

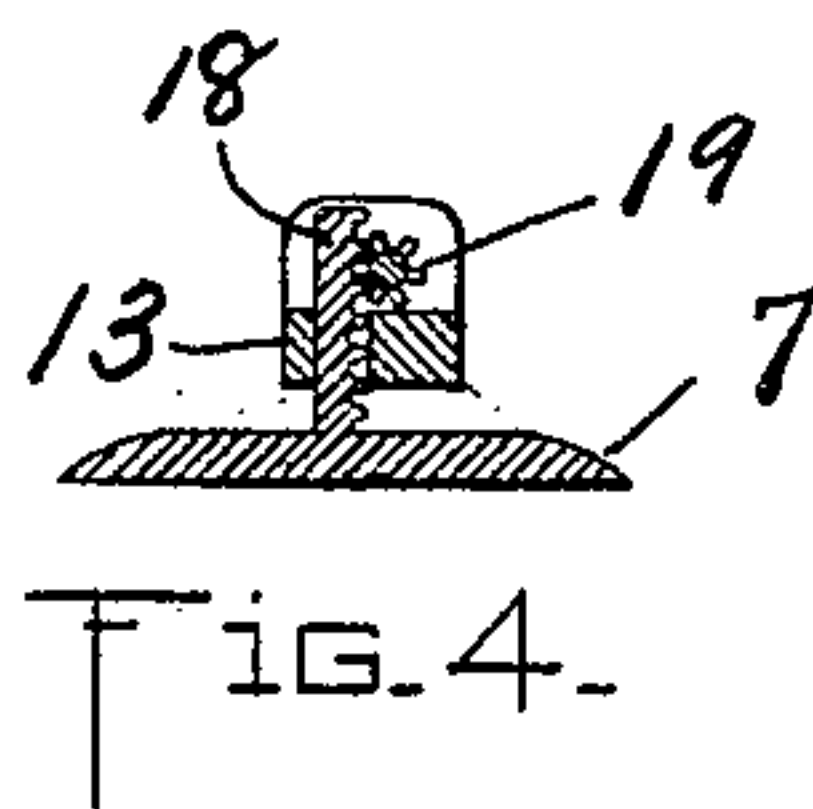
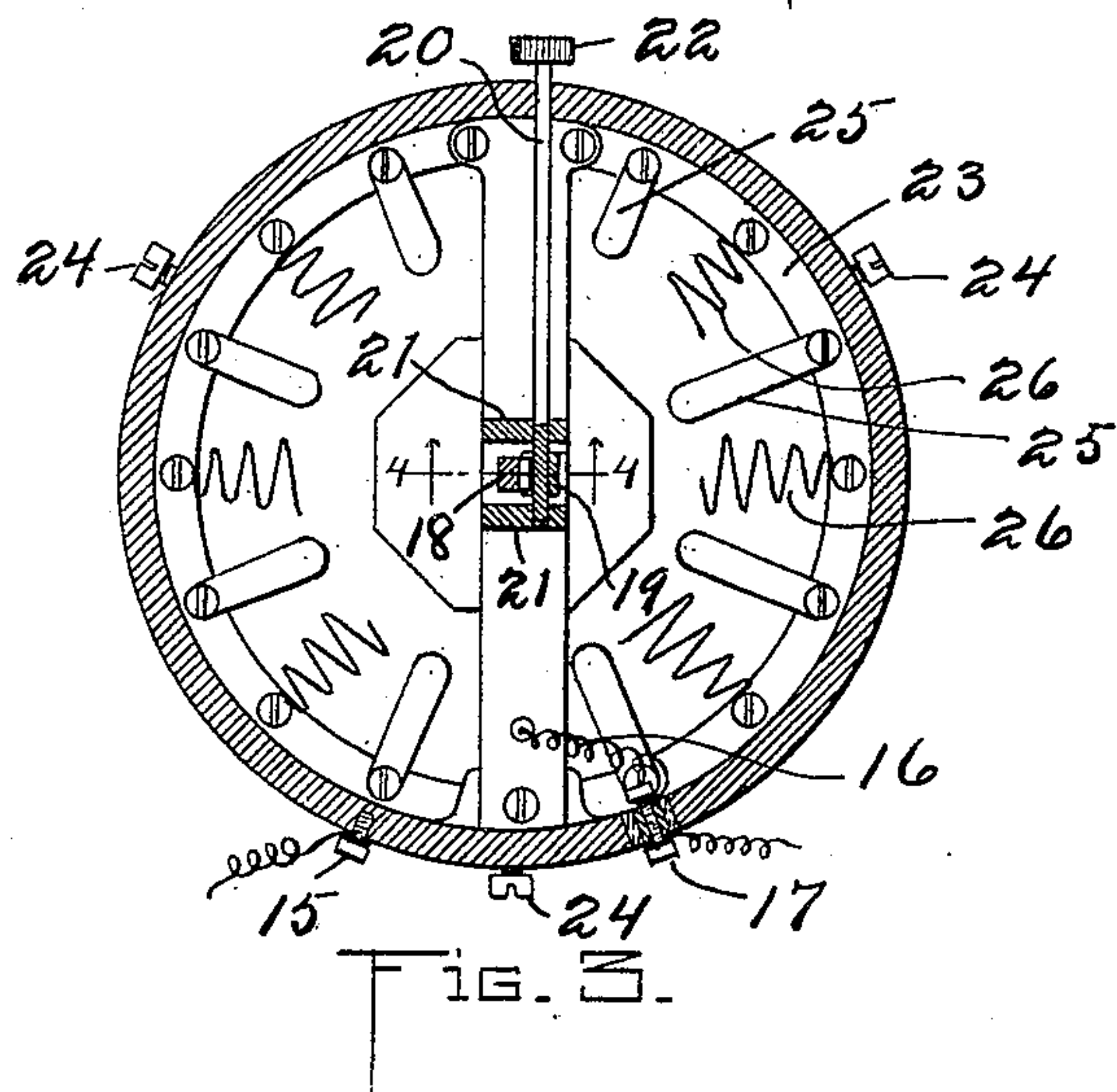
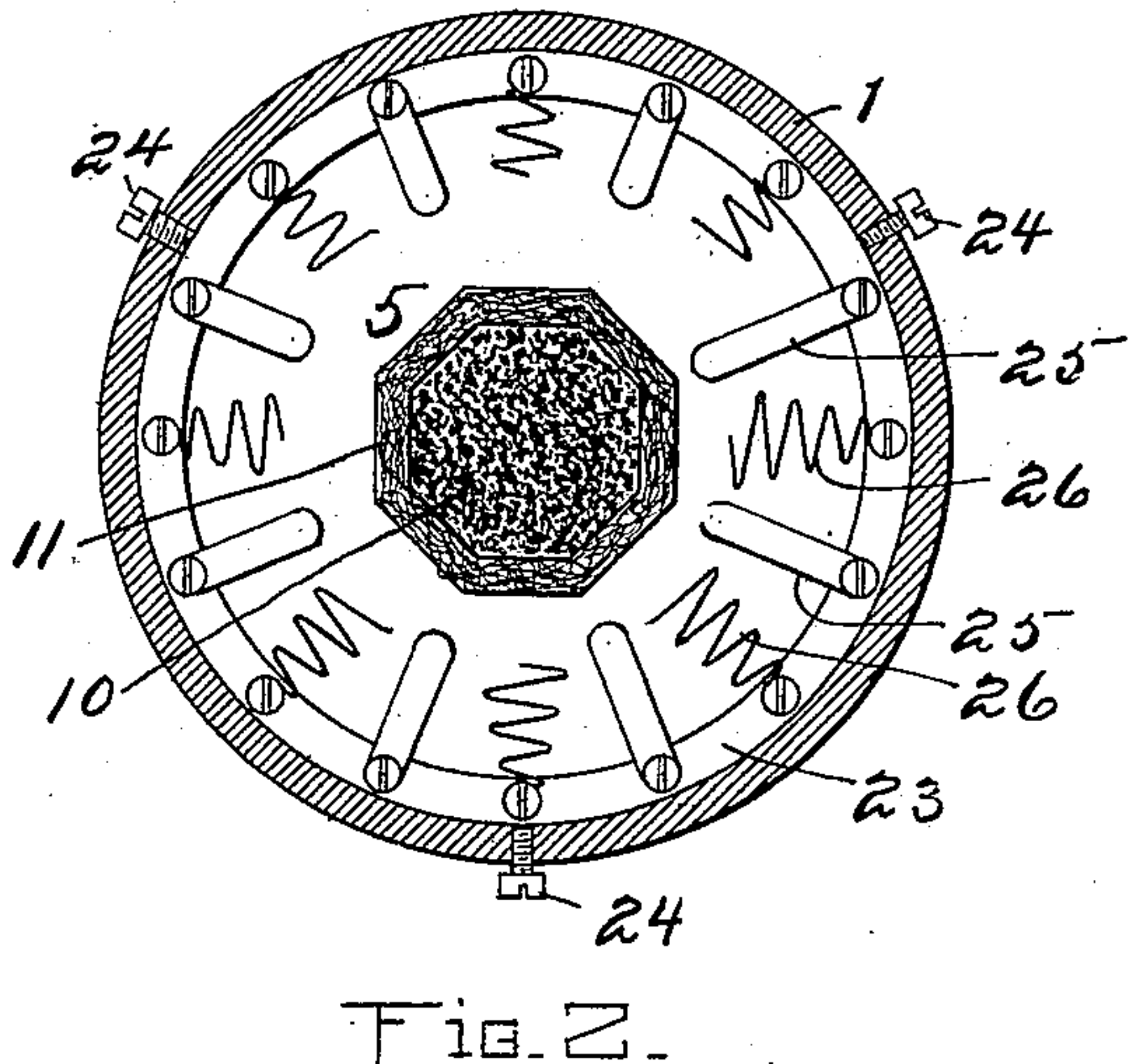
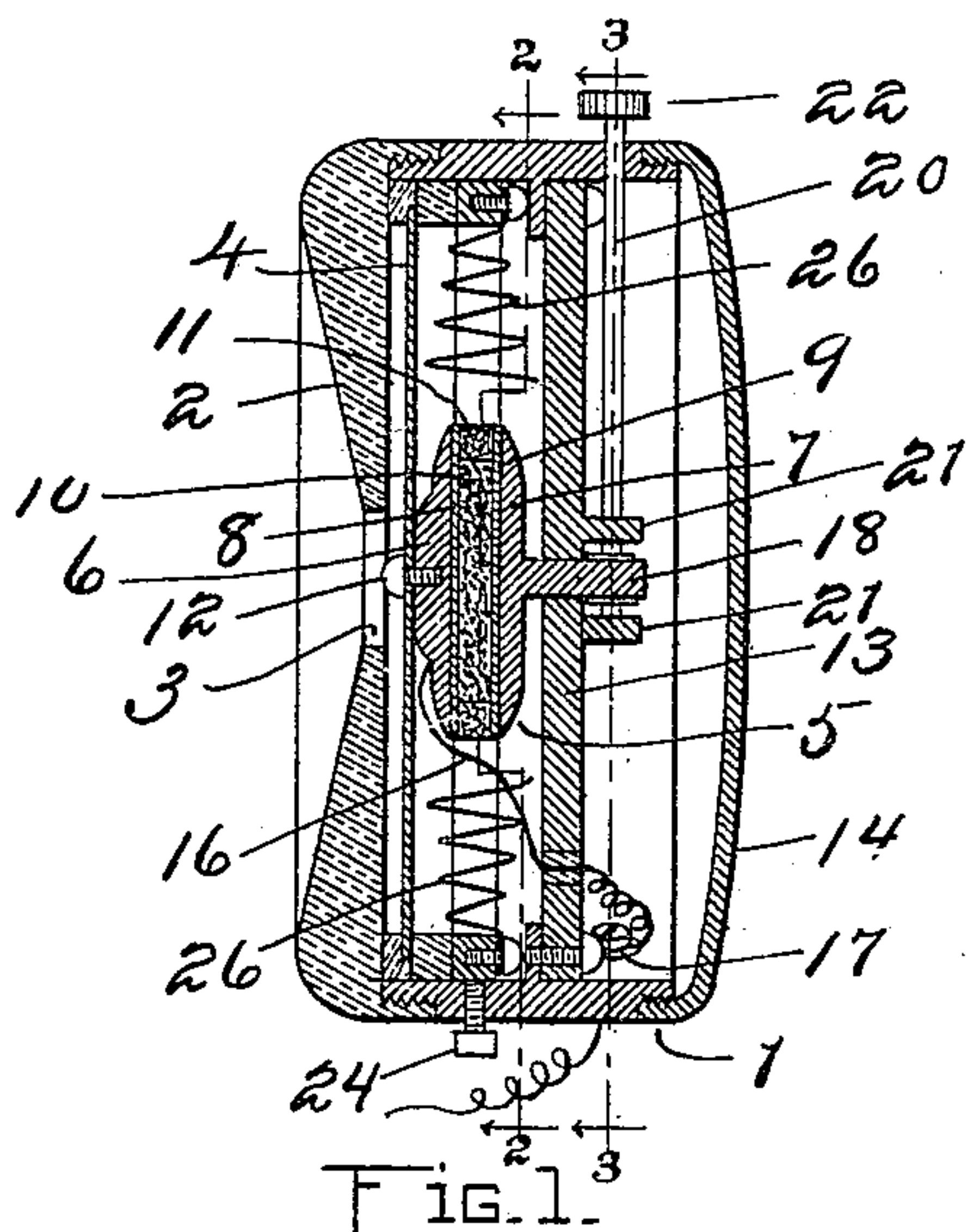
No. 667,546.

Patented Feb. 5, 1901.

L. MELLETT.
TELEPHONIC TRANSMITTER.

(Application filed June 14, 1900.)

(No Model.)



WITNESSES:
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UNITED STATES PATENT OFFICE.

LEMUEL MELLETT, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO ALBERT F. HENDERSON, OF MELROSE, MASSACHUSETTS.

TELEPHONIC TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 667,546, dated February 5, 1901.

Application filed June 14, 1900. Serial No. 20,355. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL MELLETT, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain
5 new and useful Improvements in Telephonic Transmitters, of which the following is a specification.

This invention relates to telephonic transmitters; and its object is to increase the delicacy or responsiveness of such instruments.
10 This object I attain by employing, in connection with a sound-affected resistance-varying element, such as the granular-carbon cell commonly employed in transmitters, a series of
15 vibrators which are responsive by the phenomenon known as "consonance" or "sympathetic vibration" to different sound-tones and which react upon the resistance-varying element in such manner as to increase its sensitivity to the original sounds produced.
20

Of the accompanying drawings, Figure 1 represents a median section taken from front to rear through a transmitter constructed in accordance with my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3
25 represents a section on line 3 3 of Fig. 1. Fig. 4 represents a section on line 4 4 of Fig. 3.

The same reference characters indicate the same parts in all the figures.

30 In the drawings, 1 designates a casing having a front or mouthpiece 2, provided with a central aperture 3. Behind the front 2 is the usual diaphragm 4, and behind this is the usual resistance-varying element 5, here
35 shown as comprising front and back metal plates 6 7, faced with thin carbon plates 8 9, between which is interposed a body of granular resistance-varying material 10, held in place on its edges by a retaining-ring 11 of
40 an easily-compressible material, such as felt. The front metal plate 6 of the cell is attached by a screw 12 to the diaphragm 4, so as to be vibrated when said diaphragm is vibrated by having sounds directed against it. The back
45 metal plate 7 is supported by a metal bar 13, which is fixed or rigid with the casing.

14 is a removable back cover for the casing.

It will be noted that there exists by the described construction an interior space within
50 the casing, which contains the resistance-varying element 5 and has the diaphragm 4 as

its front wall. The electrodes through which the current is to be led are constituted, respectively, by the metal frame or casing of the transmitter, with which back plate 7 is
55 in electrical connection and which has a binding-screw 15, and by a wire 16, leading from the front plate 6 to a second binding-screw 17. I prefer also to add to the above equipment of the transmitter an adjustment for
60 varying the normal distance between the front and back plates of the transmitter. This adjustment in the drawings comprises a stem 18, projecting from the rear side of the back
65 plate 7 and formed with rack-teeth, as shown in Fig. 4, said stem passing through an aperture in the bar 13, a pinion 19, meshing with said teeth, and a stem 20, which is journaled
70 in ears 21 21 on the bar 13 and has a knob or head 22 on its outer end outside of the casing 1. The stem preferably has a friction-tight fit in its bearings, so as not to rotate easily. A slight turn of the stem 20 will increase or decrease the distance between the metal
75 plates 6 7 sufficiently to decrease or increase the amplitude of the electrical waves which are transmitted along the conductors from a sound of given intensity affecting the transmitter. Hence such an adjustment affects
80 the loudness of the sound which is observed at the receiving end of the telephone-circuit.

23 is an annular support or ring fixed within the casing 1 by set-screws 24 24 and having attached to it a series of vibrators 25 26. These vibrators may be of different kinds, as
85 reeds 25 and wire spirals or coils 26, the coils being longer and deeper-toned than the reeds. They are attached at their outer ends to the ring 23, and are directed radially inward toward the granular-carbon cell 5. The vibrators 25 26 are present in sufficient number and made of such dimensions as to be sympathetically or consonantly vibrated by the
90 ordinary tones of the human voice or other sound-producers received against the diaphragm 4. The phenomenon of sympathetic or consonant vibration whereby the vibrations of one sound-producing body are transmitted through the air or other present transmitting medium and produce similar vibrations in another body at a distance is well
100 known. The vibrators 25 26 are each respon-

sive to a particular tone, and as soon as the diaphragm or the casing moves in the "vibration period" corresponding to that tone its vibrations transmitted through the air in casing 1 to that vibrator will set it in motion and cause it to emit the same tone with an intensity less than that of the original tone. As shown in the drawings, the vibrators 25 26 are present in a series of two octaves, covering the ordinary fundamental tones and the lower harmonic tones of the human voice and the fundamental and harmonic tones of ordinary sounds, such as it would be desired to transmit through the instrument. The effect of a person talking through the instrument is to maintain some of the vibrators 25 26 constantly in motion, and the sympathetic vibration or movement thus produced reacts on the cell 5 and renders more distinct the talking-sound produced in a receiver which is connected with the transmitter. This is also true of other sounds. The effect on the delicacy or capacity of the transmitter is so great that very deaf persons have been enabled, with the instrument used as a transmitter in an ordinary telephonic line of which the person held the receiver, to distinguish conversation carried on in an ordinary tone of voice. The theory on which I account for the effects which are obtained by my invention is that the reacting vibrators produce a condition of minute agitation or looseness in the grains of carbon within the resistance-varying cell, and thus render the mass more sensitive in varying the resistance to the passage of the current from one carbon particle to the next. It is well known that in ordinary transmitters the weight of the upper portions of the granulated mass in the cell tends to compact the lower portions and that it is the upper or loose strata which are principally active in

their effect on the current. If these lower layers of the mass can be kept in a loose or non-adherent condition, as I assume that they are by the operation of the reacting vibrators, so that each grain is free to have an independent movement when the mass is transversely vibrated by the diaphragm, then the whole mass of carbon will be rendered active instead of the upper portions only. It is probable, also, that the vibrators directly reinforce or increase and perpetuate the tones which set them in motion, so that a certain resonance exists, which has an increased effect on the carbon-cell.

I claim—

1. A telephonic transmitter having a chamber provided with a diaphragm, a body of loose granular resistance-varying material located in said chamber behind the diaphragm and actuated thereby, and a series of vibrators respectively responsive to different tones, located in said chamber behind the diaphragm and actuated thereby, and adapted to react independently on the granular body.

2. A telephonic transmitter comprising a casing, a cell contained in said casing and containing a body of loose granular resistance-varying material, a sound-vibrated element operatively related to said cell, and a series of vibrators surrounding and radially directed toward the cell within the casing, said vibrators being respectively responsive to different tones and adapted to agitate the cell.

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

LEMUEL MELLETT.

Witnesses:

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