

(No Model.)

D. McF. MOORE.  
INTERRUPTER.

No. 580,988.

Patented Apr. 20, 1897.

Fig. 1.

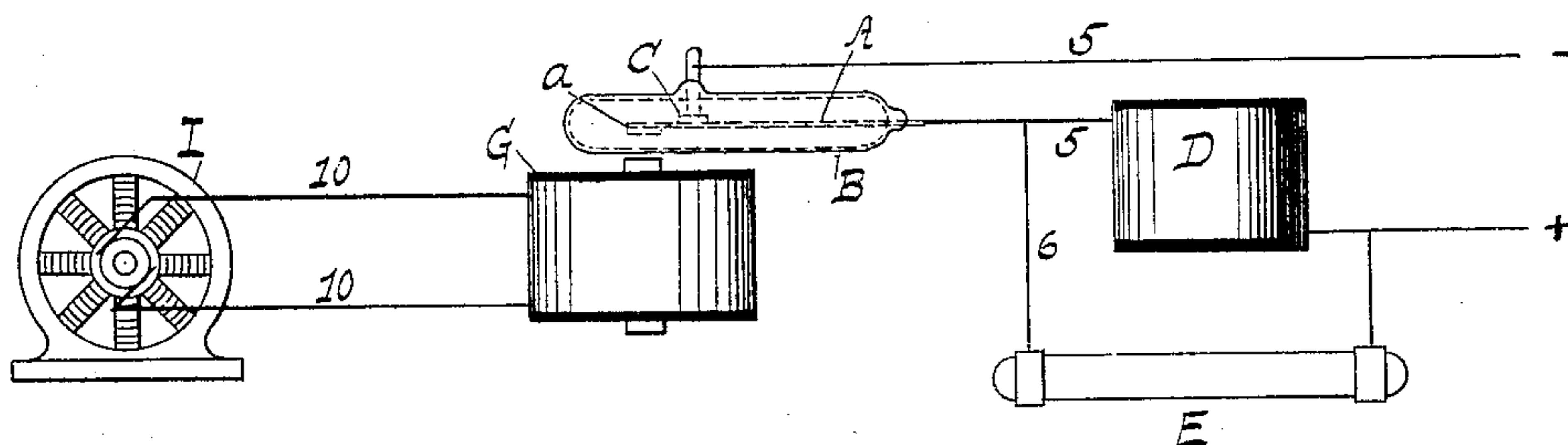


Fig. 2.

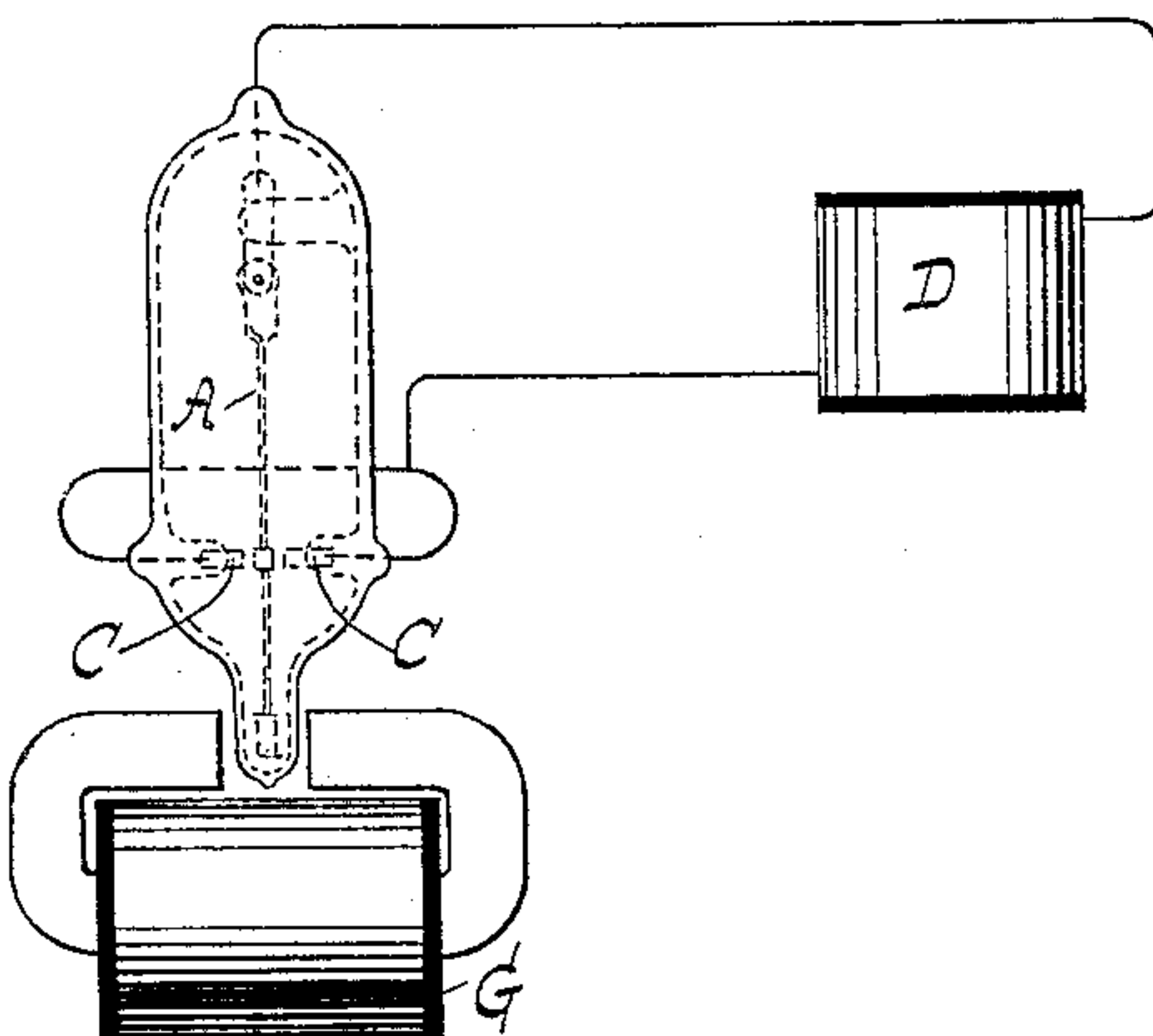
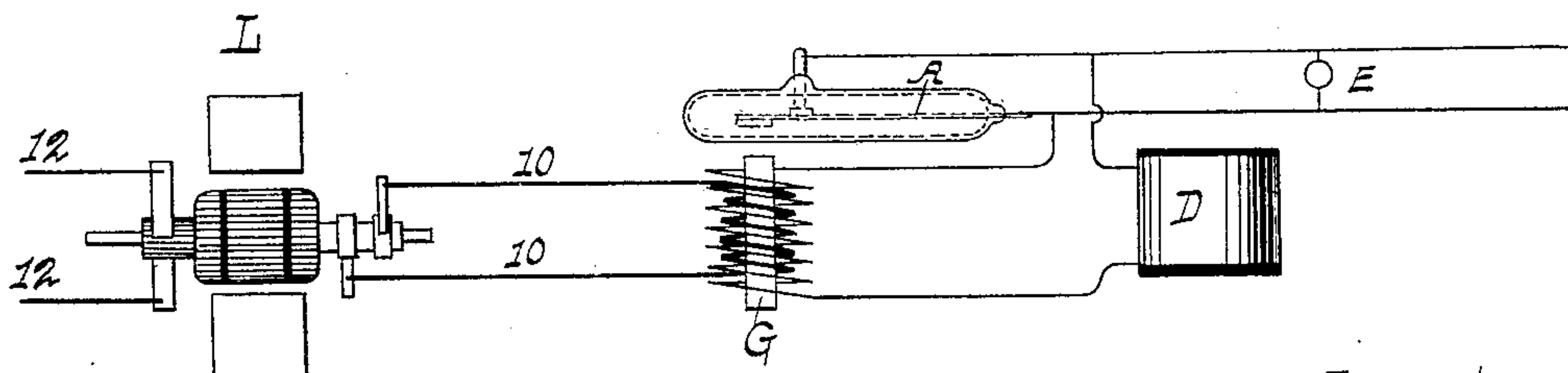


Fig. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

DANIEL McFARLAN MOORE, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE  
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## INTERRUPTER.

SPECIFICATION forming part of Letters Patent No. 580,988, dated April 20, 1897.

Application filed December 3, 1895. Serial No. 570,874. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL McFARLAN MOORE, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented a certain new and useful Interrupter, of which the following is a specification.

My invention relates to circuit-interrupters which are operated in a closed receptacle hermetically sealed for the purpose of preserving the vacuum in which the interrupter works, and is designed more particularly as an improvement upon such interrupters when operating in a circuit of induction wherein the interruptions set up electric pulsations or disturbances that may be employed for producing light, as described in my Patent No. 548,127, or may be used for any other desired purpose.

The object of my invention is to overcome the practical difficulty met with in interrupters which work in a vacuum or sealed receptacle when the operation of the interrupter is produced by an electromagnet whose action is controlled by the action of the interrupter itself, the difficulty being that any impairment of the contacts will affect the operation of the magnet and that inasmuch as the contacts are sealed they cannot be gotten at for repair or readjustment without destroying the receptacle.

My invention consists, essentially, in operating the interrupter by an electromagnet traversed by an alternating electric current passing over a circuit independent of that controlled by the interrupter-contacts.

My invention consists, further, in special arrangements of devices whereby the interrupter may be operated by an alternating current when the only source of energy at hand is a direct or continuous current.

In the accompanying drawings, Figure 1 illustrates, diagrammatically, a general arrangement of apparatus embodying my invention. Figs. 2 and 3 illustrate modifications.

A indicates the interrupter (shown as a spring-interrupter) contained in a sealed and exhausted receiver or receptacle B and con-

nected through wires sealed in the walls thereof with the exterior circuit.

C is a contact-point mounted within the same and connected with the opposite pole of said circuit through a wire sealed in the wall of the receptacle. The tension of the spring normally keeps the circuit closed, and at every vibration the circuit is interrupted, thereby producing a change of circuit condition which may be utilized for any purpose—as, for instance, when the circuit is one of induction, for setting up extra currents or electric disturbances or waves that may be employed, as set out in my prior patent, for producing light or for any other purpose.

D indicates a coil of induction included in the circuit 5, passing through the interrupter and carrying current derived from any suitable source.

E indicates the light or other translating device in a branch 6, taken from said circuit, so as to be traversed by the waves or pulsations set up by the interruption of the circuit of induction by the device B.

The interrupter A carries at its end an armature *a*, placed in the field of an electromagnet G, so that on energization of the magnet the vibrator will be drawn away from the contact C, and on a decrease or cessation of power in the magnet the spring will restore the circuit.

The electromagnet G is caused to vary in power by passing alternating electric currents through it. At each reversal when the magnet loses its power the vibrator will close its circuit, and in the intervals when the magnet is energized, whether by a current of one or the other polarity, the armature *a* will be drawn down and the circuit interrupted. The electromagnet G is in the circuit 10, connected with any source of alternating currents typified at I, said circuit being quite independent of that flowing over the contact C. As will be obvious, the rate of alternations in the circuit 10 will determine the rate of interruptions in the circuit 5, and by varying the speed of the generator of alternating currents the rate of interruption in 5 may be adjusted as circumstances may require. The armature *a*



might be polarized, if desired, but in such case it is obvious that the rate of vibration would be decreased one-half, since at every other alternation of current in 10 the armature would be repelled instead of being pulled down.

In order that the number of interruptions may not be diminished and yet that the action of the vibrator may be positive in both directions, I may arrange the polarized armature of the interrupter between two magnet-poles which are reversed at each alternation of the current circulating in their energizing-coils, as indicated in Fig. 2, where for the sake of compactness and simplicity I prefer to use the opposite poles of the same magnet G, as indicated. The vibrator B is preferably loosely pivoted, as indicated, and works between the two contacts C, which are connected with one pole of the circuit, while the interrupter A connects with the opposite pole. The coil G is in the alternating-current circuit independent of that through A.

I do not limit myself to using a continuous current in the circuit of A, but might use an alternating current therein derived, if desired, from the same source as that flowing through G, but taken through an independent branch.

When it is desired to operate the vibrator from a direct-current circuit and yet to employ alternating currents for actuating the same whose rate of alternation may be controlled, I may employ such an arrangement as indicated in Fig. 3, where L indicates any motor-transformer, one side of which is operated as a motor of the direct-current circuit 12, while its other side supplies alternating currents to the circuit 10, including the coils of the electromagnet G, which actuates the vibrator or interrupter A. This electromagnet G may itself be wound as a transformer or induction-coil and its secondary supply the current for the circuit of induction or other circuit which is interrupted by the action of A. In such circuit is included the coil of self-induction D, although such coil D might be dispensed with and the current of the secondary used for operating on the light or other translating device E connected to the circuit.

It will be obvious that by varying the rate of movement of the transformer L the rate of

alternation and the rate of action of the interrupter may be thereby varied, as occasion may require.

I do not limit myself to the use of a direct or continuous current in the circuit of induction which traverses the interrupter, for such current might be an alternating current and in this case might be taken from the same mains which supply alternating current to the interrupter-actuating magnet.

What I claim as my invention is—

1. The combination, substantially as described, with an interrupter working in a sealed receptacle, of an actuating-magnet therefor, and a source of alternating currents supplying said actuating-magnet over a branch or circuit independent of that including the contacts of the interrupter.

2. The combination, substantially as described, with an interrupter working in a sealed receptacle, of an electromagnet exterior thereto, a polarized armature carried by said interrupter, and a source of alternating currents with which said magnet is connected through a circuit independent of that including contacts of the interrupter.

3. The combination, substantially as described, of an interrupter working in a sealed receptacle between a pair of contacts, a polarized armature carried by said interrupter, a pair of actuating-magnet poles on opposite sides of said interrupter, and a source of alternating currents for said actuating-magnet supplying the same over a wire or circuit independent of that including the contacts of the interrupter.

4. The combination, substantially as described, of an interrupter working in a sealed receptacle, an actuating-magnet therefor, a motor-transformer having a continuous-current side operating as a motor, of a direct-current circuit, and an alternating-current side supplying the actuating-magnet for said interrupter over a circuit independent of that including the contacts of the interrupter.

Signed at New York, in the county of New York and State of New York, this 22d day of November, A. D. 1895.

DANIEL MCFARLAN MOORE.

Witnesses:

WM. H. CAPEL,  
D. H. DREKER.