Dec. 2, 1924. 1,517,638

L. KELLNER

ELECTRIC SWITCH

Filed April 6, 1922 2 Sheets-Sheet 1

Fig.1.

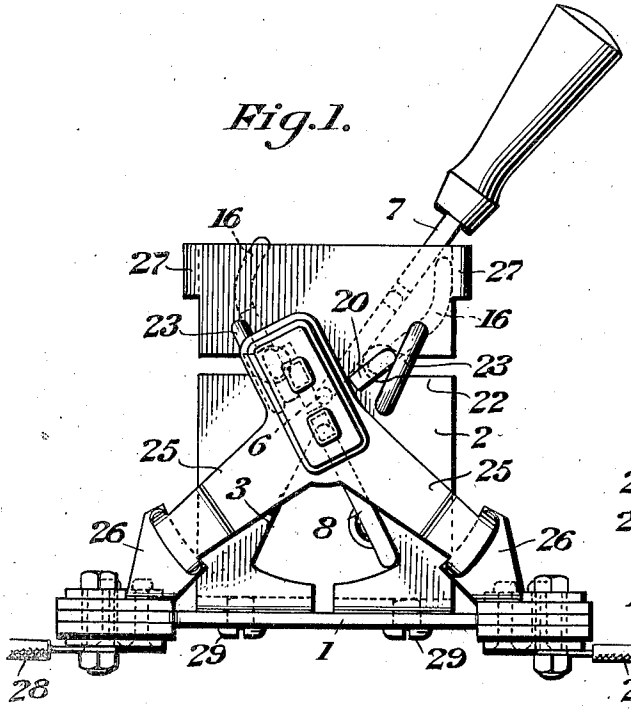


Fig.2.

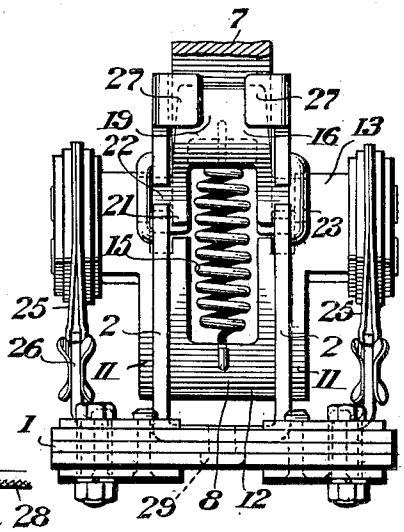
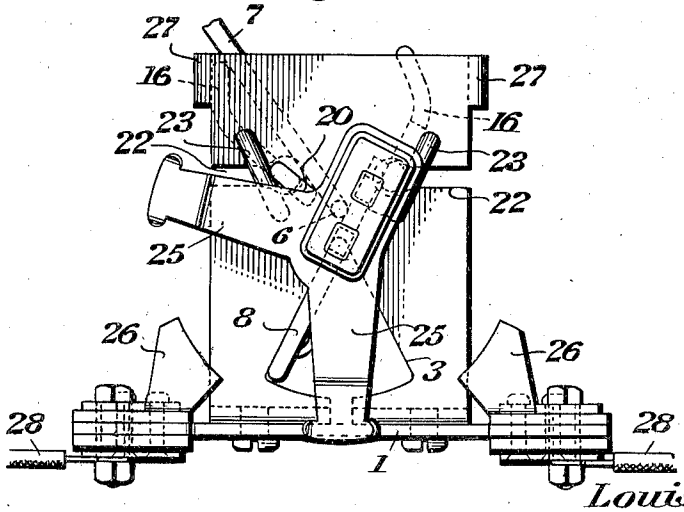


Fig.3.



Inventor

Louis Kellner

By Daniels Davis

his Attorneys

Dec. 2, 1924. 1,517,638

L. KELLNER

ELECTRIC SWITCH

Filed April 6, 1922 2 Sheets-Sheet 2

Fig.4.

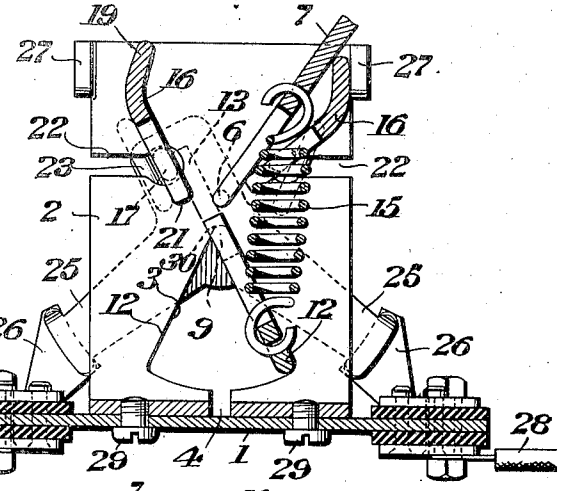


Fig.7.

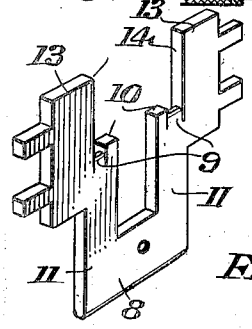


Fig.5.

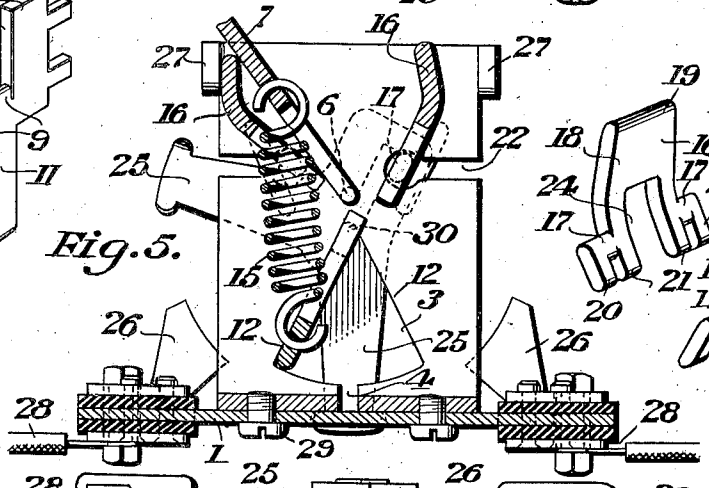


Fig.8.

Fig.9.

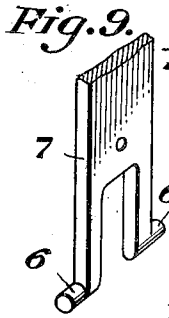


Fig.6.

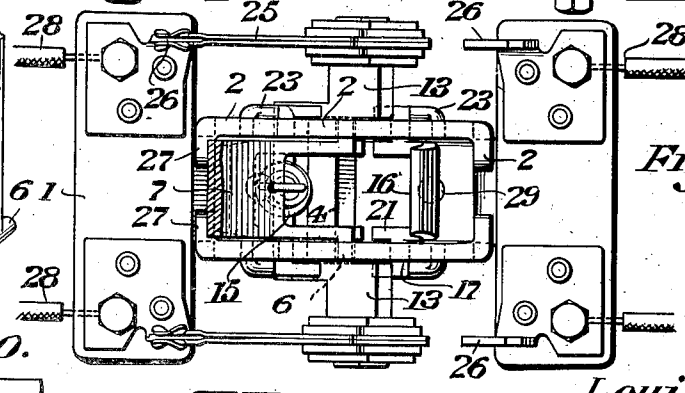


Fig.10.

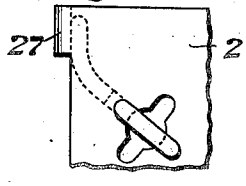
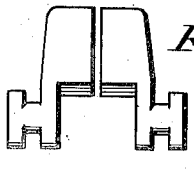


Fig.11.



Inventor

Louis Kellner

By Davis Davis

his Attorneys

Patented Dec. 2, 1924. 1,517,638

UNITED STATES PATENT OFFICE.

LOUIS KELLNER, OF BROOKLYN, NEW YORK.

ELECTRIC SWITCH.

Application filed April 6, 1922. Serial No. 550,090.

To all whom it may concern:

Be it known that I, LOUIS KELLNER, a citizen of the United States, and a resident of the borough of Brooklyn, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to improvements in manually operable electric switches, and particularly to switches of the quick make and quick break type, the object of the invention being to provide a construction which is efficient in action and economical to manufacture.

In the drawings, Fig. 1 is a side elevation of the switch showing the circuit closed;

Fig. 2 a front elevation of the switch as shown in Fig. 1;

Fig. 3 a side elevation of the switch showing the circuit open;

Fig. 4 a vertical longitudinal sectional view of the switch, the circuit being closed;

Fig. 5 a similar view, the circuit being open;

Fig. 6 a plan view of the switch with the parts as shown in Fig. 5;

Fig. 7 a perspective view of the main switch plate;

Fig. 8 a perspective view of the two kick-off levers;

Fig. 9 a perspective view of the lower end of the switch lever;

Fig. 10 a partial side elevation showing a modified form of mounting for the kick-off levers; and

Fig. 11 a front elevation of the two-piece kick-off levers.

Referring to the various parts by numerals, 1 designates the base plate, said plate being preferably H-shape in plan view. Secured to the central portion or cross bar of the base plate is a pair of vertical parallel standards 2. As shown in the drawings these standards are secured to the base plate by screws 29, but it will be understood that they may be formed integral with the base plate and extend upwardly from the opposite parallel edges of the cross bar thereof. In each standard is formed a triangular aperture 3, the side walls of said aperture inclining outwardly and downwardly, and the lower wall of said aperture being curved.

In the lower end of each standard is formed a slot 4 which extends into the aperture 3, said slots being open at their lower ends. The purpose of these slots is to permit the main switch plate to be passed upwardly into the aperture 3 when assembling the parts, as will hereinafter be more fully described. The upper contracted ends of the apertures 3 forms bearings for the switch plate, said plate rocking on said bearings and swinging back and forth in the apertures 3. Directly above the apertures 3 the standards are each formed with the bearing aperture 5 adapted to receive the outward-turned bearings 6 of the switch lever 7, said lever being mounted between the standards and extending upwardly from its bearing points. The upper end of the switch lever is provided with any suitable form of operating handle.

The main switch plate 8 is formed at its upper end with bearing portions 9 adapted to fit in the bearing portions 30 of the apertures 3. Upwardly extending lugs 10 engage the inner surfaces of the standards 2 and hold the switch plate against lateral movement through the apertures. The side portions 11 of the switch plate fit or extend into the apertures 3 and are adapted to engage the inclined walls 12 of said apertures, said walls forming stops to limit the swinging movement of the switch plate. The switch plate is also formed with the upwardly projecting portions 13, said portions lying outside of the standards and carrying the contact arms. The inner edges 14 of the extensions 13 lie close to the outer sides of the standards 2. The switch lever 7 is connected to the lower end of the main switch plate by a coil spring 15, said spring extending from a point below the bearings of the switch plate to a point above the bearings of the lever. The lower end of the lever and the upper part of the switch plate are cut away centrally to permit the spring to swing inwardly across the bearing points of said parts; and the bearing point of the lever is vertically in line with the bearing point of the switch plate and said two bearing points are located close together. It is manifest that as the operating lever is swung from one side to the other and the spring is carried over the bearing points, the switch plate will be snapped from one side of the apertures 3 to the other side thereof. It is also clear that the inclined

side edges of the apertures 3 will serve as rigid stops to limit the swinging movement of the switch plate.

Mounted between the standards on each side of the switch lever and above the bearings of the switch plate 8, is a kick-off lever 16. Each kick-off lever is formed with a pair of bearings 17 located on opposite edges of the central body portion 18. The central body portion of each lever lies between the standards and extends upwardly from the bearing portions; and the upper end of this body portion is curved upwardly and inwardly, as at 19. Each kick-off lever is formed with two pairs of lugs 20 and 21 which extend downwardly below the bearing portions 17. The lugs 21 fit close to the inner surfaces of the standards 2, while the lugs 20 fit close to the outer sides thereof. The lugs 20 are so located that they are adapted to be engaged by the upwardly extending portions 13 of the switch plate as said plate is swung from side to side in operating the switch. The kick-off levers are so arranged that when the switch plate is in engagement with one of the stop walls 12 of the apertures 3 the upper portion 13 thereof above the bearings 9 will be in engagement with lugs 20 of one of the kick-off levers and the operating lever will be in engagement with the upper end of the other kick-off lever. The kick-off levers may be pivoted in the standards in any suitable way. As shown in the drawings the standards are formed with inwardly extending slots 22, said slots being enlarged at their inner ends to receive the bearings and to permit the kick-off levers to have a limited rotating movement. To retain the levers in their proper position within the slots, cross pieces or abutments 23 are connected to the standards and extend across the slots. It is manifest, however, that these kick-off levers may be mounted in the standards in any suitable manner. Each kick-off lever is cut out at its central lower portion, as at 24, so as not to interfere with the lateral swinging of the spring 15.

The portions 13 of the switch plate are provided with outwardly extending lugs to which the contact arms 25 are secured in any suitable manner. These contact arms 25 are adapted to engage contact plates 26 carried by the base. To the contact plates 26 the circuit wires 28 are connected. As illustrated in the drawings the switch is provided with two sets of contact arms 25 and two sets of contact plates 26 to adapt the switch for use as a double-pole switch. It is manifest however that the switch may be adapted for use as a single-pole switch.

The upper ends of the standards are provided with inwardly extending lugs 27 against which the upper ends of the kick-off levers are adapted to engage, said lugs forming stops to receive the thrust of the switch lever and to limit the movement thereof.

As shown in Figs. 1 and 4 the switch is in its "on" position with the circuit closed. To move the switch to its open position, as shown in Figs. 3 and 5, the lever 7 is moved over toward the left hand, thereby swinging the spring 15 across the pivots or bearings of the switch lever and the switch plate. When the lever is brought into engagement with the upper end of the kick-off lever the said lever is swung on its bearings and its lugs 20 will force the upper end of the switch plate inwardly toward the right hand. This will throw the lower end of the switch plate toward the left hand sufficiently to bring the lower end of the spring across the dead center of the bearings 6 and 9 of the switch lever and switch plate, with the result that the switch plate will be snapped quickly from its "on" position to its "off" position, shown in Figs. 3 and 5. The kick-off lever will be manually moved through the movement of the switch lever; and the movement of the kick-off lever will result in a slight movement of the switch arms, but said movement will not be sufficient to disconnect the switch arms from the contact plates 26 and the circuit will not be broken until the spring 15 snaps the switch plate to its "off" position. The kick-off lever will swing outwardly at its upper end until it engages the stop lugs 27, said lugs taking the thrust and limiting the outward swinging movement of the kick-off lever and switch lever.

Each of the kick-off levers, as shown in Figs. 1 to 9 of the drawings, is formed of a single piece. It is obvious however that they may be made in two pieces and connected to the standards by means of key-hole slots, as illustrated in Figs. 10 and 11.

What I claim is:—

1. An electric switch comprising a support, a switch plate pivoted in said support and swinging in an aperture therein the walls of said aperture forming rigid stops for the switch plate in its "on" and "off" positions, a switch lever pivoted in said support adjacent the pivot of the switch plate, the switch plate and lever extending in opposite directions from their pivots, a coil spring connecting the switch plate to the lever and arranged to pass across the pivotal points of said two parts, and contact arms carried by the switch plate.

2. An electric switch comprising a support, a switch plate pivoted therein, a switch lever pivoted in said support adjacent the pivot of the switch plate the switch plate and the lever extending in opposite directions from their pivots, a coil spring connecting the switch plate to the said lever and arranged to pass across the pivotal points of the said two parts, a pair of kick-

off levers pivoted in the support at opposite sides of the switch lever, said kick-off levers being adapted to be engaged on one side of their pivots by the switch plate and adapted to be engaged on the other side of their pivots by the switch lever, and contact arms carried by the switch plate.

3. An electric switch comprising a support, a switch plate pivoted therein, a switch lever pivoted in said support adjacent the pivot of the switch plate the switch plate and the lever extending in opposite directions from their pivots, a coil spring connecting the switch plate to the said lever and arranged to pass across the pivotal points of said two parts, rigid stops for the switch plate in its "on" and "off" positions, contact arms carried by the switch plate, and a pair of kick-off levers pivoted in the support and adapted to be engaged by the switch plate on the opposite side of the pivot of said plate from the spring connection and adapted to be engaged and moved by the switch lever to swing the switch plate on its pivot.

4. An electric switch comprising a pair of parallel supports formed with coincident triangular apertures, a switch plate mounted in said supports the contracted ends of said apertures forming bearings for said switch plate and the diverging walls of said apertures forming rigid stops for said plate, a switch lever pivoted in said supports adjacent the bearings of the switch plate, a coil spring connected to the switch plate and to the lever and arranged to pass across the pivotal points of said two parts said spring holding the switch plate pressed against its bearings, and contact arms carried by the switch plate.

5. An electric switch comprising a pair of parallel supports formed with coincident triangular apertures, a switch plate mounted in said supports the contracted ends of said apertures forming bearings for said switch plate and the diverging walls of said apertures forming rigid stops for said plate, a switch lever pivoted in said supports adjacent the bearings of the switch plate, a coil spring connected to the switch plate and to the lever and arranged to pass across the pivotal points of said two parts said spring holding the switch plate pressed against its bearings, contact arms carried by the switch plate, and a kick-off lever on each side of the switch lever and pivoted in the support and cooperating with the switch lever to swing the switch plate on its bearings.

6. An electric switch comprising a pair of parallel supports formed with coincident triangular apertures, a switch plate mounted in said supports the contracted ends of said apertures forming bearings for said switch plate and the diverging walls of said apertures forming rigid stops for said plate, a switch lever pivoted in said supports adjacent the bearings of the switch plate, a coil spring connected to the switch plate and to the lever and arranged to pass across the pivotal points of said two parts said spring holding the switch plate pressed against its bearings, contact arms carried by the switch plate, a kick off lever on each side of the switch lever and pivoted in the support and cooperating with the switch lever to swing the switch plate on its bearings, and a rigid stop for each of the kick-off levers.

7. An electric switch comprising a pair of parallel supports formed with coincident triangular apertures, a switch plate mounted in said supports the contracted ends of said apertures forming bearings for said switch plate and the diverging walls of said apertures forming rigid stops for said plate, a pair of lugs formed on the switch plate between the supports and adjacent the bearing portions of the switch plate and adapted to engage the supports to prevent lateral movement of the switch plate on its bearings, a switch lever pivoted in said supports adjacent the bearings of the switch plate, a coil spring connected to the switch plate and to the lever and arranged to pass across the pivotal points of said two parts said spring holding the switch plate pressed against its bearings, and contact arms carried by the switch plate.

8. An electric switch comprising a vertical support, a switch plate pivoted in said support and extending downwardly from its pivotal point, a switch lever pivoted in said support directly above the pivot of the switch plate and extending upwardly from its pivot, a coil spring connected to the switch plate below its pivot and connected to the switch lever above its pivot and arranged to pass across the pivotal points of said two parts, a kick-off lever on each side of the switch lever and pivoted in the support above the pivot of the switch plate, the upper ends of said kick-off levers being adapted to be engaged by the switch lever, upwardly extended projections formed on the switch plate and adapted to engage the kick-off levers below their pivots, and contact arms carried by the switch plate.

In testimony whereof I hereunto affix my signature.

LOUIS KELLNER.