

L. LARSEN.
ELECTRIC SWITCH.
APPLICATION FILED JAN. 25, 1909.

961,242.

Patented June 14, 1910.

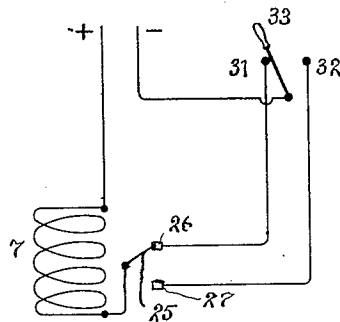


FIG. 4.

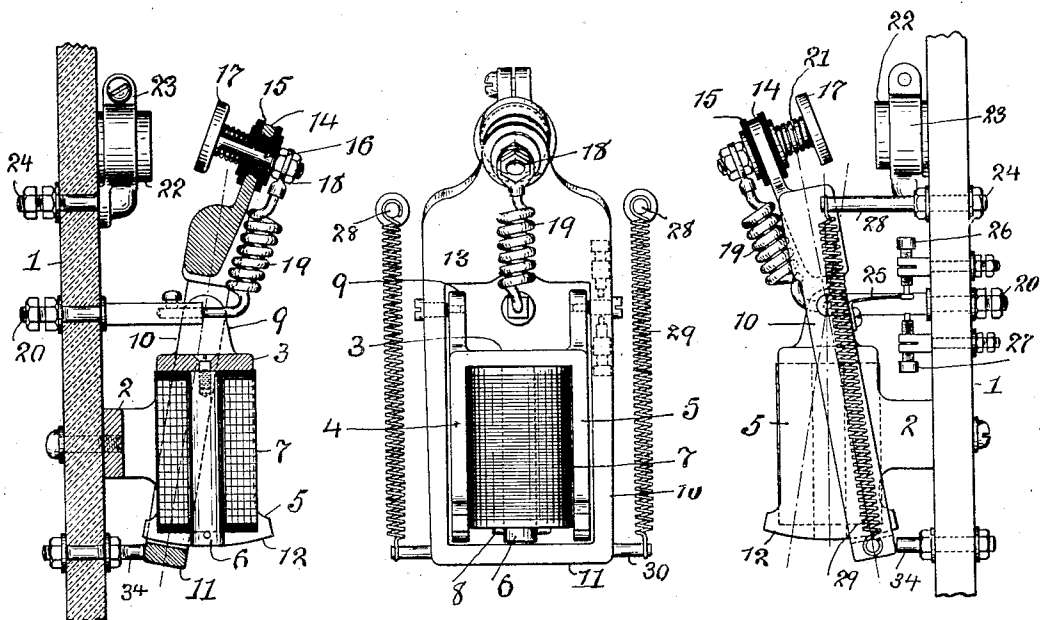


FIG. 1.

FIG. 2.

FIG. 3.

WITNESSES:

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ELECTRIC SWITCH.

961,242.

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To all whom it may concern:

Be it known that I, LOUIS LARSEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Electric Switches, of which the following is a specification.

The invention relates to electrically controlled switches, and consists in the construction whereby a pivoted armature frame and springs acting thereon coact to insure more perfect circuit closing contact at the switch terminals.

In the accompanying drawings—Figure 1 is a vertical section, Fig. 2 a front view, and Fig. 3 an edge view of my switch. Fig. 4 is a diagram showing the electrical connections to the magnet.

Similar numbers of reference indicate like parts.

Upon the base or back plate 1 is secured the bracket 2 of magnetic material which comprises, preferably integrally, a horizontal member 3 and two vertical parallel members 4, 5. Secured to the under side of member 3 and between members 4, 5, is a depending core 6. The magnet coil 7 is received upon said core, and secured in place by the cross pin 8.

Pivoted in upwardly projecting lugs 9 on member 3 is a frame 10 of magnetic material, the lower transverse member 11 of which extends below the curved lower edges 12 of members 4, 5, and forms an armature for the core 6. On the upper transverse member 13 of the frame, which is weighted by being made of larger cross sectional area, is formed an eye 14, in which is disposed a sleeve 15 of insulating material. A rod 16, carrying at one end the metal contact disk 17, passes loosely through said sleeve, and has at its opposite end clamp nuts 18 for the attachment of the circuit conductor 19, which is connected to the binding post 20 which extends through the base 1. A spiral spring 21 on rod 16 normally sets out the contact disk 17, and also serves as a cushion for said disk when the frame 10 is swung to bring said contact disk against the fixed contact block 22. Said fixed contact is held in a suitable collar 23 supported on the binding post 24, which also extends through the base 1.

Secured on the rear side of frame 10 is a leaf spring 25 which may make contact with

one or the other of the adjustable contact pins 26, 27, in accordance as the frame 10 is swung inwardly or outwardly to make or break contact between disk 17 and fixed block 22. On the back plate 1 are two posts 28 from which helical springs 29 extend downwardly and are connected to rods 30 extending from the ends of the lower frame member 11. The circuit to be closed or opened by the apparatus proceeds from binding post 20 by conductor 19 to contact disk 17, and thence to contact block 22 to binding post 24.

The circuit controlling the apparatus (see Fig. 4) proceeds through magnet coil 7 to leaf spring 25. From the pins 26, 27 conductors lead to contact points 31, 32, and circuit continues from either of these points, in accordance with the direction in which the hand switch, indicated at 33, is thrown, to the negative terminal. Assuming the parts to be in the position shown in the drawings, circuit is closed through the magnet 7 and spring 25 by moving the hand switch 33 to make contact at 31, Fig. 4. The magnet then attracting its armature swings the lower member 11 of frame 10 outwardly. The disk 17 is thus moved into contact with block 22, at the same time circuit is broken between spring 25 and pin 26 and closed between said spring and pin 27. The movement of the frame is assisted by the inertia of its weighted portion 13. The function of the helical springs 29 is to hold the frame in either position, for it is obvious that said springs do not pull in a vertical direction, except when the lower frame member 11 is directly beneath the core 6. Hence, when the armature 11 is attracted toward the core, its movement is against the pull of the springs 29 until it passes to the opposite side of the core axis, and then the springs reverse their effect and tend to carry it to the extreme outer portion. Similarly on the inward movement of the armature, the springs operate finally to bring and hold the same in contact with the fixed stop pin 34.

When circuit is closed at contact disk 17 and block 22, the spring 25 makes contact with pin 27. If then, the hand switch 33 be moved into contact with point 32, the magnet will be again energized, and by attracting the armature will operate to open the circuit. It will thus be seen that the construction is such, that the throwing of

the hand switch 33 in either direction closes circuit through the magnet coil, and that hence, said coil actuates its armature to move the contact disk 17 not only toward, 5 but also away from the block 22.

I claim:

1. The combination of a base, an electro-magnet, a pivoted frame surrounding said magnet, having a member of inductive material constructed to swing below and across 10 the pole of said magnet, a contact carried by said frame above said pivot, a fixed contact on said base, and a spring secured to said frame and to said base and operating 15 to hold said contacts in circuit closing juxtaposition.

2. The combination of a base, an electro-

magnet, a pivoted frame surrounding said magnet, having on opposite sides of its pivot a member of inductive material constructed 20 to swing below and across the pole of said magnet and a weighted portion, a contact carried by said frame above said pivot, a fixed contact on said base, and a spring secured to said frame and to said base and 25 operating to hold said contacts in circuit closing juxtaposition.

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

LOUIS LARSEN.

Witnesses:

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