

No. 846,673.

PATENTED MAR. 12, 1907.

A. KOESCHE.
ELECTRIC SWITCH.
APPLICATION FILED DEC. 26, 1906.

Fig. 1.

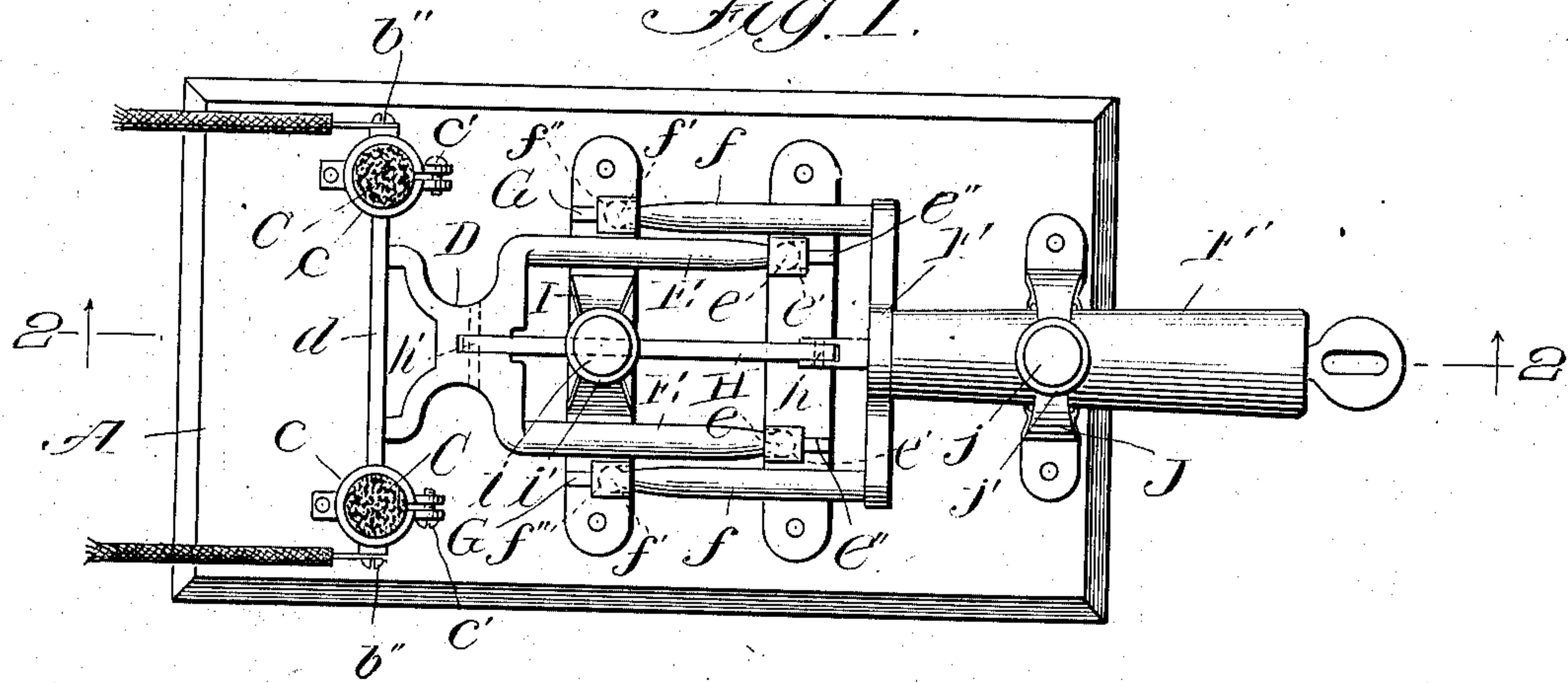


Fig. 2.

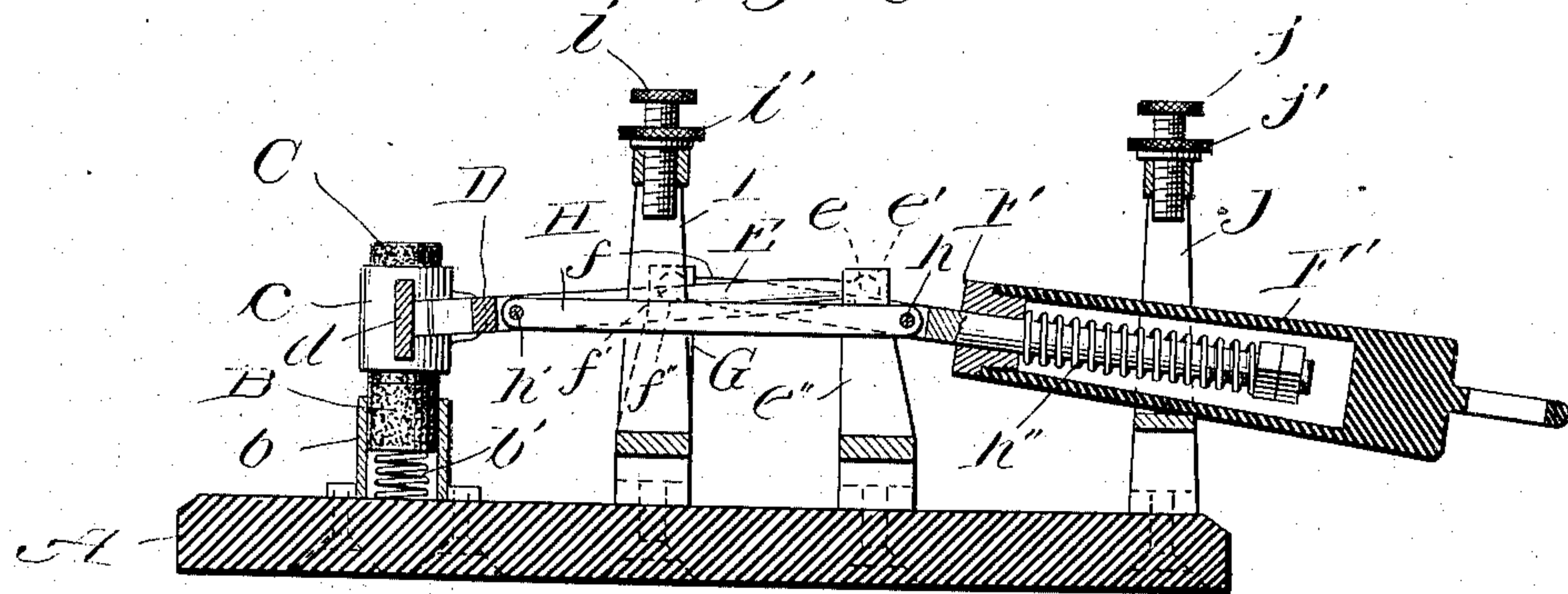


Fig. 3.

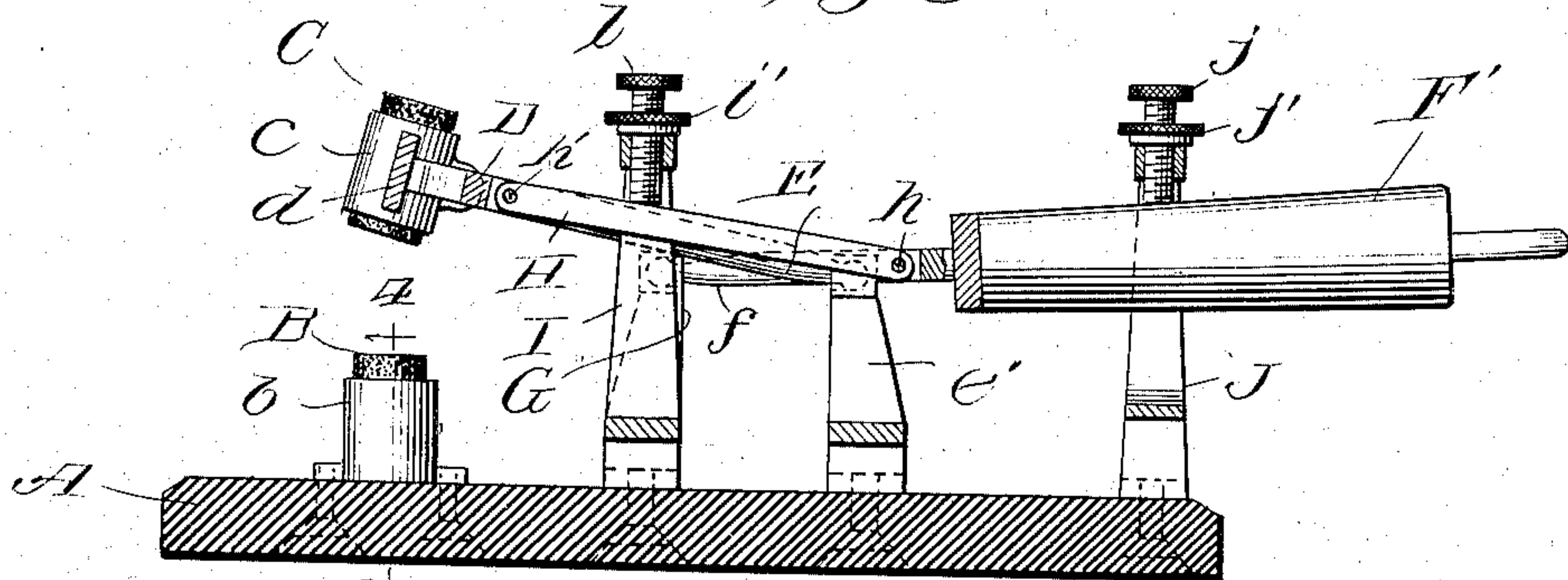
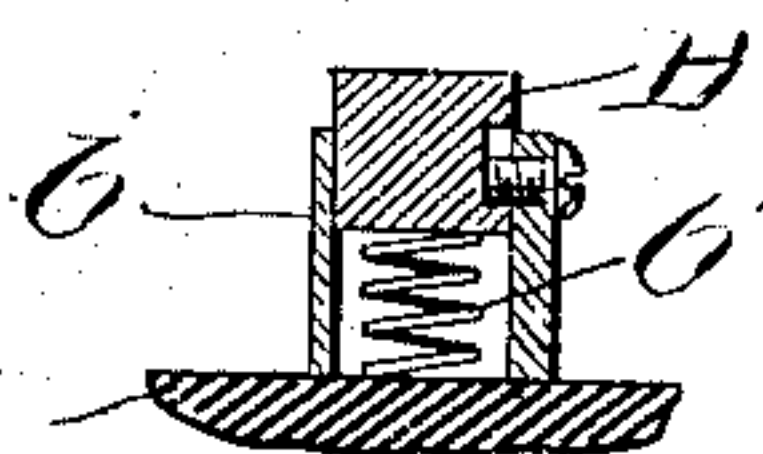


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

No. 846,673.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed December 26, 1905. Serial No. 293,238.

To all whom it may concern:

Be it known that I, ANDREW KOESCHE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Electric Switches, of which the following is a specification.

The object of this invention is to provide an electric switch of simple and inexpensive construction and in which the contacts can be widely and quickly separated by a short movement of the operating-handle to prevent sparking and flashing, and thereby avoid deterioration of the contacts.

The invention has other objects in view which will be fully and clearly pointed out hereinafter in the detailed description.

In the accompanying drawings, illustrating one embodiment of the invention, Figure 1 is a top plan view of a single-pole switch. Fig. 2 is a sectional view on the line 2 2 of Fig. 1, showing the switch closed. Fig. 3 is a similar view showing the switch open. Fig. 4 is a section on line 4 4 of Fig. 3.

On a suitable base A a stationary carbon contact B is yieldably mounted in a holder *b*, a spring *b'* being located within the holder beneath the contact. A movable contact C is adjustably mounted in a split sleeve *c*, carried by a contact-lever D. The holder *b* has a binding-post *b''*, and the sleeve *c* is clamped on the carbon contact by a screw *c'*, which could be utilized as a binding-post in a single-pole switch. In the drawings I have shown a single-pole switch in which there are two stationary contacts and two movable contacts, but it will only be necessary to describe one pair, as they are preferably made alike. The two movable contacts are carried on the ends of a cross-piece *d*, fastened to the forward end of the lever D.

The contact-lever D is bifurcated—that is to say, it is provided with two arms E, which have their outer ends *e* rounded and fulcrumed in bearings *e'* in the upper ends of the standards *e''*. A handle-lever F is also bifurcated, having two arms *f* similarly rounded at their ends *f'* and fulcrumed in bearings *f''* in the standard G. A rod H is pivotally jointed at *h* and pivotally connected at its forward end *h'* to the contact-lever D. The other end of this jointed rod is slidably arranged within the handle-lever, and a compression-spring *h''* exerts a constant ten-

sion on the rod for a purpose hereafter described. The joint *h* of the rod H is located between the handle and the fulcrum of the contact-lever. The rod H extends through a yoke I, mounted on the base and provided with a set-screw *i*, having a lock-nut *i'*, whereby the upward movement of the rod can be regulated. The handle-lever F also extends through a yoke J, provided with a set-screw *j*, having thereon a lock-nut *j'*, whereby the upward movement of the handle-lever can be regulated.

The fulcrums for the arms of the handle-lever are located between the handle *F'* of said lever and the stationary contacts, and the fulcrums for the arms of the contact-lever are located between the handle and the fulcrums for the arms thereon, so that the arms of the contact-lever are arranged alongside of the arms of the handle-lever for more or less of their length. These fulcrums are located in substantially the same horizontal plane and above the plane of the stationary contacts, so that when the switch is closed the contact-lever will be inclined downwardly from its fulcrum to its free end and the handle-lever will be inclined downwardly in the opposite direction from its fulcrum to its free end, as illustrated in Fig. 2. At this time the rod H will be somewhat bent at its joint; but when the handle is raised the rod will straighten out, further compressing the spring until the joint of the rod H passes above the plane of the fulcrum of the contact-lever, whereupon the spring acting on the rod will cause the rod to swing the contact-lever quickly into open position, leaving a gap between the contacts of sufficient width to prevent sparking under high voltage. It will be obvious that the levers can be arranged and adjusted to provide for a gap of any desired width. The yielding stationary contacts will prevent a separation of the contacts due to any slight movement of the contact-lever which may occur during the initial movement of the handle-lever, and a perfect contact is therefore maintained until the handle-lever carries the joint of the rod H above the center of the fulcrum for the contact-lever. This movement of the handle-lever is comparatively short by reason of the fact that its fulcrum is located in advance of the fulcrum of the contact-lever, and as the contact is not broken until the

handle-lever approaches close to the limit of its upward movement it is apparent that the contact-lever will be swung quickly to its open position under the influence of the spring h'' . By breaking the connection quickly and swinging the movable contacts in a comparatively wide gap avoids flashing and sparking and therefore prolongs the life of the contacts.

10 I have illustrated a single-pole switch, but this is only one embodiment of the invention, and it will be apparent that it can be embodied in double-pole switches by insulating the cross-piece d and supplying the necessary

15 contacts.

The handle F' is insulated, and its movement is controlled by the length of the handle-lever. If the handle-lever is reduced in length and the contact-lever is increased in length, the movement of the handle will be lessened and the gap increased in width.

What I claim, and desire to secure by Letters Patent, is—

1. An electric switch comprising a stationary contact, a contact-lever fulcrumed at one end, a movable contact carried by said lever at its other end, a handle-lever arranged in substantial alinement with the contact-lever and fulcrumed at one end between the ends of the contact-lever, and yielding means connecting the handle-lever and the contact-lever and comprising a spring-pressed rod slidably arranged in the handle of the handle-lever, said rod being pivotally connected at its forward end to the contact-lever and pivotally jointed in front of the handle.

2. An electric switch comprising a stationary contact, a contact-lever fulcrumed at one end, a movable contact carried by said contact-lever at its other end, a handle-lever fulcrumed at one end between the ends of the contact-lever, said fulcrums being in a plane above the stationary contact, and a spring-controlled rod connected to said handle-lever between its ends and to said contact-lever between its ends.

3. In an electric switch, the combination of a stationary contact, a contact-lever fulcrumed at one end, a movable contact carried by the other end of said contact-lever, a handle-lever fulcrumed at one end between the ends of the contact-lever, said fulcrums being in a plane above the stationary contact, a rod pivotally connected to the contact-lever and slidably arranged in the handle-lever, and a spring within the handle-lever acting on said rod.

4. In an electric switch, the combination of a stationary contact, a contact-lever ful-

crumed at one end, a movable contact carried by said contact-lever at its other end, a handle-lever fulcrumed at one end between the ends of the contact-lever, said fulcrums being in a plane above the stationary contact, a rod pivotally connected at one end to said contact-lever and slidably arranged in the handle-lever, said rod being jointed adjacent to said handle-lever, and a spring within the handle-lever acting on said rod.

5. In an electric switch, the combination of a stationary contact, a bifurcated contact-lever fulcrumed at its bifurcated end, a movable contact carried by the other end of said contact-lever, a handle-lever bifurcated at one end and fulcrumed at its bifurcated end between the ends of the contact-lever, the bifurcated ends of said contact and handle levers overlapping one another, and yielding means connecting said levers and located within their bifurcated ends.

6. In an electric switch, the combination of a base, a stationary contact on the base, standards on the base, a bifurcated contact-lever having its bifurcated end fulcrumed in a pair of said standards, a movable contact carried by the other end of said contact-lever, a bifurcated handle-lever fulcrumed at its bifurcated end in another pair of said standards and located between the ends of the contact-lever, yielding means connecting said levers and located within their bifurcated ends, and means for limiting the outward movement of said levers.

7. An electric switch comprising a base, a stationary contact on the base, standards on the base, a bifurcated contact-lever fulcrumed at its bifurcated end in a pair of said standards, a movable contact carried by the other end of said lever, a bifurcated handle-lever having its bifurcated end arranged to overlap the bifurcated end of the contact-lever, said bifurcated end of the handle-lever being fulcrumed in another pair of said standards located between the ends of the contact-lever, means for limiting the outward movement of said levers, a rod pivotally connected at one end to the contact-lever between the movable contact and the fulcrum of the handle-lever, and having its other end slidably arranged in said handle-lever, a compression-spring within the handle-lever and acting on said rod, and a joint in said rod between said handle-lever and the fulcrum of the contact-lever.

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