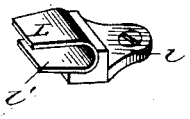


Fig. 1.

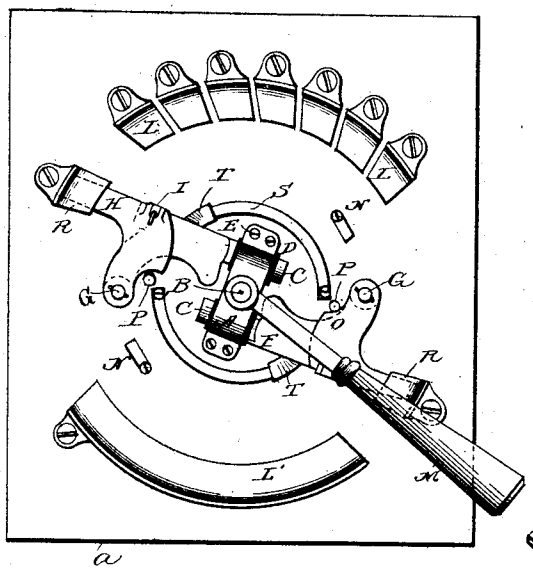


Fig. 2.

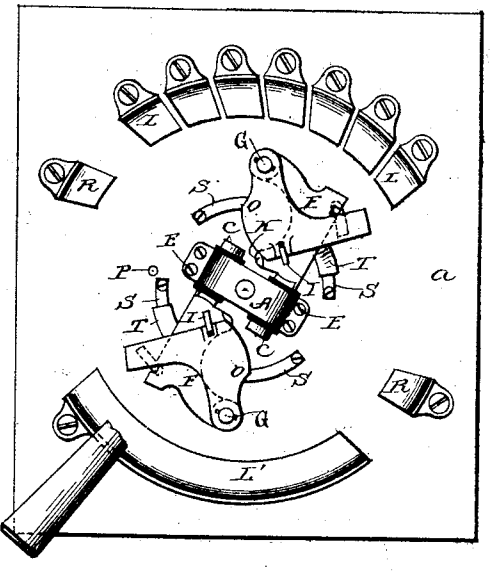
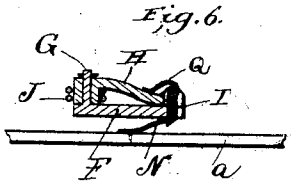


Fig. 6.



Witnesses:
Alex. F. Stewart.
Thomas Durant

Inventor.
Franklin A. Weller
By Church & Church
his Attys.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANKLIN A. WELLER, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO HERBERT C. HILL, OF SAME PLACE.

SWITCH-BAR.

SPECIFICATION forming part of Letters Patent No. 513,745, dated January 30, 1894.

Application filed February 27, 1893. Serial No. 463,874. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN A. WELLER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Switch-Bars; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention has for its object to provide a switch for shunt wound motors, with which both the field and armature circuits may be instantly broken and again established through the greatest rheostat resistance when it is desired to start the motor.

The invention consists in addition to the usual stationary rheostat contact pieces, of a movable and extensible contact piece or pieces mounted on a switch bar and held in extended position during the forward movement of the bar and retracted when a retrograde movement of the bar takes place, thus moving out of range of the stationary contacts while the switch bar is returning to first position, whereby the circuit is broken and can only be established through the greatest resistance.

Further than this the invention consists in certain novel details of construction and combinations and arrangements of parts all as will be now described and pointed out particularly in the appended claims.

Referring to the accompanying drawings: Figure 1 is a top plan view of the switch with the movable contacts in position to establish the circuits when the switch bar is advanced. Fig. 2 is a similar view with parts in the position they occupy immediately after the circuits are broken. Fig. 3 is an elevation of the switch bar and movable contacts. Fig. 4 is a perspective view of one end of switch bar and movable contact. Fig. 5 is a similar view of one of the stationary contacts. Fig. 6 is a detail section showing the tripping catch and latch for holding one of the movable contacts in operative position.

Like letters of reference in the several figures denote the same parts.

As is usual in this class of apparatus, a suitable base plate or support is provided such as indicated at *a* for instance, and upon this base plate or support is mounted a standard B carrying what I shall herein term the insulating hub A of the switch bar formed of any suitable material or metal and having attached thereto an operating handle M of approved form. Two horizontal openings are preferably formed through the insulating hub A substantially parallel to each other, and in these openings are rigidly mounted the oppositely projecting switch arms F surrounded at their bases C by insulating sleeves D and clamped in position by screws E as shown clearly in Figs. 1, 2 and 3.

Pivoted on studs G on the outer ends of the arms F are what I term the movable contacts H preferably of angular form as shown, with the pivot at the end of one arm and the contact surface at the end of the opposite arm, whereby when swung on the studs or pivots the outer or contact ends will move nearly in direct lines toward and from the center or hub of the switch bar. Under the influence of springs J coiled around the hubs of the movable contacts the said contacts tend to fold in as shown in Fig. 2 coming to rest against stop projections K on the arms and they are held extended or outward by latches I journaled on the outer ends of the arms or movable contacts and engaging recesses in the edges of the inner ends of the arms where they are held under normal circumstances by springs Q.

The stationary contacts are arranged radially around the center on which the arms turn, and as shown, an upper series L is provided connected with the rheostat, a long lower contact L′ connected with the fields of the motor and two small dead blocks R R not in circuit with anything and acting simply to hold the ends of the switch arm firmly in place when the current is cut off, with the switch ready to establish the circuit as in Fig. 1.

With the parts in the position shown in Fig. 1, when it is desired to start the motor the switch bar is turned bringing the movable contacts into engagement with the stationary contacts and as it is desired to increase the speed, the bar is turned more and more, gradually cutting out the resistance of the rheostat; then assuming that it is desired

to stop, the bar is given a slight retrograde movement causing the latches to be released by striking the spring tripping catches N which have been depressed by the latches during their forward movement and have sprung up behind the same as shown in Fig. 6. The springs J now assert themselves and the movable contacts are swung on their pivots to the position shown in Fig. 2 away from the stationary contacts and the switch bar may be moved back to first position with the contacts out of engagement. Just before the bar reaches first position the shoulders O on the movable contacts strike pins or stops P and throw said contacts out into normal position (see Fig. 1) when the latches again engage and hold them in such position.

For convenience, long segmental contacts S are provided on the base *a* around the center B upon which spring contact plates or strips T, on the arms F, rest to complete the circuits, the contacts S, it being understood forming terminals of the circuits to the motor armature and fields.

The special design of the stationary contacts is immaterial, but I prefer to employ a construction such as illustrated in Fig. 5 and consisting of a base block *l* with U-shaped contact ends *l'* adapted to engage with the top and bottom of the movable contact holding it in place by friction, as well as insuring the electrical contact of the parts.

From the foregoing, it will be seen that by the use of movable and extensible contact arms mounted on the bar and held extended while the switch bar is advancing and retracted or moved away from the stationary contacts during the backward movement of the bar I am enabled to provide a switch of simple design with which the circuits may be instantly broken when it is desired to stop the motor and when the switch bar is at any point, for by a simple duplication of the tripping catches N retrograde movement of the bar from any point will trip the latch and break the circuits.

It is obvious that the manner of mounting the movable and extensible contact arms on the bar may be varied and well known mechanical principles applied to secure the desired extension when the operating handle moves forward and a retraction during retrograde movement. Hence I do not wish to be understood as limiting myself to the exact construction shown.

Having thus described my invention, what I claim as new is—

1. In a motor switch, the combination with the stationary contacts, of the switch bar, the movable and extensible contact arm carried thereby and controlled by the movement of the bar and an operating handle; substantially as described.

2. In a motor switch, the combination with the stationary contacts, of the switch bar, the movable and extensible contact arm carried thereby, a latch for holding said arm and an operating handle; substantially as described.

3. In a motor switch, the combination with the stationary contacts, of the movable switch bar having a folding contact arm and a latch for holding said arm extended; substantially as described.

4. In a motor switch, the combination with the stationary contacts, of the movable switch bar having a folding contact arm, a latch for holding said arm extended and a spring catch for releasing the latch; substantially as described.

5. In a motor switch, the combination with the stationary contacts, of the movable switch bar having a folding contact arm, a spring for retracting the arm, and a latch for holding the arm extended with means for releasing the latch; substantially as described.

6. In a motor switch, the combination with the stationary contacts, of the movable switch bar having a folding contact arm, a spring for retracting the arm, a latch for holding the arm extended and a stationary catch for releasing the latch; substantially as described.

7. In a motor, switch, the combination with the stationary contacts, of the movable switch bar having a movable contact arm, a stationary projection for extending the arm and a latch for holding the arm extended; substantially as described.

8. In a motor switch, the combination with the stationary contacts, of the movable switch bar having a movable contact arm, a stationary projection for extending the arm, a latch for holding the arm extended and a catch for releasing the latch; substantially as described.

9. In a motor switch, the combination with the stationary contacts, of the movable switch bar having a movable contact arm, a stationary projection for extending the arm, a latch for holding the arm extended, a spring for retracting the arm and a catch for releasing the latch when the bar is given a retrograde movement; substantially as described.

10. In a motor switch the combination with the stationary contacts, of the movable switch bar having oppositely arranged movable contact arms, stationary projections in the paths of said arms for extending the same, latches on the arms cooperating with the bar to hold the arms extended, springs for retracting the arms and catches for releasing the latches when the bar is given a retrograde movement; substantially as described.

FRANKLIN A. WELLER.

Witnesses:
ARTHUR W. CROSSLEY,
T. H. WILLIAMS.