

(No Model.)

2 Sheets—Sheet 1.

D. McF. MOORE.
OSCILLATING INTERRUPTER.

No. 580,987.

Patented Apr. 20, 1897.

Fig. 1.

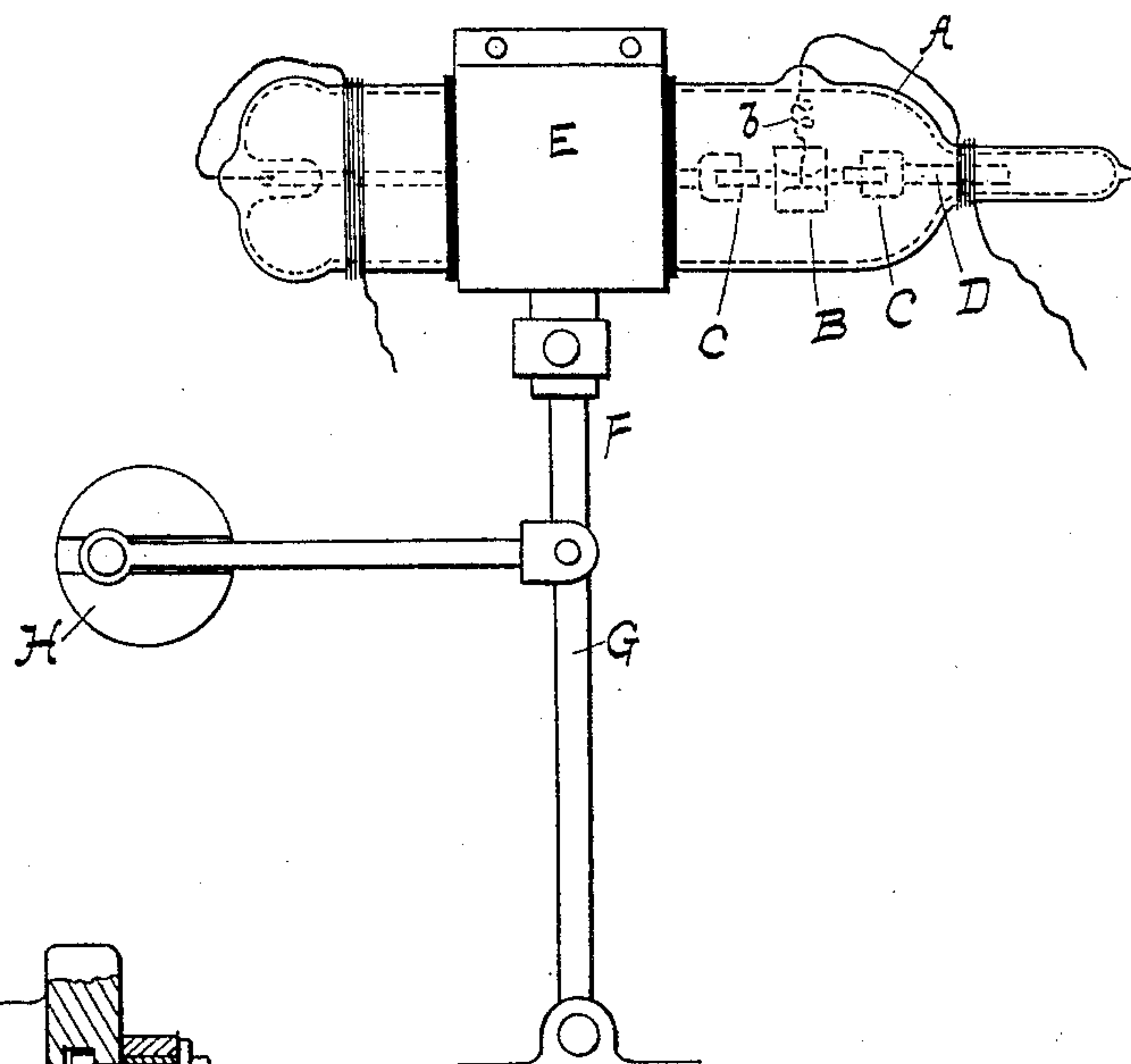


Fig. 4.

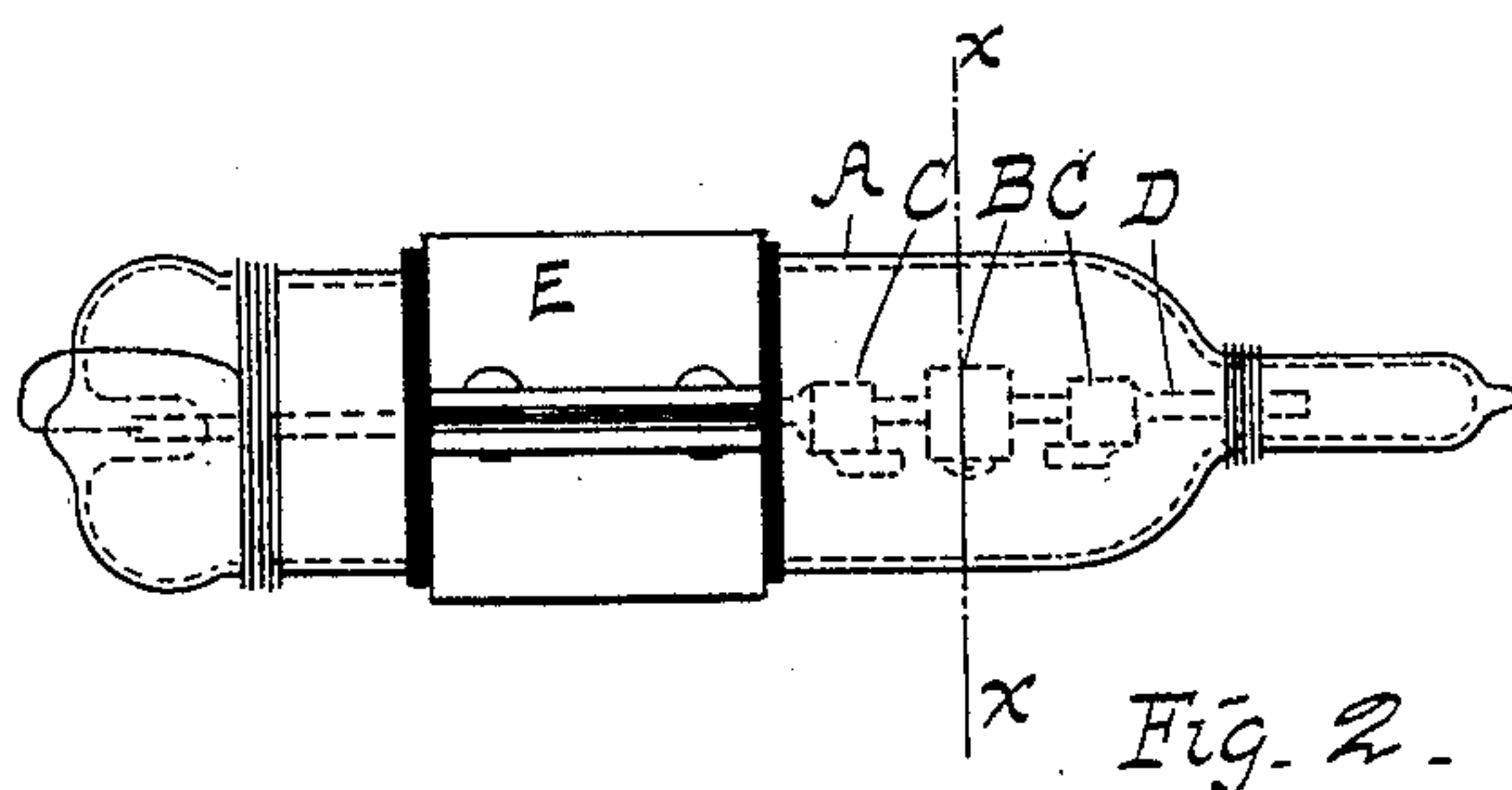
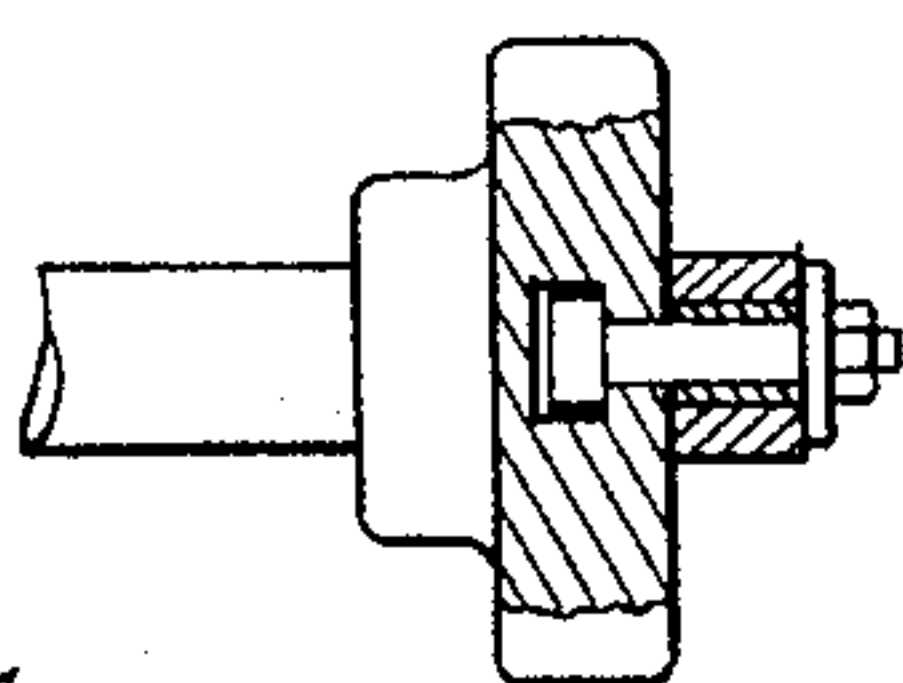
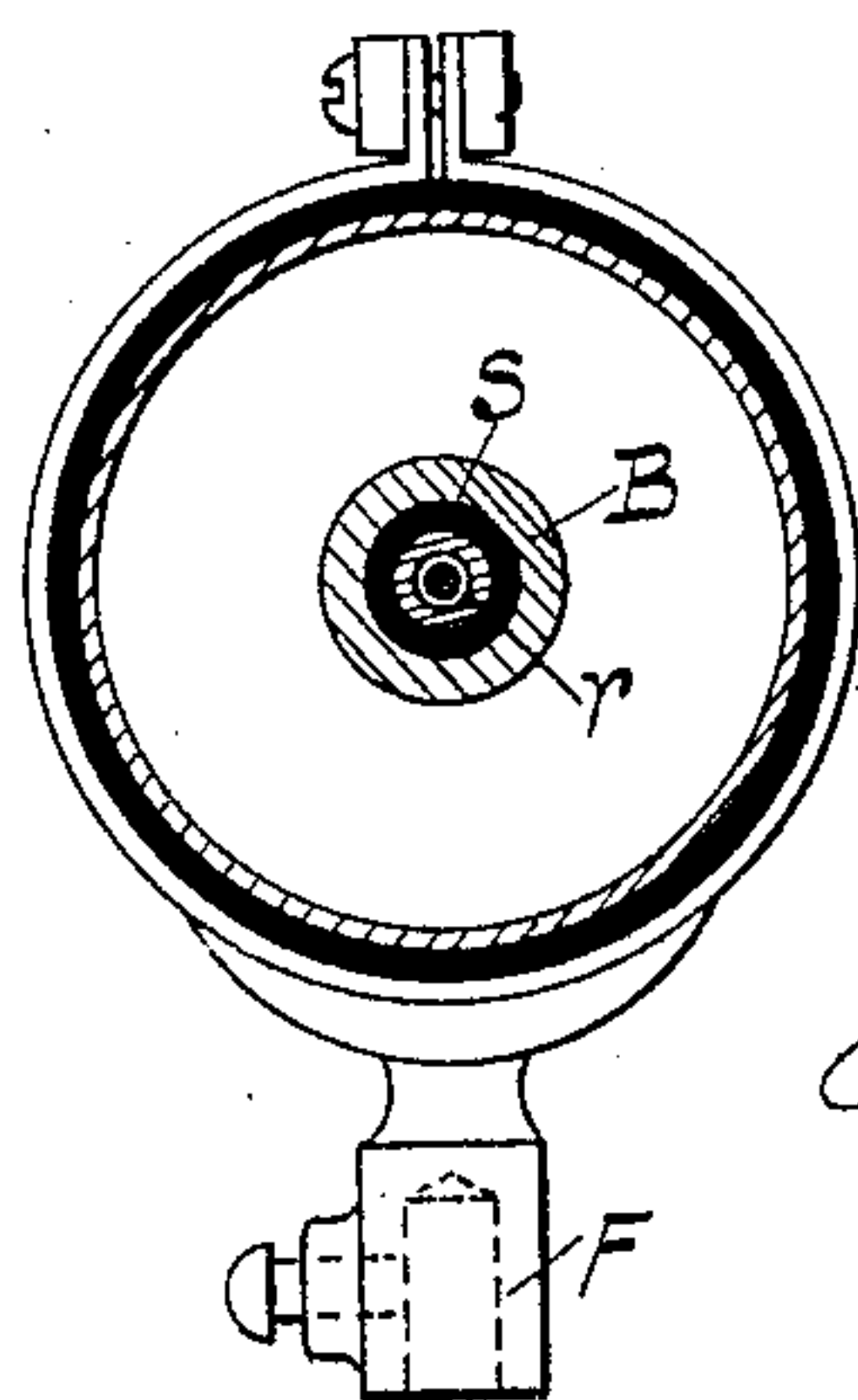


Fig. 2.

Fig. 3.



Witnesses

J. Landring
W. H. Capel.

Inventor.

Daniel McFarlan Moore

By *H. T. Townsend*
Attorney

(No Model.)

2 Sheets—Sheet 2.

D. McF. MOORE.
OSCILLATING INTERRUPTER.

No. 580,987.

Patented Apr. 20, 1897.

Fig. 5.

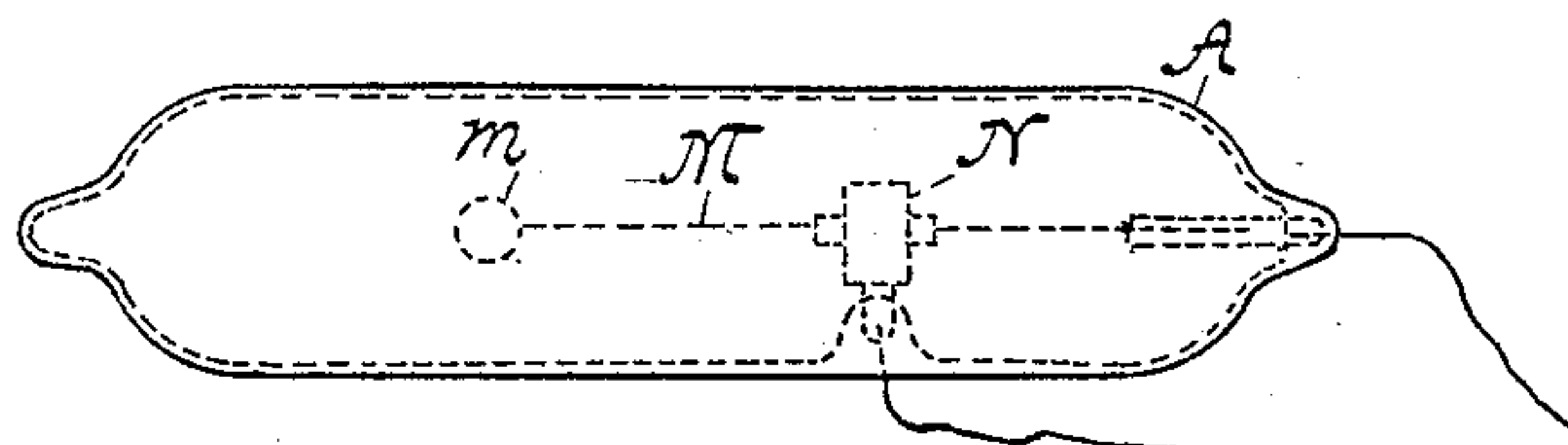
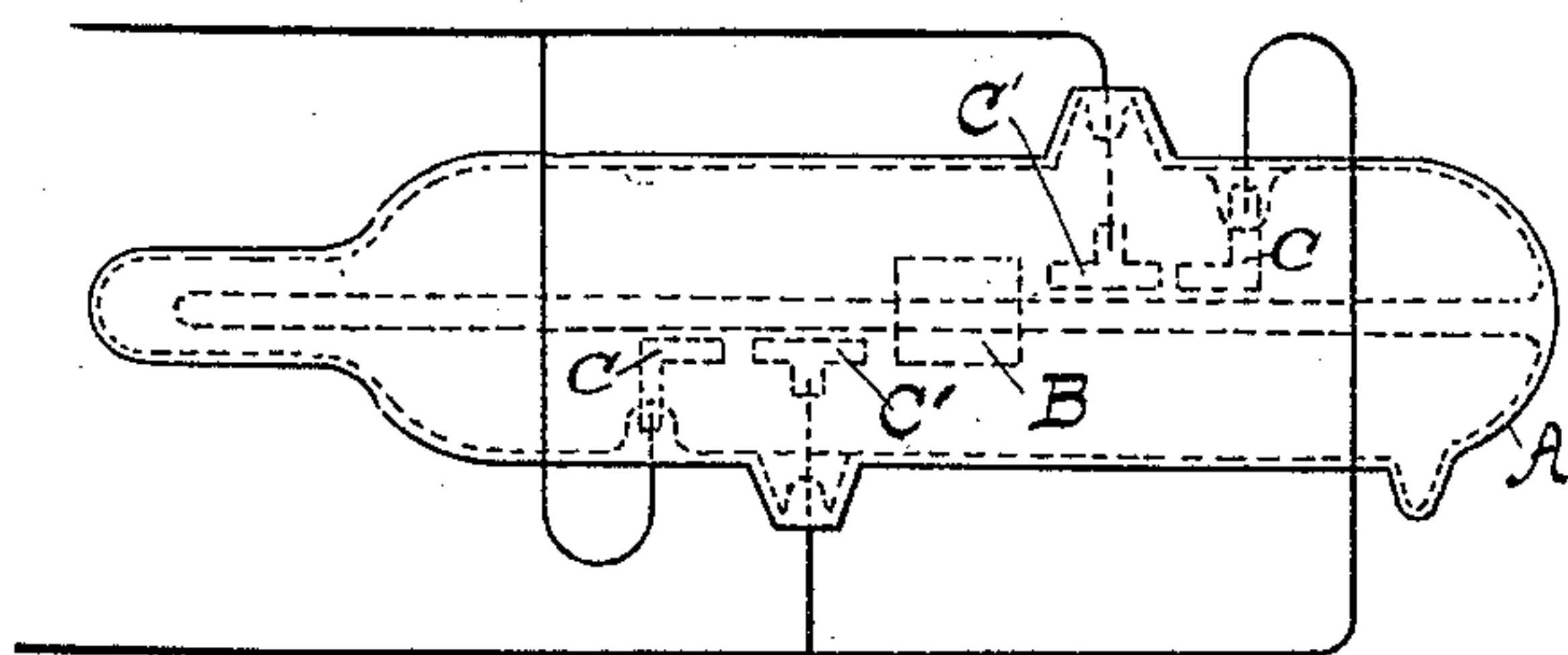


Fig. 7.

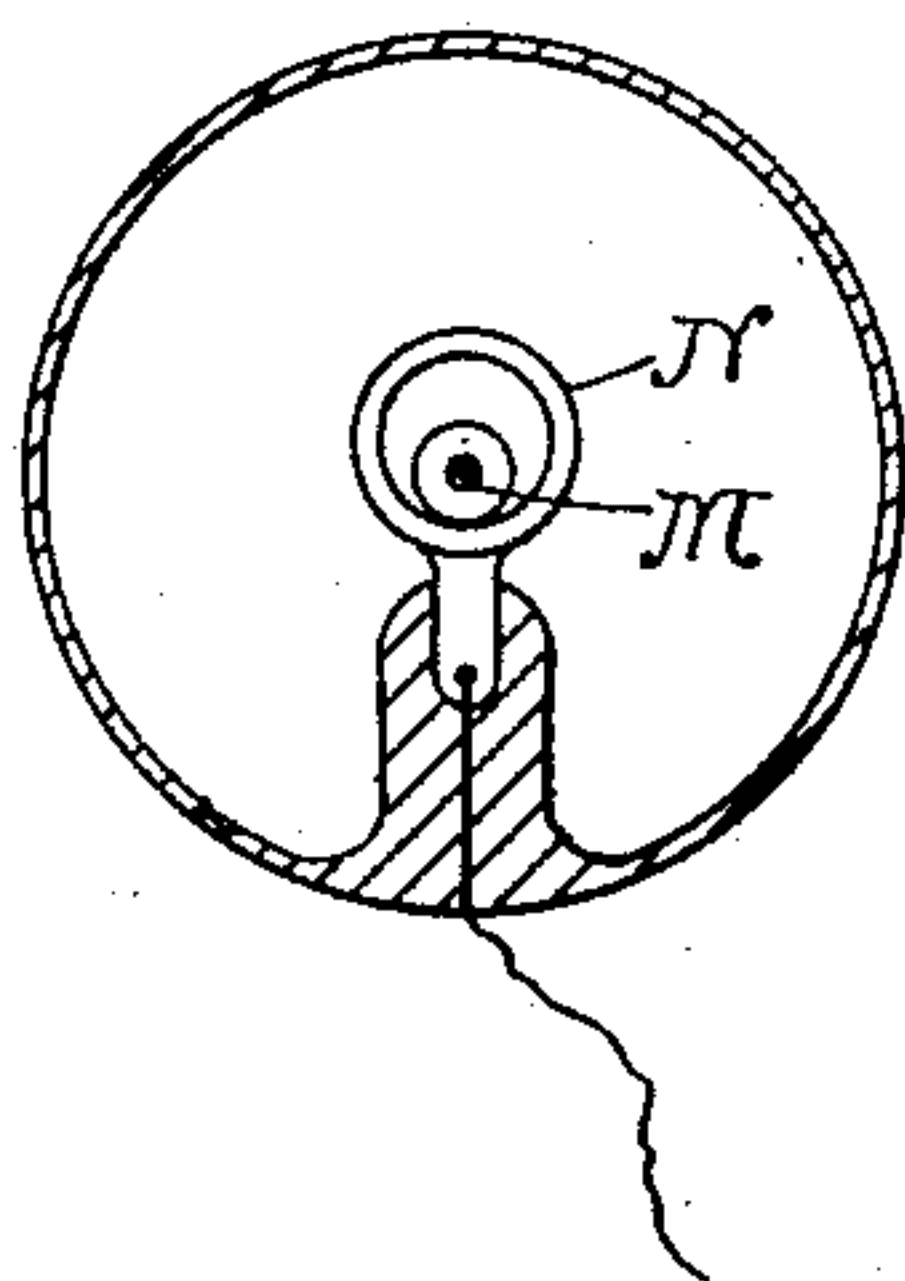
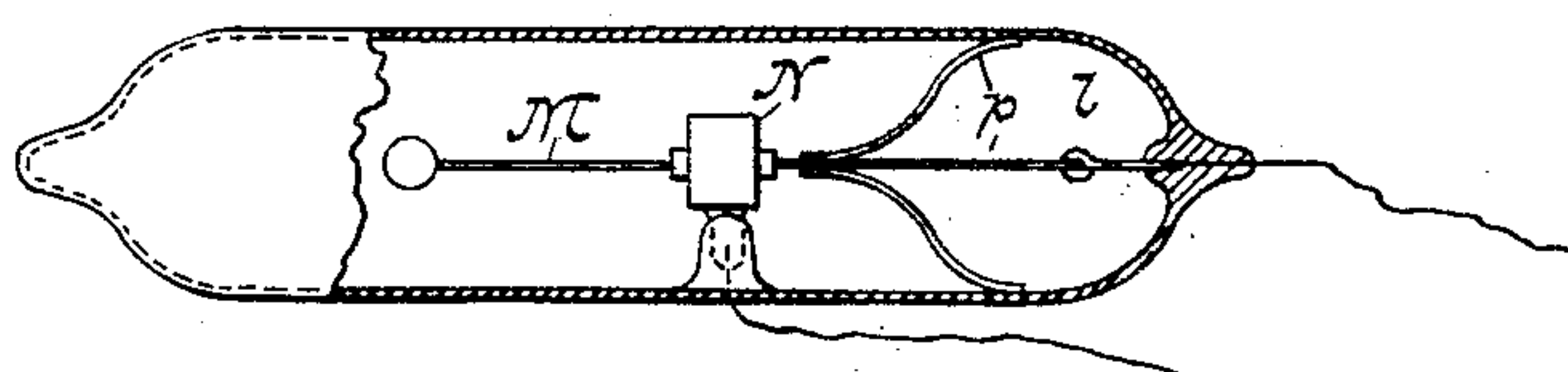


Fig. 6.

Fig. 8.



Witnesses

J. Landring
W. H. Capel.

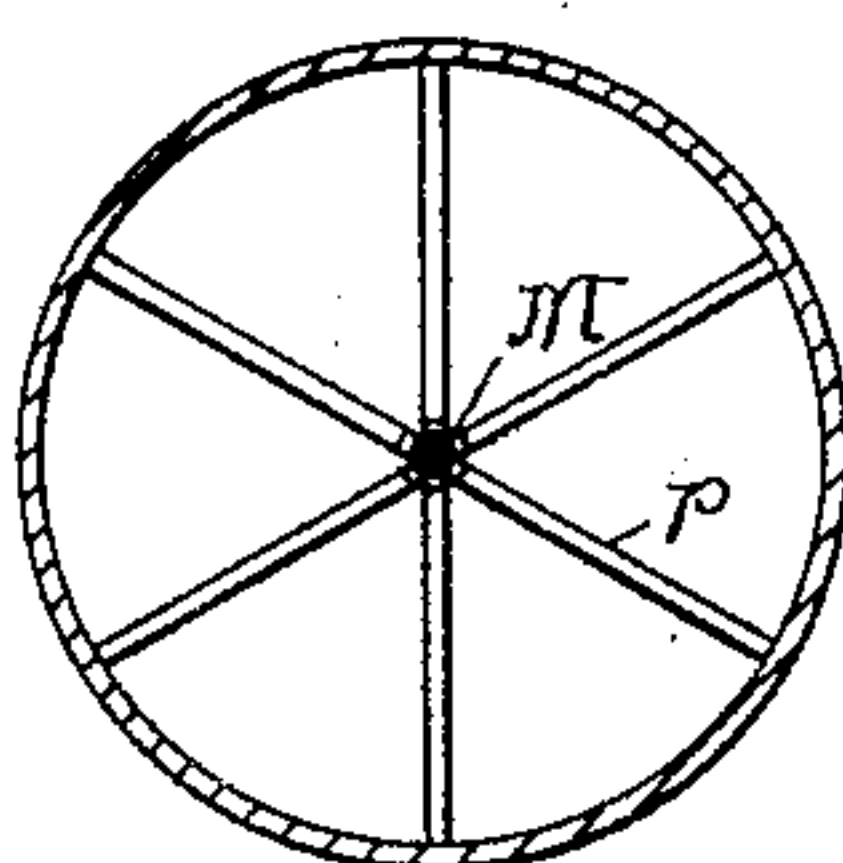


Fig. 9.

Inventor

Daniel McFarlan Moore.

By H. Townsend
Attorney

UNITED STATES PATENT OFFICE.

DANIEL MCFARLAN MOORE, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE
MOORE ELECTRICAL COMPANY, OF NEW YORK, N. Y.

OSCILLATING INTERRUPTER.

SPECIFICATION forming part of Letters Patent No. 580,987, dated April 20, 1897.

Application filed December 3, 1895. Serial No. 570,873. (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 Oscillating Interrupter, of which the following is a specification.

My invention relates to interrupters for electric circuits, and more particularly to such as have their contacts in a vacuum or hermetically-sealed space.

The object of my invention is to avoid difficulties experienced with such devices when operated by electromagnets whose circuit includes the interrupting-points, and to produce an interrupter which shall be certain and uniform in action as well as capable of ready adjustment for varying the rate of interruption.

Interrupters constructed and operated in accordance with my invention are especially useful for employment in circuits of induction described in my prior patent, No. 548,127, so as to cause electric vibrations or disturbances suitable for producing light, as therein described, or for other purposes.

My invention consists, essentially, in the combination, with an oscillatory interrupter having its contacts within a sealed receptacle, of mechanism for positively vibrating or oscillating said receptacle or its support at a uniform or regular rate and with such rapidity as to cause regular or uniform breaks of circuit of the same rate by the momentum or inertia of the contained oscillatory parts. The parts within the interrupter, and which by the shaking action are caused to oscillate, are by preference loosely mounted, so as to move freely and be devoid of any bias, such as would exist in the case of a spring-mounted contact, and so as to follow freely any change in the rate of movement of the actuating mechanism. I do not, however, exclude from my invention the use of a spring-mounted oscillatory part within the sealed receptacle.

In the accompanying drawings, Figure 1 is a general side elevation of an apparatus embodying my invention. Fig. 2 is a plan of the interrupter. Fig. 3 is a cross-section, on an enlarged scale, taken on the line $x x$, Fig.

2. Fig. 4 is a cross-section, on an enlarged scale, through the crank-disk shown in Fig. 1. Figs. 5, 6, 7, 8, and 9 show modified forms of interrupter adapted for use in carrying out my invention, Figs. 7 and 9 being on enlarged scale.

Referring to Figs. 1 to 4, the support for the interrupter consists of a glass tube or receptacle A, hermetically sealed and exhausted or containing some inert gas adapted to protect the contacts from corrosion. The interrupter itself, which may be of any desired form, is here shown as composed of a contact B, connected to one pole of the circuit by a flexible connection b , sealed in a wall of the receptacle, and two contacts C C at opposite sides of B, connected to the other pole of the circuit and between which B is adapted to oscillate. Contact B is mounted so as to slide on a rod D, mounted within the tube or receptacle A, and is of such weight that its momentum or inertia may overcome the friction upon the rod and may cause firm connection with the opposite contacts to be made at each oscillation of the support. It is caused to make and break the circuit by oscillating or shaking the tube or receptacle in the longitudinal direction of the rod by some mechanism adapted to give it a regular rate of positive oscillations of sufficient rapidity to cause the action to take place through the inertia or momentum of the contained oscillatory part. It is obvious that the contact might be mounted in other ways, so as to be capable of oscillation. The rod D, on which B slides, is of metal, and to insulate B from D contact B is provided with a bushing of metal r , set in a sleeve s of insulation, as indicated in the cross-section. Contacts C are also mounted on the rod D and in electrical connection therewith. They are connected with the opposite pole of the circuit by said rod, which at its end is joined to a wire sealed in the end of the receptacle and wrapped around the same.

E is a clamp in which the tube A is secured. At F the clamp is provided with a socket and set-screw, by which it may be fastened to a pivoted arm or lever G, that is vibrated or shaken by any suitable mechanism—as, for instance, by a crank H on a shaft driven by

any suitable power and connected to G by a connecting-rod. By adjusting the rate of revolution of the shaft it is obvious that the rate of oscillation may be adjusted as may be required in order to produce the best and most uniform action of the interrupter.

The excursions of contact B or other oscillatory portion of the circuit-breaker are preferably made small. To adjust the throw of the support of said contact, as may sometimes be desirable, the throw of the crank may be adjusted in the manner indicated, the crank-pin being made adjustable radially in a transverse slot in the face of the crank-disk and fastened in any desired position by a clamp-nut.

Instead of using the oscillatory portion of the interrupter as a contact it may be made to impinge upon and operate the contact, as indicated in Fig. 5, wherein fixed contacts (indicated at C C) are mounted on rod D, of glass or other insulating material, opposite spring-mounted contacts C' C', arranged in position to be engaged by a block B, of glass, which is adapted to slide on rod D, and, by alternately engaging with contacts C' C', to force them against the bias of their springs into contact with C C.

In Figs. 6 and 7 the oscillatory portion of the interrupter consists of a weighted spring M, carrying at one end the small weight *m*, which might be of magnetic material for operation as the armature of an actuating-magnet. The opposite end of the spring is connected through the wall of the receiver A with one pole of the circuit, so that the spring forms one contact of the interrupter. The opposite contact consists of a conducting-ring N, connected with the opposite pole of the circuit. The spring may be made to vibrate within the ring so as to make and break circuit therein. When the point of contact on the ring becomes impaired, fresh contact-surfaces may be brought into action by simply changing the direction of oscillation or vibration of the oscillatory or vibratory contact.

In Fig. 8 the part M is loosely hung at a pivot *l* and is centered by a number of springs *p*, which will aid in breaking contact what-

ever may be the direction of the oscillatory transverse movements imparted to the tube or receiver.

What I claim as my invention is—

1. The combination of an oscillatory or vibratory support, mechanism for imparting a vibrating motion to said support at a rapid and regular rate, and a circuit-interrupter mounted on said support and having one or more of its parts movable with relation to the support and adapted to produce a vibratory make and break of circuit at frequent regular intervals by the inertia or momentum of the moving part or parts of the interrupter, as and for the purpose described.

2. The combination, substantially as described, of an oscillatory interrupter the contact portions of which are contained in a sealed receptacle but electrically connected through walls of said receptacle, of mechanism for positively vibrating or oscillating said receptacle or its support at a uniform or regular rate and with such rapidity as to cause regular or uniform breaks of circuit of the same rate by the momentum or inertia of the contained oscillatory parts.

3. The combination, substantially as described, of an interrupter whose contacts are in a sealed receptacle, a sliding oscillatory member in said receptacle, means for securing said receptacle to a vibratory or oscillatory support, and mechanism for oscillating said support positively in both directions and at such rate as to cause the contained oscillatory member to operate the interrupter by inertia or momentum, as and for the purpose described.

4. In an interrupter, the combination with the oscillating member capable of vibration in different planes, of a ring or encircling contact member, as and for the purpose described.

Signed at New York, in the county of New York and State of New York, this 26th day of November, A. D. 1895.

DANIEL MCFARLAN MOORE.

Witnesses:

WM. H. CAPEL,
D. H. DECKER.