

(No Model.)

J. O. HEINZE, Jr.  
CUT-OUT AND CIRCUIT PROTECTOR.

No. 496,308.

Patented Apr. 25, 1893.

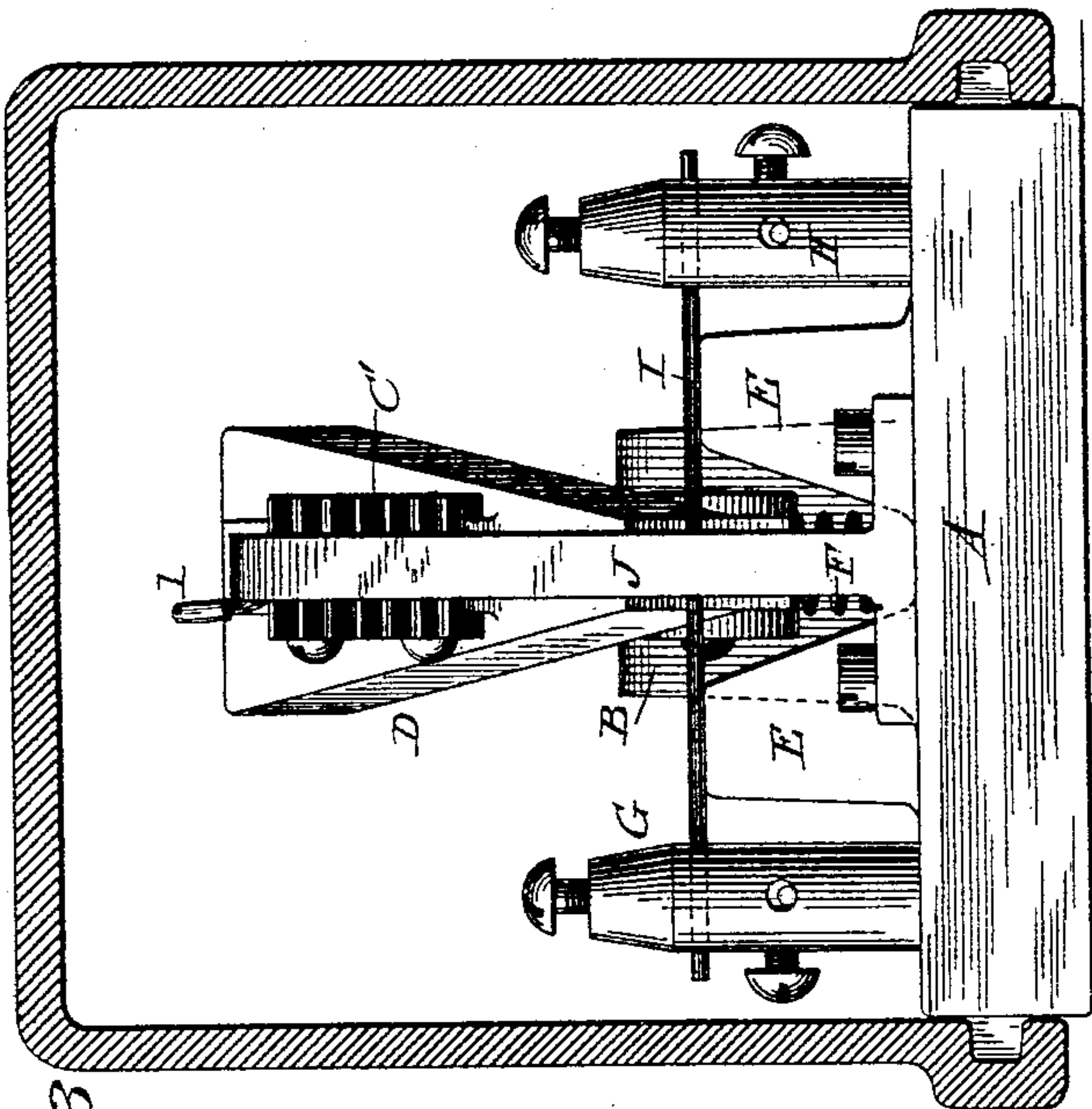


Fig. 3

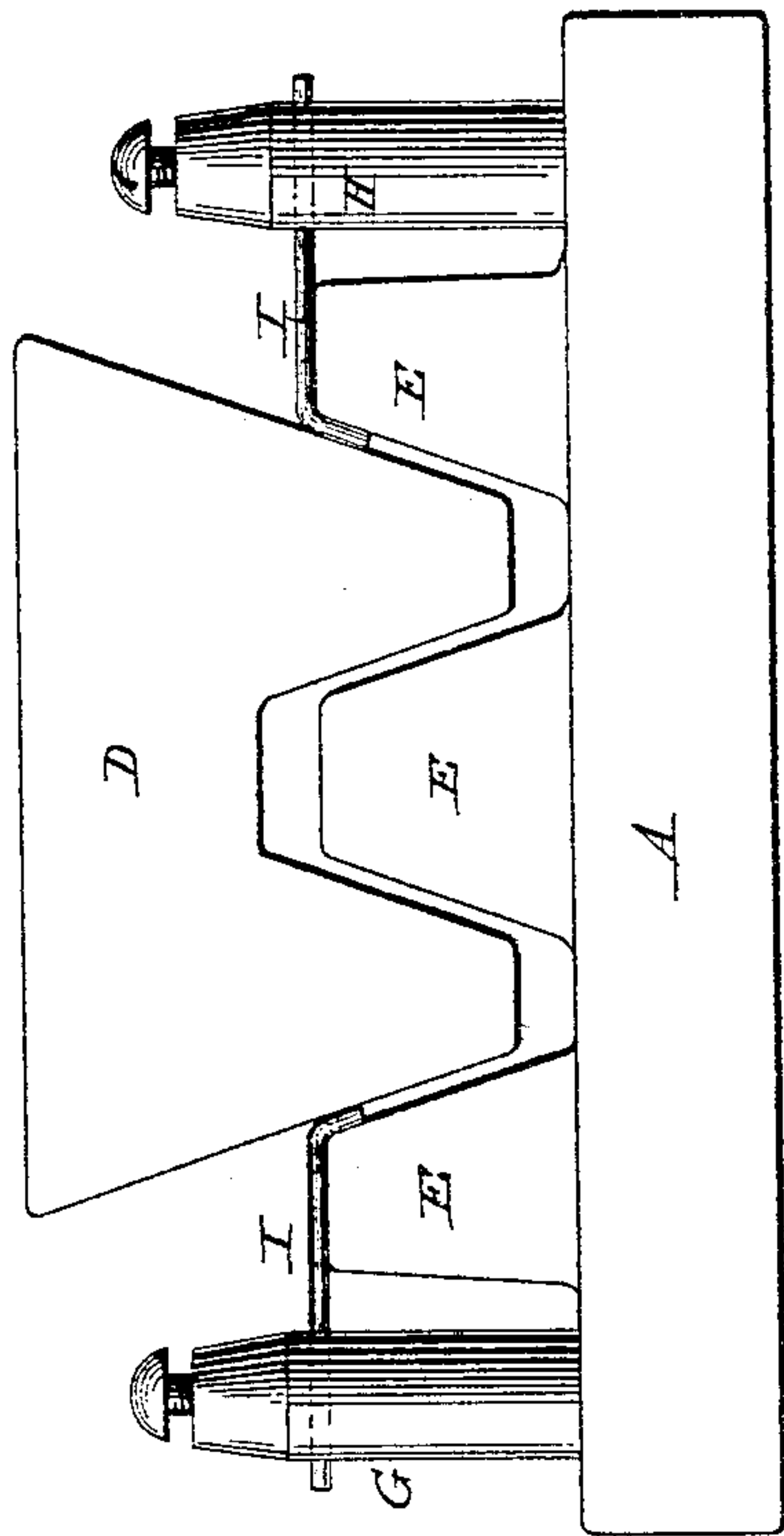


Fig. 4.

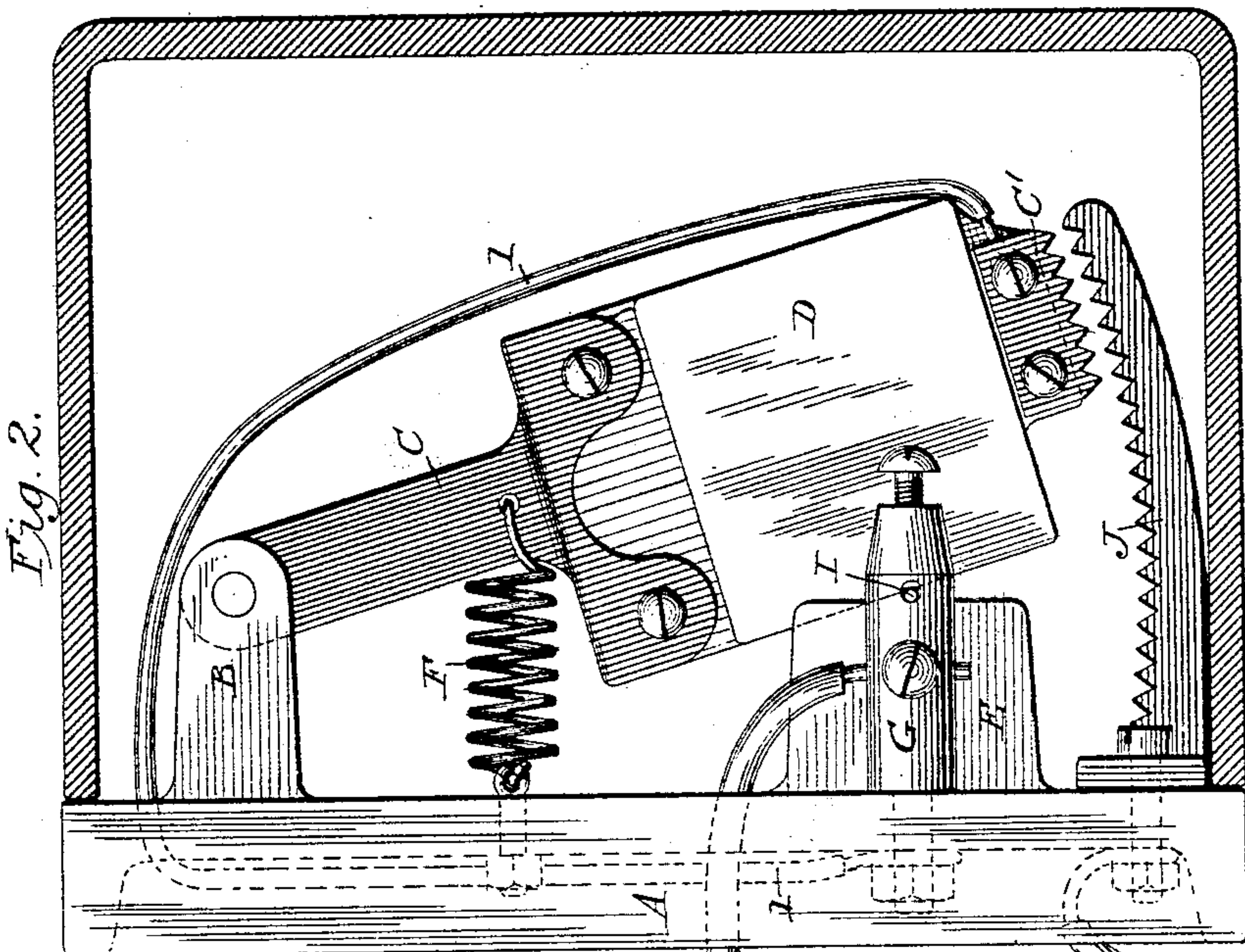


Fig. 2.

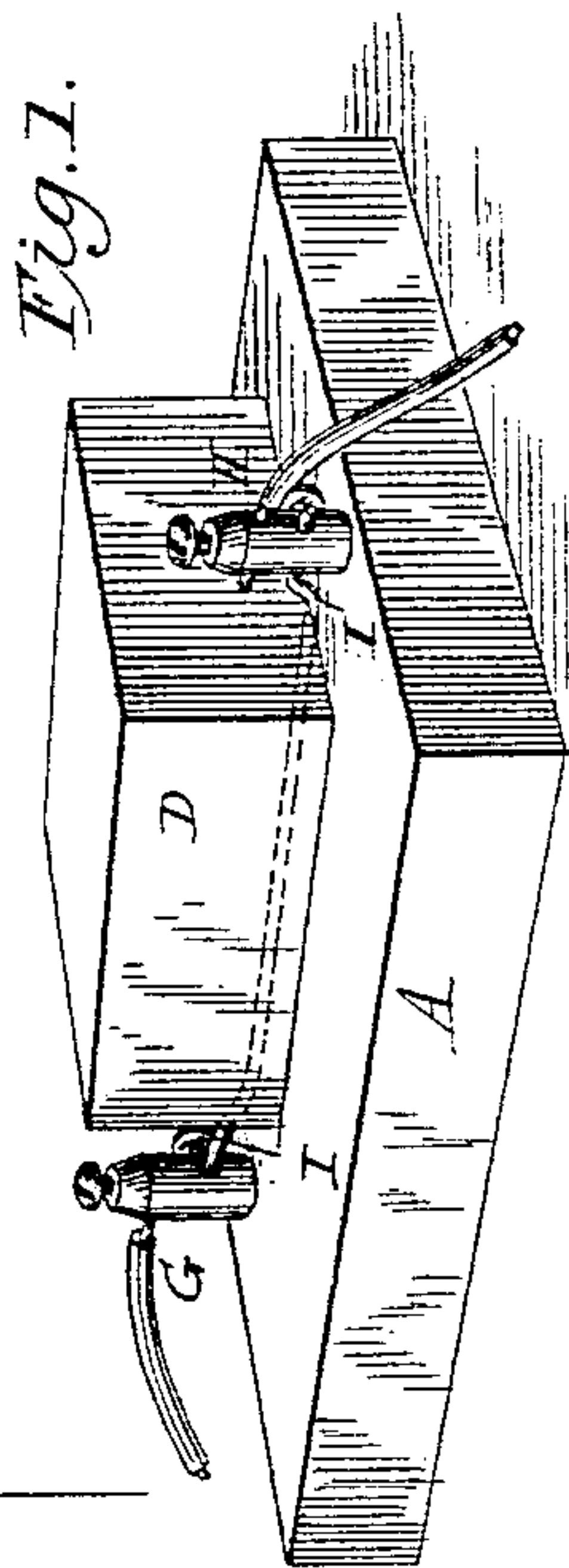


Fig. 1.

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# UNITED STATES PATENT OFFICE.

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## CUT-OUT AND CIRCUIT-PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 496,308, dated April 25, 1893.

Application filed October 15, 1892. Serial No. 449,024. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN O. HEINZE, Jr., a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Cut-Outs and Circuit-Protectors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in cut-outs and circuit protectors.

In the construction of electric circuits for the operation of various kinds of electrical instruments or forms of translating apparatus it often happens that actual working conditions allow the possibility of a great excess of current at points where an excess might work damage and destruction. The simplest means of preventing accidents of this sort comprise a weak spot, commonly known as a fuse wire, which in the presence of a current which will be dangerous to the apparatus will be melted and the circuit thereby opened. Where the abnormal current is of high tension it frequently happens that an arc will be formed across the opening in the circuit caused by the blowing of the fuse and it is to the extinguishment of this arc that a principal feature of the present invention relates, as will more fully and at large appear from the following description. Furthermore, the protective apparatus includes means for grounding the main circuit across an air space so that in case the excess of current comes from lightning the circuit will be grounded and the current carried to earth without injury to any of the apparatus. This provision of course is also available with any current of sufficient intensity to cross the air space.

In the accompanying drawings: Figure 1—is a perspective view of a generic embodiment of my invention. Fig. 2—is a side elevation of my cut-out and circuit protector, showing the same in place upon a wall and with part of the cover removed. Fig. 3—is

an end view. Fig. 4—is a transverse sectional view of a modification.

A generic form of my invention is shown in Fig. 1, in which it is a base of refractory insulating material, as for instance, porcelain. G. H. are the terminals of an electric circuit. I is a fuse wire spanning the circuit terminals. D is a block of refractory insulating material which rests upon the fuse wire and which will, the moment the fuse is destroyed settle down upon the base and by filling the space previously occupied by the fuse wire and thereby closing the path of the arc with a block of insulating material, extinguishing the arc, which would usually be formed upon the destruction of the fuse.

The remaining figures illustrate a specific embodiment of the invention which will now be described.

As shown in Figs. 2 and 3 the swinging arm C is hinged to a post B and said arm C carries a wedge shaped block, D, of refractory insulating material. E E are a pair of wedge shaped posts secured to or formed integral with the base A, and placed under the block D at such distance apart that when the arm C is in its lowest position the block D carried thereby will fit in between and fill the opening between the posts E E. A spring F is connected to the lever C and base A for the purpose of pulling the lever C downward when the same is free to move, thus enabling the apparatus to be applied in any position. G H are a pair of metallic binding posts arranged on opposite sides of the posts E E. A fuse wire I is secured at its ends in terminal posts G H and also partly sustained by passing across the posts E E, the circuit wires being connected to the posts G and H and the circuit completed through the fuse-wire I. Before inserting the fuse-wire the lever C is raised, the fuse-wire is then inserted and the insulating block D carried by said lever is then allowed to rest upon the fuse-wire where it is sustained until said wire is destroyed, when the block D is, by the action of the spring F drawn down between the posts E E. In case the destructive current is of such intensity as to form an arc between the posts E E the descent of the block D will



increase its length and decrease its area to a very large extent, thereby in most instances extinguishing the arc and preventing any damage.

5 In order to provide for all contingencies the outer end, C' of the lever C is serrated, and a serrated metallic post J is provided upon the base A. The post J is curved in a line radial to the path of the arm C so that the serrations upon the end of said arm will always  
10 be in the same relation to the serrations or teeth on the post J, said distance being such as will allow the passage of a high tension current between the points of serrations when  
15 a predetermined pressure has been reached. The post G and the serrated outer end C' are connected by conductor 7. The serrated post J is connected to the ground in any suitable manner as by conductor 4.

20 While in many instances I find it sufficient to employ a single block D and a pair of insulating posts E E, occasions will arise where the plurality of such devices might be necessary to accomplish the results desired. A  
25 duplicate arrangement is indicated in Fig. 4 and it will be obvious that a greater number of arc rupturing devices or extinguishers might be employed where the situation appeared to require them.

30 My device is particularly available as a lightning arrester for the reason that the serrated surfaces always occupy the same relation and are always ready for action, so that whether it be lightning or an excessive current on the line wire the instant the fuse is  
35 blown or before that in the case of a very small current of high intensity the escape must be to ground and it will be particularly noted that no movement of any kind or coming together of connected surfaces is required  
40 to happen before this relief is afforded. Therefore there can be no failure to act and a particularly desirable apparatus is the result.

45 Various minor modifications and changes in the details of construction will occur to one skilled in the art but they may be made without departing from the spirit or nature of the invention.

50 Having described my invention, what I claim is—

1. A fusible cut-out for electric circuits, comprising circuit terminals, a fuse wire spanning said terminals, and sustained by refractory insulating material; a movable block of  
55 refractory material normally sustained by the fuse and adapted when released by the destruction of the fuse to substantially close the space previously spanned by the fuse and  
60 thereby increase the distance to be traversed by an arc between the terminals.

2. A fusible cut-out for electric circuits, comprising circuit terminals, a fuse wire spanning the same; a pair of posts of refractory  
65 insulating material upon which the fuse wire is supported, a pivoted spring actuated block, also of refractory insulating material and

formed to fill a space or spaces between the posts, said block being normally sustained by the fuse-wire.

3. A fusible cut-out for electric circuits comprising circuit terminals, a fuse-wire spanning the same, two or more pairs of posts of refractory insulating material upon which the fuse-wire is supported; pivoted spring  
75 actuated blocks, one for each pair of posts, arranged and adapted to be normally sustained upon the fuse wire and to enter and fill spaces between the posts when said fuse-wire is destroyed.

4. A fusible cut-out for electric circuits, comprising circuit terminals; posts of refractory insulating material between said terminals, said posts supporting the fuse-wire; a pivoted spring actuated block, also of refractory insulating material, said block normally  
85 sustained upon the fuse wire and adapted upon the destruction of said fuse-wire to enter and fill a space or spaces between the posts whereby the area of an arc established  
90 between the posts is diminished and its length increased, the same being thereby extinguished.

5. A fusible cut-out and protecting device for electric circuits comprising circuit terminals; a fuse-wire spanning said terminals and sustained by refractory insulating material; a movable block of refractory material normally sustained by the fuse and adapted when  
95 released by the destruction of the fuse to close a space or spaces previously spanned thereby; a conductor carried by the movable block and connections therefrom to one of the circuit terminals, and a grounded metallic connection located in juxtaposition to the  
100 free end of the conductor carried by the movable block.

6. A fusible cut-out and protecting device for electric circuits comprising circuit terminals and a fuse-wire spanning said terminals, posts of refractory insulating material over which the wire passes and between which it is sustained; a pivoted spring actuated lever provided with an arc-extinguishing block of refractory insulating material, normally sustained upon the fuse and adapted upon the  
110 destruction of the fuse to close the space or spaces between its insulated supporting posts; a radial serrated post at the desired distance from the path of the end of the lever; electrical connections from the entering circuit terminal to the extremity of the pivoted lever and a ground connection from the radial  
115 serrated post whereby a current of abnormal potential would be grounded by the formation of an arc between the extremity of the lever and the serrated post.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN O. HEINZE, JR.

Witnesses:

STEPHEN JANNUS,  
F. D. BLACKISTONE.