R. R. MILLER.

ELECTROMECHANICAL SWITCH.

APPLICATION FILED DEC. 2, 1911.

1,106,576. Patented Aug. 11, 1914.

Fig. 1

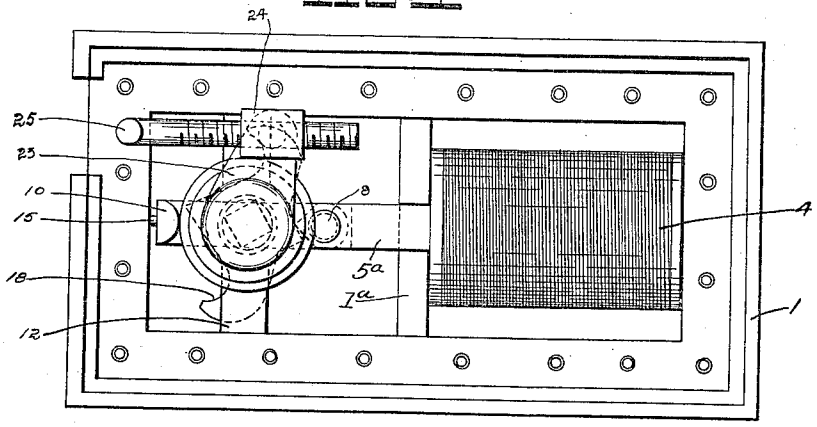


Fig. 2

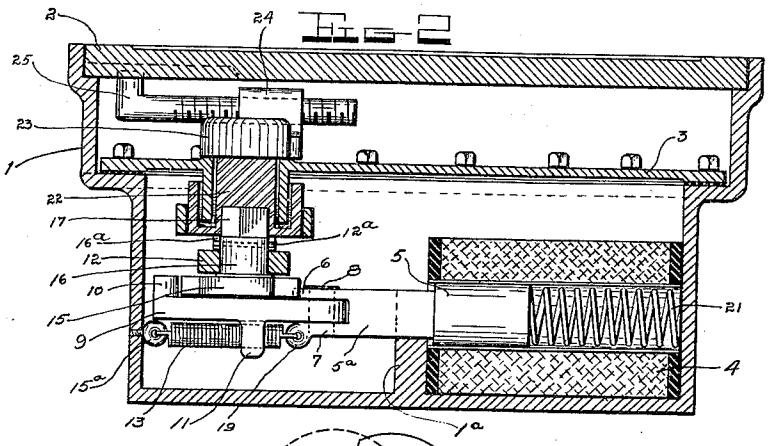


Fig. 4

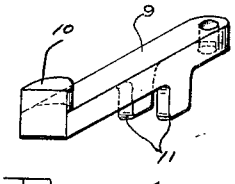
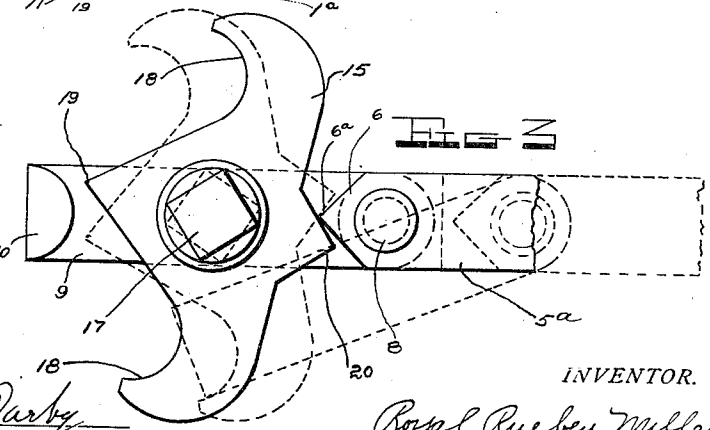


Fig. 3



WITNESSES:

Willard C. Darby

F. E. Glaze

INVENTOR.

Royal Reuben Miller

BY

Lyman D. Henny

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROYAL RUEBEN MILLER, OF PUEBLO, COLORADO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE MILLER ELECTRIC SWITCH COMPANY, A CORPORATION OF COLORADO.

ELECTROMECHANICAL SWITCH.

1,106,576. Specification of Letters Patent. Patented Aug. 11, 1914.

Application filed December 2, 1911. Serial No. 663,593.

To all whom it may concern:

Be it known that I, ROYAL RUEBEN MILLER, a citizen of the United States, residing at Pueblo, Colorado, have invented certain new and useful Improvements in an Electromechanical Switch, of which the following is a specification.

My invention relates to improvements in an electromechanical switch, and the objects of my improvements are; 1st, to provide a means for actuating the mechanism that moves a switch tongue; 2nd, to provide a lock means for holding the switch when in position; and, 3rd, to utilize the power of the electric current to operate mechanical means for switch throwing purposes as well as to simplify the mechanism of the mechanical parts of such switch. I obtain these objects by the mechanisms illustrated in the accompanying drawings, in which,—

Figure 1 is a top plan view of my device inclosed in the box with the covers removed; Fig. 2 is a vertical, longitudinal sectional view showing parts in elevation; Fig. 3 is a detail plan view of the locking and alternating cam piece; and Fig. 4 is a perspective view of the centering arm.

Similar numerals refer to similar parts throughout the several drawings.

The device herewith described is an improvement on the device covered by Letters Patent numbered 1,007,886, issued by the United States Patent Office, November 7, 1911, to this applicant.

One of the objects of this improvement is to simplify the mechanisms described in said former patent, and to provide improved locking means.

In a suitable box adjacent to the switch tongue to be operated, the mechanism is disposed and connected by suitable means with such switch tongue. A solenoidal magnet 4, in a portion of the box, is connected by transmission means with a shunt circuit from the main trolley line. In this solenoidal magnet is provided a plunger 5, having the arm 5^a; which arm 5^a is supported by the bracket 1^a. The exterior end of the arm 5^a is bifurcated producing the arms 6 and 7. The centering arm 9 has on one end the lug 10, and the other end is attached, pivotally by pin 8, between the arms 6 and 7. On the underside of the centering arm 9 are placed guide pieces 11. The coil spring 13 is attached to the eye means 15 and the eye 19 in the arm 7, and rests between the arms 11.

The bracket 12 is so disposed that it supports the cam piece 15 hereinafter described. The cam piece 15 is provided with a V-shaped cam track extending from the point 19 on each side to the curved ends 18. On the rear of the cam piece is a similar V-shaped element 20. A shaft 16 is attached to and extends above the cam piece 15, and the upper part 17 is squared to engage in cap 22. On the head 23 of cap 22 is the arm 24 in which is adjusted the screw arm 25 for attachment to connections with the switch tongue. The collar 12^a is attached to the shaft 16 by pin means 16^a, thereby sustaining the said cam piece on the bracket 12. The end of the upper arm 6 is V shaped at 6^a and adapted to engage operatively with the V shaped element 20. The illustrations show a box with covers, 2 and 3, and while the same is not necessary to the operation of this device, similar construction is deemed desirable. The water proof means on the inner cover 3, for the operation of the shaft, is not claimed as a novelty herein. The returning spring 21 operates in the interior of the solenoidal magnet against the inclosed end of the plunger 5.

The solenoidal magnet being energized, the plunger 5 is drawn inwardly, compressing the spring 21, the point 6^a is drawn away from engagement with the V shaped element 20, and the boss 10 travels on the cam track on the side presented by the position of the cam piece 15, engaging the curved portion 18, and pulls the cam piece into position shown in the dotted lines in Fig. 3, thereby moving the throwing arm 24, and by connection therewith deflects the tongue of the switch. Upon the circuit being cut off from the solenoidal magnet 4, the spring means 21 returns the plunger 5 and its connections to the position shown in solid lines in Figs. 2 and 3, and the point 6^a engages the V shaped element 20, as shown in Fig. 3, holding the cam piece 15 in position and the switch tongue in its place until again actuated. The spiral spring 13, by reason of the engagement of the arms 11, brings to a central position the centering arm 9 when it is released from engagement with the circular ends 18 so that the same is held in position for the next operation of the device, which

will draw in the opposite direction from that in which it was formerly thrown, since the point 19 of the cam track is always on one side of the center of the centering arm 9 when it is not in engagement with the cam tracks.

I am not claiming a switching device primarily and while aware that electromechanical switch devices have been patented, what I do claim is:—

1. In a device of the character described having a solenoidal magnet adapted to be connected with a source of electric current, the combination of a plunger in said solenoidal magnet with spiral spring returning means included in said magnet; an arm attached to said plunger with the exterior end bifurcated forming two arms; an engaging point on the upper arm of last said two arms; a centering arm pivotally attached between the two arms of said plunger arm provided with a boss and extended guides adapted to engage a spiral spring; a V shaped element attached posteriorly to a cam piece adapted to engage operatively said engaging point on said upper arm; and the shaft attached to a cam piece for connection with a switch tongue; all substantially as set forth.

2. In an electro-mechanical switch of the character described, a locking means composed of a V shaped element on the posterior portion of a cam track piece, and a V shaped element attached to a plunger adapted to engage the said posterior V shaped element on said cam track when the said plunger is at rest and not being actuated by any electrical current and adapted to hold said cam track in a stationary position.

ROYAL RUEBEN MILLER.

Witnesses:
W. C. DARBY,
C. M. WALKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."