

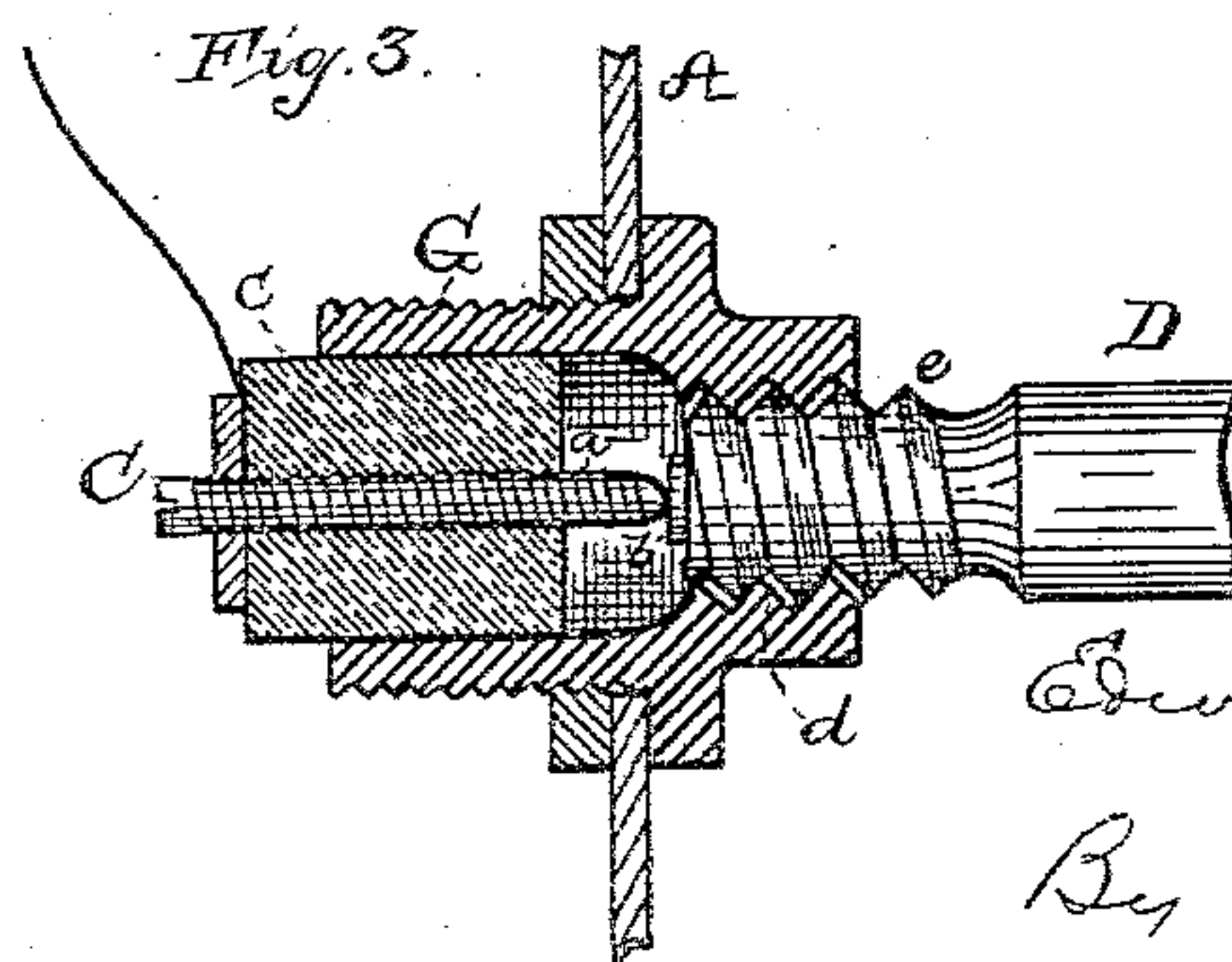
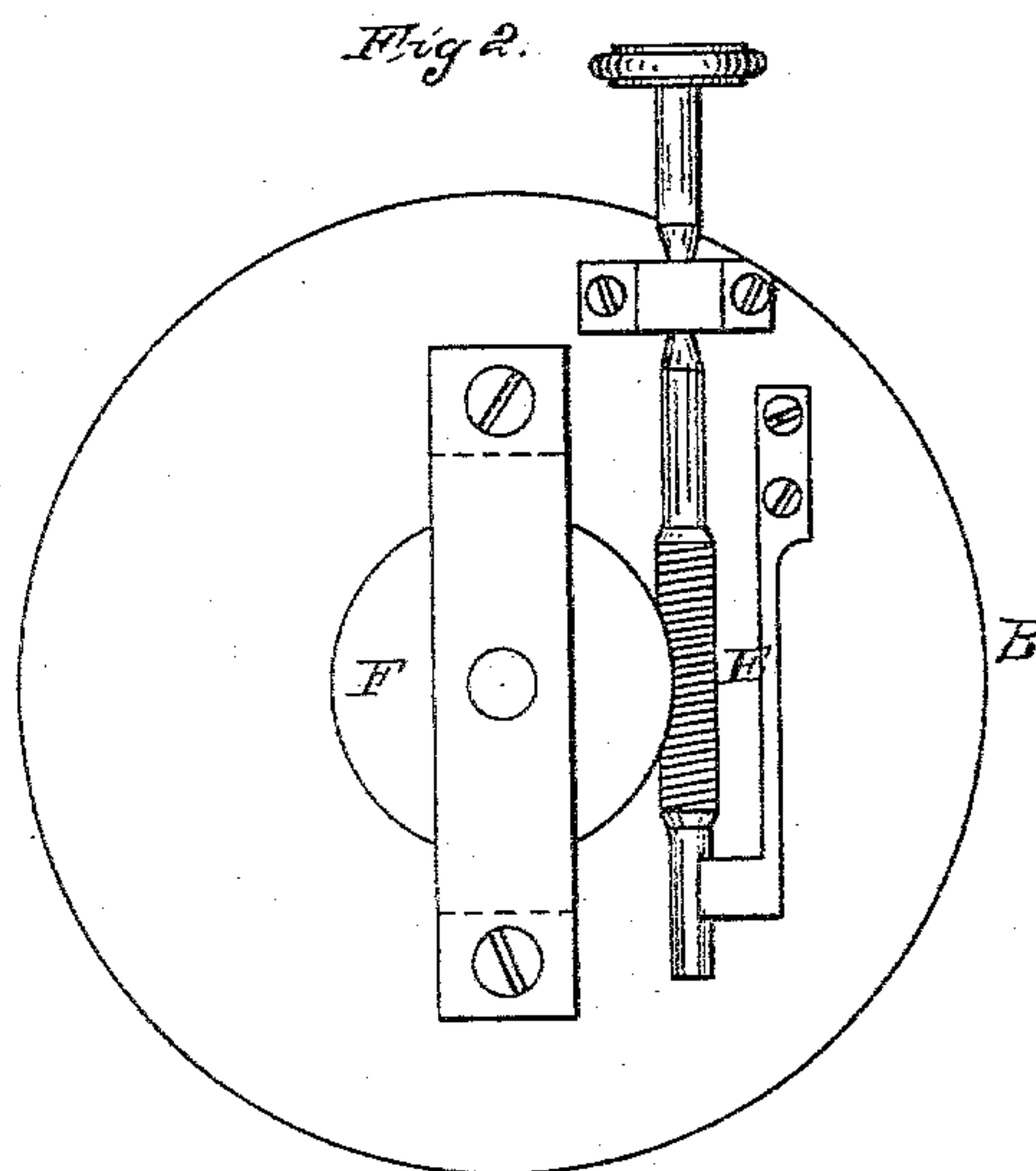
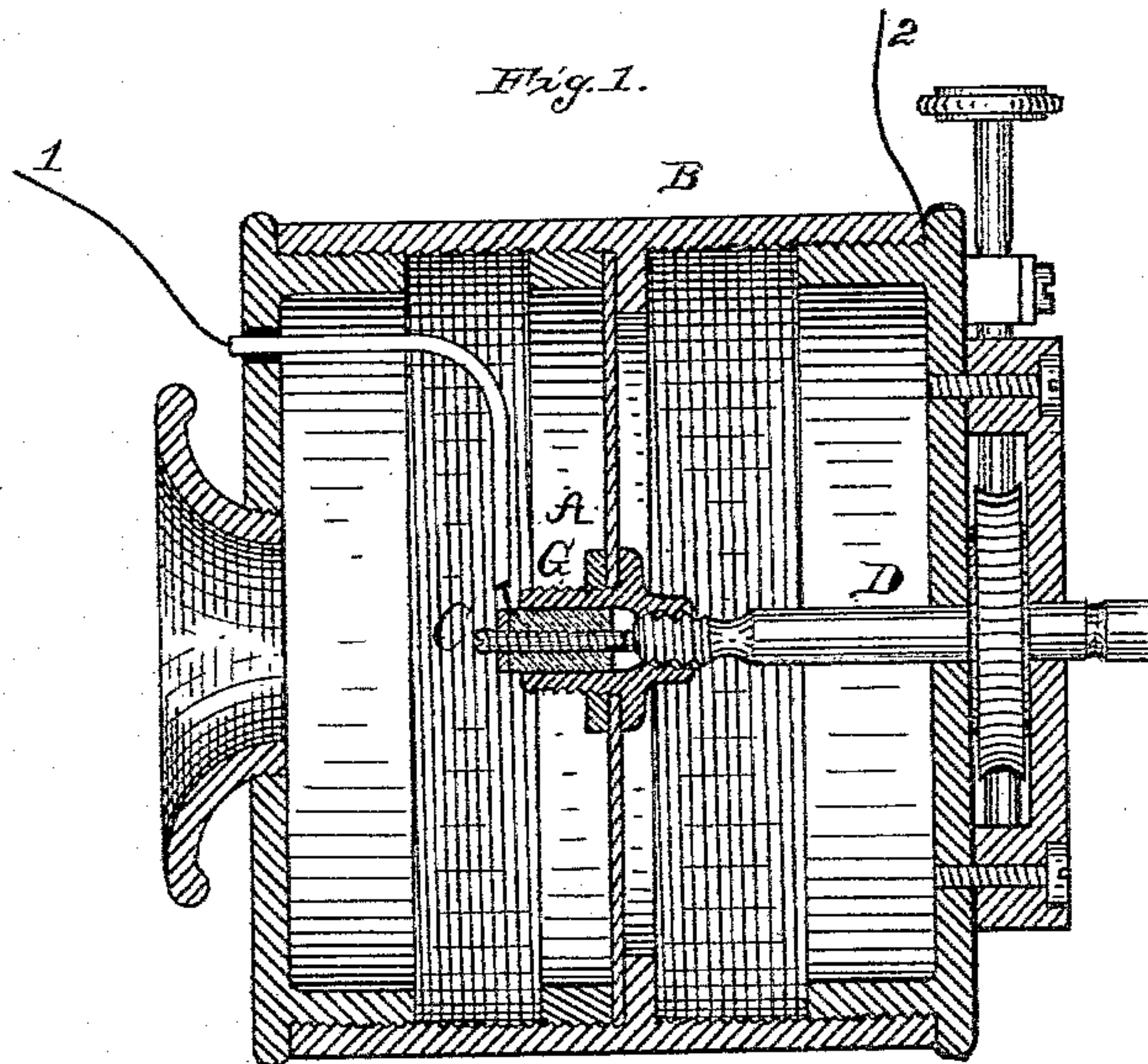
(Model.)

E. H. JOHNSON.

TELEPHONE.

No. 356,689.

Patented Jan. 25, 1887.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD H. JOHNSON, OF NEW YORK, N. Y.

TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 356,689, dated January 25, 1887.

Application filed December 8, 1883. Serial No. 114,000. (Model.)

To all whom it may concern:

Be it known that I, EDWARD H. JOHNSON, of New York city, in the county and State of New York, have invented a certain new and useful Improvement in Telephones, of which the following is a specification.

The object I have in view is to produce a telephone whereby articulate speech can be transmitted practically and successfully by means of contacts or electrodes of platinum or other metals, which instrument will maintain its adjustment and can be readily duplicated.

The instrument, having contact-electrodes of platinum arranged according to this invention, is also capable of use as a receiving-telephone.

The invention consists in providing means for locking the metal contact-electrodes together positively, the construction being such that the impact of the sound-waves is taken by the contacts and not by the locking device. This latter feature may be secured by the use of a loose screw-thread, which, while drawing the parts positively together, permits the transmission of the impact of the sound-waves to the contacts, one of the contacts being carried by the diaphragm, while the other is rigidly supported from the case. Suitable insulation of the parts is also made, so that the electric current will be directed through the contacts. Adjusting devices are provided to bring the contact-electrodes into proper relation with each other.

Such being the principal features of the construction embodying my invention, my theory of its operation, by which, however, I do not wish to be concluded, is as follows: Telephone-transmitters employing contact-electrodes of platinum have not heretofore been practically operative for the transmission of articulate speech on account of the extent of movement permitted at the contacts, which were forced so far apart by the impact of the fundamental sound-waves that they could not come together again in time to respond from their normal position to a sufficient number of the sound-waves to produce clear articulation at the receiver, and such instruments, further, were permanently thrown out of adjustment by the contraction and expansion of the diaphragm, due to changes in temperature.

I have determined by my experiments that articulate speech can be transmitted electrically by the use of such instruments, provided the contacts are maintained in such relation that they can respond from the normal condition of the circuit to all the sound-waves, or a sufficient number of them to produce clear articulation. This I accomplished with marked success with instruments having diaphragms of felt or equivalent material, as described in my former application No. 111,817, by reason of the limited movement which such diaphragms permitted. I find, however, that a positive locking of the electrodes makes a superior instrument, and one which maintains its adjustment better and has advantages in mechanical construction. The positive locking together of the electrodes also prevents the separation of the electrodes or the throwing of the instrument out of adjustment by the expansion and contraction due to changes in temperature, which takes place in the diaphragm.

When electrodes of platinum are locked positively together, I consider that the impact caused by the sound-waves at the meeting surfaces of the electrodes produces a rebound, which separates the meeting surfaces slightly, the distance, however small, being sufficiently great to affect the current so as to enable the instrument to efficiently transmit articulate speech.

My invention is illustrated in the accompanying drawings in a simple form of instrument having platinum contacts and a single diaphragm, although the invention is equally applicable to more complex forms of telephones.

Figure 1 is a sectional view of the instrument; Fig. 2, an elevation of the back of the same, showing the adjusting device; Fig. 3, an enlarged sectional view of the contacts and the means for locking them positively together.

Like letters denote corresponding parts in all three figures.

A is a diaphragm, of metal, mica, or other suitable material, which is clamped at its periphery in a suitable inclosing-case, B, which is shown as made of metal, but which may be of any insulating material. The front con-

tact, *a*, of the instrument is the end of a platinum screw, *C*, while the back contact, *b*, of platinum is mounted on the end of a turning spindle, *D*, extending through the case and prevented from longitudinal movement therein. This spindle is turned by a worm, *E*, engaging a worm-wheel, *F*, secured to the spindle.

In the center of the diaphragm is clamped a metallic sleeve, *G*, the front end of which is closed by an insulating-block, *c*, through which passes the platinum screw *C*.

The rear end of the sleeve is provided with an internal screw-thread, *d*, with which engages a screw-thread, *e*, on the inner end of the spindle *D*. The spindle *D* being turned into the sleeve *G*, the diaphragm is drawn backward until the contacts *a b* touch each other. The proper relation of the electrodes is determined by adjustment with the instrument in circuit. The screw-threads *d* and *e* are formed to fit loosely together, as shown in Fig. 3, so that while the contacts will be drawn positively together and locked in that position by the screw-threads the impact of the sound-waves will not be transmitted through the screw-threads *d e*, but through the contacts *a b*. The circuit-connections 1 2 are made with the screw *C* and with the case.

In addition to the functions of the parts, as before explained, it may be stated that the spindle *D* forms a rigid connection from the center of the diaphragm to the case, preventing the bulging of the diaphragm or its movement in any way from the correct position.

What I claim is—

1. In a telephone, the combination of an inclosing-case, a diaphragm, a metal contact or electrode carried by said diaphragm, and a metal contact or electrode connected rigidly with said case, said contacts or electrodes be-

ing locked positively together, substantially as set forth.

2. In a telephone, the combination of an inclosing-case, a diaphragm, a metal contact or electrode carried by said diaphragm, and a metal contact or electrode connected rigidly with said case, said contacts or electrodes being positively locked together and the impact of the sound-waves being received by the contacts or electrodes, substantially as set forth.

3. In a telephone, the combination of an inclosing-case, a diaphragm, a metal contact or electrode carried by said diaphragm, a metal contact or electrode connected rigidly with said case, means for locking said electrodes positively together, and means for adjusting their relation to each other, substantially as set forth.

4. In a telephone, the combination of an inclosing-case, a diaphragm, a metal contact or electrode carried by said diaphragm, a metal contact or electrode connected rigidly with said case, and a device for locking said contacts or electrodes positively together by means of a loose screw-thread, substantially as set forth.

5. In a telephone, the combination of an inclosing-case, a diaphragm, a contact or electrode carried by said diaphragm, a contact or electrode connected rigidly to said case, a sleeve locking said contacts or electrodes positively together, and insulating material insulating said contacts or electrodes from said sleeve, substantially as set forth.

This specification signed and witnessed this 1st day of December, 1883.

EDWARD H. JOHNSON.

Witnesses:

EDWARD H. PYATT,
EDWARD C. ROWLAND.