

No. 670,252.

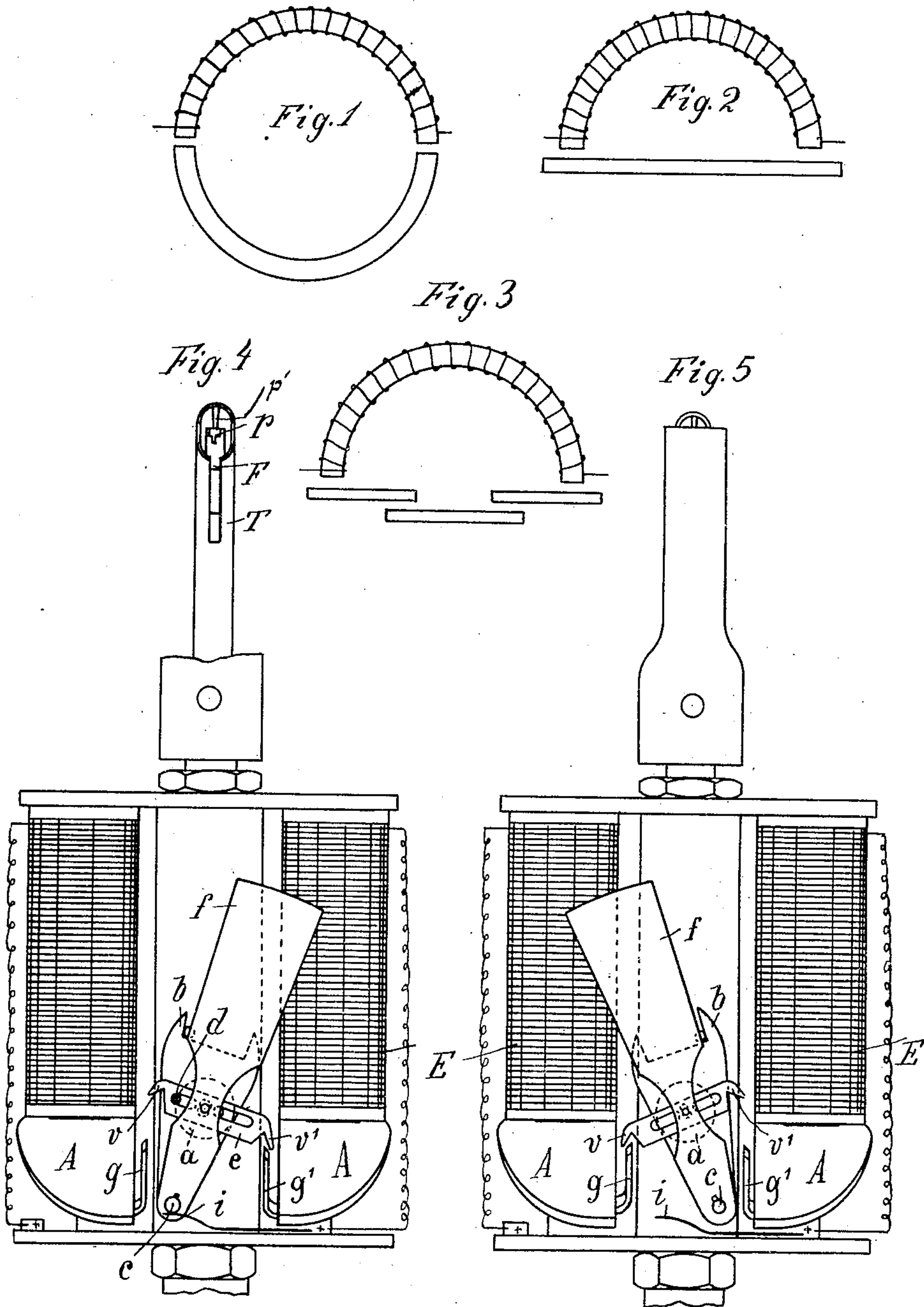
Patented Mar. 19, 1901.

E. SCHMIDT.
IGNITING DEVICE.

(Application filed Jan. 19, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
Carl Funder
sew Mischung

Inventor:
Ernest Schmidt
By: *Ernest H. Hoppe*
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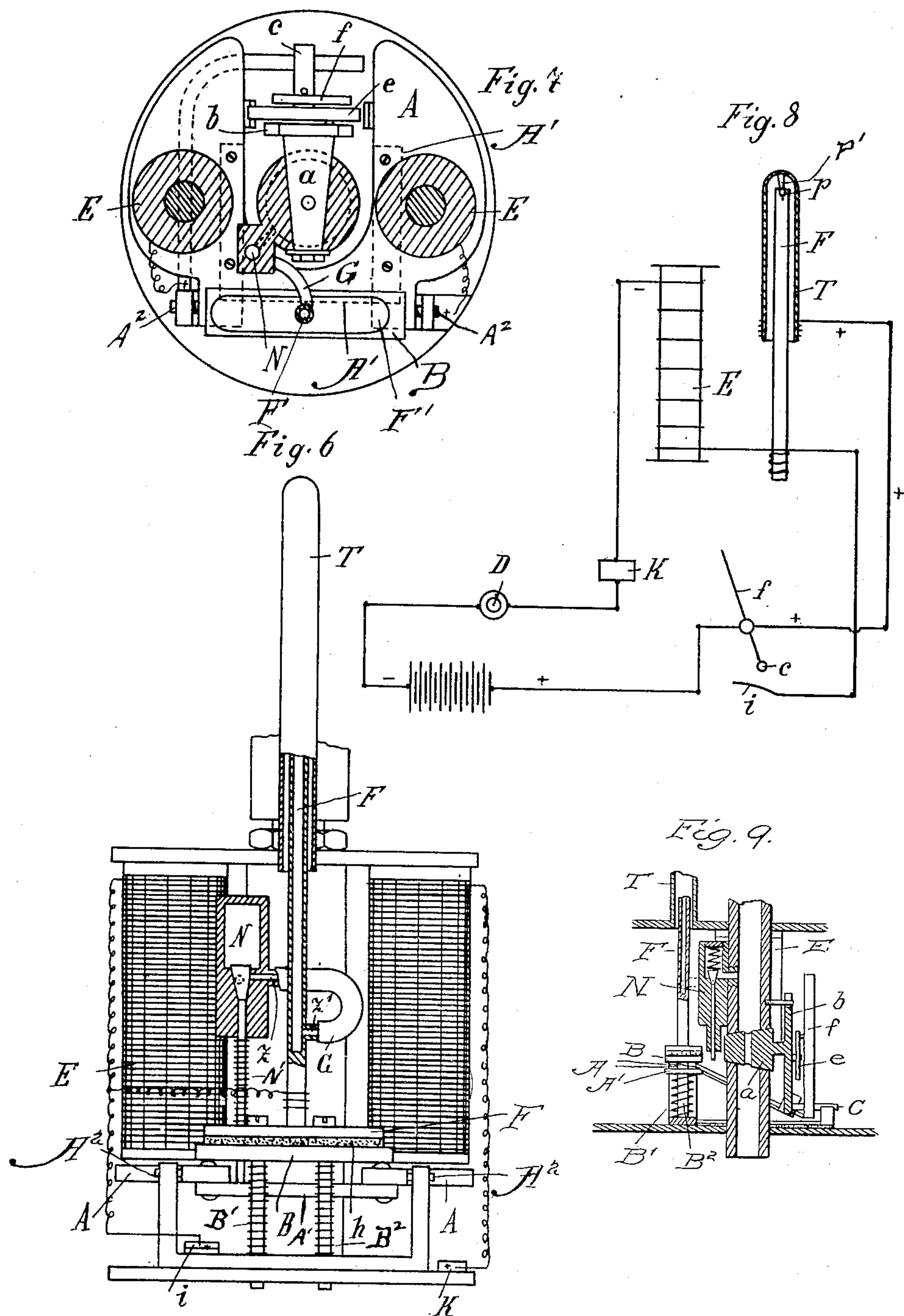
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IGNITING DEVICE.

(Application filed Jan. 19, 1900.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

ERNEST SCHMIDT, OF WILMERSDORF, GERMANY.

IGNITING DEVICE.

SPECIFICATION forming part of Letters Patent No. 670,252, dated March 19, 1901.

Application filed January 19, 1900. Serial No. 2,063. (No model.)

To all whom it may concern:

Be it known that I, ERNEST SCHMIDT, a subject of the Emperor of Germany, residing at Wilmersdorf, near Berlin, Germany, have invented a certain new and Improved Igniting Device, of which the following is a description.

The devices for igniting gas lights or lamps by means of electricity as hitherto employed have the disadvantage that they are liable to become inoperative owing to the deficient formation of sparks, and the friction of the plug of the cock is often so great that the armature has not sufficient power to open the same. According to the present invention these disadvantages are obviated in that a weight is employed to assist in turning the plug of the cock, while the proper generation of sparks is attained by means of an induced current having an extremely high vibratory effect.

In order to render the present specification easily intelligible, reference is had to the accompanying drawings, in which similar letters of reference denote similar parts throughout the several views.

Figures 1, 2, and 3 are diagrams of electromagnets necessary for explaining the present device. Fig. 4 is a front elevation of the igniting device, showing the cock closed; Fig. 5, a similar elevation showing the cock open; Fig. 6, a sectional elevation showing the arrangement of the armature and the igniting-flame; Fig. 7, a sectional plan on a plane through the center of the cock-plug; Fig. 8, a diagram showing the electric wires, and Fig. 9 is a vertical section taken at a plane at right angles to that of Fig. 6.

The present invention is based on the following peculiarities, which have been observed in connection with various classes or constructions of armatures.

In Fig. 1 a divided ring is illustrated having the upper half formed to an electromagnet, the lower part being the armature. If current is passed through the windings of the upper part, the armature will be attracted, and if the current is cut off the armature will fall back; but it will remain hanging a short period, owing to the magnetism remaining in the magnet after the current has been cut off. If a flat armature, as illustrated in Fig. 2, is

employed, the same will fall off the magnet when the current has been cut off somewhat more quickly than the curved armature, and if a compound armature, such as illustrated in Fig. 3, is employed the same will fall back from the magnet almost immediately the current is cut off. These facts have been proved by experiment. In connection with electric igniting devices it is of great importance to have the various phases of the making and breaking of the current follow each other with great rapidity, and this has hitherto been prevented by the residue of magnetism remaining in the magnet after the current has been cut off.

The device consists of the following parts: The plug *a* of the gas-cock is provided with a plate *b*, attached to its end and having at its lower part a pivot *c*, to which is loosely attached a weighted lever *f*, having a rearwardly-extending pin adapted to engage a slot of a slide *e*. This slide *e* is mounted on two pins *d d* of the plate *b* and is capable of a lateral sliding movement on the said pins by means of slots. The plate *e* is further provided with hooks *v v'* at each end, which are adapted to engage with the upwardly-turned ends *g* and *g'* of the armature *A*. The armature *A* is pivotally supported at *A²*, Fig. 7, and, as will be seen from Figs. 6 and 7, consists of the two wings *A A*, connected up by means of a saddle-piece *A'*, of brass, or the armature may be of iron and made in one piece of a saddle shape. I prefer brass, however, because then the cross-bar *B*, which, together with it, forms the compound armature above referred to, will form the sole means for the passage of the lines of the current. The member *B* of the compound armature is mounted above the armature *A*, Fig. 6, said part *B* being vertically guided on suitable pins *B²* and normally held out of contact with *A* by means of upwardly-operating springs *B'*. On this part of the armature is mounted the igniting-tube *F*, having a base *F'*, insulated from the said armature by means of an insulating layer *h*. This tube is in connection with a gas-supply through the valve *N*, the stem of which is operated by the rise and fall of the armature *A*, as will be seen from Fig. 9, and the igniting-tube is connected up to the valve-

housing by means of a flexible pipe G. To the top of the tube F is attached a contact p , adapted to cooperate with the contact p' , mounted in the top of a stationary tube T, so that when the plate B vibrates sparks will be formed at this contact.

The device operates in the following manner: Assuming the parts to be in the position illustrated in Fig. 4 and the cock a closed, the weighted arm f will lie on the right-hand side and the slide e will have been slid over its guide-pins, so as to bring the hook v' in position above the hook g' on the right-hand wing of the armature A. If the electromagnet E is energized, the armature A will be attracted and the hook g' , as the armature rises, will tip the arm b , plate or slide e , and the weighted arm f over toward the left, thus opening the cock; but the parts will not attain the position shown in Fig. 5 until the current has been broken, since the arm f cannot move the slide into position above the hook g until the latter—*i. e.*, the armature—has again fallen into the position shown at Fig. 5. As soon as this takes place the weight f moves the slide e to its extreme left position, in which case the hook v lies in position for engagement with the hook g of the armature, when the latter again rises. Before, however, the armature falls—*i. e.*, during its first attraction—it attracts the second member B of the compound armature, and this member pulls down the igniting-tube F, and consequently breaks contact at $p p'$, whereupon the armature part B will be pushed upward by its spring B', again making contact at $p p'$. The contact will be made and broken by the part B so quickly that this part will not entirely rise and fall, but will vibrate, the armature A remaining attracted, and thus an energetic spark formation will take place between the platinum contacts $p p'$. The armature A when first attracted pushes up the stem of the valve N, Fig. 9, and opens the latter, so that gas flows through pipe F and will burn as a long jet-flame at the top of the tube. If the current is now interrupted, the weighted arm f will complete its movement into the position shown at Fig. 5, and the armature will release the stem of the valve N, which falls by the action of the spring N', cutting off the gas-supply to the igniting-flame, which is consequently extinguished, the gas-flame having been properly ignited. When the current is again sent through the magnet E in order to extinguish the main flame, the left-hand hook g will tilt over the slide e by means of its hook v , and thus turn the cock a out. At this operation no sparks will be formed at $p p'$, because the pin c of the arm f contacts with an insulated spring i when in this position, Fig. 4, and spring i is in contact with the tube F direct, so that the current passes directly to this tube without vibrating the part B. When the current is broken, the arm f pushes the slide into the position shown

at Fig. 4 by gravity and the parts are ready for igniting the flame again.

In the diagram shown in Fig. 8 the arrangement of the conductors is illustrated, the same being provided with the contact-button D, the pole-clamps K, and passing from the battery through magnet E, thence around the tube F to the spring i and from the battery at the other line to the stationary tube T, as will be understood.

I claim as my invention—

1. An electric igniting device for gas-lights consisting of an electromagnet having a compound armature, comprising the wings A and the second armature member B extending across the ends of the same, an igniting-tube fast to the member B means for vertically guiding the latter and springs to normally hold it out of contact with the armature A, a contact at the top of the igniting-tube between it and a stationary conducting-tube, the said igniting-tube being insulated from the member B but being arranged in the electric circuit, a gas-supply valve for the igniting-tube having a stem projecting into the path of movement of the armature A a main gas-cock and means for turning the same in opposite directions at each attraction of the armature and means for conducting the current direct to the igniting-tube when the gas-cock is turned off substantially as described.

2. In an electric igniting device, the combination of an electromagnet having a compound armature consisting of a pivotally-supported saddle-shaped armature and a vertically-guided joining member for the two wings of the said saddle, means for normally keeping the second member out of contact with the main part of the armature, a gas-supply valve to the igniting-flame having a valve-stem projecting into the path of movement of the main armature part, an igniting-tube mounted on the second armature member and insulated therefrom, flexible gas connection from the supply-valve housing to the said igniting-tube, a contact between the top of the said tube and a stationary conductor, in proximity to the flame, electric connection to the tube F, a main gas-cock and means for operating the same when the armature is attracted, means for reversing the direction of its movement at each attraction of the said armature and means for conducting the current direct to the tube F when the gas-cock is turned off substantially as described.

3. In an electric igniting device, the combination of an electromagnet having a compound armature consisting of a pivotally-supported saddle-shaped armature and a vertically-guided joining member for the two wings of the said saddle, means for normally keeping the second member out of contact with the main part of the armature, a gas-supply valve to the igniting-flame having a valve-stem projecting into the path of movement of the main armature part, an igniting-tube

mounted on the second armature member and
insulated therefrom, flexible gas connection
from the supply-valve housing to the said ig-
niting-tube, a contact between the top of the
5 said tube and a stationary conductor, in prox-
imity to the flame, electric connection to the
tube F, a main gas-cock and means for oper-
ating the same when the armature is attracted
consisting of a plate *b*, having a weighted arm
10 *f*, pivoted at its lower end thereto, a slide-
plate *e* to slide on the said plate *b* said slide
having hooks *v v'* at either end and being piv-
oted to the weighted lever, means for arrest-

ing the said slide with one or other of its
hooks in position for engagement with the ar- 15
mature and means for conducting the cur-
rent direct to the igniting-tube F when the
main cock is turned off substantially as de-
scribed.

In witness whereof I have hereunto set my 20
hand in presence of two witnesses.

ERNEST SCHMIDT.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.