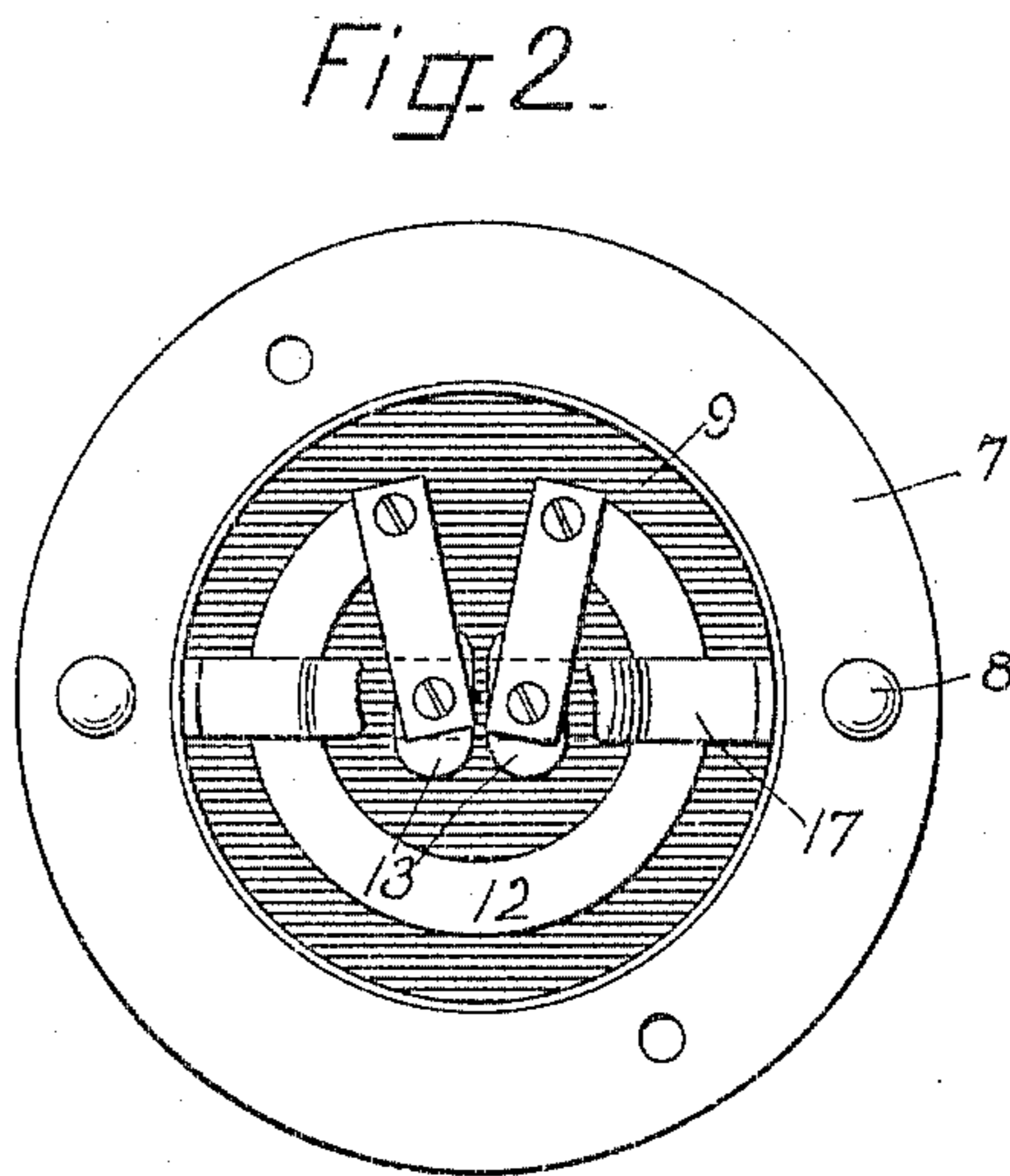
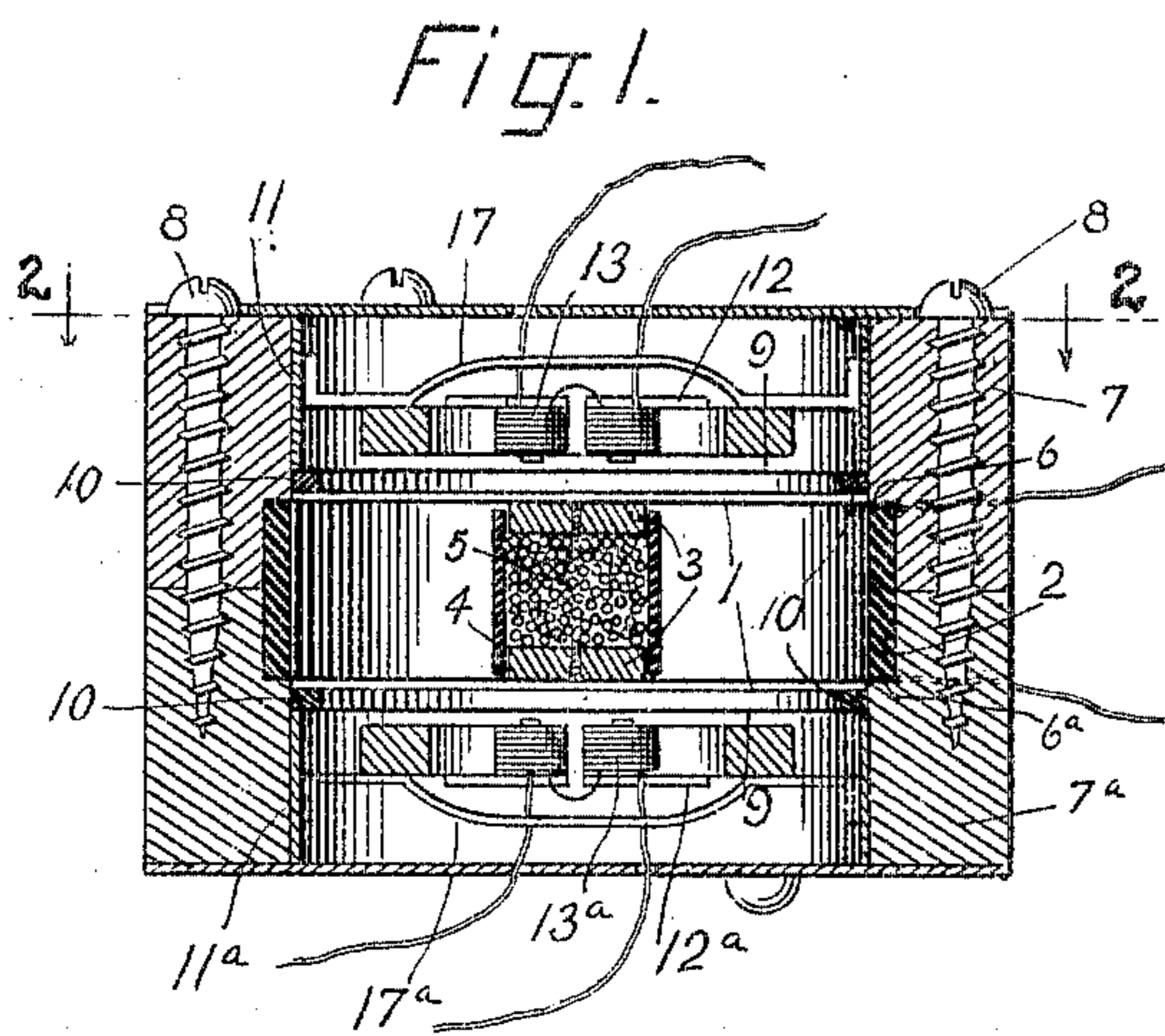
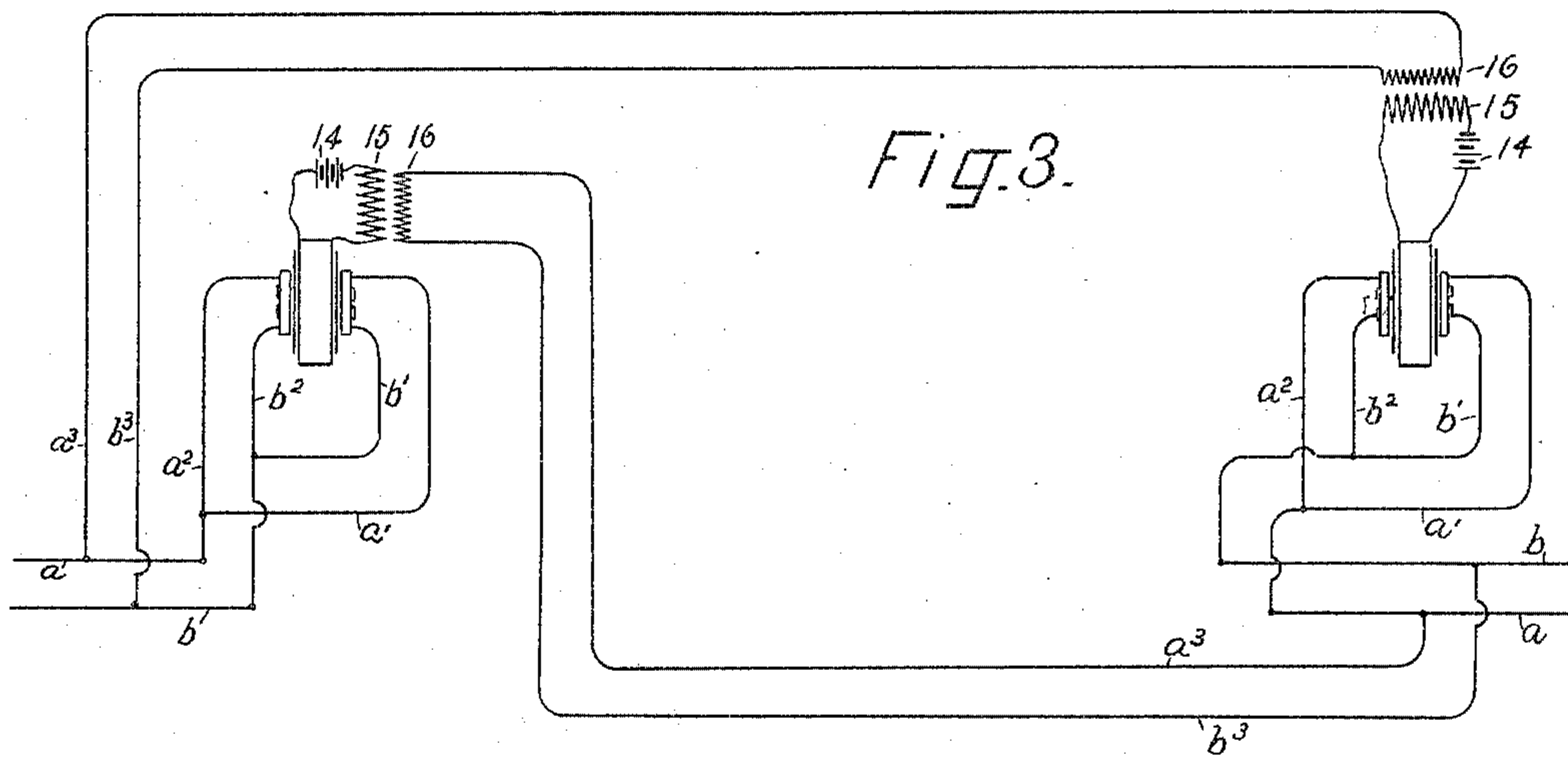


No. 784,175.

PATENTED MAR. 7, 1905.

E. PARSONS.
AUTOMATIC TELEPHONE REPEATER.

APPLICATION FILED FEB. 16, 1903.



WITNESSES

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UNITED STATES PATENT OFFICE.

EMORY PARSONS, OF CHICAGO, ILLINOIS.

AUTOMATIC TELEPHONE-REPEATER.

SPECIFICATION forming part of Letters Patent No. 784,175, dated March 7, 1905.

Application filed February 16, 1903. Serial No. 143,478.

To all whom it may concern:

Be it known that I, EMORY PARSONS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Automatic Telephone-Repeaters, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved device for repeating sound from a receiver to a transmitter interposed on a telephone-line for the purpose of increasing the distance to which a message may be transmitted by telephone.

It consists in the features of construction shown in the drawings and set out in the claims.

In the drawings, Figure 1 is an axial section of my improved telephone-repeater. Fig. 2 is a section at the line 2 2 on Fig. 1. Fig. 3 is a diagrammatic view showing the circuits between two remote instruments embodying my invention.

My improved telephone-repeater comprises two receivers placed upon opposite sides of a duplicate transmitter—that is to say, a transmitter having a diaphragm on each side adapted to receive vibrations from the duplicate receivers, respectively, and give corresponding pulsation to the line-current with the aid of an induction-coil. This intermediate transmitter comprises the two diaphragms 1 1, which are spaced by the short cylinder 2, made of insulating material, against the ends of which the diaphragms are lodged. Each diaphragm has at the center a block 3 of electrically-conductive material, the blocks facing each other and being telescoped into the opposite ends of the short tube 4, which is of insulating material, the space in the cylinder 4 between the two blocks 3 being occupied by granulated carbon 5. The diaphragms are held against the ends of the spacing-cylinder 2 by shoulders 6 6^a of the opposite annular frames or cases 7 7^a, which are themselves bound together by screws 8. These cases inclose the receivers, the diaphragms 9 9 of such receivers being lodged therein spaced away from the diaphragms at 1 1 of the transmitter by spacing-rings 10 10 of insulating material, the receiver-

diaphragms being bound against said spacing-rings by the shells 11 11^a of the receivers, which inclose and support the magnets 12 12^a and magnetizing-coils 13 13^a of the receivers, holding them out of contact with the receiver-diaphragms. Any convenient means of mounting the magnet on the shells may be employed, as the cross-bars 17 17^a, illustrated in the drawings.

14 is the local battery; 15 16, the induction-coil, 15 representing the primary and 16 the secondary wire of such coil.

a may represent the line-wire on which the pulsation due to a transmitter elsewhere on the line is coming in. This line-wire is divided sending two branches *a'* and *a''* to the electromagnet-coils of the two receivers, and from them corresponding branches *b'* and *b''* extend and are joined in the return-wire *b*.

From this construction it will be understood that there will result synchronous vibration of the two diaphragms of the duplex transmitter, causing corresponding pulsations in the local circuit, which comprises the granulated carbon between the diaphragms, the local battery, and the primary wire of the induction-coil, so that in the secondary wire of the latter there will arise a correspondingly-pulsating induced current, by which the sound will be transmitted by means of the line to a distant receiver. In order to transmit and repeat automatically in both directions over the line, I employ these repeaters in pairs, connecting the several elements in the manner shown in the diagram Fig. 3, by reference to which it will be understood that in addition to branching the wires *a* and *b* to lead to the electromagnet-coils of the receivers of that instrument they are also provided with branches *a'* and *b'* to the secondary wire of the induction-coil of the other instruments.

In order that the maximum effect of the incoming current may be produced on the transmitter for causing pulsation in the local circuit which includes the primary wire of the induction-coil, the resistance in the branches of the circuit which include the two receivers which influence such transmitter should be preferably less than that of the parallel branch comprising the wires *a* *b'* of the sec-

ondary coil 16 of the other instrument, since obviously if this last - mentioned parallel branch constituted a relatively very short circuit the effect desired upon the transmitter from the two receivers would be materially reduced.

I claim—

1. A telephone-repeater comprising a transmitter having a plurality of diaphragms; a medium interposed between the diaphragms, exposed to their vibrations; a local circuit comprising such medium and the primary wire of an induction-coil; a like plurality of telephone-receivers having their diaphragms facing the transmitter-diaphragms respectively; an incoming-line circuit which is branched to include in parallel the electromagnet-coils of the several receivers, the secondary wire of the induction-coil being in the outgoing-line circuit.

2. Repeating devices for a telephone-circuit comprising a pair of instruments, each comprising a transmitter having a plurality of diaphragms; a medium interposed between the diaphragms and exposed to their vibrations; a local circuit comprising such medium and the primary wire of an induction-coil; a like plurality of telephone-receivers having their diaphragms facing the transmitter-diaphragms respectively; an incoming-line circuit which is branched to include in parallel the coils of the electromagnets of the several receivers, the secondary wire of the induction-coil of each instrument being a branch circuit from the incoming-line circuit of the other instrument, and in parallel with the branches to the electromagnet-coils of the same, the resistance of said secondary wire being greater than the resistance of the electromagnet-coils.

3. A telephone-repeater comprising a transmitter having a plurality of diaphragms; a medium interposed between them and exposed to their vibration; a local circuit comprising such medium and the primary wire of the induction-coil; a like plurality of telephone-receivers having their diaphragm-influencing magnets in position to influence the trans-

mitter-diaphragms respectively; an incoming-line circuit which is branched to include in parallel the coils of such magnets respectively, the secondary wire of the induction-coil constituting the outgoing-line circuit.

4. A telephone-repeater comprising a shell or casing, a plurality of diaphragms and a medium interposed between them exposed to their vibration or inclosed within the shell or casing and constituting a transmitter, and a like plurality of telephone-receivers contained within the same casing having their diaphragms facing the transmitter-diaphragms respectively at a short interval, forming an inclosed air-chamber between the corresponding diaphragms of the transmitter and receivers respectively; a local circuit comprising the medium interposed between the transmitter-diaphragms and the primary wire of an induction-coil; an incoming-line circuit which is branched to include in parallel the electromagnet-coils of the several receivers, the secondary wire of the induction-coil being in the outgoing-line circuit.

5. A telephone-repeater comprising a transmitter having a plurality of diaphragms; a medium interposed between the diaphragms exposed to their vibrations; a local circuit comprising such medium and the primary wire of an induction-coil; a like plurality of telephone-receivers having their diaphragms facing the transmitter-diaphragms respectively at a short interval affording air-space between the facing diaphragms respectively, and a shell which encompasses and incloses such air-space; an incoming-line circuit which is branched to include in parallel the electromagnet-coils of the several receivers; and the secondary wire of the induction-coil, which is located in the outgoing-line circuit.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 6th day of February, 1903.

EMORY PARSONS.

In presence of—

D. McLAUGHLIN,
J. J. HOWARD.