

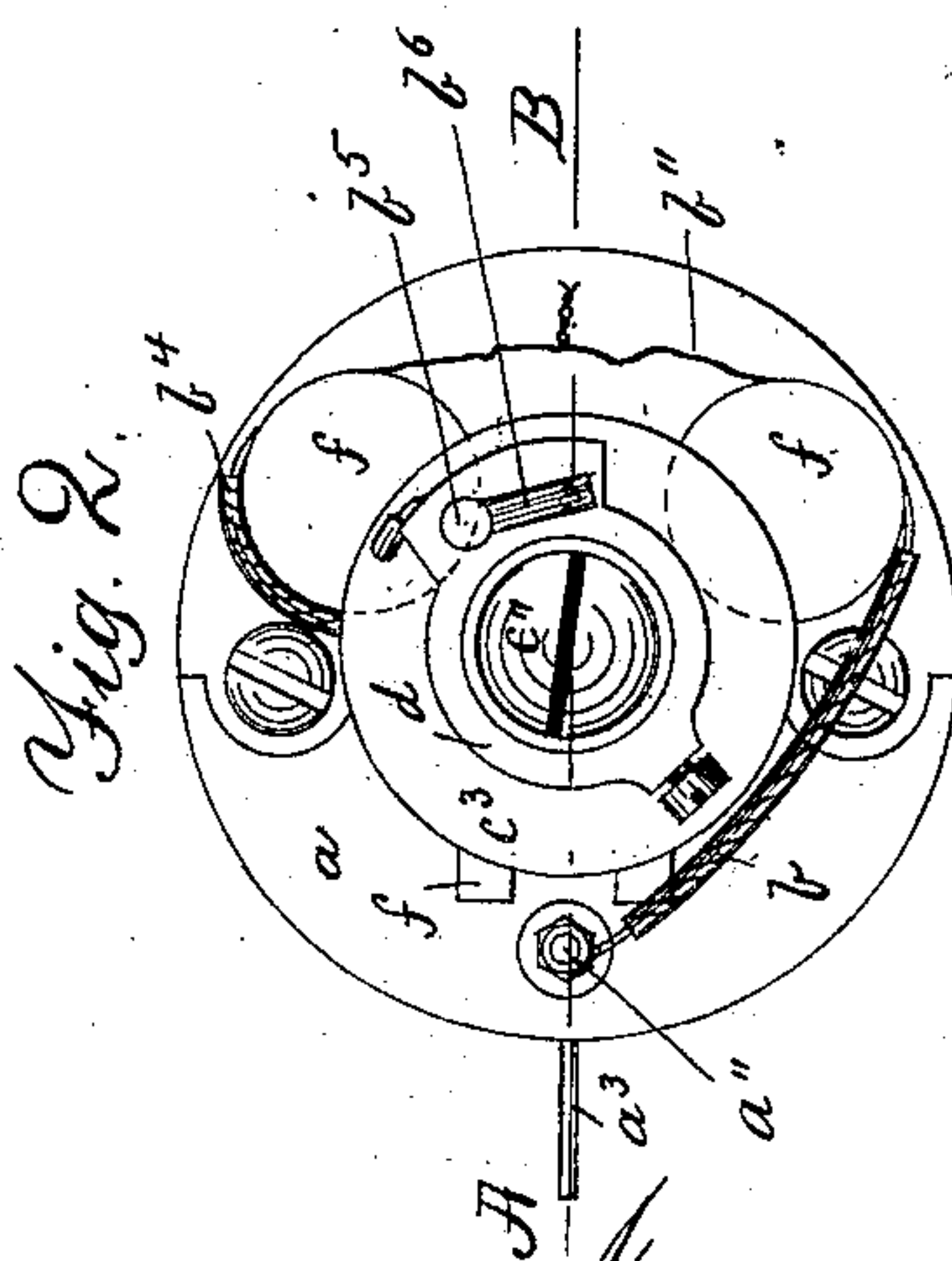
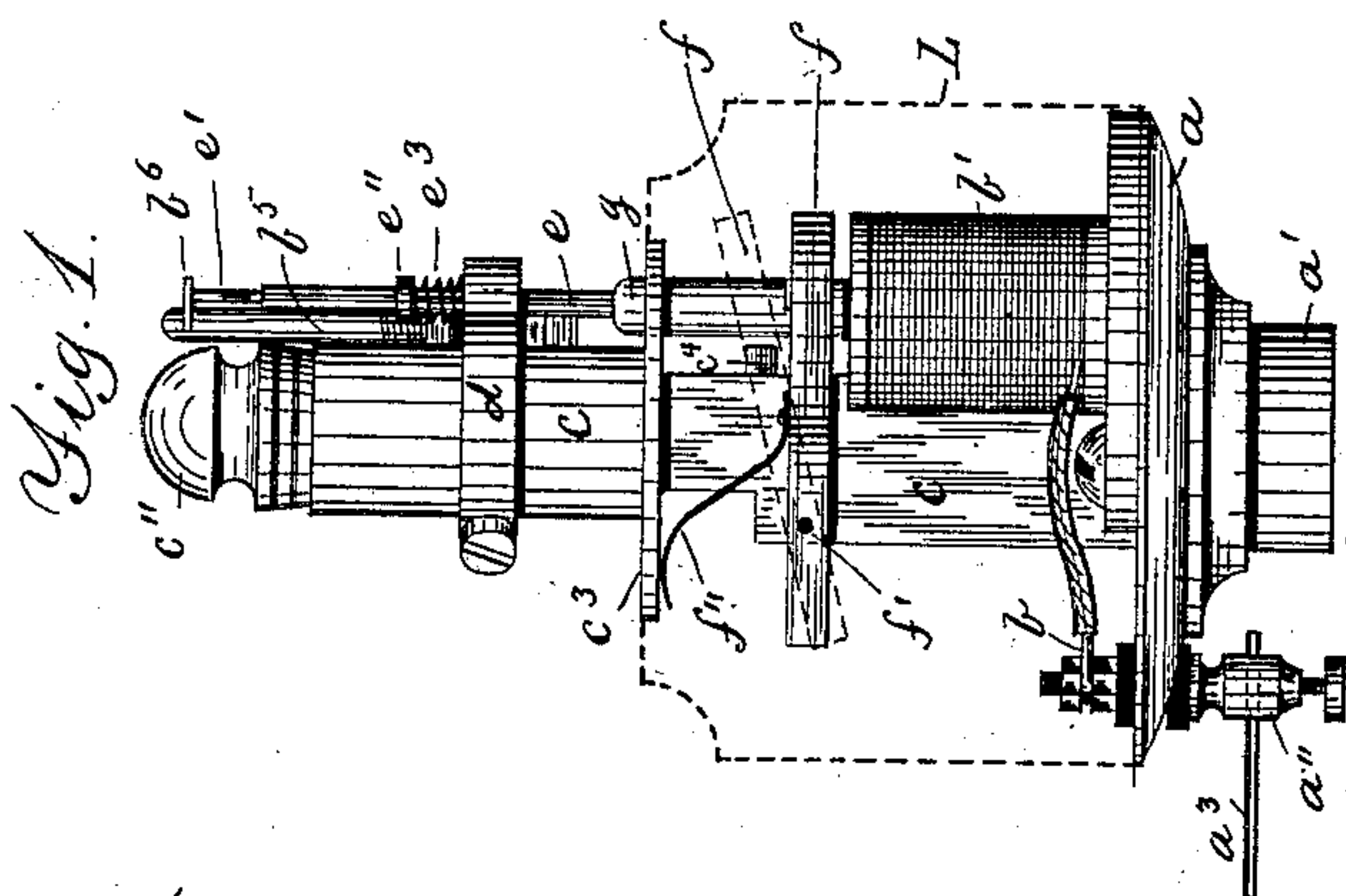
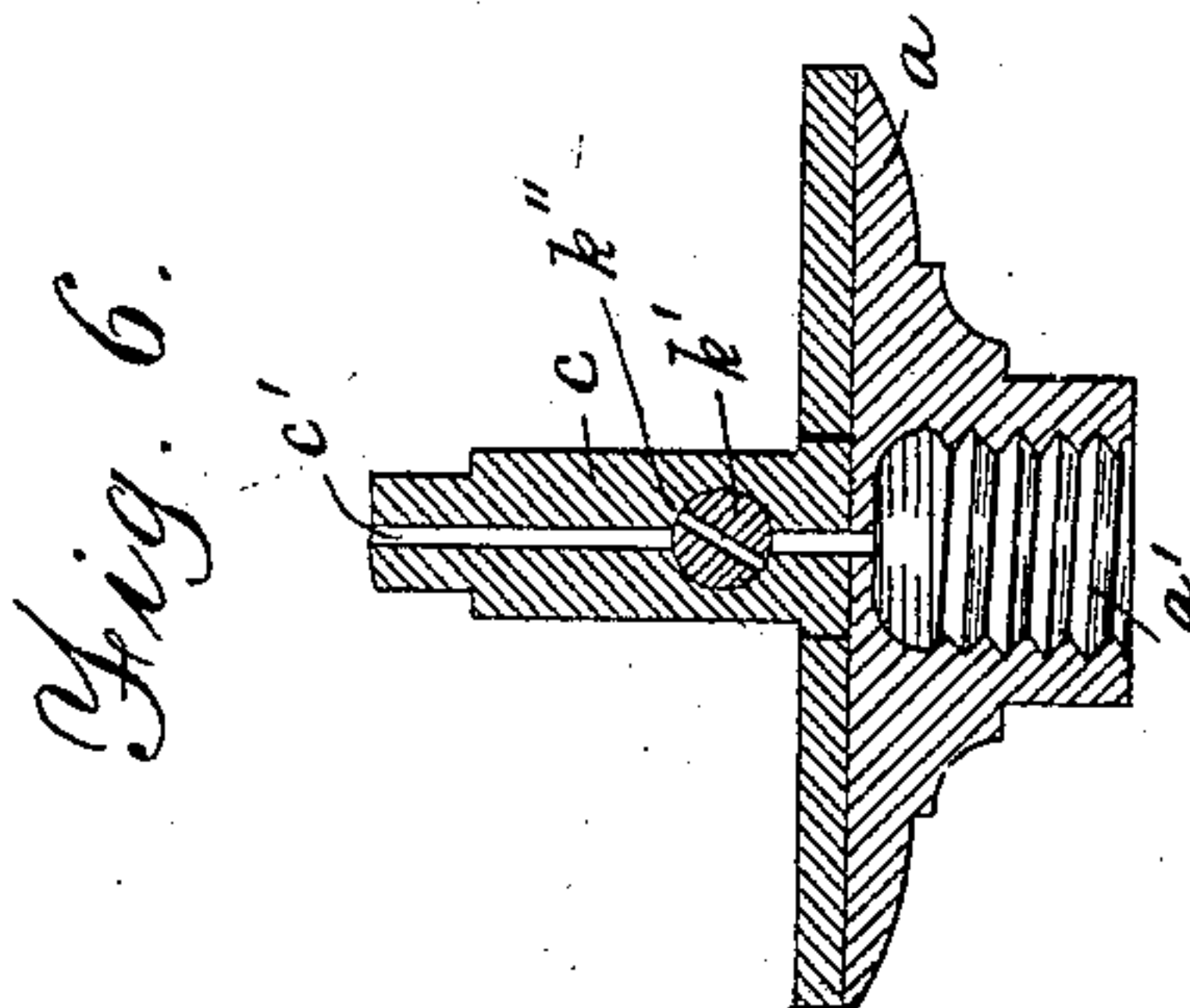
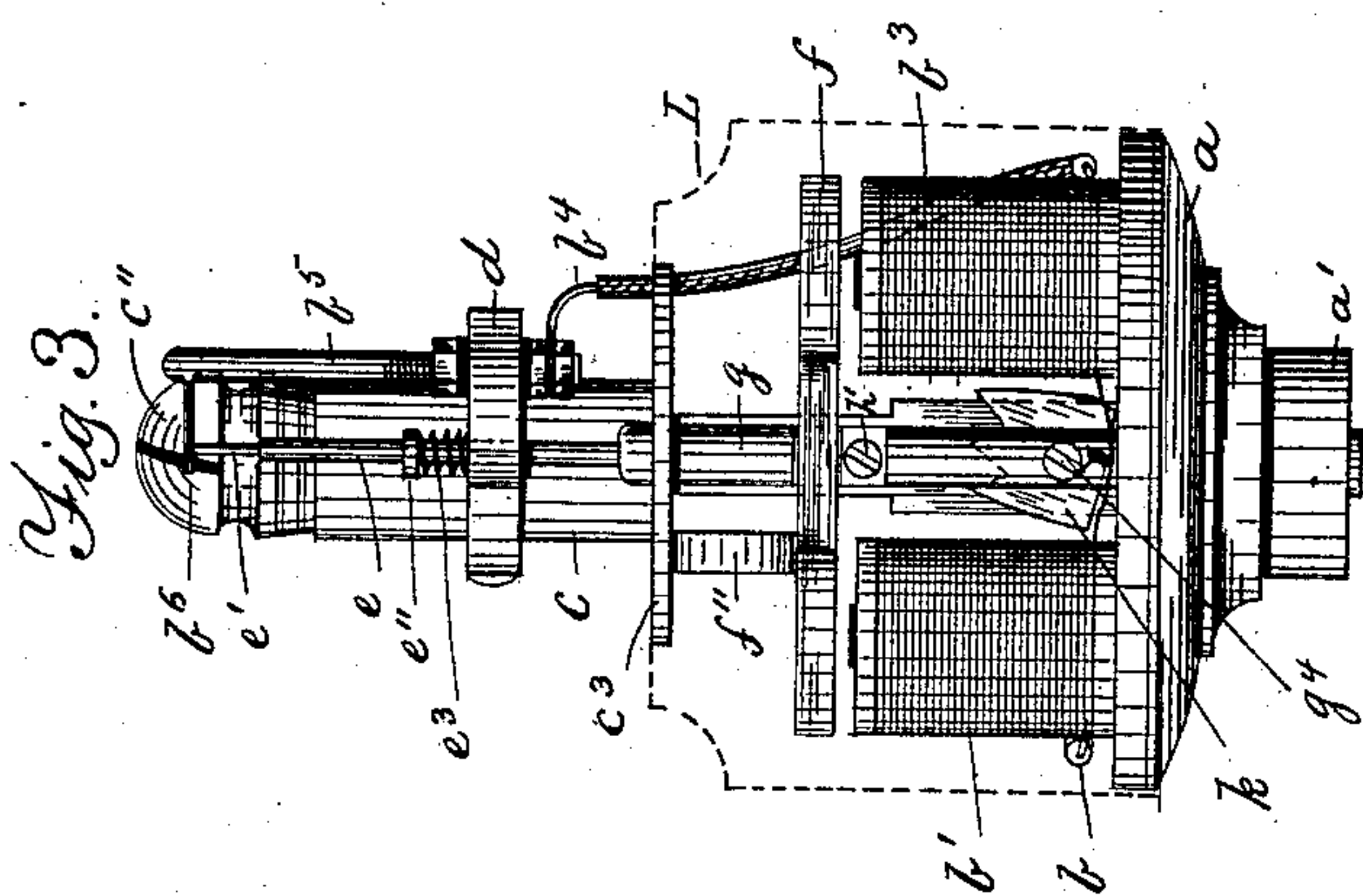
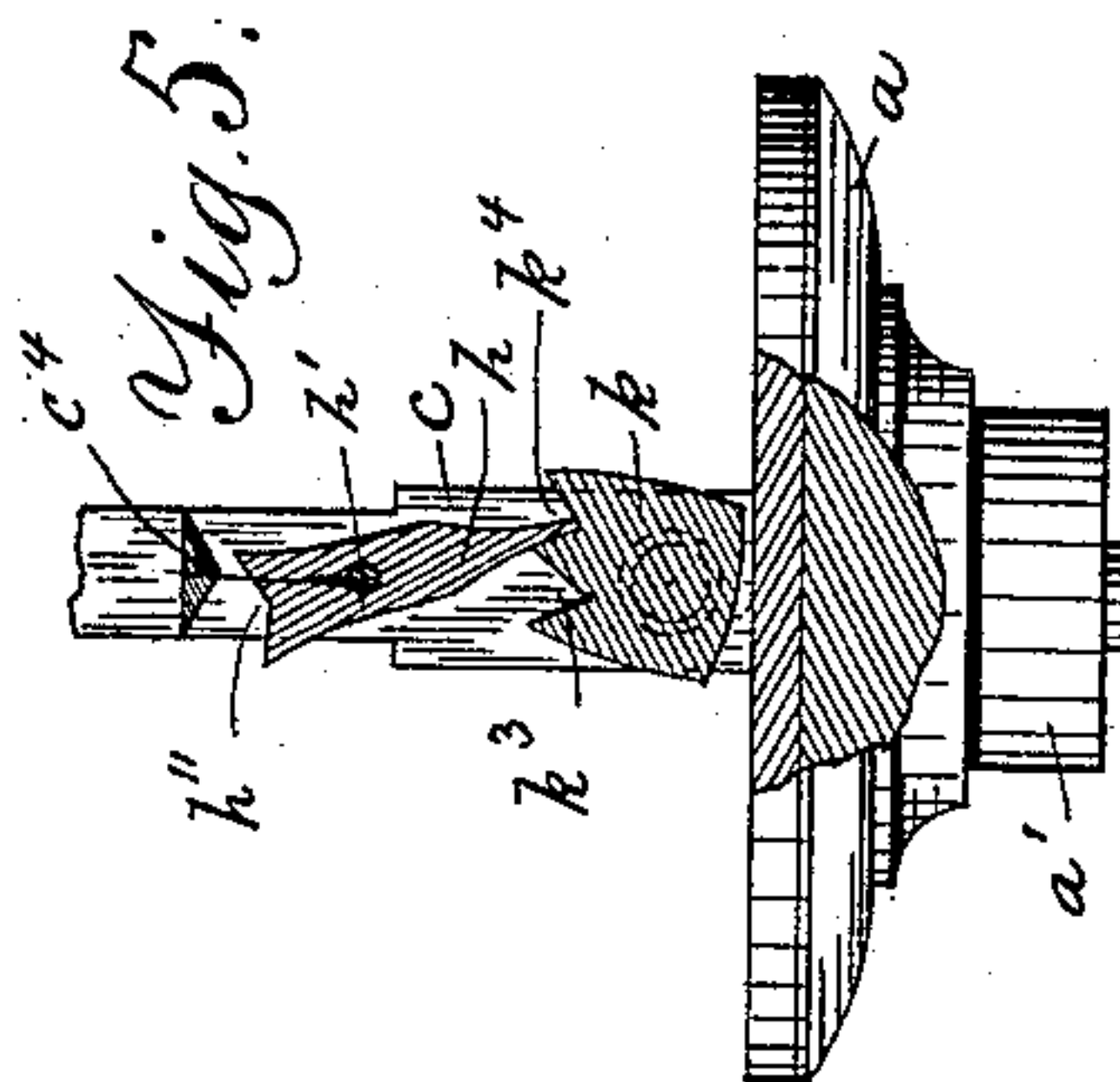
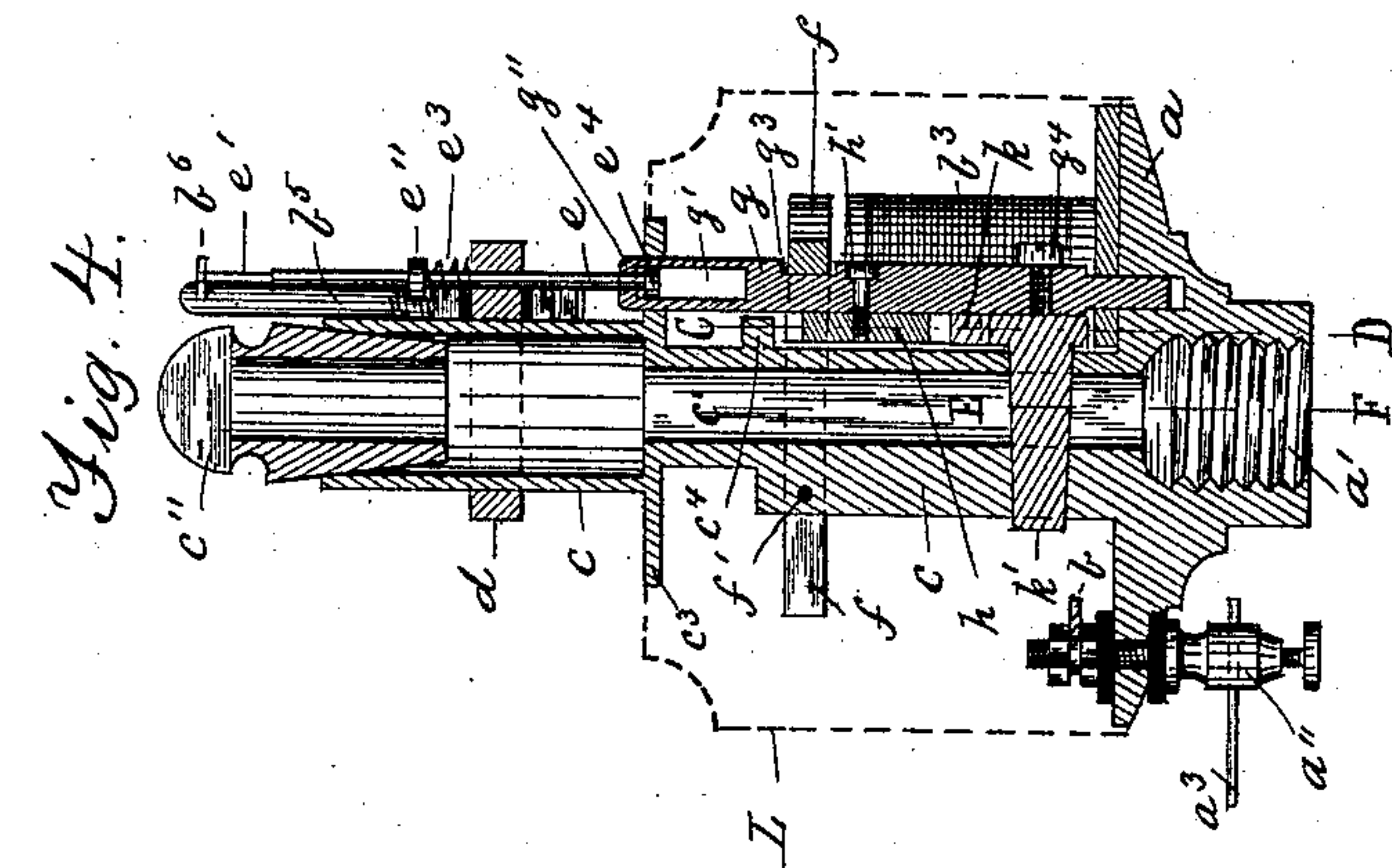
(No Model.)

E. E. BAILEY.

# AUTOMATIC ELECTRIC GAS BURNER.

No. 382,249.

Patented May 1, 1888.



Witnesses.  
Charles L. Fogg.  
Henry Chadbourne.

Inventor.  
Elmer E. Bailey.  
by Alvan Andren his atty.



# UNITED STATES PATENT OFFICE.

ELMER E. BAILEY, OF WEST EVERETT, ASSIGNOR OF ONE-HALF TO  
WILLIAM SEARS, OF MALDEN, MASSACHUSETTS.

## AUTOMATIC ELECTRIC GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 382,249, dated May 1, 1888.

Application filed November 9, 1887. Serial No. 254,678. (No model.)

*To all whom it may concern:*

Be it known that I, ELMER E. BAILEY, a citizen of the United States, and a resident of West Everett, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Automatic Electric Gas-Burners, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in automatic electric gas-burners, and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a side elevation of the invention. Fig. 2 represents a plan view, and Fig. 3 represents a front elevation, of it. Fig. 4 represents a vertical longitudinal section on the line A B, shown in Fig. 2. Fig. 5 represents a detail sectional view on the line C D, shown in Fig. 4; and Fig. 6 represents a detail sectional view on the line E F, also shown in Fig. 4.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

The object of my invention is to so construct an automatic electric gas-burner that a single wire and single push-button only shall be required to open and close the gas-cock and to ignite the gas at the tip of the burner, as will hereinafter be more fully shown and described.

In carrying out my invention I use a plate or frame, *a*, having a screw-threaded shank, *a'*, adapted to be screwed to the gas-pipe in the usual manner. To this plate is secured, in an insulated manner, the binder-screw *a''*, to which is metallically connected the single wire *a'''*, leading from a battery and provided with a push-button or switch, as is usual in electrical devices, by which the electric current may be sent through such wire or cut-off from the same at the wish of the operator. From the insulated binder-screw *a''* leads the wire *b* to the electro-magnet *b'*, and from the latter leads the wire *b''* to the electro-magnet *b'''*. From the latter leads the wire *b<sup>4</sup>* to the insulated post *b<sup>5</sup>*, having platinum bar or other suitable electrode, *b<sup>6</sup>*, attached to its upper end, as shown.

*c* is the gas-pipe, made in one piece with or

secured in a suitable manner to the plate *a*, and having a vertical perforation, *c'*, and a lava tip or burner, *c''*, secured in a suitable manner to its upper end, as shown.

*d* is a clamping-ring secured to the pipe *c*, and to it is secured in an insulated manner the post *b<sup>5</sup>*, before mentioned. The ring *d* also serves as a bearing for the rod *e*, the upper end of which terminates as a platinum wire or electrode, *e'*, as shown. On the rod *e* is made a collar or projection, *e''*, and between it and the ring *d* is located a spring, *e<sup>3</sup>*, which serves to hold the upper end of the electrode *e'* in contact with the electrode *b<sup>6</sup>* at all times, except when the gas is to be ignited at the tip of the burner.

*f* is the armature that is pivoted at *f'* to the gas-pipe *c*, as shown, and to it is secured the spring *f''*, the upper end of which bears against the under side of a plate or projection, *c<sup>3</sup>*, secured to the gas-pipe *c*, as shown, said spring serving to raise the armature to the position shown in dotted lines in Fig. 1 when no current is passing through the electro-magnets *b' b'''*.

The rod *e* is metallically connected to the gas-pipe *c*, and consequently to the ground, by the medium of the usual gas-supply pipe connected to the plate *a* and its screw-threaded shank *a'*.

*g* is the pawl-carrying bar, which is guided in recesses in the plate or projection *c<sup>3</sup>* and the plate or frame *a*, as shown in Fig. 4, said bar *g* having a cylindrical recess, *g'*, in its upper end for the reception of the collar or enlargement *e<sup>4</sup>*, that forms the lower end of the electrode-rod *e*, as shown in Fig. 4. The bar *g* has in its upper end an internally-projecting annular flange, *g''*, which comes in contact with the collar *e<sup>4</sup>* when said bar is moved sufficiently downward by the action of the electro-magnets and the armature, and thus causes the circuit to be broken between the electrodes *b<sup>6</sup>* and *e'* when the gas is to be ignited by the spark passing between said electrodes.

The armature *f* is loosely connected to the bar *g*, as shown in Fig. 4, by having its edge projecting into a recess, *g<sup>3</sup>*, in the front of the bar *g*, as shown in Fig. 4, by which arrange-



ment a positive motion is imparted to said bar  $g$  as the armature  $f$  rises or falls. To the rod or bar  $g$  is pivoted at  $h'$  the pawl  $h$ , as shown in Figs. 4 and 5, the lower end of which, as it is pressed downward, actuates the toothed block  $k$ , that is secured to or forms a part of the cock  $k'$ , which latter projects through the lower end of the gas-pipe  $c$ , and is provided with a lateral perforation or opening,  $k''$ , as shown in Fig. 6.

The block  $k$  has in its upper end two recesses,  $k^3$  and  $k^4$ , the former being made somewhat deeper than the latter, as shown in Fig. 5, the object of which is as follows: The recess  $k^4$  is made sufficiently small so that it shall serve as a stop for the pawl  $h$  when the cock  $k'$  is being closed, as shown in Figs. 5 and 6, and thus limit the downward motion of said pawl, its rod  $g$ , and the armature  $f$ , and thereby preventing the flange  $g''$  on the upper end of the rod  $g$  from actuating the collar  $e^4$  on the electrode-rod  $e$ , and thus keeping the electrodes  $e'$  and  $b^6$  in metallic contact during the closing movement of the cock  $k'$ , and thus preventing a spark from passing between said electrodes during the operation of shutting off the gas-supply to the burner.

When the electric current is cut off by the usual switch or push-button from the wire  $a^3$ , the armature  $f$  is automatically swung upward by the influence of its spring  $f''$  to the position shown in dotted lines in Fig. 1, and during such upward motion of the armature the rod  $g$  and pawl  $h$  are carried upward, the latter being automatically returned to a perpendicular position by the influence of the V-shaped projection  $e^4$  on the gas-pipe  $c$  engaging into the corresponding V-shaped recess  $h''$  in the upper end of the pawl  $h$ , as shown in Fig. 5. If the current is now made to pass through the wires  $b$   $b''$   $b^4$ , the electro-magnets  $b'$   $b^3$ , and electrodes  $b^6$   $e'$ , the armature  $f$  is attracted toward the upper ends of the electro-magnets  $b'$   $b^3$ , causing the rod  $g$  to be depressed, the pawl  $h$  to enter the deeper recess  $k^3$ , and thereby to turn the block  $k$  sufficiently to open the cock  $k'$ , so as to admit the gas to the burner-tip  $c''$ , at the same time as the flange  $g''$  in the upper end of the rod  $g$  actuates the collar  $e^4$  on the electrode-rod  $e$ , and thus breaks the circuit between the electrodes  $e'$   $b^6$ , causing a spark to be emitted at this place, by which the gas is ignited at the tip of the burner, and such spark or sparks will be emitted at this place as long as the operator continues to depress the button by which the circuit is closed, causing the armature to vibrate slightly and rapidly, but not sufficiently to disengage the pawl  $h$  from the deeper recess  $k^3$  on the block  $k$ . If now the current is cut off from the wire  $a^3$ , the armature  $f$  is drawn upward by the influence of its spring  $f''$  to the position shown in dotted lines in Fig. 1, leaving the cock  $k'$  open and the gas burning, and during such upward motion of the armature the pawl  $h$  is automatically returned to its normal vertical position by the influence of

the V-shaped projection  $e^4$  acting on the V-shaped recess  $h''$  in the upper end of the pawl  $h$ , as before mentioned. Should the current now be connected to the single wire  $a^3$ , the armature  $f$  is attracted toward the electro-magnets to the position shown in the drawings, causing the pawl  $h$  to enter the recess  $k^4$  in the block  $k$ , and to turn the latter sufficiently to close the cock  $k'$ , and thus to shut off the supply of gas to the burner without breaking the circuit at the electrodes  $e'$   $b^6$ , and without producing a spark at such place, the bottom of the recess  $k^4$  serving as a stop for the lower end of the pawl  $h$  to limit the downward motion of the rod  $g$ , so as to prevent the breaking of the circuit at the electrodes  $e'$   $b^6$  and consequent vibration of the armature, and so on.

It will thus be seen that in this my improved device I use only a single wire connected to the battery for the purpose of shutting off the gas-supply without producing a spark, and for the purpose of alternately turning on the gas and simultaneously breaking the circuit and producing a spark between the electrodes  $e'$   $b^6$ , as above set forth.

L in dotted lines in Figs. 1, 3, and 4 represents the inclosing shell or case, as usual.

$g^4$  is a set-screw, screwed through the bar  $g$ , and having its inner end pressing against the front of the toothed block  $k$ , as shown in Fig. 4, for the purpose of keeping the cock  $k'$  tight in its bearings in the pipe  $c$  as it is being turned around its axis to open and close the gas-supply.

What I wish to secure by Letters Patent and claim is—

1. In an automatic electric gas-burner, one or more electro-magnets electrically connected by means of a single wire to the stationary insulated electrode  $b^6$ , in combination with the movable ground-connected electrode  $e'$ , the stop-cock  $k'$ , and armature  $f$ , substantially as and for the purpose set forth.

2. In an automatic electric gas-burner, the stop-cock  $k'$  and its block  $k$ , having recesses  $k^3$   $k^4$ , of varying depths, in combination with the movable rod  $g$ , pivoted to and actuated by the armature  $f$ , the pawl  $h$ , pivoted to said rod  $g$ , and the electrode  $e'$ , loosely connected to said rod  $g$  in such a manner that every alternate downward motion of said rod will cause the circuit to be broken between the electrodes  $b^6$   $e'$ , as and for the purpose set forth.

3. In an electric automatic gas-burner, the gas-pipe  $c$ , having stop-cock  $k'$ , with recessed blocks  $k$   $k^3$   $k^4$ , as described, and the stationary V-shaped projection  $e^4$ , combined with the movable armature  $f$ , the rod  $g$ , pivoted to and actuated by said armature, the pawl  $h$ , pivoted to the rod  $g$ , and having V-shaped recess  $h''$  in its upper end, and the electrode  $e'$ , loosely connected to said rod  $g$ , in a manner as described, so that every alternate movement of the armature shall cause the circuit to be broken between the electrodes  $e'$   $b^6$ , as set forth.

4. In an automatic electric gas-burner, the



gas-pipe *c* and the stop-cock *k'*, located therein, combined with the movable rod *g*, pivoted to the armature *f*, and having the set-screw *g'*, for the purpose of retaining the stop cock in  
5 place, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two sub-

scribing witnesses, on this 8th day of November, A.D. 1887.

ELMER E. BAILEY.

Witnesses:

ALBAN ANDRÉN,  
HENRY CHADBURN.