

(No Model.)

S. BERGMANN & J. T. DEMPSTER.

ELECTRICAL SWITCH.

No. 376,976.

Patented Jan. 24, 1888.

FIG. 1.

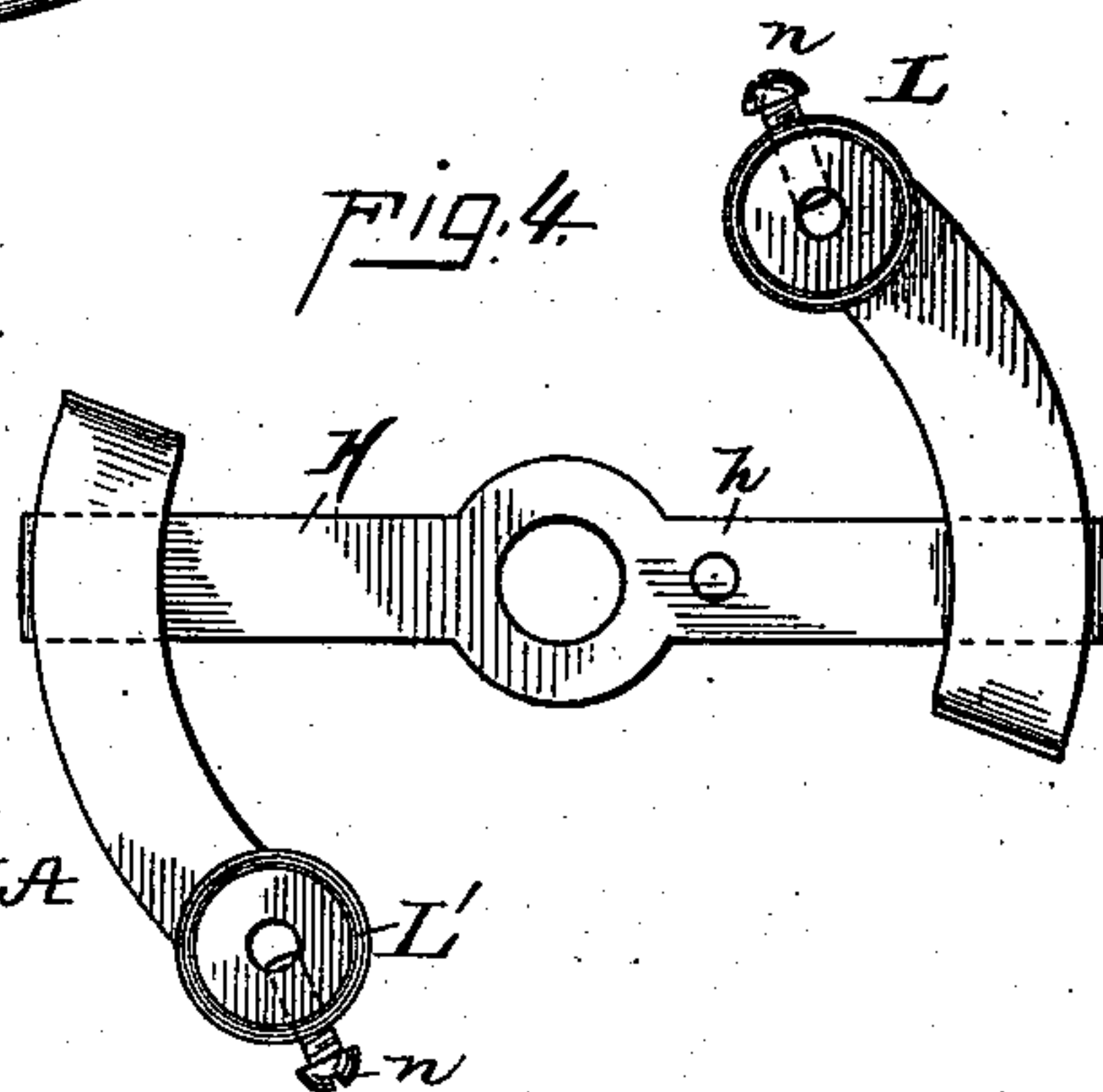
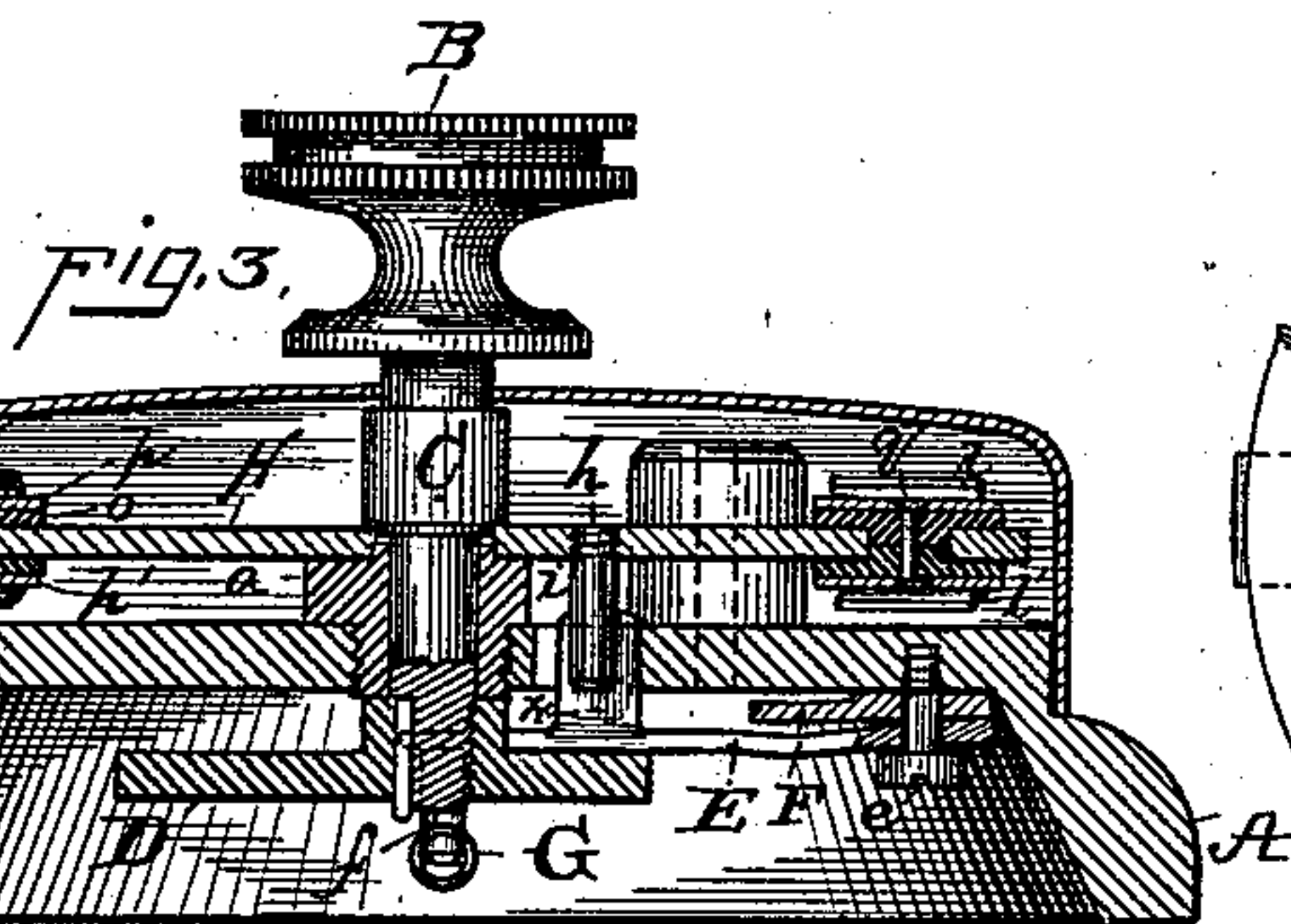
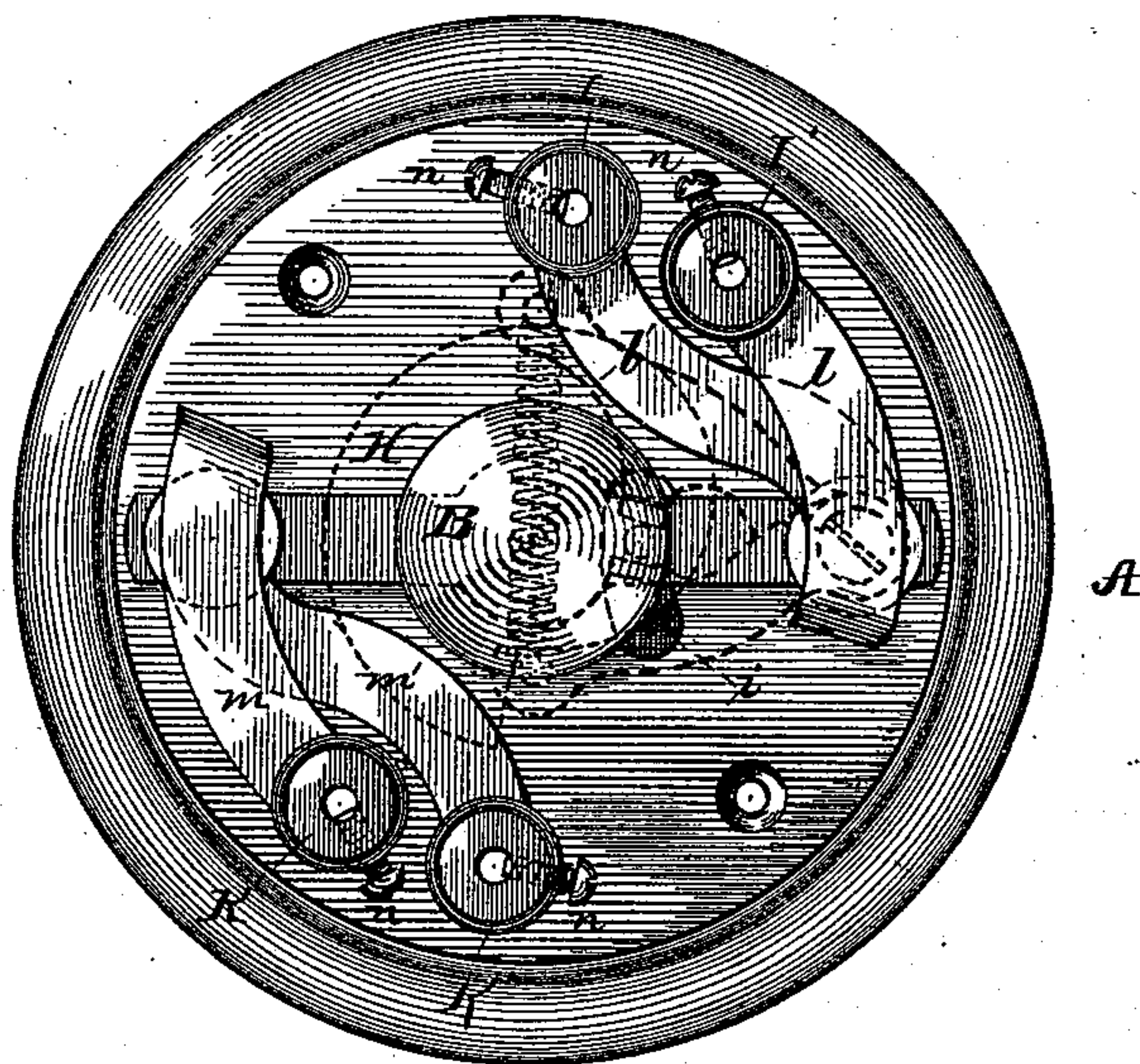
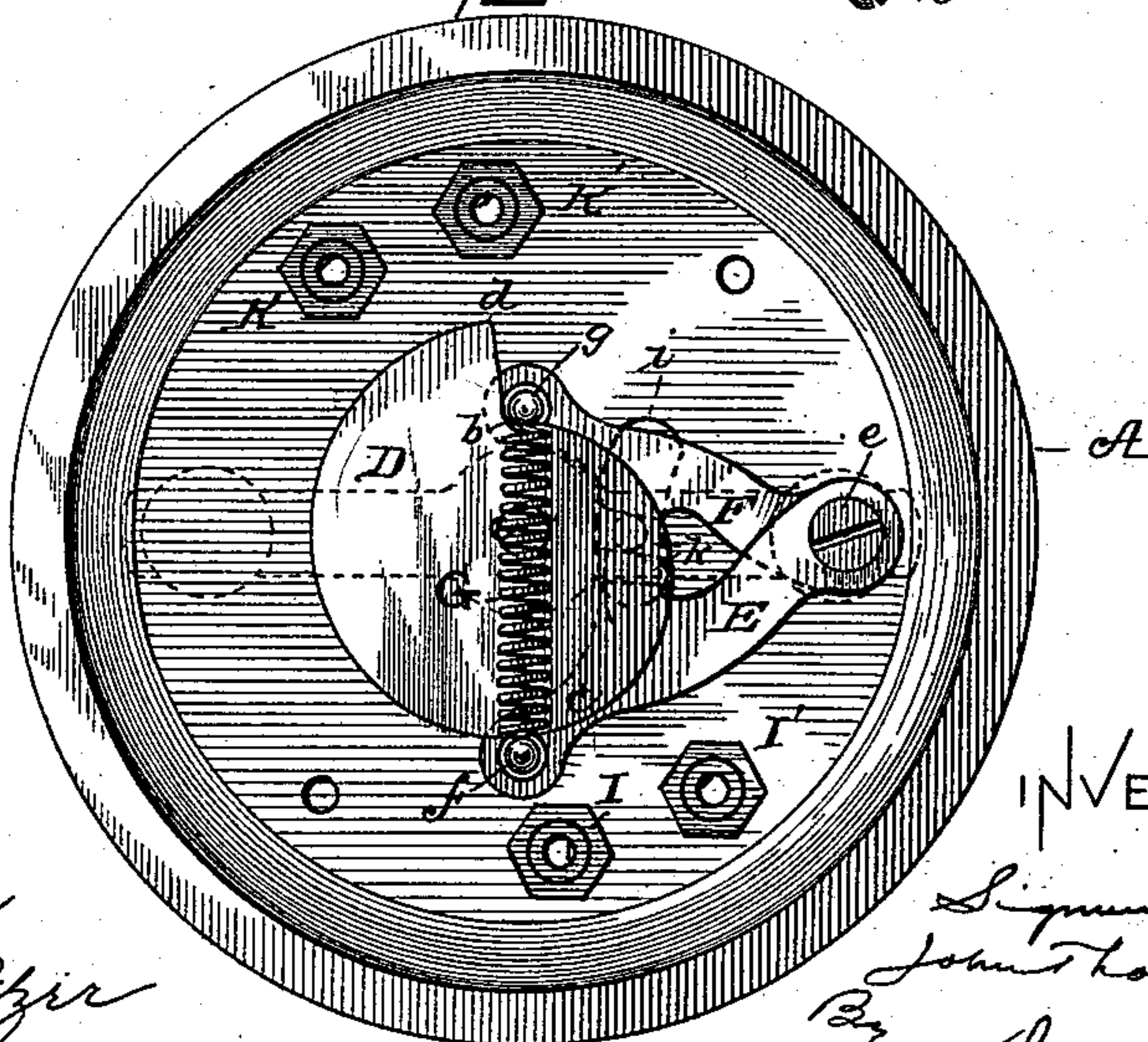


FIG. 2.



ATTEST:  
*Ed. Rowland*  
*William Pryor*

INVENTORS:  
*Sigmund Bergmann*  
*John T. Dempster*  
*By* *Wm. L. Lee*  
*attorney*



# UNITED STATES PATENT OFFICE.

SIGMUND BERGMANN, OF NEW YORK, N. Y., AND JOHN THOS. DEMPSTER, OF SUMMIT, NEW JERSEY, ASSIGNORS TO BERGMANN & COMPANY, OF NEW YORK, N. Y.

## ELECTRICAL SWITCH.

SPECIFICATION forming part of Letters Patent No. 376,976, dated January 24, 1888.

Application filed May 27, 1887. Serial No. 239,521. (No model.)

*To all whom it may concern:*

Be it known that we, SIGMUND BERGMANN, of New York city, in the county and State of New York, and JOHN THOMAS DEMPSTER, of Summit, in the county of Union and State of New Jersey, have jointly invented a certain new and useful Improvement in Electrical Switches, of which the following is a specification.

10 The object we have in view is to produce a simple, compact, and durable movement for "snap-switches" for making and breaking electric circuits, and especially circuits employing heavy currents, such as those for operating electric lamps or motors.

15 In switches of this character, in order to make and break the circuit with rapidity and certainty, and thereby prevent the formation of an arc at the contacts, a spring-movement is provided, so connected with the moving contact-piece and with an operating-handle that the turning of the handle does not directly move the contact-piece, but acts to store up power in the spring, which is released by the continued movement of the handle and throws the contact-piece independent of the handle and with a rapid and certain movement. This broad subject-matter we do not claim.

20 Our invention, however, relates to a switch of this character; and it consists in the peculiar mechanism employed by us for producing the snap action of the switch, in the combination therewith of the elements of the switch, and in certain details of construction of the switch and its parts, all as more fully herein-  
30 after explained, and pointed out by the claims.

35 In the accompanying drawings, forming a part hereof, Figure 1 is a top view of a double-pole switch embodying our invention, with the cover removed and with the parts under the base shown in dotted lines; Fig. 2, a bottom view of the same switch; Fig. 3, a vertical section of the same switch, and Fig. 4 a view of the contacts and moving contact-piece of a single-pole switch.

40 A is a base of suitable insulating material, one that is incombustible being preferred. This base is preferably circular in form, and is hollowed out on its under side to inclose the parts of the movement.

50 B is the operating-handle, mounted upon a

spindle, C, which passes centrally through the top of the base and is perpendicular thereto. A metal bushing, *a*, surrounds the spindle 55 where it passes through the base, and forms a bearing for the easy working of the spindle. On the end of the spindle, beneath the top of the base, is secured a cam, D, which is formed of a plate and is constructed with an eccentric 60 rise from a point, *b*, to an opposite point, *c*, and from the point *c* the cam is concentric with the spindle to the point *d*, where there is a direct radial drop in the cam connecting the high point *d* of the cam with the lowest point, 65 *b*. Two arms, E F, are pivoted by the screw *e* to the under side of the base near its edge and project toward the cam D, pins *f g* on the inner ends of the arms resting normally against the cam at the opposite points *b c*. These pins 70 *f g* are connected by a spiral spring, G, which is strained slightly and holds the pins normally against the cam.

Above the base there is mounted upon the bushing *a*, so as to turn freely thereon, a cross- 75 bar, H. This bar has a pin, *h*, projecting from it downwardly into a curved slot, *i*, in the top of the base. The arms E F have fingers *k*, which project upwardly into the slot *i* on opposite sides of the pin *h*, and normally embrace 80 the pin. The cross-bar H is the moving contact-piece of the switch, or carries the moving contact-pieces, as will be presently explained. The function of the parts that have been described is to throw this cross-bar first in one 85 direction and then in the other.

With the parts in the position shown in Fig. 2, the pin *f* of arm E rests at the point *c* of the cam D at the top of the rise on the cam, while the pin *g* of arm F rests at the lowest 90 point, *b*, of the cam. Now, the handle and cam being turned, the inner end of the arm F will be forced outwardly by the rise of the cam, while the arm E will remain stationary, its pin working on the concentric portion of the 95 cam. The effect of this movement is to put the spring G under tension by spreading the pins *f g* apart. At the same time the finger *k* on the arm F will move away from the pin *h* on the cross-bar H. The movement being con- 100 tinued, the finger on arm F will reach the end of the slot *i* at the same time the point *d* of the cam will pass under the pin *f* on the arm E. The spring G, being at its greatest tension, will



draw the pin *f* and the inner end of the arm *E* inwardly with great rapidity, bringing the pin *f* to the lowest point, *b*, of the cam. The finger *k* on the arm *E* bearing on the pin *h* of the cross-bar *H*, such cross-bar will be thrown with rapidity, under the full power of the spring *G*, in one direction. Now, if the handle is turned farther, the arm *F* will remain stationary, while the arm *E* will be moved by the rise of the cam, again straining the spring, and when the pin *g* of the arm *F* is passed by the point *d* of the cam the cross-bar *H* will be thrown in the opposite direction with the same rapidity and force.

For the contacts of a double-pole switch four posts, *I I'* and *K K'*, are mounted on the base at opposite sides. From these posts spring contact-plates *l l'* and *m m'* project around the edge of the base in opposite directions. The plates *l l'* are parallel at their free ends, and are placed one above the other, and this is also true of the plates *m m'*. The posts *I I' K K'* pass through the top of the base. They are hollow, so that circuit-wires can be run up into them from the underside of the base, and they have screws *n* above the base for securing the circuit-wires. One side of the circuit will be broken at the posts *I I'* and the other side at the posts *K K'*, so that by simultaneously bridging the springs *l l'* and *m m'* the two sides or poles of the circuit will be closed. To do this without forming a cross or short circuit, the cross-bar *H* is perforated at each end and has two buttons, *o o'*, of insulating material, which are placed on opposite sides of the bar and meet in the perforation. Two disks or plates, *p p'*, of copper, are placed on the buttons *o o'* and are connected by a copper rivet, *q*, which passes through the buttons. The buttons insulate the plates *p p'*, as well as the rivet *q*, from the cross-bar. The cross-bar has a similar set of connected contact-plates at the other end.

When the handle is turned to throw the ends of the cross-bar between the pairs of stationary contact-plates *l l' m m'*, they will be bridged by the plates *p p'* and rivets *q* on the ends of the cross-bar, and the circuit will be closed. When the cross-bar is thrown in the opposite direction, it will leave the plates *l l'* and *m m'* and will break the circuit.

For a single-pole switch, Fig. 4, only two posts, *L L'*, will be used. These will be on opposite sides of the base, and the cross-bar *H* will make metallic contact with springs from these posts. The circuit when completed will pass from one post to the other through the cross-bar.

What we claim is—

1. In an electrical switch, the combination of a moving contact-piece, arms throwing such contact-piece in opposite directions, a cam spreading such arms apart and constructed with a drop to release such arms alternately, and a spring forcing said arms together, substantially as set forth.

2. In an electrical switch, the combination,

with a moving contact-piece and an operating-handle, of a cam turned by such handle and constructed with a rise, a concentric portion and a direct drop, two arms forced upon opposite sides of the cam by a spring, and connections from such arms to the moving contact-piece, substantially as set forth.

3. In an electrical switch, the combination, with a moving contact-piece and an operating-handle, of two pivoted arms connected with and moving the contact-piece in opposite directions, a cam turned by the handle and located between such pivoted arms and constructed with a drop to release such arms alternately, a spring connecting the arms and drawing them together upon the cam, and connections from such arms to the moving contact-piece, substantially as set forth.

4. In an electrical switch, the combination, with a base, of a moving contact-piece and an operating-handle located above the base, a cam beneath the base turned by such handle, two pivoted arms beneath the base embracing the cam and forced thereon by spring-pressure, a slot in the base, and fingers from the pivoted arms extending into said slot and embracing the contact-piece or a pin therefrom, substantially as set forth.

5. In an electrical switch, the combination, with the base, of a stationary bushing therein, the operating-spindle turning through such bushing, the moving contact-piece turning upon the bushing independent of the spindle, a cam turned by the spindle, pivoted arms embracing the cam and forced thereon by spring-pressure, and connections from the arms to the moving contact-piece, substantially as set forth.

6. In an electrical switch, the combination, with the base, of the moving contact-piece, the operating-spindle, the cam constructed with a rise, a concentric portion, and a direct drop, the pivoted arms embracing the cam, a spring drawing the arms together upon the cam, a pin on the contact-piece projecting into a slot in the base, and fingers on the pivoted arms embracing such pin, the parts being constructed and arranged to operate substantially as set forth.

7. In an electrical switch, the combination, with the swinging metallic cross-bar having perforated ends, of two sets of stationary contact-springs, one set being in the path of movement of each end of the bar, insulating-buttons on the ends of the bar, contact-plates on such buttons, and a rivet connecting the opposite contact-plates at each end of the bar through the insulating-buttons and the perforation in the cross-bar, substantially as set forth.

This specification signed and witnessed this 20th day of May, 1887.

SIGMUND BERGMANN.

JOHN THOS. DEMPSTER.

Witnesses:

P. H. KLEIN, Jr.,

JNO. F. GEIDEL.