(No Model.)

E. R. KNOWLES.

ELECTRIC SWITCH OR CUT-OUT.

No. 396,880. Patented Jan. 29, 1889.

Fig. 1.

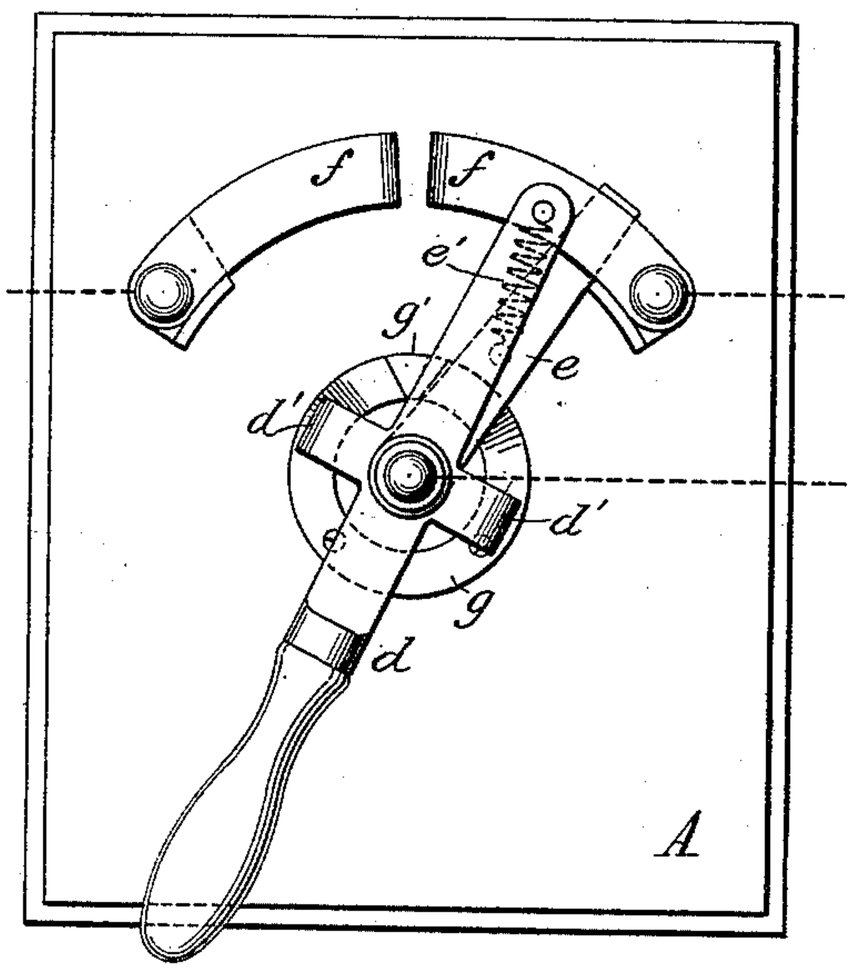


Fig. 2.

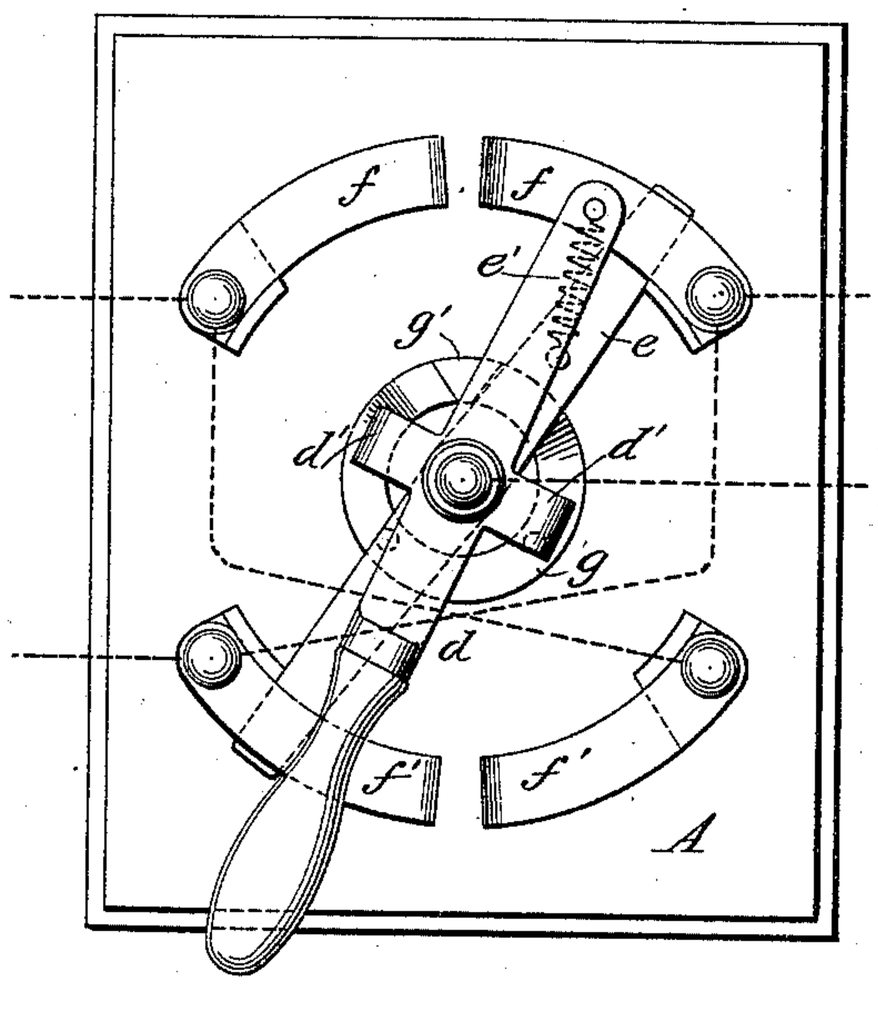


Fig. 3.

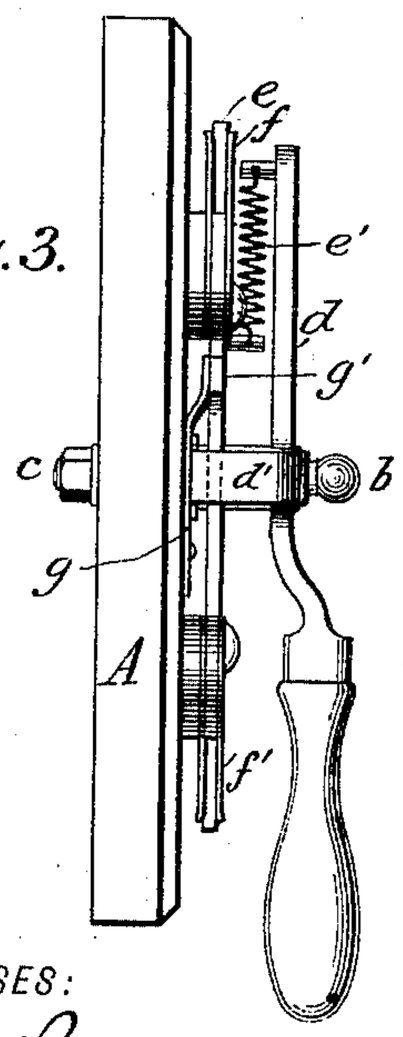
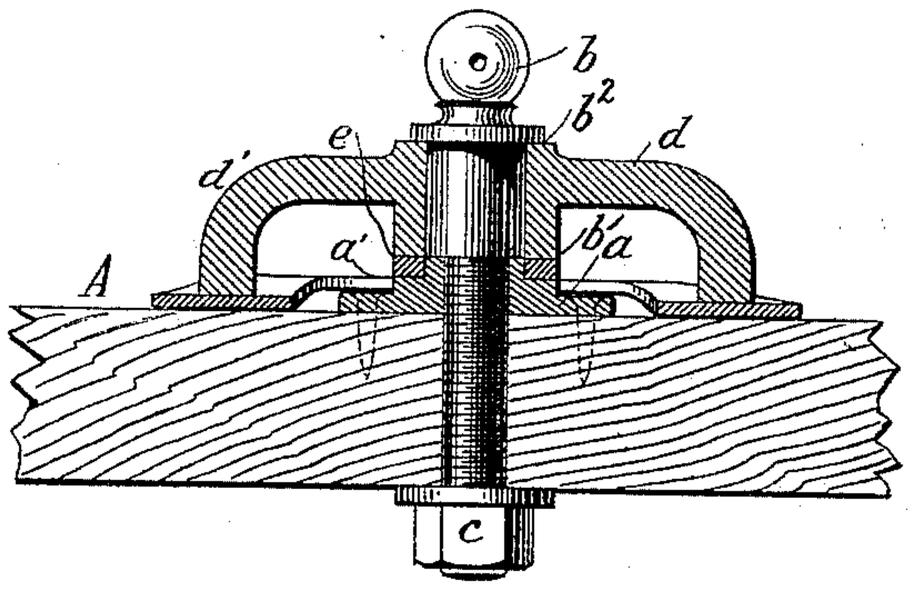


Fig. 4.



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ELECTRIC SWITCH OR CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 396,880, dated January 29, 1889.

Application filed September 14, 1888. Serial No. 285,389. (No model.)

To all whom it may concern:

Be it known that I, EDWARD R. KNOWLES, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Switches or Cut-Outs, of which the following is a specification.

The invention has reference to electric switches or cut-outs of that particular class in which the make and break of the circuit is accomplished by a quick movement to prevent injurious sparking. This general form of switch being well known in the art, I do not claim it broadly, but confine myself to my specific construction and its substantial equivalents.

Referring to the drawings, Figures 1 and 2 represent views in elevation of single and double pole-switches, respectively. Fig. 3 represents a side view of the double pole-switch, and Fig. 4 represents a section through the center post.

An important feature of this invention is that it provides a switch of small comparative cost, and to explain this the details of the manner of forming and putting the parts together will be explained.

To the base A is secured, by screws or otherwise, a nut, *a*, having an annular shoulder, *a'*. A central pin or post, *b*, having two shoulders, *b' b²*, at its upper end, and a threaded shank passes down through the nut and the base until the limiting-shoulder *b'* rests upon the extended portion of the nut. The operating-lever *d* is located between the flange *b²* and the nut, while the circuit-controlling arm *e* is placed between the operating-lever and the nut. The operating-lever thus swings upon the post *b*, while the circuit-controlling arm turns upon the extended portion of the nut. Both parts, therefore, may move independently of each other, while the construction is such that binding is impossible. The post is held in position by a clamping-nut, *c*, which also binds the line-wire. By this construction I am also enabled to tighten up the bearing to compensate for wear. The knob with hole is for the purpose of inserting a pin with which to turn the screw.

The operating-lever is represented by *d*. It is loosely mounted upon the shaft, and has formed upon it two lateral and downwardly-extending arms, *d' d'*, which radiate from the center upon each side of the arm.

e represents the circuit-controlling arm. It is also loose upon its bearing, but is connected with the operating-arm *d* by a spring, *e'*. The spring is connected with the upper end of the lever *d* and at any suitable point between the extremities of the arm *e*.

The terminal contacts are represented by *f f* and *f' f'*. I prefer to make each of the contacts in the form of springs bearing toward each other and the circuit-controlling arm, similar to a knife-blade.

The means which I have provided for locking the circuit-controlling arm in either of its positions is a spring, *g*, of circular form, secured to the base concentrically with the pivot of the operating-lever. One side of the spring is bent upward, as shown, and at the center of its highest portion a lug or catch, *g'*, is attached. The circuit-controlling arm, when in either of its normal positions, is on one side or the other of this catch, and its position cannot be changed until the spring is pressed downward to remove the catch from the path of the arm. This is accomplished by the lateral extensions on the operating-lever, which ride upon the spring and press the raised portion downward, thus carrying the catch below the plane of the circuit-controlling arm.

The circuits are simple and easily followed on reference to the drawings.

The operation of the switch is obvious. Supposing the circuit-controlling arm to be locked upon either side of the catch *g'*, to reverse the switch the lever is moved in the proper direction to expand the spring *e*. At the same time one of the lateral extensions *d'* approaches the elevated portion of spring *g*. The motions are regulated so that the circuit-controlling arm will be released when the proper tension has been put upon spring *e'*. The arm then snaps over and changes the circuit.

It will thus be seen that I have provided a switch that is economically manufactured, inasmuch as its principal parts may be stamped out and bent into shape. The switch is also very efficient.

Having now described my invention, I claim—

1. The manually-operated lever and the cir-

cuit-controlling bar pivoted loosely, a circular spring-plate placed concentrically with the pivot of the operating-lever, a pair of lugs attached to the operating-lever, arranged to ride upon said spring-plate, and a latch secured to the spring-plate for the circuit-controlling bar.

2. The manually-operated lever and the circuit-controlling bar pivoted loosely and connected by a spring, a circular spring-plate placed concentrically with the pivot of the operated lever, a pair of lugs attached to the operating-lever, arranged to ride upon said spring-plate, and a latch secured to the spring-plate for the circuit-controlling bar.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDWARD R. KNOWLES.

Witnesses:
WM. A. ROSENBAUM,
FRANK C. GRUER.