

No. 665,492.

C. L. WHITE & F. W. COLE.

Patented Jan. 8, 1901.

ELECTRIC SWITCH.

(Application filed Mar. 30, 1899.)

(No Model.)

Fig. 1.

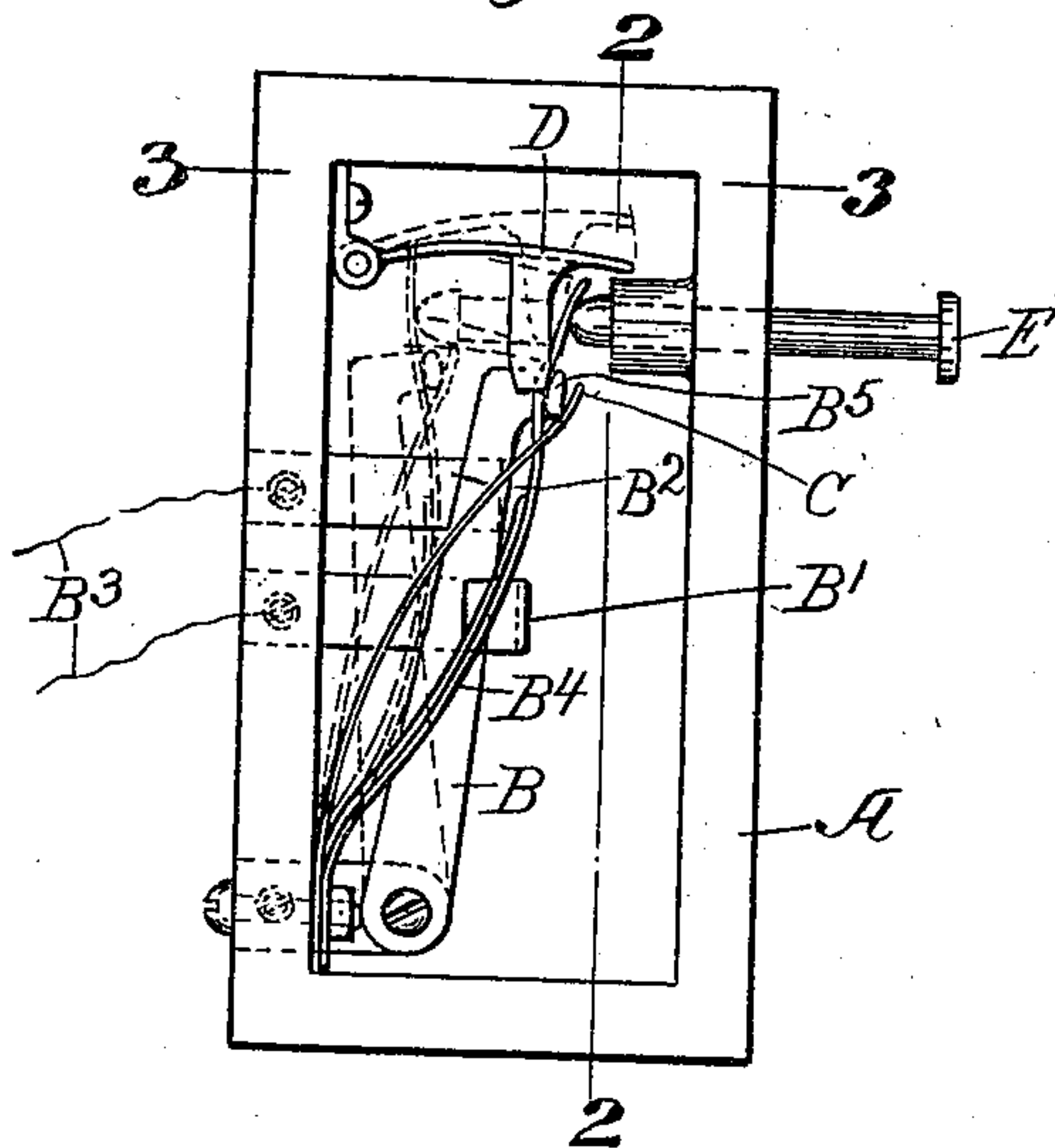


Fig. 2.

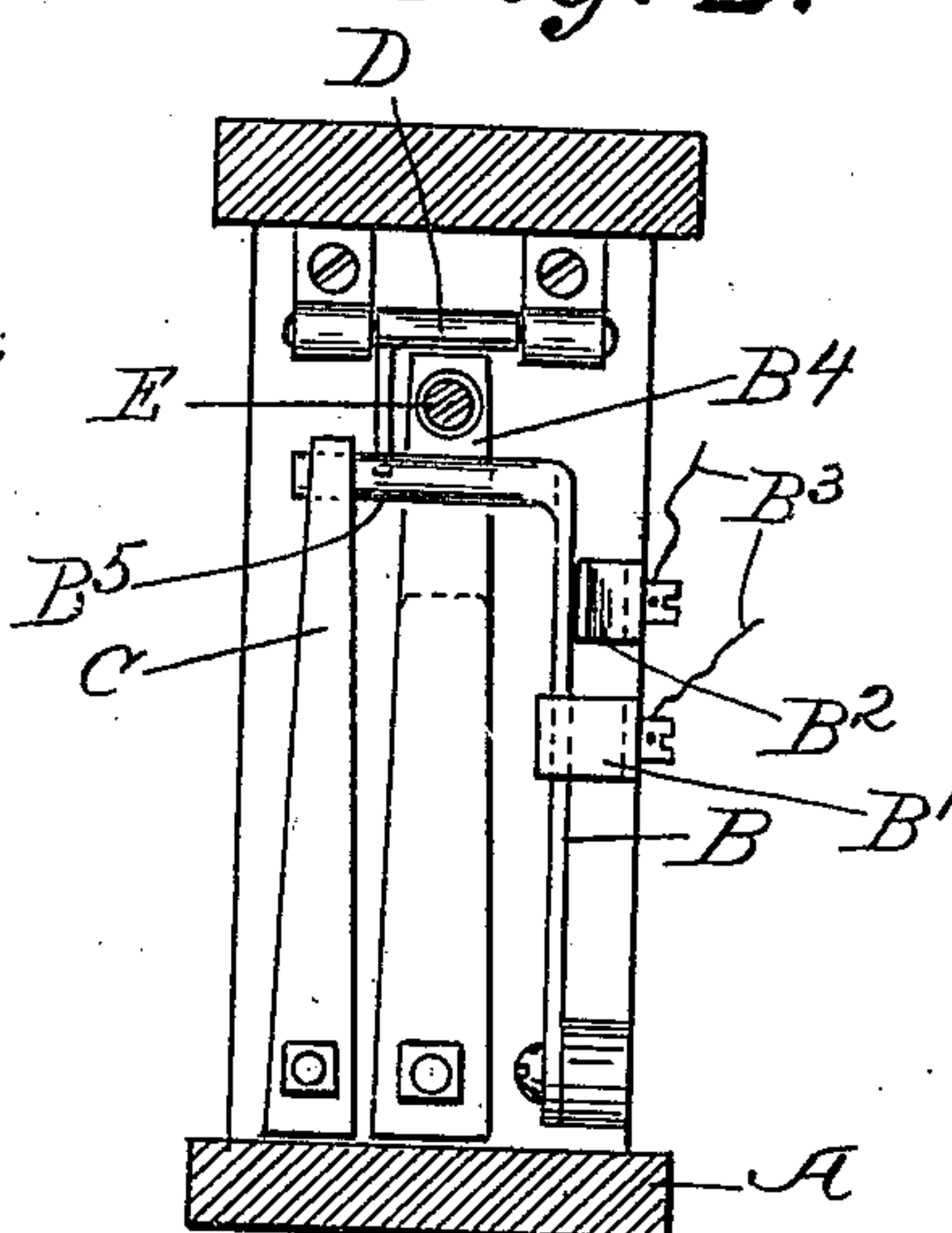


Fig. 3.

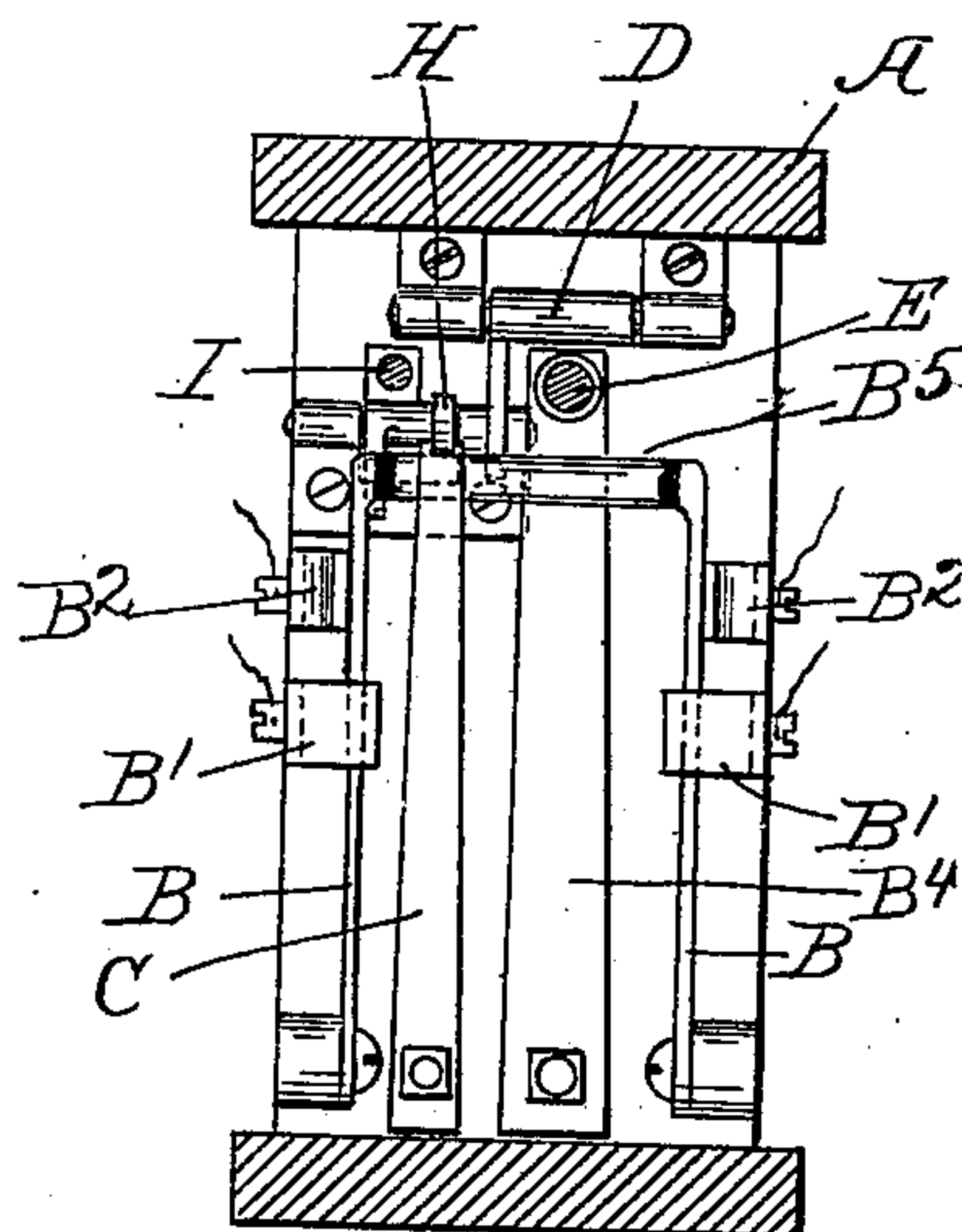
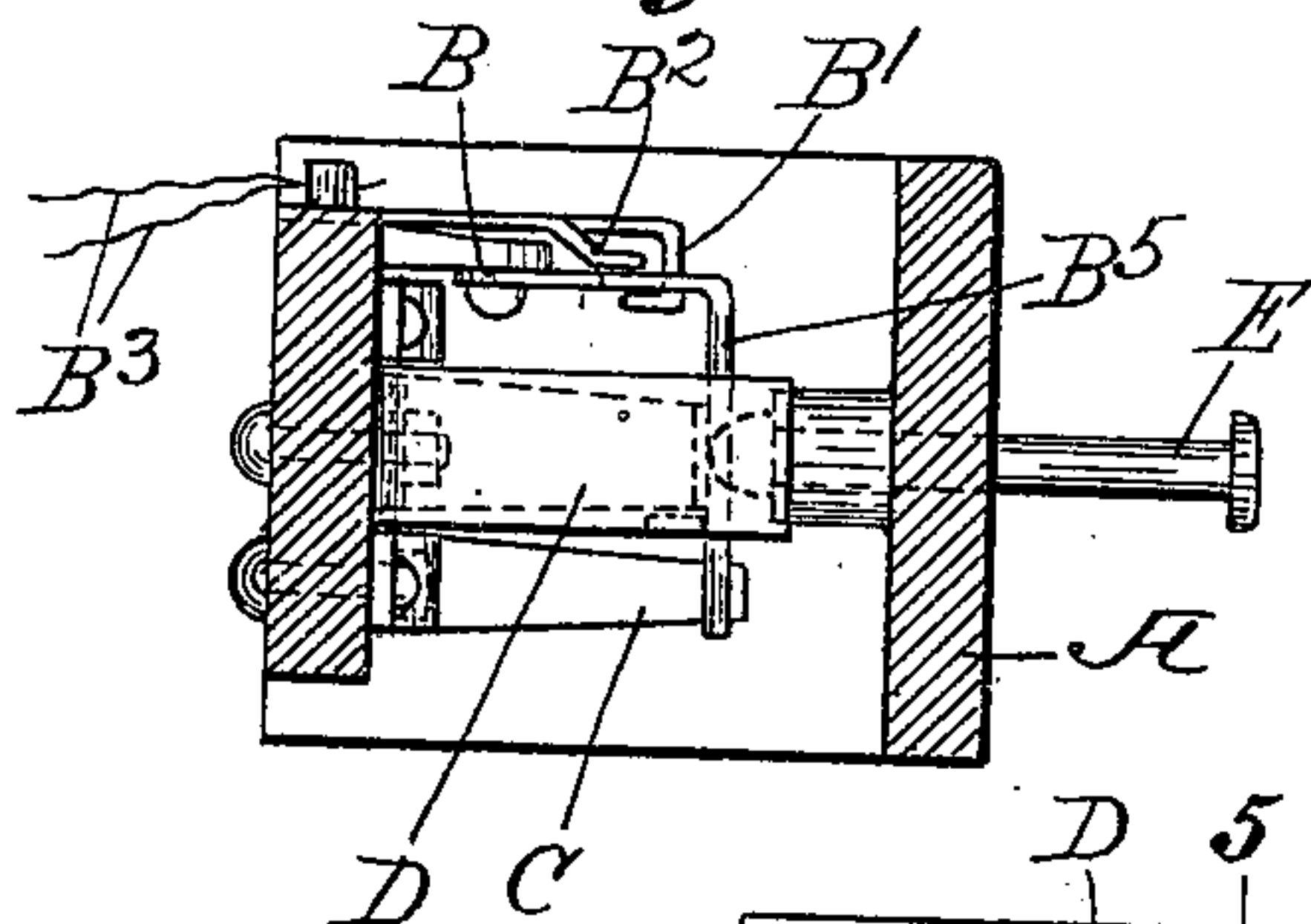


Fig. 5.

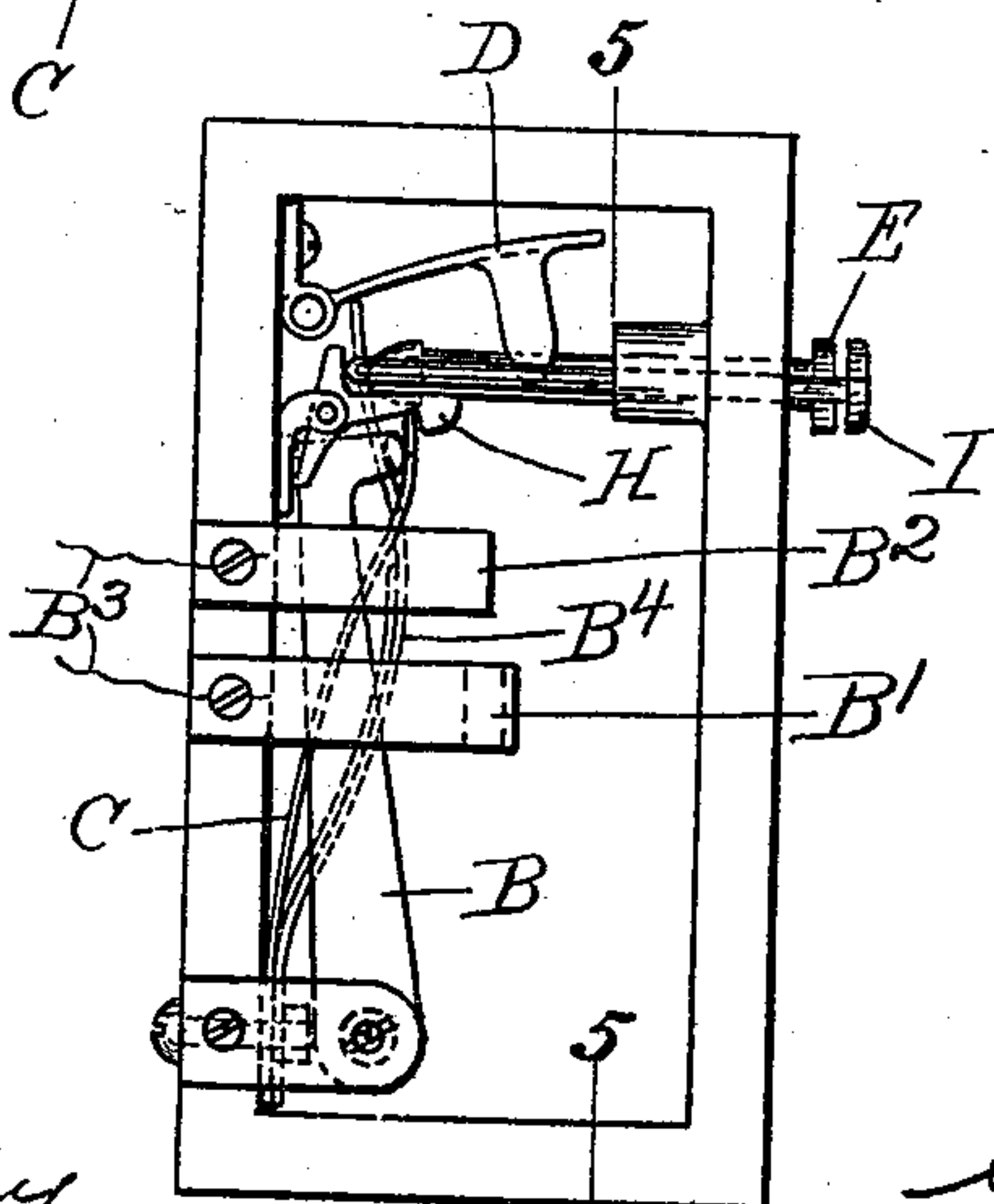


Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 665,492, dated January 8, 1901.

Application filed March 30, 1899. Serial No. 711,065. (No model.)

To all whom it may concern:

Be it known that we, CHARLES L. WHITE and FRANK W. COLE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electric Switches, of which the following is a specification.

Our invention relates to electric switches, and has for its object to provide a new and improved switch of this description.

Our invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of a switch embodying our invention, having a portion of the casing removed so as to expose the mechanism. Fig. 2 is a section on line 2 2, Fig. 1. Fig. 3 is a section on line 3 3, Fig. 1. Fig. 4 is a view showing a modified construction. Fig. 5 is a section on line 5 5, Fig. 4.

Like letters refer to like parts throughout the several figures.

In Figs. 1, 2, and 3 we have shown a switch particularly adapted to be used in places where the switch is operated by the operation of some other mechanism operating to produce some result other than the varying of an electric circuit. Many uses of this kind will readily occur to those versed in the art—such, for example, as the application to a door, whereby the switch is operated by the movement of the bolt which locks the door. One of the difficulties with switches as heretofore constructed for this purpose is that too much of an arc is produced in breaking the circuit, such arc soon destroying the contacts. With our construction this and other evils are obviated.

It is of course evident that the switch may be used in any connection where a switch is applicable, and we have therefore not attempted to show these various uses.

Referring now to the drawings, wherein we have illustrated in a somewhat diagrammatic manner one construction embodying our invention, we provide a suitable casing A of any desired form and material, within which the parts of the switch are mounted. The switch-arm B is movably mounted in any desired manner and is adapted to complete the circuit between the two contacts B' B², connected in circuit by the conductors B³. It

will be seen that when this switch-arm is moved out of contact with these contacts the circuit will be broken. The switch-arm B is preferably provided with a projecting part B⁵, which engages the return-spring B⁴ and also the break-spring C. A suitable latch or holding device D is movably mounted in proximity to the end of the return-spring, said latch or holding device normally engaging the projecting part B⁵ on the switch-arm, so as to prevent said switch-arm from being moved by the break-spring C. Opposed to the return-spring is a plunger or moving part E, adapted when actuated to move said return-spring away from the projecting part on the switch-arm. The latch or holding device and the return-spring are so formed and positioned as to permit the end of the return-spring to be moved some distance by the plunger or moving part E without affecting the relation of the several parts of the switch, the further movement of said spring, however, moving the latch or holding device so as to release the switch-arm and permit the break-spring to instantly move said switch-arm to break the circuit between the contacts B' B². This result may be obtained in various ways—for example, by locating the back portion of the latch or holding device so that it will be engaged by the end of the return-spring when said end is near the limit of its movement and move the latch a sufficient amount to release the switch-arm.

Referring now to Fig. 1, we have shown in dotted lines the return-spring in the position where it engages the latch and lifts it, so as to release the switch-arm. It will be seen that this return-spring when it reaches the position to move the latch is far enough away from the switch-arm to permit the break-spring to instantly move the switch-arm into a position to break the circuit. The circuit remains broken until the movable part E is released. In this event the return-spring engages the projecting part B⁵ on the switch-arm and moves it back, so as to connect the contacts and again complete the circuit. During this movement the latch is engaged by the projecting part B⁵ and is lifted, so as to allow said part to pass, and then drops down in front of the part B⁵, as shown in full lines, Fig. 1. When it is desired to hold the switch-

arm out of contact with the contacts $B^1 B^2$ when the movable part E is released, we may provide a suitable latch or holding device for this purpose. It is of course evident that any
 5 desired construction to produce this end may be employed. As shown, for example, in Fig. 4, we provide the engaging device H, so positioned as to engage the switch-arm or some portion associated therewith and hold
 10 it away from the contacts. In this event we provide a second movable part I, by means of which the engaging device H may be released, so as to permit the return-spring to move the switch-arm to its initial position in
 15 order to complete the circuit. It will be noted that in this device there are no coiled springs, but that the return-spring is simply a flat piece of metal attached to the casing at one end. It will also be seen that this con-
 20 struction is exceedingly simple and that there are no parts liable to get out of order. It will also be noted that in the event the switch should fail to operate its simplicity enables it to be easily and quickly repaired by any
 25 electrician.

We have described in detail a particular construction embodying our invention; but it is of course evident that the parts may be varied in form, construction, and arrange-
 30 ment without departing from the spirit of our invention, and we therefore do not wish to be limited to the construction shown.

In Figs. 4 and 5 we have shown a double-pole switch having two sets of contacts and
 35 two switch-arms, the two switch-arms being connected together, as shown in Fig. 5. The engaging device H, as shown in Fig. 4, instead of directly engaging the switch-arm engages the break-spring C. This engaging
 40 device is pivotally connected to the casing, and the switch-arm is released by pushing forward the movable part I. We have shown the two parts I and E as located in proximity to each other; but it is of course evident that
 45 their position will be regulated by the conditions to be met. When the switch-arm is held in the position shown in full lines, Fig. 4, pressure applied to the movable part I moves the latch or engaging device H upward
 50 and releases the parts, so that the circuit will be completed.

The use and operation of our invention are as follows: When the parts are in the position shown in full lines in Fig. 1, the circuit
 55 is complete. If now it is desired to break the circuit, the movable part E is moved forward, so as to move the return-spring B^4 away from the projecting part on the switch-arm. The relation of the other parts is not affected by
 60 the first part of the movement of the return-spring, for the reason that the latch D prevents the break-spring from acting. When the return-spring has reached the position shown in dotted lines, Fig. 1, it engages the
 65 latch and lifts it, so as to release the switch-arm. The break-spring then acts to suddenly move the switch-arm to the position

shown in dotted lines, Fig. 1, and instantly breaks the circuit without permitting a dangerous or injurious spark. If the movable
 70 part E is moved by means of some other mechanism, such as the bolt of a door or the like, the circuit will be broken so long as the parts remain in the position shown in dotted lines. As soon as the movable part E is released the
 75 parts move back to the position shown in full lines and the circuit is completed. When the engaging device shown in Fig. 4 is used, it is necessary to move the part I in order to release the switch-arm and permit the circuit
 80 to be completed.

We claim—

1. A switch, comprising a pivoted switch-arm adapted to make and break an electric circuit, a laterally-movable linear spring con-
 85 nected near one end to a fixed part and engaging said switch-arm at or near its other end, said spring being adapted to move said switch-arm when released to a position to break the circuit, a holding device adapted
 90 to engage said switch-arm and hold it in a position to complete the circuit, a reciprocating part independent of said spring and adapted when moved to move the holding device and release the switch-arm so that said spring may
 95 operate to move it.

2. A switch, comprising a movable switch-arm adapted to make and break an electric circuit, an actuating device for moving said
 100 switch-arm to a position to break the circuit, a second actuating device for moving said switch-arm back to its initial position, said actuating devices both normally engaging some part on said switch-arm and also engag-
 105 ing a fixed part, the points of the latter engagement of both actuating devices being on the same side of the points where they engage the switch-arm, a movable part associated with said second actuating device and adapted,
 110 when moved, to render said second actuating device inoperative, a holding device associated with said switch-arm and normally holding it in its initial position, the parts so disposed that the holding device is released
 115 by the movement which renders the second actuating device inoperative.

3. A switch, comprising a switch-arm adapted to make and break an electric circuit, a linear break-spring adapted to move said
 120 switch-arm to an inoperative position, a linear return-spring adapted to return said switch-arm to its operative position, said springs being placed substantially side by side, a movable part adapted, when actuated, to render the return-spring inoperative, a holding de-
 125 vice adapted to hold the switch-arm, the parts so disposed that the holding device is released after the return-spring is rendered inoperative.

4. A switch, comprising a pivoted switch-arm adapted to make and break an electric
 130 circuit, a linear break-spring adapted to move said switch-arm to an inoperative position, a linear return-spring adapted to return said

switch-arm to its operative position said springs crossing each other at some point along their length, a movable part adapted to engage said return-spring, when actuated, and move it away from the switch-arm, a movable holding device engaging said switch-arm so as to hold it in position when the return-spring is moved away, the parts so disposed that the holding device is moved so as to release the switch-arm after the return-spring has been moved to a predetermined position.

5. A switch, comprising a switch-arm adapted to make and break an electric circuit, a break-spring adapted to move said switch-arm to an inoperative position, a return-spring adapted to return said switch-arm to its operative position, a movable part adapted to engage said return-spring, when actuated, and move it away from the switch-arm, a movable holding device engaging said switch-arm so as to hold it in position when the return-spring is moved away, the parts so disposed that the holding device is moved so as to release the switch-arm after the return-spring has been moved to a predetermined position, an engaging device for holding the switch-arm in its inoperative position, and means associated therewith for actuating the engaging device so as to release said switch-arm.

6. A switch, comprising a movable switch-arm adapted to make and break an electric circuit, an actuating device for moving said switch-arm to a position to break the circuit, a second actuating device for moving said switch-arm back to its initial position, a movable part associated with said second actuating device and adapted, when moved, to render said second actuating device inoperative, a holding device associated with said switch-arm and normally holding it in its initial position, the parts so disposed that the holding device is released when the second actuating device is rendered inoperative, and an engaging device adapted to engage said switch-arm, when in its inoperative position, and hold it in such position.

7. A switch, comprising a switch-arm adapted to make and break an electric circuit, a break-spring adapted to move said switch-arm to an inoperative position, a return-spring adapted to move said switch-arm back to its operative position, a movable part adapted, when moved, to engage said return-spring and move it out of the way of the switch-arm, a gravity holding device adapted to engage the switch-arm and hold it after the return-spring is moved away, and means for moving said gravity holding device so as to release the switch-arm when the return-spring is moved to a predetermined position.

8. A switch, comprising a switch-arm adapted to make and break an electric circuit, a spring associated with said switch-arm and adapted to move it to break the circuit, a return-spring for returning said switch-arm to a position to complete the circuit, a gravity-latch normally engaging said switch-arm so as to hold it in its initial position, a reciprocating part adapted to engage said return-spring and move it with relation to the switch-arm so as to render it inoperative, said spring during the latter part of its movement engaging said gravity-latch so as to release it and render the first-mentioned spring operative.

9. A switch, comprising a switch-arm adapted to make and break an electric circuit, two independent springs associated with said switch-arm adapted to move said arm in opposite directions, a holding device for holding said switch-arm in an operative position, a movable part associated with the spring adapted to move said arm to its operative position, said movable part when moved being adapted to move said spring away from its contact with the arm, the spring during the latter part of its movement being adapted to engage the holding device so as to move it, thereby releasing the switch-arm.

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Witnesses:

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HOMER L. KRAFT.