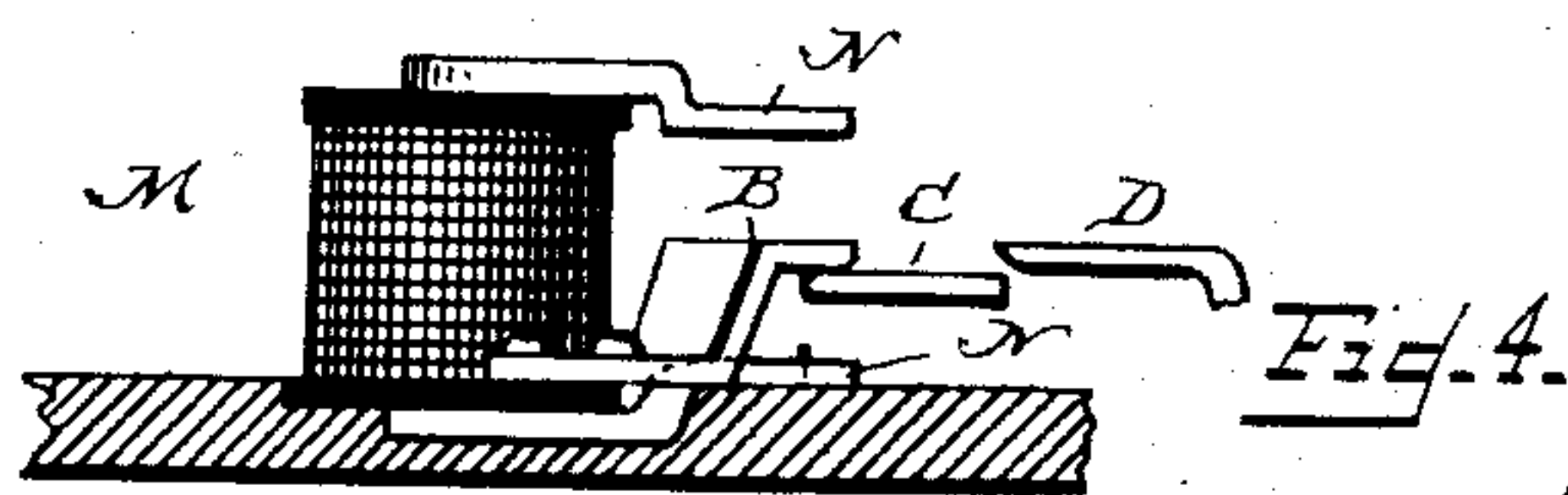
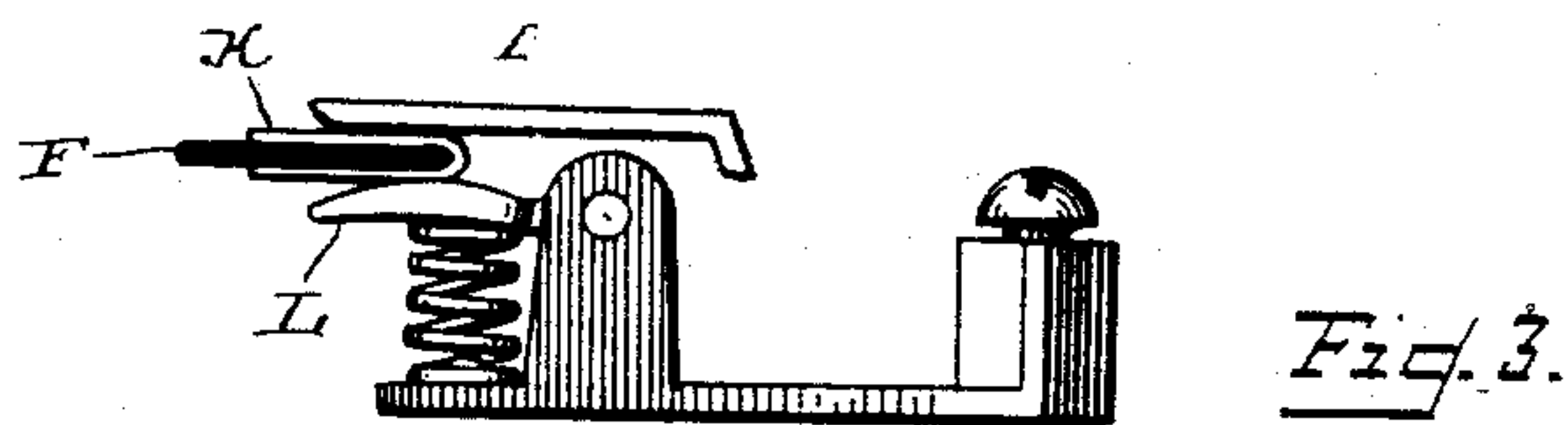
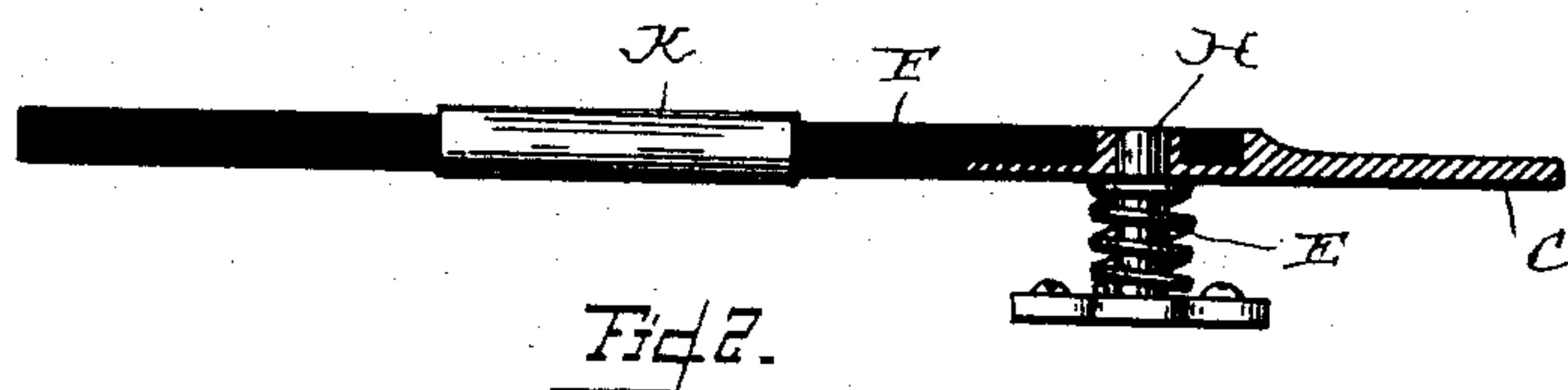
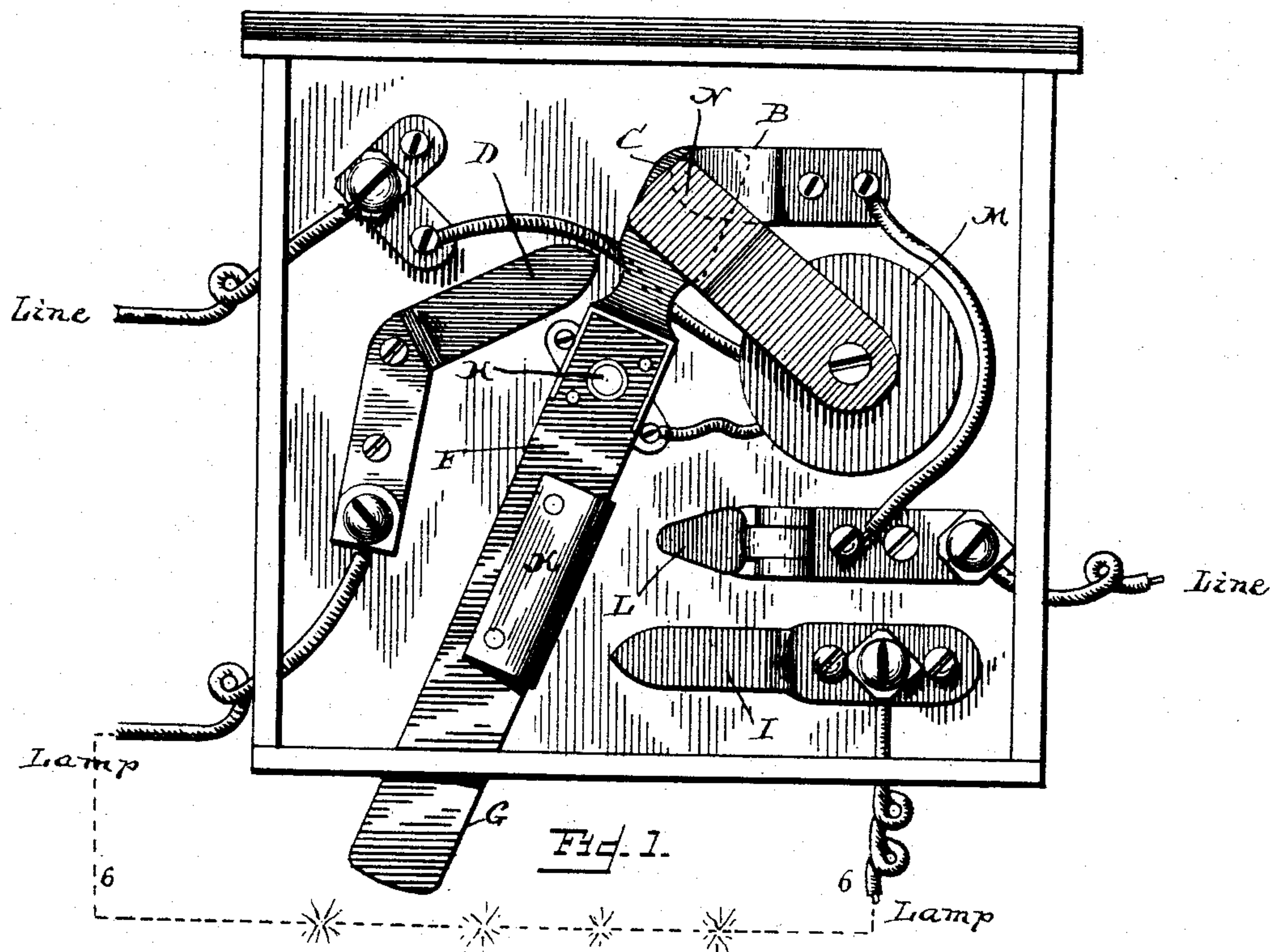


(No Model.)

A. P. SEYMOUR.  
CUT-OUT.

No. 411,935.

Patented Oct. 1, 1889.



Witnesses  
Ira R. Steward.  
H. S. Capel

Inventor  
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By his Attorney  
H. B. Townsend



# UNITED STATES PATENT OFFICE.

ALBERT P. SEYMOUR, OF SYRACUSE, NEW YORK.

## CUT-OUT.

**SPECIFICATION** forming part of Letters Patent No. 411,935, dated October 1, 1889.

Application filed January 3, 1889. Serial No. 295,320. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT P. SEYMOUR, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Improved Cut-Out, of which the following is a specification.

My invention relates to electric switches designed for use on circuits carrying heavy electric currents—such, for instance, as arc-light circuits. In this class of switch a source of damage and danger of fire arises from the tendency of an electric arc to form on opening of a contact of the switch, and the danger is especially notable in the case of what are termed “cut-out switches,” constructed to shift the current from the main line to a loop or branch which may be carried into a building where arc-lights are located. In switches of this character there is often a tendency of the arc to maintain itself at the open or line contact even after contact of the branch is closed, and this tendency has often given rise to conflagrations and increases largely fire risk.

The principal object of my invention is to avoid these difficulties; and my invention consists, essentially, in the combination, with the line-contact of the cut-out switch, of an arc-rupturing magnet whose coils are in a connection between the opposite pole of the line and the movable switch-contact, so that even after contact is fully established with the branch contact the magnet will still have its coils in circuit and will blow out any arc tending to continue after full establishment of connection with the branch.

My invention consists, further, in certain details of construction hereinafter more particularly described and claimed.

In the accompanying drawings, Figure 1 is a plan of a switch embodying my invention. Fig. 2 is a longitudinal section and edge view of the switch-lever. Fig. 3 is a side view of two of the contacts with the switch-lever in cross-section. Fig. 4 is an end view of the switch-lever, the contacts at the upper end of the lever and the magnet being shown in side elevation.

A is a box or case, of any desired character,

for the switch, and B is a solid or fixed massive contact connected with one pole of the line-circuit.

C indicates a solid movable contact block or plate which plays between contact B and a similar contact D, connected to one pole of the branch to which the line-current is to be shifted.

B and D are overhanging solid contact-blocks, and the contact C is adapted to make sliding connection with their under surfaces, such contact being for this purpose mounted on or forming an extension of a support which is pivoted on a pin or stud H and is pressed in the direction of the axis of said stud or pivot by an upwardly-pressing spring E surrounding the pivot.

The contact C is of sufficient width to bridge the space or opening between B and D for a double purpose: first, to preserve the continuity of connection on plate C, and, second, to prevent the switch-lever from sliding off its pivot by the action of the spring E when it moves from one contact B D to the other.

By making the contacts of the form shown with overhanging ends, against the under surface of which the lever engages, the contact parts are entirely surrounded by air, which prevents their heating, while, besides, they may be, if desired, given a slight elasticity. Moreover, it will be seen that by making the contacts in this form and arranging the lever so as to be always in engagement with one or the other of them said lever will be held upon its pivot without the use of any other holding pins or screws, such as would be necessary if the contacts were placed upon the base and the lever made connection upon the upper surface of the same.

F is the switch or contact lever, carrying the movable contacts of the device and operated by a handle G or other means. The lever F carries the contact C as an extension of the metallic pivotal portion of the lever, such metal portion being fastened to the insulated portion, as shown, and being directly pivoted on the metallic post H. Through the post and spring electric connection is made with the contact C. The lever fits loosely on its pivot, so as to be capable of a slight rocking



motion, thereby permitting it to adapt itself to contact D and contact I, with which it is required to make connection at the same time, and which are at opposite sides of the pivot.

5 Contact I is likewise made as an overhanging contact of a solid massive piece of metal, and at its under surface a plate K, secured to the insulating portion of the lever, makes sliding connection, being pressed into connection with  
10 the contact-surface of I by the action of the spring E, which tends to move the lever on its axis in the line of the axis and in a direction transverse to the contact-surfaces of I as well as of C and D. Contact I connects to one  
15 pole of the branch opposite that to which D is connected. Plate K makes connection also with a contact L at the same time that it strikes I. The contact L is a spring or yielding contact, and for this purpose is made as  
20 a pivoted metal block upheld by a spring, as shown in Fig. 3, and having its contact-surface upon its upper side. Contact L connects with the same pole of the line as B.

M indicates an electro-magnet whose coils  
25 are in the electric connection between the opposite pole of the line to that to which B is connected and the movable contact C. The electro-magnet has its poles N arranged to embrace the contact C, as indicated, thereby  
30 bringing to bear a magnetism or magnetic field, the effect of which is to rupture any arc forming between contacts B and C. As the coils of the magnet are in the line-circuit with the switch, an exceedingly powerful rupturing effect may be produced when the device  
35 is used on a circuit carrying a heavy current. This magnet might be of any other form suitably applied to produce an arc-rupturing field at the contact B.

40 When the switch-lever is in the position shown in Fig. 1, the main-line circuit is closed through the electro-magnet M, post and spring E H, switch-lever and contact C, to contact B, and out, the connection with the branch  
45 circuit being broken at D, as well as at I L K. The magnet is now in circuit and remains in the circuit described so long as contact of C with B continues and the contact B is in a powerful magnetic field. When the lever is  
50 turned to the other position, the main-line connections are broken with B and a connection of C with D substituted. When the contact C leaves B, any arc tending to form will be ruptured by the magnet; but even if the  
55 arc should tend to remain after full establishment of connection with D it is certain to be ruptured, because the coils of electro-magnet M still remain in the path of the main-line currents, the path of which is now through D,  
60 the circuit 6, and contacts I L, which are united by contact K when the lever is turned to break connection at B and substitute connection at D.

In the position of the lever shown in full  
65 lines good contact with B is produced by the spring E, which tends to lift the lever off its

point, but is prevented from doing so by the contact B and the engagement of the handle end of the lever with the edge of the slot in the box through which it passes. When the  
70 lever is turned to the other position to close the branch, good sliding contact with I and D is made by the spring, which tends to move the lever in the direction of the axis of its support, and any tendency to inequality or  
75 defect of connection with either contact I D is compensated for by the fact that owing to the loose mounting or pivoting of the lever it may rock or tilt and adjust itself to good contact with both. Good connection of plate K  
80 with both contacts I L, although one is fixed, is secured through the fact that L is a spring-contact.

The use of overhanging contacts is useful when the lever has a spring tending to lift it  
85 off its pivot; but I do not limit myself to such contacts, excepting when the spring tending to press the lever toward the plane of contact is applied so as to act in a direction to lift the lever off its pivot.  
90

The main feature and the principal value of my invention lies in the magnet applied and mounted in the special manner claimed for preventing arcing at the contacts of a switch that shifts a line-current to a branch.  
95

What I claim as my invention is—

1. The combination, in an electric switch, of a main-line contact connected to one pole of the line, a branch contact, an intermediate contact connected to the other pole of the  
100 line, and an arc-rupturing magnet applied to the main-line contact and having its coils in the line-connection from the opposite pole of the line to the intermediate contact, as and for the purpose described.  
105

2. In an electric switch, the combination, with two contact-blocks mounted on a suitable base and having overhanging contact ends, of an intermediate moving contact making sliding connection with the under  
110 surface of the overhanging ends and wider than the space between them, and a spring tending to move the intermediate contact bodily in a line transverse to the plane of the contact-surfaces and away from the base carrying the contact-blocks.  
115

3. The combination, in a lever electric switch, of two simultaneously-engaged fixed contacts D I at opposite sides of the pivotal point for the lever and an intermediate sliding-contact switch-lever provided with a  
120 spring tending to press it in the direction of its pivoted axis and toward the plane of the contact-surfaces for the fixed contacts, said contact-lever being fitted loosely to its pivot,  
125 so as to be capable of a slight rocking motion in a direction transverse to the plane of its swing, as and for the purpose described.

4. The combination, with the switch-lever loosely fitted to its pivot, so as to be capable  
130 of a slight rocking movement in a direction transverse to the plane of its swing, and hav-

ing a spring tending to move it in the direction of its pivotal axis, of the two fixed sliding-connection contacts I D at opposite sides of the pivotal point for the lever, and a spring-  
5 contact L, engaged by the levers simultaneously with the other two.

Signed at Syracuse, in the county of Onon-

daga and State of New York, this 31st day of December, A. D. 1888.

ALBERT P. SEYMOUR.

Witnesses:

JOHN C. KEEFFE,  
LOUIS S. TOVEY.