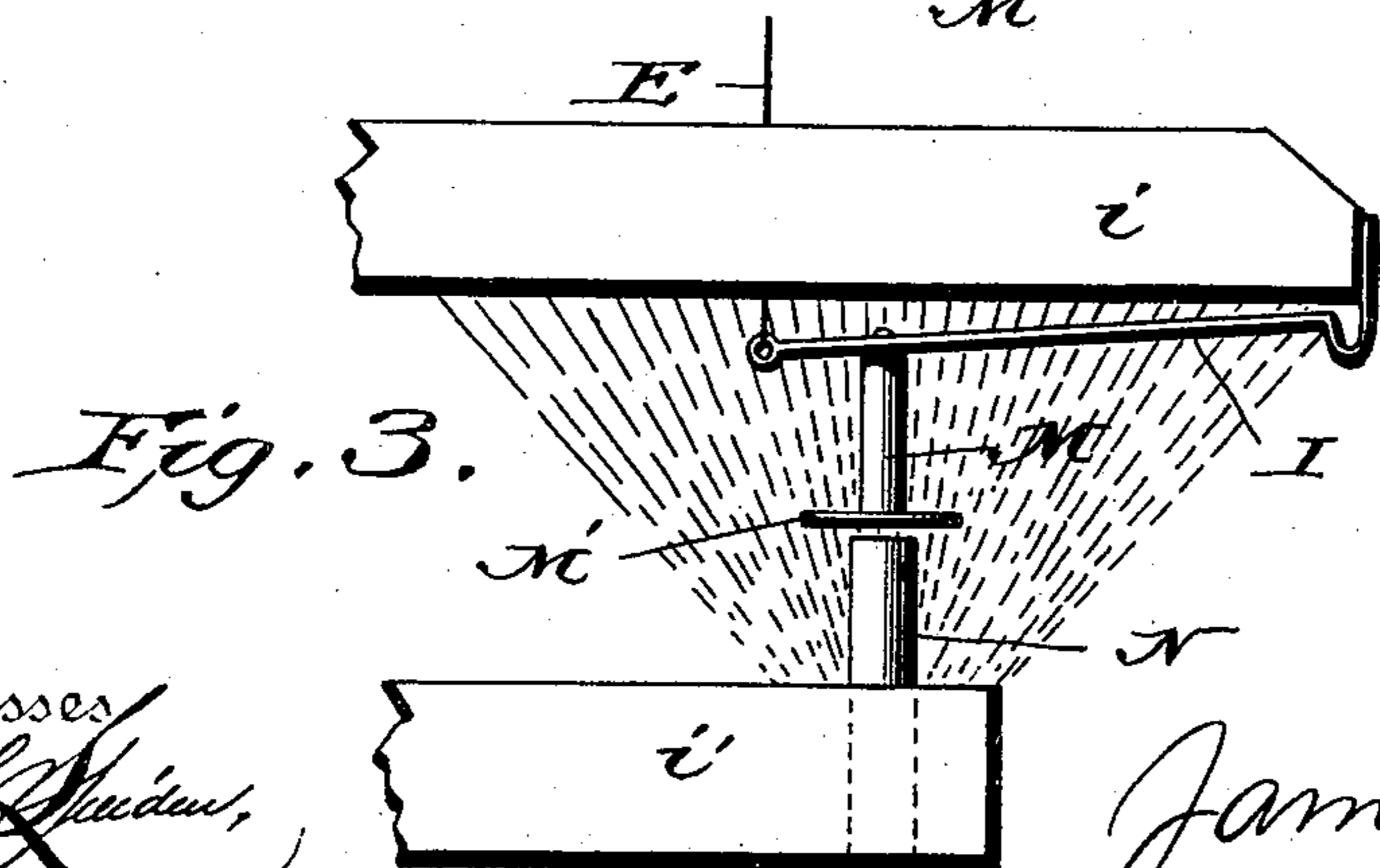
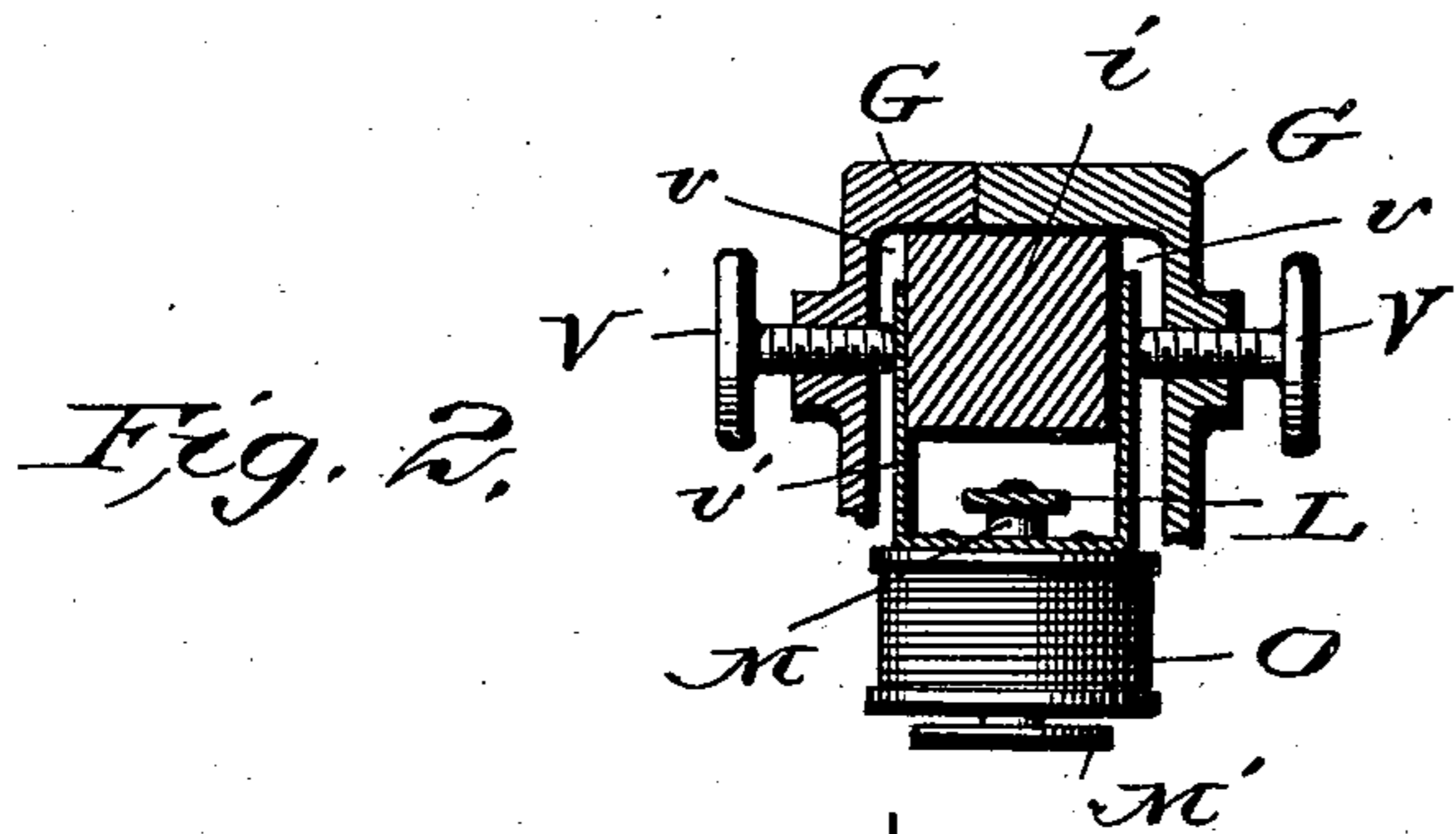
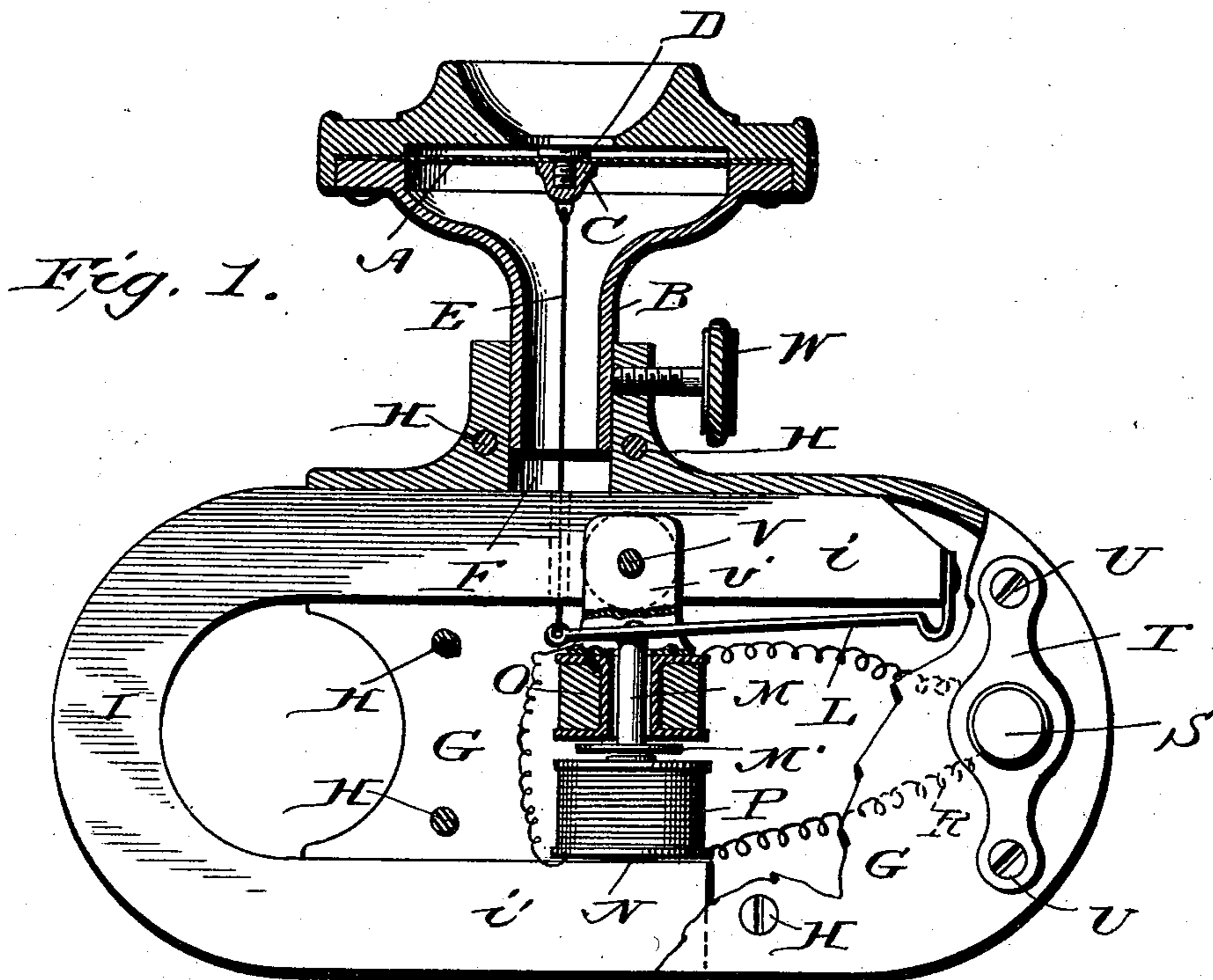


(No Model.)

J. A. BROWN.  
MAGNETO TELEPHONE.

No. 506,305.

Patented Oct. 10, 1893.



Witnesses  
*James A. Brown,*  
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Inventor  
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# UNITED STATES PATENT OFFICE.

JAMES A. BROWN, OF MOLINE, ILLINOIS.

## MAGNETO-TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 506,305, dated October 10, 1893.

Application filed July 26, 1893. Serial No. 481,532. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. BROWN, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in a Combined Long-Distance Telephone Transmitter and Receiver; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to dynamic telephones for long distance lines and which are adapted to be used as a combined transmitter and receiver, the energizing medium for transmission and receiving being produced by variation in the magnetic field between the two poles of a permanent or electro magnet, the former being preferable as it obviates the use of batteries or other current generators which would be required for energizing an electro magnet.

The prime object of the invention is the provision of a long distance telephonic transmitter and receiver in which the diaphragm is located wholly without the field the variation of which between the two poles of a magnet controls the pulsations of an armature or core by means of which the transmission and the reception of a message is effected.

A further object of the invention is the construction of a simple mechanism for carrying out the objects of the invention in a satisfactory, efficient and economical manner.

The invention consists of the novel features and the peculiar construction and combination of the parts which will be hereinafter more fully described and claimed and which are shown in the annexed drawings, in which,—

Figure 1 is a side elevation of the invention, the helix or coil for actuating the pulsating core or armature, and the diaphragm supporting case being shown in section. Fig. 2— is a cross section of the north pole arm of the magnet and case showing the means for adjustably connecting the helix or coil of the pulsating core or armature therewith.

Fig. 3— is a diagrammatical view showing the field between the two poles of the magnet by dotted lines.

The magnet I is of the usual horse shoe shape and has the arm *i*, corresponding to the north pole, made longer than the arm *i'* which corresponds to the south pole. This magnet is preferably permanent. A case G, G incloses the operating parts and is made in halves which are bolted together by the fastenings H. An opening F is provided in the case G G to receive the stem of the diaphragm supporting case B B, a binding screw W being provided to hold the case B B in place. The diaphragm A is secured in the case B B in the ordinary manner and is provided at its center with a screw D and nut C between which the diaphragm is clamped. A wire E is attached at one end to the nut C and its other end is connected with the pulsating armature or core composed of the core M and the spring L. An electro magnet P is mounted on the arm *i'* and constitutes a prolongation of the south pole, the core N of soft iron being permanently secured to the said arm. A solenoid is attached to the arm *i* and is composed of the helix or coil O and the soft iron core M. The helix O is adjustably connected with the arm *i* by a stirrup *v'* which embraces the sides of the said arm and is clamped thereto in the required position by binding screws V passing through the case G. A space *v* is provided between the magnet I and the case G to receive the arms of the stirrup and admit of the latter having a limited movement to permit of the required and proper adjustment of the helix O. The core M is attached to the spring L and with the latter constitutes the pulsating armature. The inner end of the wire E is attached to the spring L. The end of the core M opposite the electro magnet P is expanded as shown at M' to increase its magnetic effect. The parts L and M constitute the north pole, the extremity being at M'. The helix O and the coil P are wound so that the induced current of each is of like polarity. A block T of insulating material is attached to the case by screws U and is provided with binding screws S, one on each side, to which the terminals Q and R of the coils O and P are electrically connected.

When used as a transmitter a powerful induced current is generated. This induced current is of great scope and varying intensity such as is required for long distance telephone service. By having the arms of the magnet of different length and the solenoid and the fixed electro magnet in co-incident relation a powerful field is produced, the lines of force radiating from a field of great extent and equi-distant in the north to the south pole. The solenoid and the electro magnet being located in a powerful magnetic field a disturbance of the armature in its own field will produce a corresponding variation of the magnetic field of the electro magnet and create an induced current sufficient for long distance telephony.

When used as a receiver, it being remembered that the solenoid and the electro magnet are in a powerful magnetic field and that the diaphragm is under tension, the armature is very sensitive and will respond to the slightest change or variation of the magnetic field between the poles and transmit the same to the diaphragm.

In operation as a transmitter the vibrations of the diaphragm A are transmitted to the armature by the wire E, and the armature pulsating varies the scope and the resistance of the magnetic field whereby the greatest possible change is made in the lines of force cut by the coils P and O, thereby producing an induced current of great volume and varying intensity corresponding with the vibrations of the diaphragm. It is preferred to attach the part L to the part M on the side opposite to that shown. As a receiver the resistance of the diaphragm is extremely sensitive to the electric impulse passing through the coils O and P which will intensify and vary the magnetic power of the opposite poles M and N. The pole M being mounted on the spring arm L will be drawn to or form the pole N in response to the varying intensity of the current traversing the said coils O and P. This motion will be transmitted to the diaphragm by the connections herein set forth.

What I claim to be new in my invention, and desire to secure by Letters Patent, is—

1. In a dynamic telephone transmitter and receiver a horse shoe magnet, a solenoid forming a pole piece of the said magnet and having its core constructed to vibrate in the field of the said magnet and connected with the diaphragm, and a pivoted spring support for said core substantially as described.

2. In a dynamic telephone transmitter and

receiver, a horse shoe magnet, a diaphragm without the magnetic field of the said magnet, an electro magnet, forming a pole of the magnet, and an armature constituting the opposite pole of the said magnet and adapted to pulsate in the field of the magnet and having connection with the said diaphragm, and a pivoted spring support for said core substantially as described.

3. In a dynamic telephone transmitter or receiver, a horse shoe magnet, a diaphragm arranged without the field of the said magnet, an electro magnet and a solenoid constituting the poles of the said magnet, the core of the solenoid forming an armature and adapted to pulsate within the field of the magnet and having connection with the diaphragm, and a pivoted support for said core substantially as set forth.

4. In a dynamic telephone receiver or transmitter, a horse shoe magnet, an electro magnet and a solenoid constituting the poles of the magnet and having the wires wound to produce a current in each of like polarity, an armature to vibrate in the field of the magnet, and having connection with the diaphragm, substantially as set forth.

5. In a dynamic telephone transmitter or receiver, a permanent horse shoe magnet, a diaphragm located beyond the magnetic field of the said magnet, a solenoid and an electro magnet located within the field of the said magnet and constituting the poles thereof and wound to produce a current in each of like polarity and a varying magnetism in the cores of the electro magnets, the pulsating core of the solenoid being connected with the diaphragm, and a pivoted spring support for said core, substantially as set forth.

6. In a dynamic telephone receiver or transmitter the combination of a magnet, a case surrounding the same, an electro magnet forming a pole of the magnet, a stirrup attached to the said electro magnet and having its parallel members embracing the sides of the magnet and working in recesses in the said case, and binding screws passing through the said case and adapted to clamp the members of the stirrup against the sides of the magnet, substantially as described, as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES A. BROWN.

Witnesses:

ARVID E. KOHLER,  
AXEL. H. KOHLER.