

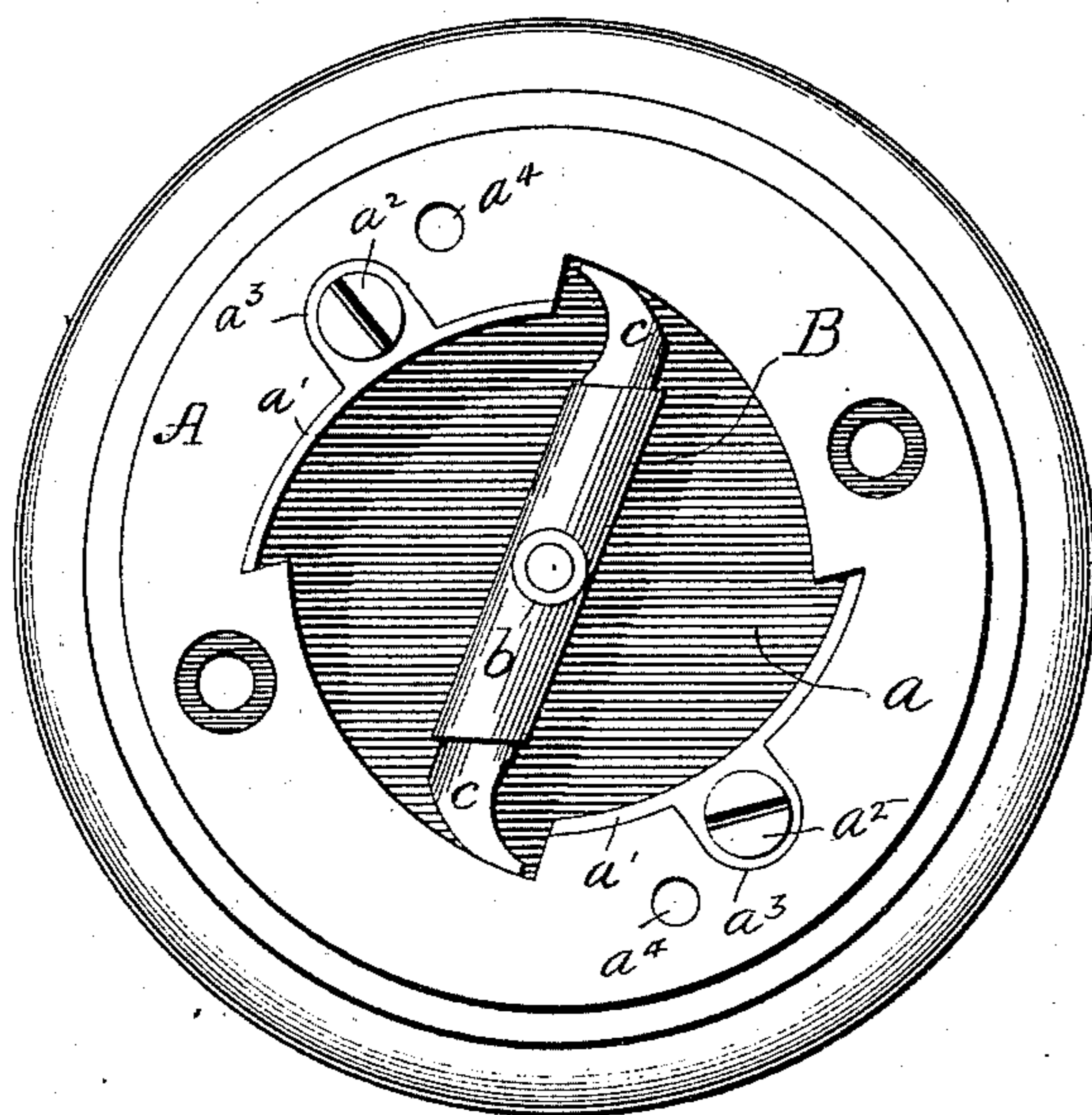
(No Model.)

E. W. LITTLE.  
CUT-OUT.

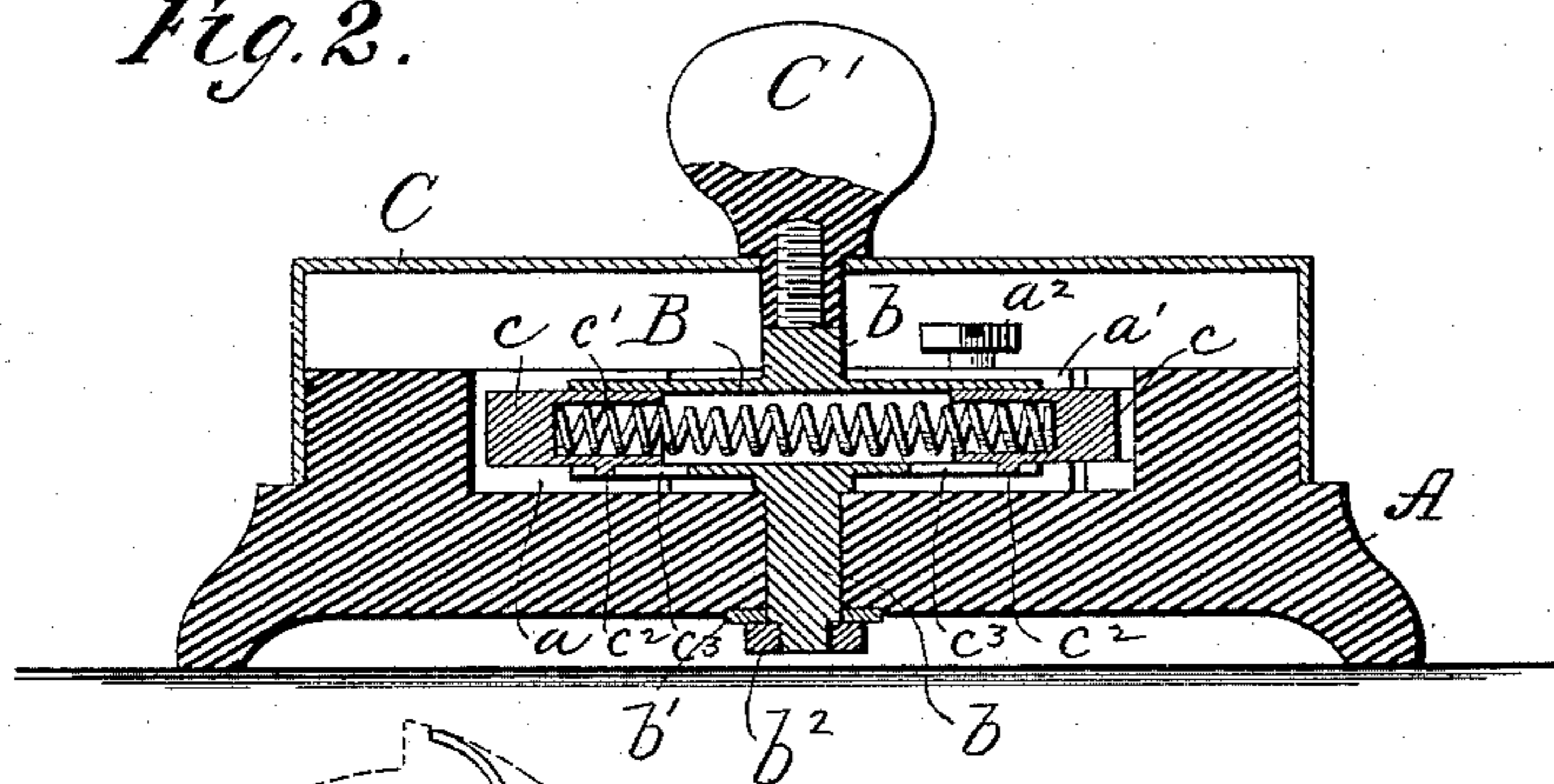
No. 421,179.

Patented Feb. 11, 1890.

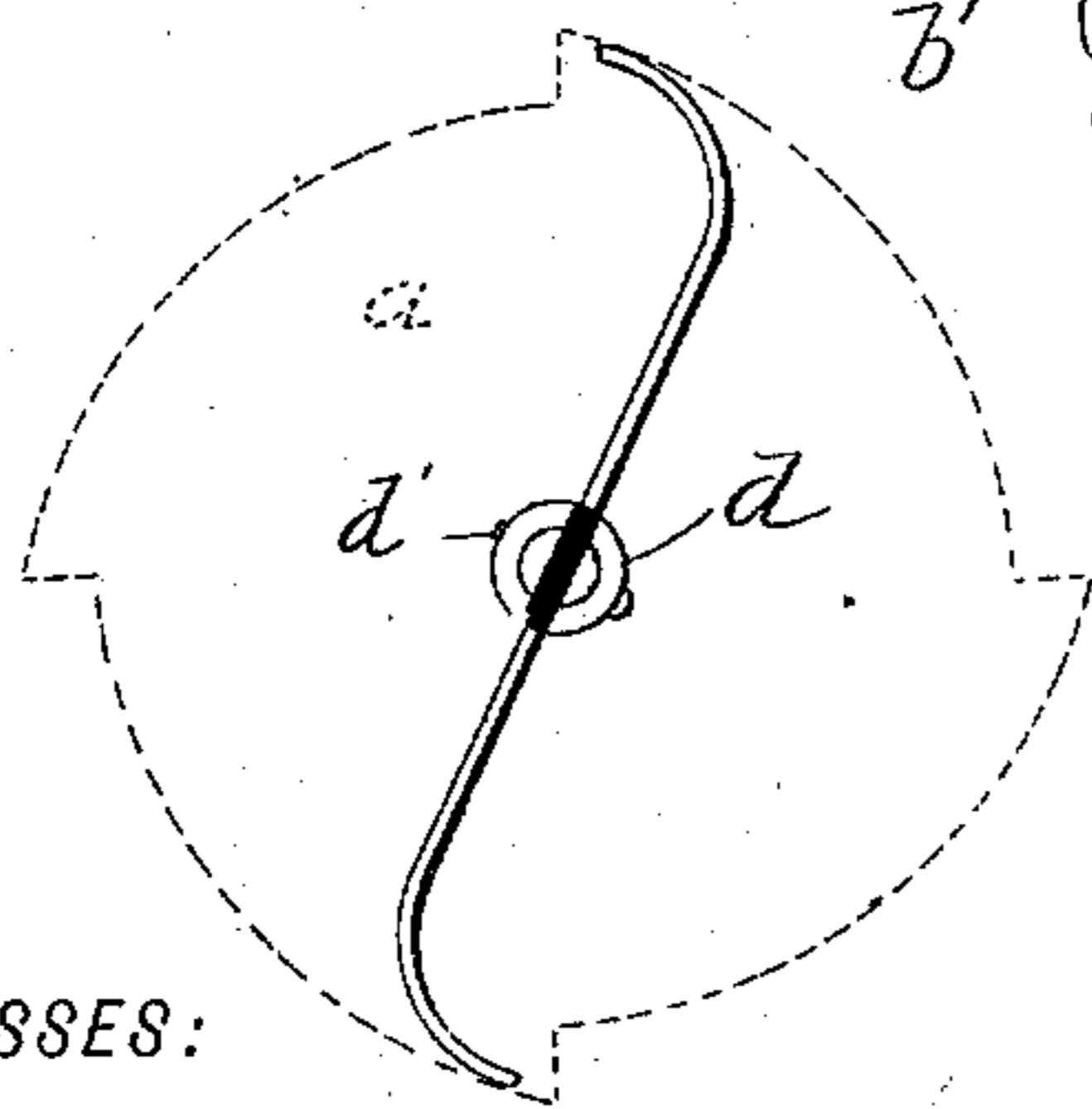
*Fig. 1.*



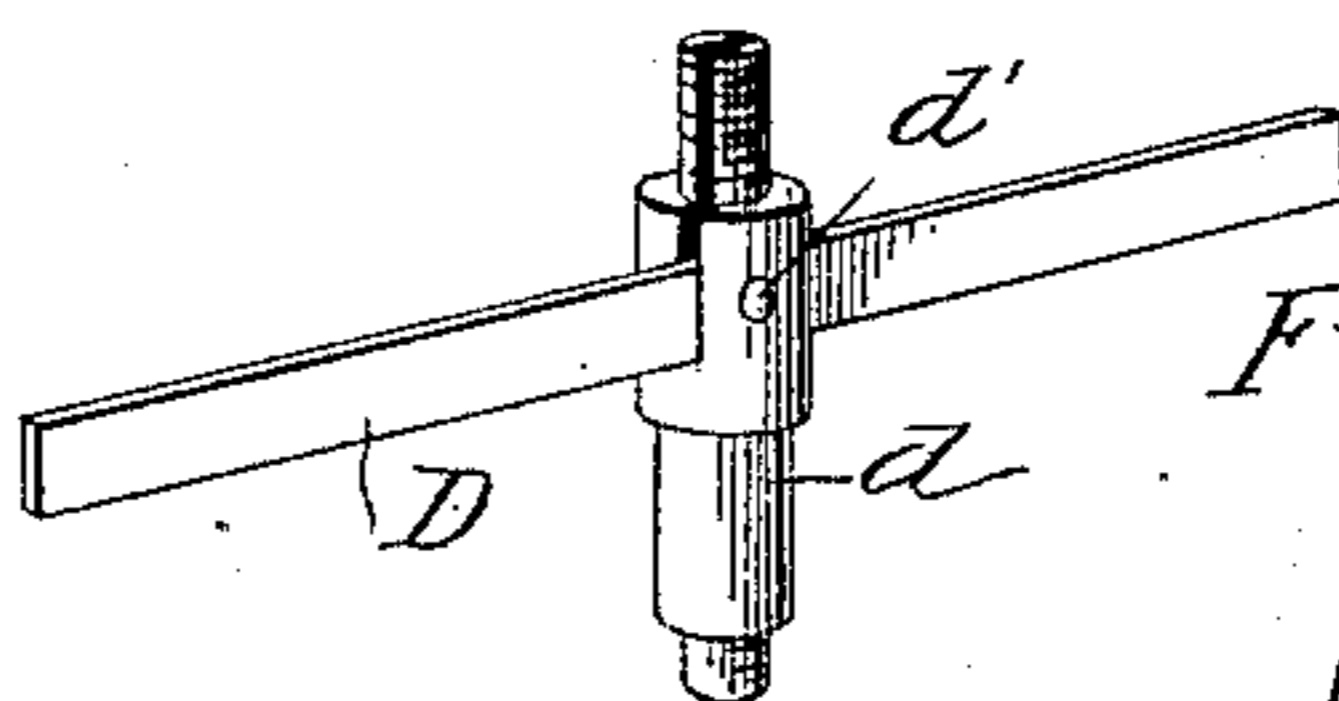
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 421,179, dated February 11, 1890.

Application filed November 19, 1889. Serial No. 330,909. (No model.)

*To all-whom it may concern:*

Be it known that I, EVERETT W. LITTLE, a citizen of the United States, residing in New York city, in the county of New York 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 pertains to electric switches or cut-outs, the principal objects being the production of a switch embodying simple and compact mechanism which is efficient in operation. The mechanism consists, in general, of a base having a circular cavity in its face, the walls of which are notched to form a ratchet, the alternate teeth of the ratchet being faced or armed with metallic contact-plates, against which a pair of movable contacts may be brought to complete a circuit, or by a further movement of the contacts to break the circuit. The construction of the movable contacts is such that they partake of a rapid movement at the time a change of contact is made. The construction of the device carrying out this function will be described with reference to the accompanying drawings, in which—

Figure 1 represents a plan of the switch with the handle and cover removed; Fig. 2, a central section of the switch complete; and Figs. 3 and 4, a plan and perspective, respectively, of a modified form of circuit-closing arm.

Referring to the drawings by letter, A represents the supporting-base of the switch. It may be formed of wood, porcelain, or any similar and suitable insulating material. In its upper face and centrally located is a cavity  $a$ , having perpendicular sides, which are cut out to form four teeth having the appearance of a ratchet, each tooth occupying a quarter of the circle. Two of the teeth opposite each other are faced with copper strips  $a'$   $a'$ , which extend the length of the teeth, and are held in place by the binding-screws  $a^2$ , passing through ears  $a^3$ , bent over from the strips onto the face of the block or base. Adjacent to these screws the holes  $a^4$  are provided, through which the electric conductors may be passed. Their ends are then bent under and secured by the binding-screws  $a^2$ . The faces of the other two teeth are left bare.

The center of the base is perforated to form a bearing for the circuit-controlling arm B. This consists of a cylindrical casting having formed upon its upper and lower sides trunnions  $b$   $b$ , the lower one of which extends through the perforation in the block, in which it acts as a journal for the circuit-closer. Near its lower end it has a squared portion, over which is placed a washer  $b'$ , resting against the lower side of the base, and on the threads at the extreme end the nut  $b^2$  works and is set against the washer. The nut therefore bears against a surface which rotates with the circuit-closer, and is not loosened in the operation of the latter. The trunnion on the upper side extends through the shell or housing C, and is fitted with a key  $C'$ , by means of which the switch is operated. The body of the casting B is bored longitudinally, and into each end is fitted a sliding block  $c$   $c$ . These blocks are chambered out at their inner ends to receive the ends of a spiral spring  $c'$ , placed in the casting B between them. They also carry a small feather  $c^2$ , which runs in a slot  $c^3$ , formed in the lower side of the casting. This prevents any rotation of the blocks and holds them square to their work. The outer ends or toes of these blocks are curved in a lateral direction, so that their extreme ends will be considerably out of the plane of the body B. When the parts are in position, the toes of the blocks bear against the teeth of the ratchet with a yielding pressure.

In operation the handle  $C'$  is turned in the direction of the arrow, and the blocks  $c$   $c$  are brought successively into contact with a pair of metallic and insulated surfaces. As the handle is turned, the blocks move along the surfaces of two opposite teeth, and, owing to their eccentricity, the blocks are forced into the body B, compressing the spring  $c'$  until they run off the ends of the teeth, when the spring exerts its pressure and forces the blocks out abruptly against the next pair of teeth, thus making or breaking the contact suddenly. The circuit of course is from the metallic plate on one tooth of the ratchet through the circuit-controller to the metallic plate on the opposite tooth. The lateral extension of the contact-blocks at the ends of the arm is to allow the cylindrical portion of the arm to

travel away from the end of the ratchet-tooth before the circuit is broken; otherwise an arc may be formed between the plate and arm.

5 In Figs. 3 and 4 I have illustrated a different form of circuit-controlling arm, which may as well be used with the form of block described. It consists simply of the strip D, of spring metal, which, when confined in the  
10 cavity  $a$ , assumes the form shown in Fig. 3—that is, with the ends bent in opposite directions and impinging against the opposite walls of the cavity. With this form of circuit-closer I use simply a post  $d$  in the center.  
15 This is split part way down to receive the strip D, which is then secured in place by pin  $d'$ . The key screws over the top of the plug, and is prevented from becoming loose by the tendency of the two sides of the post  
20 to spring apart.

It will be observed that next to efficient operation this switch possesses the feature of compactness, in that the working parts are nearly all housed in by the cavity in the block  
25 or base, thus making the depth of the device very small.

Having thus described my invention, I claim—

30 1. A block or base provided with a cavity having ratchet-shaped walls, in combination with a rotating circuit-controlling element, consisting of an arm pivoted in the middle and carrying telescoping spring-operated contact-blocks at each end, for the purpose  
35 set forth.

2. The block or base provided with the cav-

ity having ratchet-shaped walls, in combination with the rotating circuit-controlling element, consisting of the chambered cylindrical body carrying the internal spring and  
40 the sliding contact-blocks at each end forced outward by said spring, for the purpose set forth.

3. The combination, with the contacts of an electric switch, of a circuit-controlling  
45 arm consisting of a cylindrical hollow body having trunnions upon opposite sides, one of which forms the journal of the arm and the other the point of attachment for a handle, a sliding contact-block in each end of the  
50 arm, and a coiled spring located inside the arm to force the blocks outward.

4. In an electric switch or cut-out, the pivoted circuit-controlling cylindrical hollow  
55 arm having the slots  $c^3$  at each end and carrying the sliding contact-blocks  $c$ , each provided with a feather  $c'$ , working in the slots, in combination with the contact-surfaces  $a' a'$ , for the purpose set forth.

5. In a switch or cut-out, the combination,  
60 with a base or block having a cavity formed with ratchet-like walls, of a circuit-closing arm having sliding contacts telescoping at each end, said contacts having laterally-extending toes, for the purpose set forth. 65

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

EVERETT W. LITTLE.

Witnesses:

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THOMAS K. TRENCHARD.