

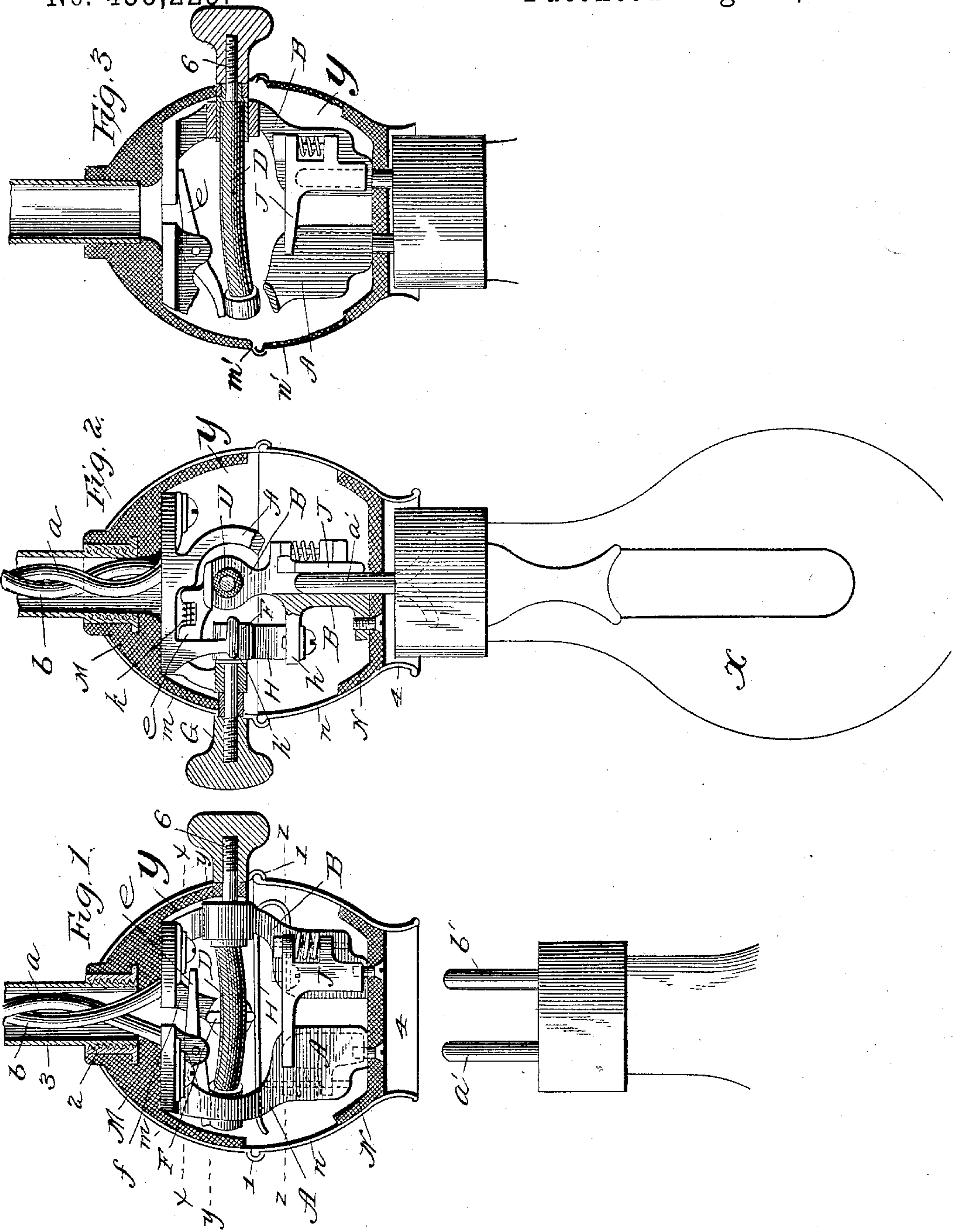
(No Model.)

2 Sheets—Sheet 1.

C. HEISLER.  
ELECTRIC CUT-OUT.

No. 435,223.

Patented Aug. 26, 1890.



Witnesses  
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Attorney

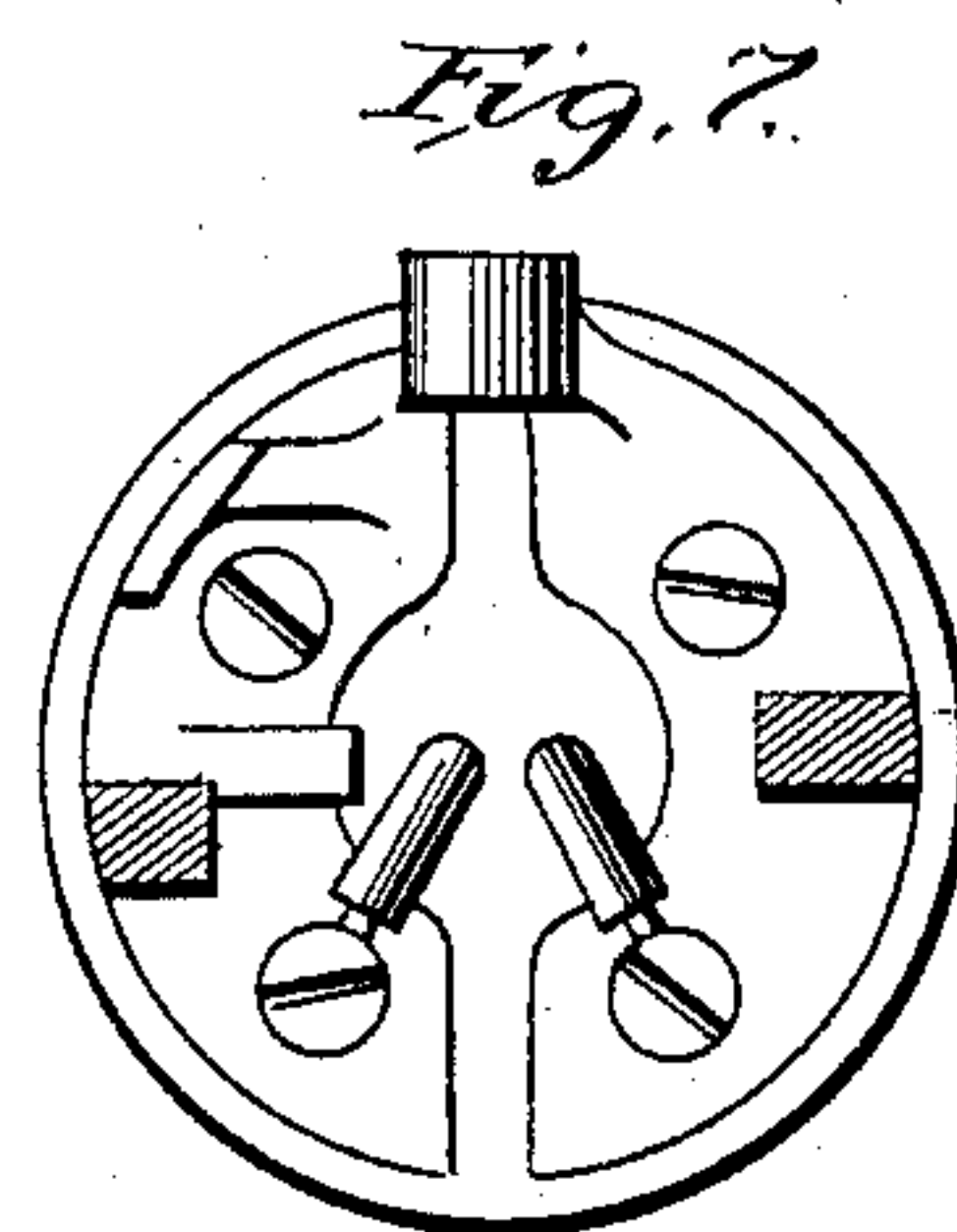
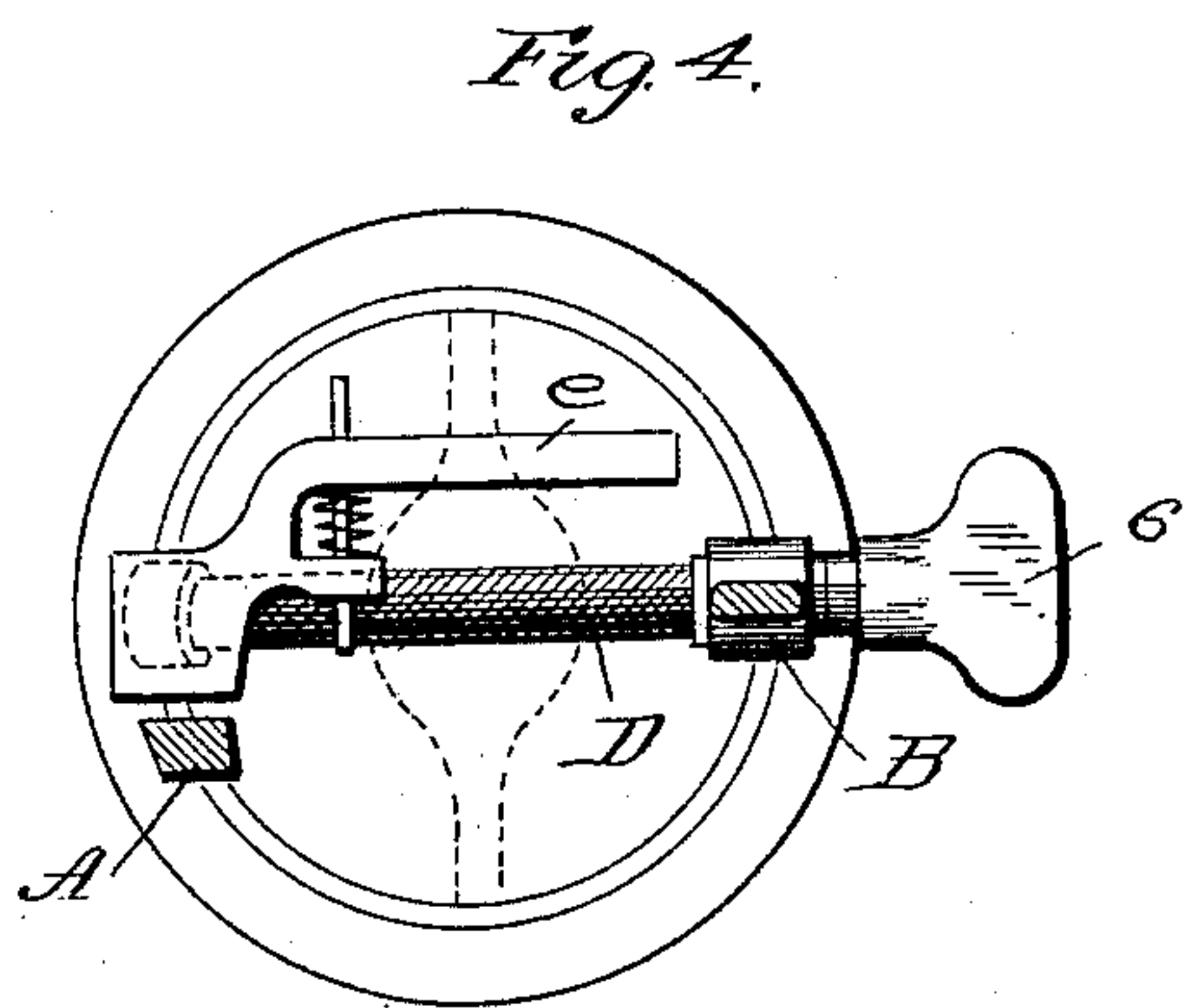
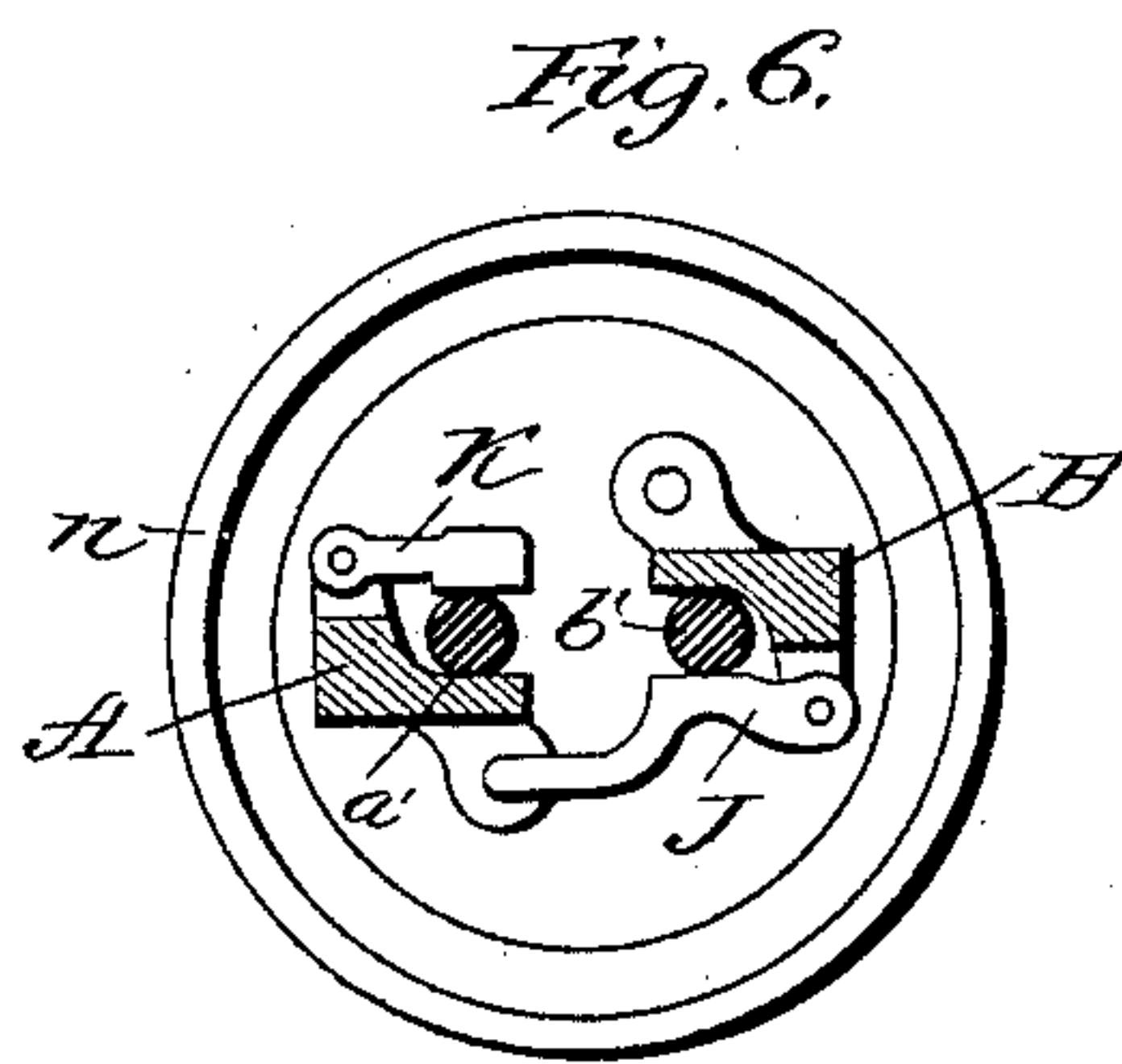
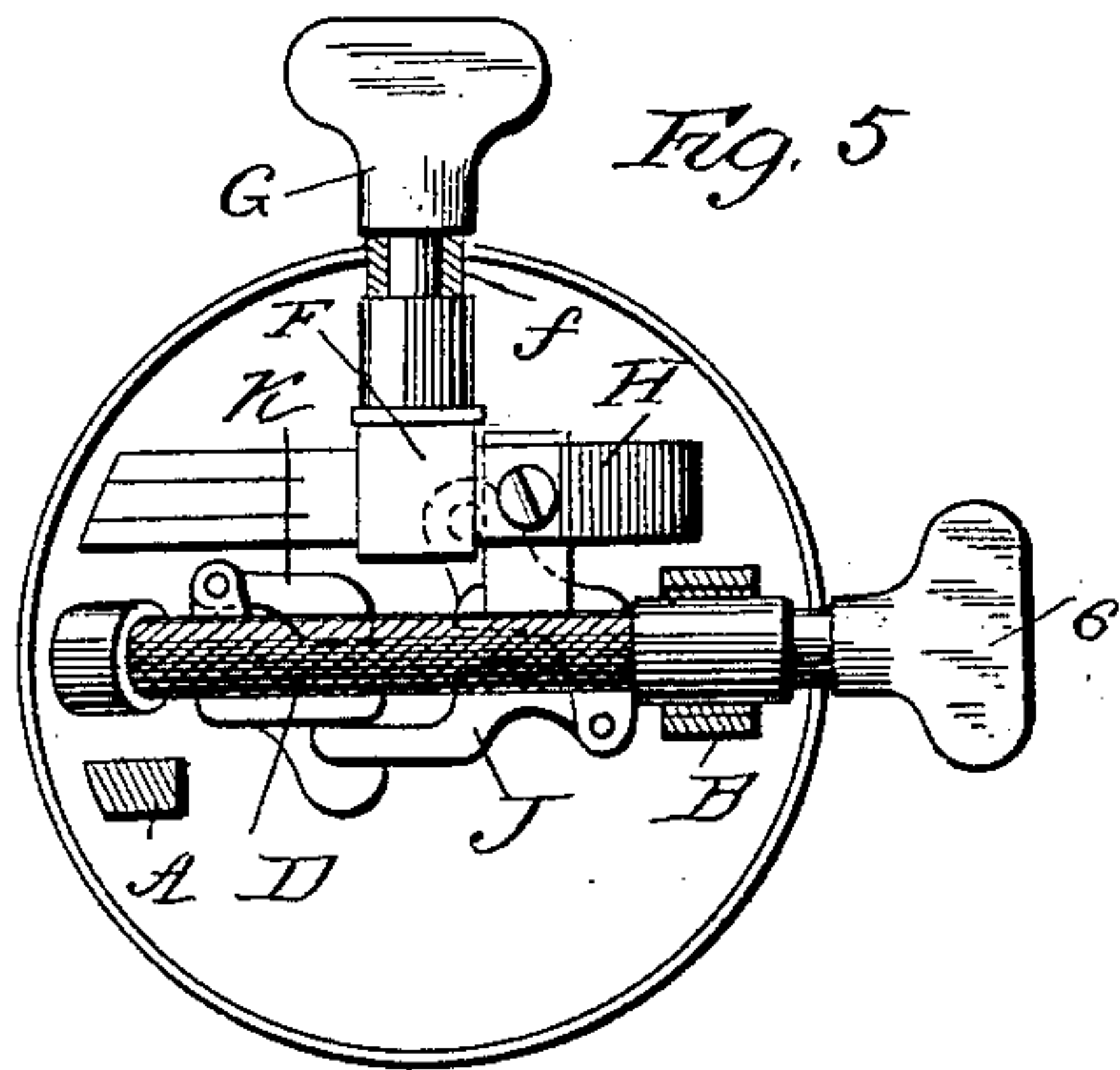
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

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## ELECTRIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 435,223, dated August 26, 1890.

Application filed April 26, 1889. Serial No. 308,652. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES HEISLER, of St. Louis, in the State of Missouri, have invented a new and useful Improvement in Electric Cut-Outs; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is designed to guard against breaks or abnormal resistances in an electric circuit in the event of the conductors of the lamps breaking, burning out, or not working properly, and while I have shown the invention as applied to an incandescent electric lamp I do not wish to limit the broad principle of my invention to this application.

My invention consists, broadly, of a piece of material of poor conductivity in shunt with the lamp or circuit to be protected, said piece being of material expansible or movable within itself, and being in engagement with a movable contact, whereby when the lamp or branch circuit fails to work the "cut-out" piece will become heated by the current and then expand or move, causing the movable contact-point to be operated to close the circuit and cut out the defective lamp or branch entirely.

My invention also includes the combination, with the cut-out device, of the operating-piece made of composition material, and non-metallic.

It includes, further, the combination, with the cut-out device, of the operating-piece made of a special composition. In this device means are provided for automatically closing the circuit when the terminals of the filament or of the branch circuit are withdrawn from their contacts—as, for instance, when the lamp is removed from its socket—and this means constitutes a part of my invention. The details of construction and insulation are also included in my invention.

In the drawings, Figure 1 is a vertical section and side elevation of the lamp working normally. Fig. 2 is a similar view a quarter-turn from Fig. 1, part of the frame being broken away. Fig. 3 is a view similar to Fig. 1, parts being broken away, and with the lamp or branch circuit cut out. Figs. 4, 5, and 6 are detail plan views on lines  $x x$ ,  $y y$ , and

$z z$ , respectively, Fig. 1. Fig. 7 is a bottom view on line  $x x$ , Fig. 1.

In the drawings, X is the lamp, and Y the casing containing the cut-out mechanism. The casing is composed of upper and lower flanged pieces M N, of insulating material. Over these may be placed the metallic covering-sheets  $m n$ , connected by a joint  $l$ , or the insulating-flanges may have thinner portions  $m' n'$ , which extend to connect with each other, as in Fig. 3. The insulating-piece M has an opening through it, about which is embedded the threaded socket 2, and into this the tubular support 3 is screwed. The pieces M N are connected by two brackets A B, preferably of metal, and essentially of good conductivity. The line-wires  $a b$  enter through the tube 3 and are connected electrically and mechanically with the brackets A B, respectively, by binding-screws. The lamp fits in a socket 4, formed by the extension of the shell  $n$ , and its terminals  $a' b'$  (which may represent the terminals of any branch line) pass through the bottom piece N and into electrical contact with the brackets A B, being held by spring-arms J K, hereinafter referred to. The circuit from the line is thus formed through the wire  $a$ , for instance, the bracket A, lamp-terminal  $a'$ , lamp or branch circuit terminal  $b'$ , bracket B, and line-wire  $b$ .  $e$  is the movable contact, shown as a lever pivoted to ears of bracket A, with its end adapted, under abnormal conditions, to be moved into contact with the other bracket to establish a short circuit and cut out the defective lamp or branch. The rear end of the movable contact  $e$  rests under tension of spring  $k$  upon the metallic end  $d$  of the cut-out-operating piece D, which is shown as in the shape of a bar supported in a bearing on the bracket B. This piece is in electrical connection with the bracket B, and also the bracket A, through the contact  $e$ ; but it is of high resistance, and therefore does not rob the circuit or lamp of any appreciable amount of current. The said operating-piece is made of material which will expand, bend, twist, or move in some way under the action of a considerable current—as, for instance, by becoming flexible it will be bent downwardly by its own weight. For this



purpose I form it of a compound preferably non-metallic and made up of rubber and carbon-dust or graphite or other conducting substance, the ingredients being so proportion-

5 ated that the piece is of poor conductivity. When the lamp or branch circuit fails to work properly, and an abnormal resistance thus arises, the current will be forced through the operating tubular piece D, which, under action  
10 of said current, will expand, bend, or move in such a way that the contact-piece will move into engagement with the bracket B, and thus establish the circuit directly between said brackets. The operating-piece has a shank 6  
15 extending through the shell, upon which is a finger-piece by which the bar D may be turned to reset the parts, as in Fig. 1.

As before stated, the terminals  $a'$   $b'$  are held by spring-arms J K. When the lamp is  
20 removed, it is essential that the circuit be not broken, and for this purpose the arm J extends from the bracket B, where it is pivoted, over in front of the bracket A, and when the terminals are removed the spring-arm bears  
25 upon the said bracket A, and thus keeps the circuit closed. A manual switch is also provided in this device, which consists of the spring H, supported on a lug  $h$  of the bracket B, and extending across to bear upon the lug  
30  $h'$  of the other bracket, and the switch-key G F, supported in a bearing  $f$  of the bracket B. The two brackets constitute the main supports for the parts, the means of connecting the upper and lower pieces M N, and the elec-  
35 trical conductors between the lines and the terminals  $a'$   $b'$ .

I claim as my invention—

1. In a cut-out device, a movable contact and a non-fusible expansible operating-piece per-  
40 manently in shunt to conduct the current and effect the closing of the circuit when the lamp or branch circuit fails to work, substantially as described.

2. In a cut-out device, a movable contact and  
45 a non-fusible expansible operating-piece D permanently in shunt to conduct the current and effect the closing of the circuit when the lamp or branch circuit fails, said piece being non-metallic, substantially as described.

3. In a cut-out device, a movable contact and  
50 a non-fusible expansible operating-piece permanently in shunt to conduct the current and effect the closing of the circuit when the lamp or branch circuit fails to work, said piece being composed of rubber and a conducting sub-  
55 stance or material, substantially as described.

4. In combination, in a cut-out, the support-  
ing-bracket B, forming part of the circuit, the

movable contact, and the automatically-oper-  
ating piece D, of high-resistance conducting 60  
material, supported by said bracket, the said movable contact being in engagement with said piece D, substantially as described.

5. In combination, the two supporting-  
brackets A B, forming parts of the circuit be- 65  
tween the main line and the lamp, the movable contact  $e$ , supported in the bracket A and arranged to move against the other bracket, and the expansible operating-piece D, in shunt  
70 and in engagement with the movable contact, substantially as described.

6. In combination, the two supporting-  
brackets A B, forming parts of the circuit be- 75  
tween the main line and the lamps, the movable contact  $e$ , in connection with one bracket and arranged to engage with the other bracket  
80 when moved, and the expansible operating-piece D, in engagement with the movable contact, said piece being supported by the other bracket, substantially as described.

7. In combination, the lamp and the holder,  
the lamp-terminals, the contacts fixed to the  
holder, and an automatically-movable arm op- 85  
erating between the contacts to close the circuit between them when the terminals of the  
lamp are removed, said arm being in line with  
the terminals to be moved thereby and act-  
ing to hold the lamp by engaging with said  
terminals and holding them against the con- 90  
tacts, substantially as described.

8. In combination, the lamp with its ter-  
minals, the holder with the brackets A B, form-  
ing parts of the circuit, the contacts to receive  
the terminals, and the automatically-movable  
arm J, arranged in line with the terminals, for 95  
holding the lamp and for closing the circuit, substantially as described.

9. In combination, the lamp with its ter-  
minals, the holder with its contacts therefor, 100  
and the lamp-holding arm pivoted to one contact and arranged to move against the other and bear upon and be moved by the terminals of the lamp.

10. In combination, the lamp, the holder,  
the cut-out mechanism comprising the mov- 105  
able contact and the thermo-motive piece D, said piece being expansible and having an extension outside the holder for resetting the parts, substantially as described.

In testimony whereof I have signed my 110  
name to this specification in the presence of two subscribing witnesses.

CHARLES HEISLER.

Witnesses:

GEO. M. BLOCK,  
W. AUFDERHEIDE.