

(No Model.)

J. E. DANN & J. LAPP.
TELEPHONE TRANSMITTER.

No. 338,492.

Patented Mar. 23, 1886.

Fig. 1.

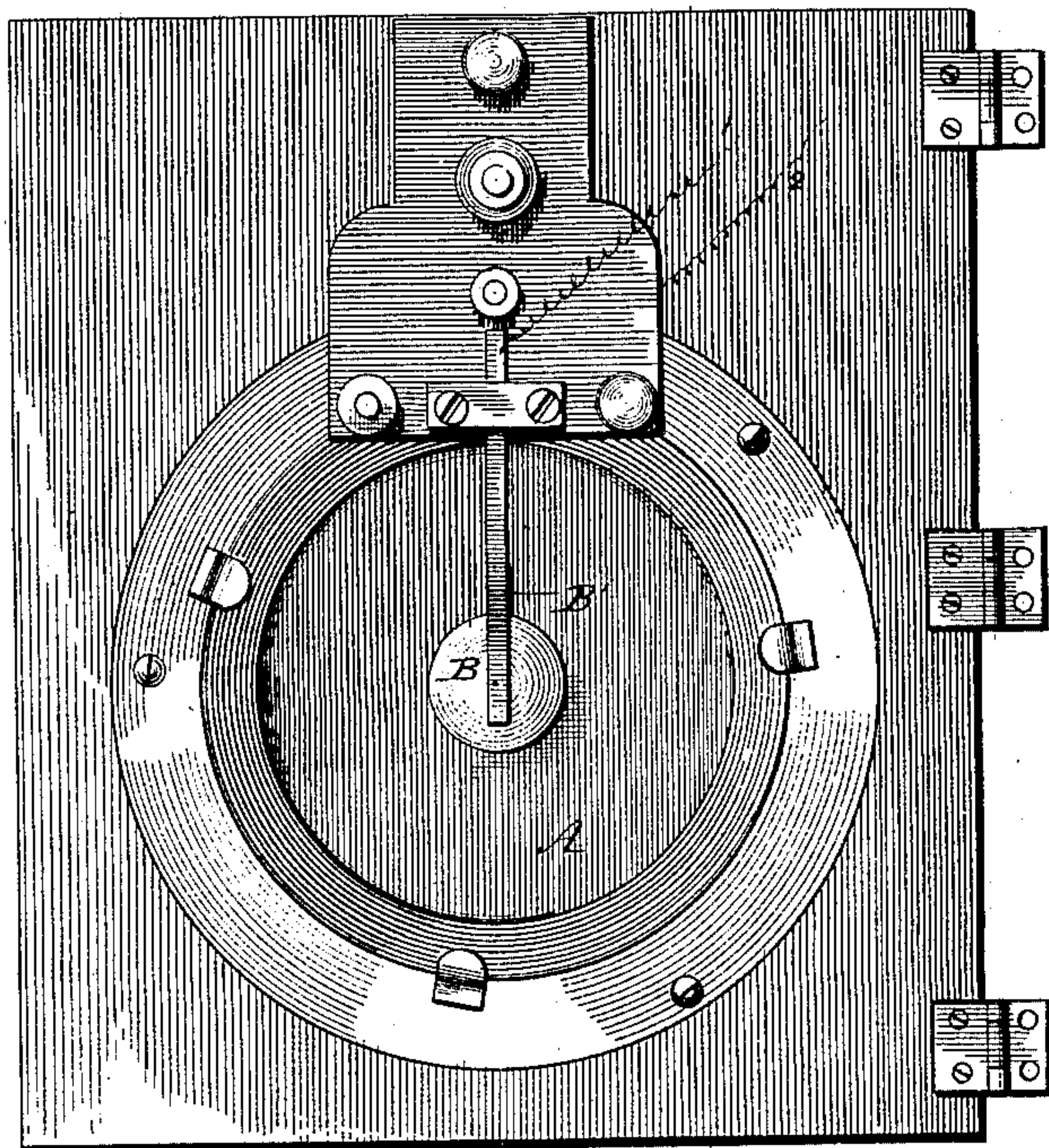


Fig. 2.

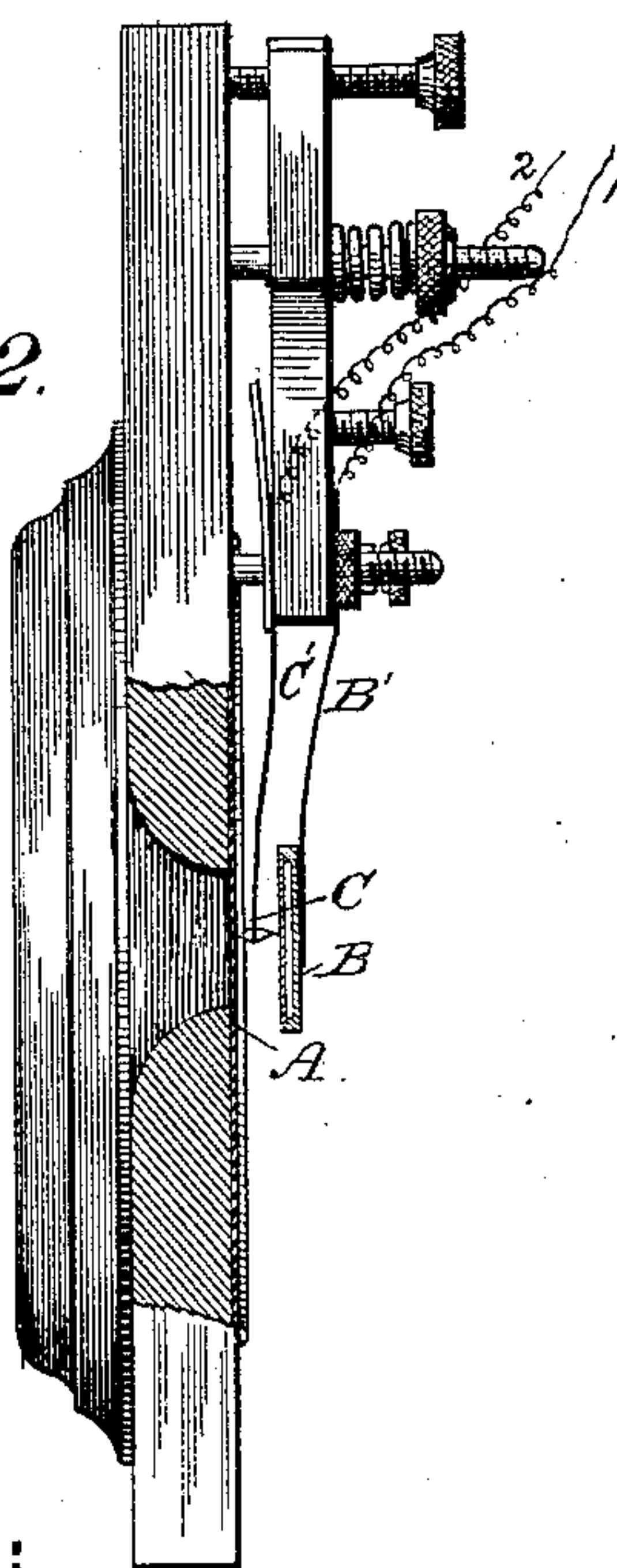


Fig. 3.

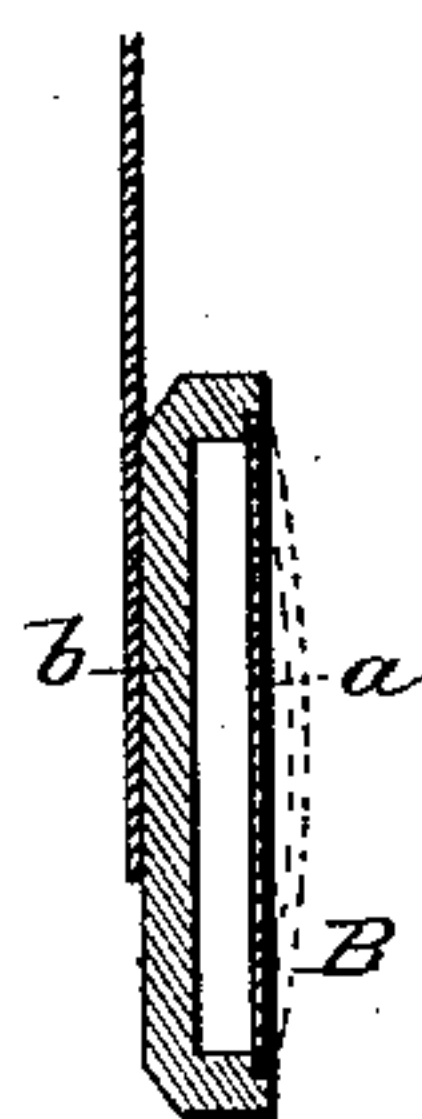
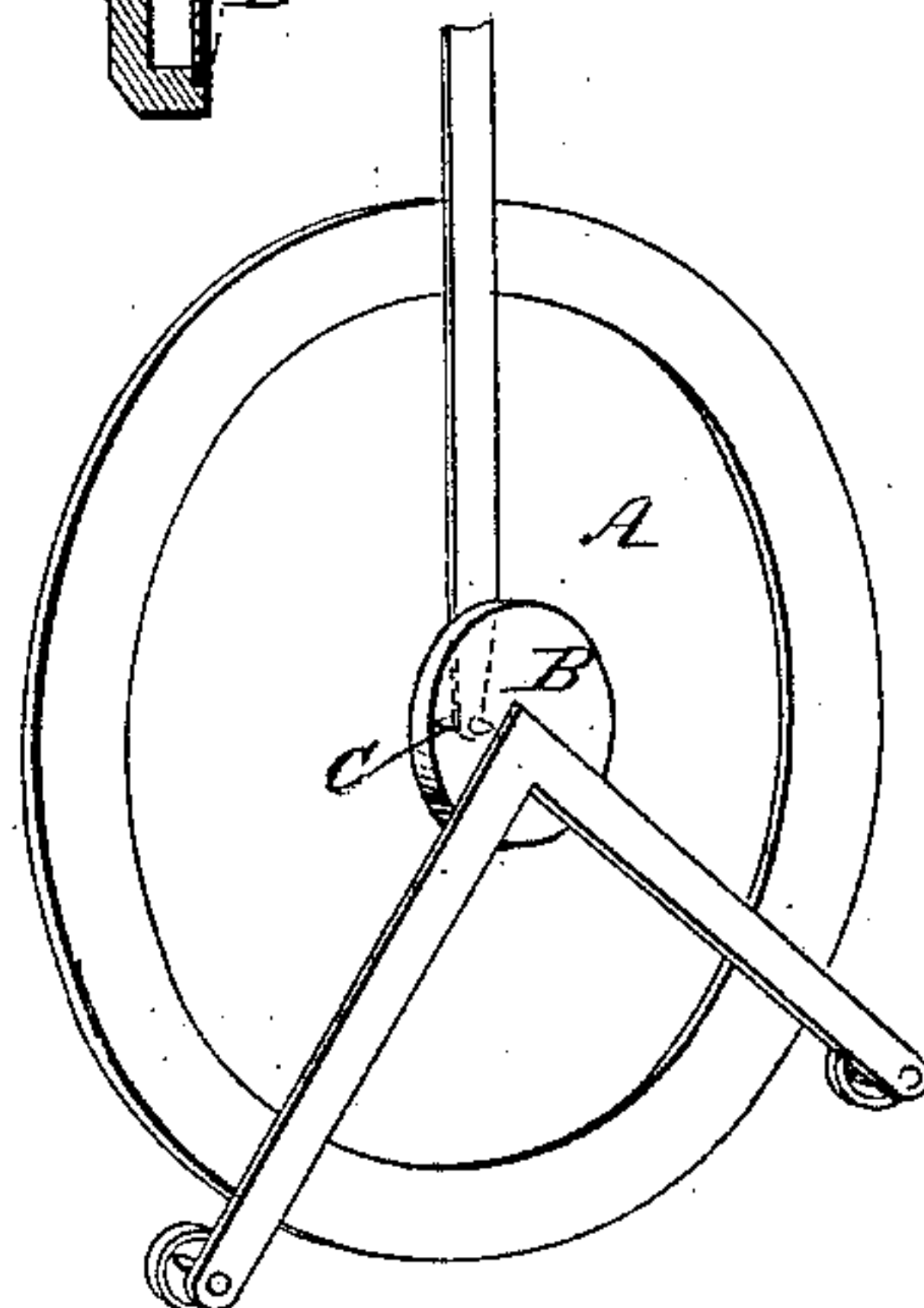


Fig. 4.



WITNESSES:

Fred. G. Dieterich
Amos W. Hart

INVENTOR:

J. E. Dann
J. Lapp
BY *Munn & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN E. DANN AND JOHN LAPP, OF HONEOYE FALLS, NEW YORK.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 338,492, dated March 23, 1886.

Application filed October 31, 1885. Serial No. 181,532. (No model.)

To all whom it may concern:

Be it known that we, JOHN E. DANN and JOHN LAPP, of Honeoye Falls, in the county of Monroe and State of New York, have invented a new and useful Improvement in Telephonic Transmitters, of which the following is a description.

In the accompanying drawings, Figure 1 is a rear elevation of the front of a transmitter-box, showing our invention applied thereto. Fig. 2 is a side view, with part in section. Fig. 3 is a central section of the larger electrode enlarged. Fig. 4 is a perspective view illustrating a modification.

This invention is an improvement upon the Reis transmitter, or, more particularly, upon instruments of the Reis type having two small electrodes that are free to vibrate in connection with the diaphragm. These electrodes must act with perfect freedom, in order to attain the required rapidity of vibration essential to transmission of a certain rapid succession of sound-waves; but heretofore such action has not been practicable, owing to undue adhesion of the electrodes.

We have conducted experiments with the purpose of discovering a reliable method or means for neutralizing such adhesive force, and have found an improved result could be attained by use of a local circuit acting through the electrodes reversely to the main circuit; and we have also become satisfied that an analogous but greater effect could be attained by constructing the electrodes of different metals or other substances which are non-attractive or mutually repellent; but the device we have found satisfactory, and therefore purpose to employ, is an embodiment of the well-known principle that certain metals, notably iron, become expanded when under the influence of an electrical current. We have therefore provided one of the electrodes with a portion which is free to expand under the effect of the current, so as to aid mechanically in securing the required freedom of vibration of the electrodes, as will be hereinafter set forth.

Referring to Figs. 1, 2 of the drawings, the letter A indicates the diaphragm of the transmitter, the same being constructed and arranged in the usual manner.

Letter B indicates the larger electrode, and C the smaller one, which is placed between the former and the diaphragm, and normally in light contact with both. Said electrodes are shown attached, respectively, to springs B' C', which may be held by the devices shown, which are adapted to adjust them as required to secure the required degree of pressure between them; but rigid bars may be substituted for the springs when the action of gravity is depended on, as in the instrument indicated in Fig. 4, in which the arrangement is more nearly analogous to the pure Reis type. The spring B' of the larger electrode, B, is in practice connected by a wire, 1, with the primary of an induction-coil, (not shown,) and the spring C' of the companion electrode by wire 2 with one pole of a battery, whose other pole is also united to said primary. The entire coil may, however, be dispensed with and any device employed that will duly increase the strength of the current on the line.

The construction of the larger electrode, which mainly embodies our invention, will be readily understood by reference to Fig. 3. It consists of a thin metal disk or diaphragm, *a*, made of iron or equivalent material, and its holder *b*, made of brass or other metal not subject to appreciable expansion under electrical influence. The holder *b* has a circular recess, and is provided with an internal shoulder or rabbet. The diaphragm *a* fits snugly within the rim of the holder and rests on said shoulder, as shown. It is essential that the edge of the diaphragm shall be confined either by close frictional contact with said rim or by solder or other equivalent means, since the desired action of the larger electrode depends mainly on the expansion of the central portion of the diaphragm, as will be now explained.

It is well known that, owing to some form of molecular change, a bar of iron when traversed by an electrical current becomes somewhat elongated. It is therefore apparent that if a current be sent through the diaphragm of electrode B it will normally become enlarged—that is to say, expanded radially and most at the center; but such expansion being prevented by its own perimeter, or by the rigid rim of holder *b*, a compensating change of form is produced, in that the diaphragm is projected

outward or bulged into convex shape, as shown exaggerated in Fig. 3. This change of form of the electrode will obviously assist in securing the desired freedom of vibration, and thus favorably affect the transmission of speech.

What we claim is—

1. In a telephonic transmitter of the type hereinbefore indicated, the combination, with the diaphragm, of two vibrating electrodes, one of which is composed of a metal piece that readily expands under electrical influence, and another part or holder that is not materially affected by such influence, substantially as specified.

2. In a telephonic transmitter of the type hereinbefore indicated, the combination of the larger electrode having a diaphragm that is free to expand with the diaphragm of the instrument, and the other electrode placed in-

mediately, substantially as shown and described.

3. In a telephonic transmitter of the type hereinbefore indicated, the combination, with the diaphragm of the instrument and an electrode, of a second electrode having a socket or holder, and a thin iron diaphragm inserted therein and confined at its perimeter, substantially as shown and described.

4. In a telephonic transmitter of the type hereinbefore indicated, the electrode B, composed of the thin iron diaphragm, and the holder in which the latter is held, as shown and described.

JOHN E. DANN.
JOHN LAPP.

Witnesses:

AMOS W. HART,
SOLON C. KEMON.