

(No Model.)

R. S. BARNUM.
TELEPHONE TRANSMITTER.

No. 584,810.

Patented June 22, 1897.

Fig. 1.

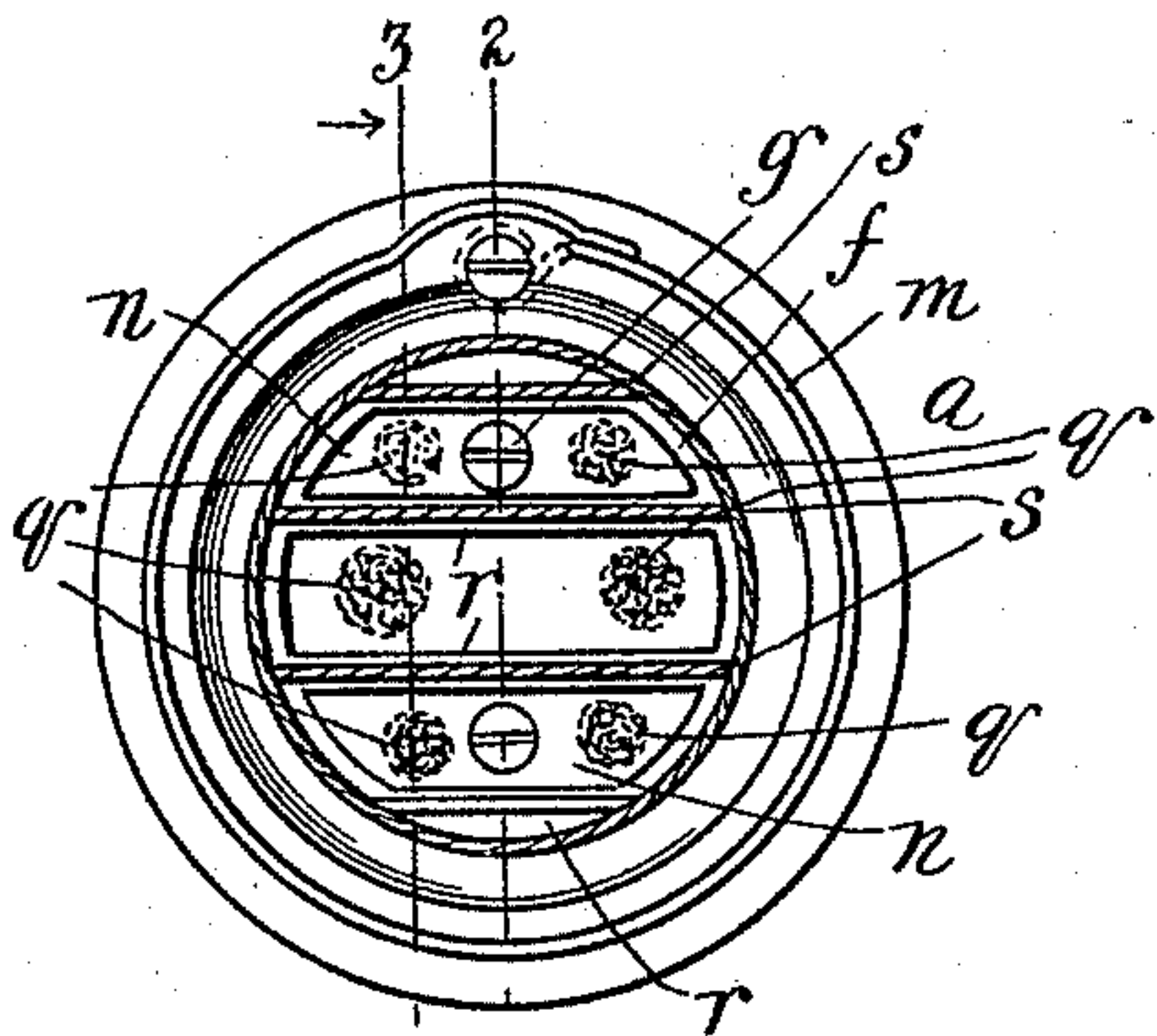


Fig. 2.

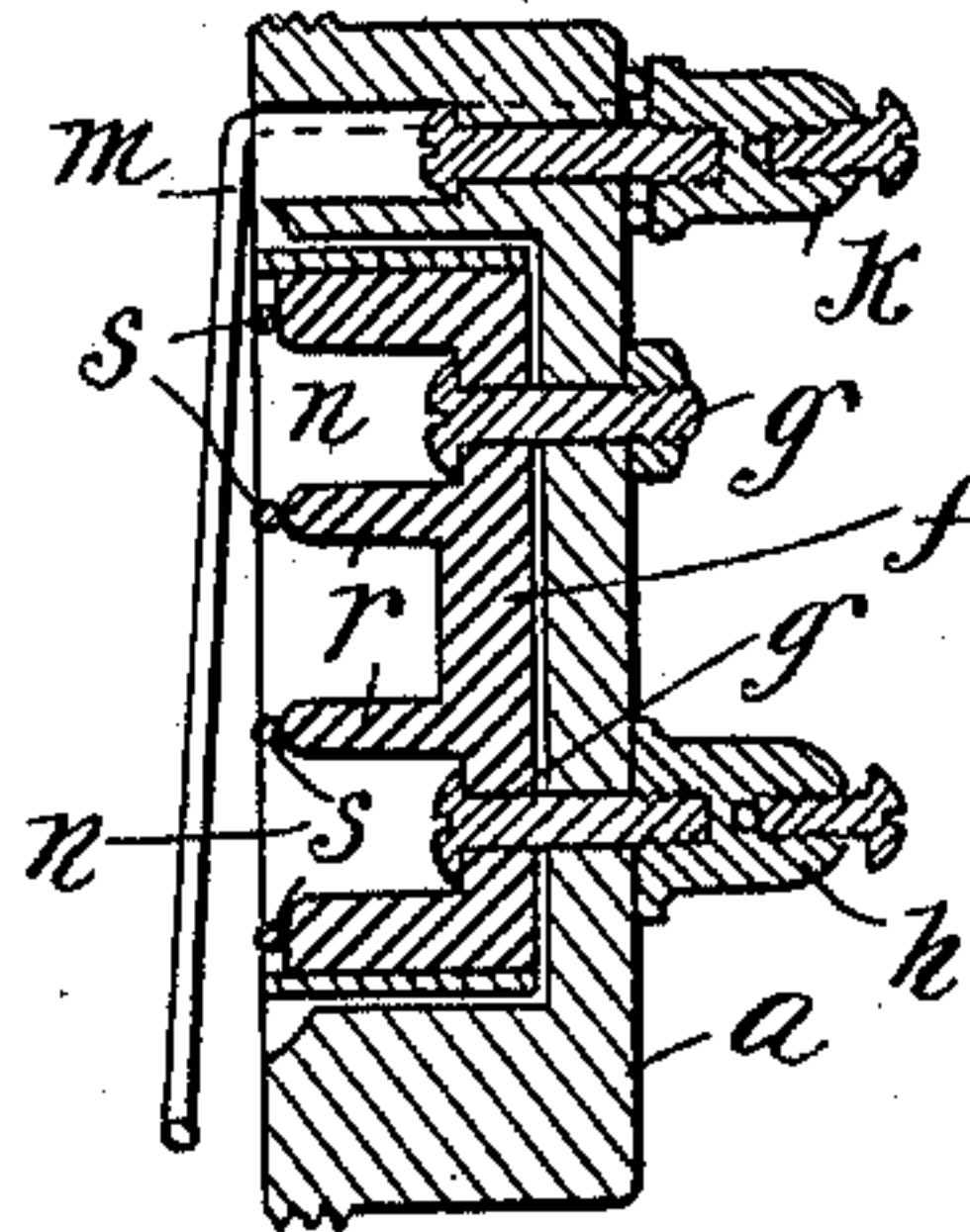


Fig. 4.

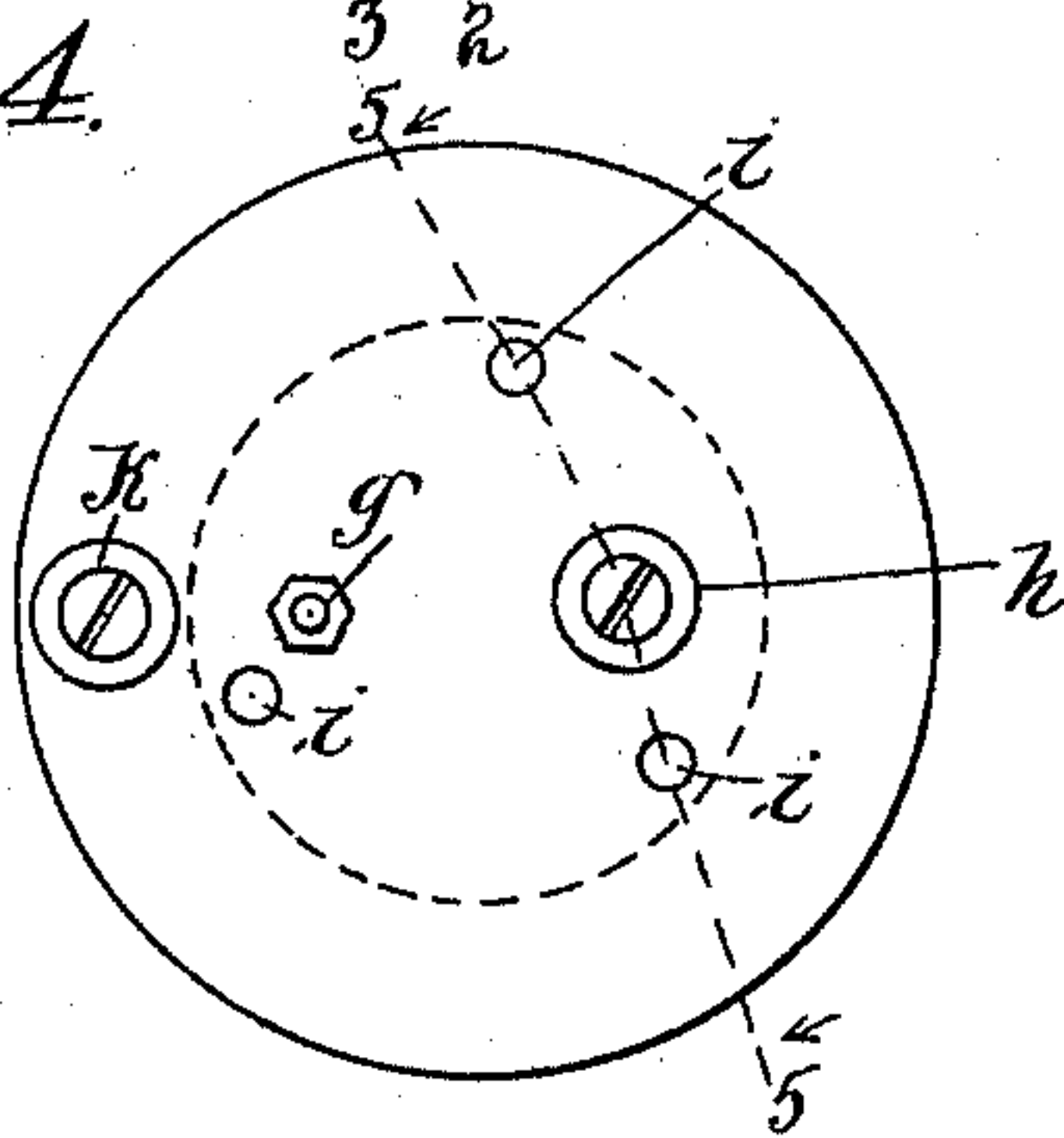


Fig. 3.

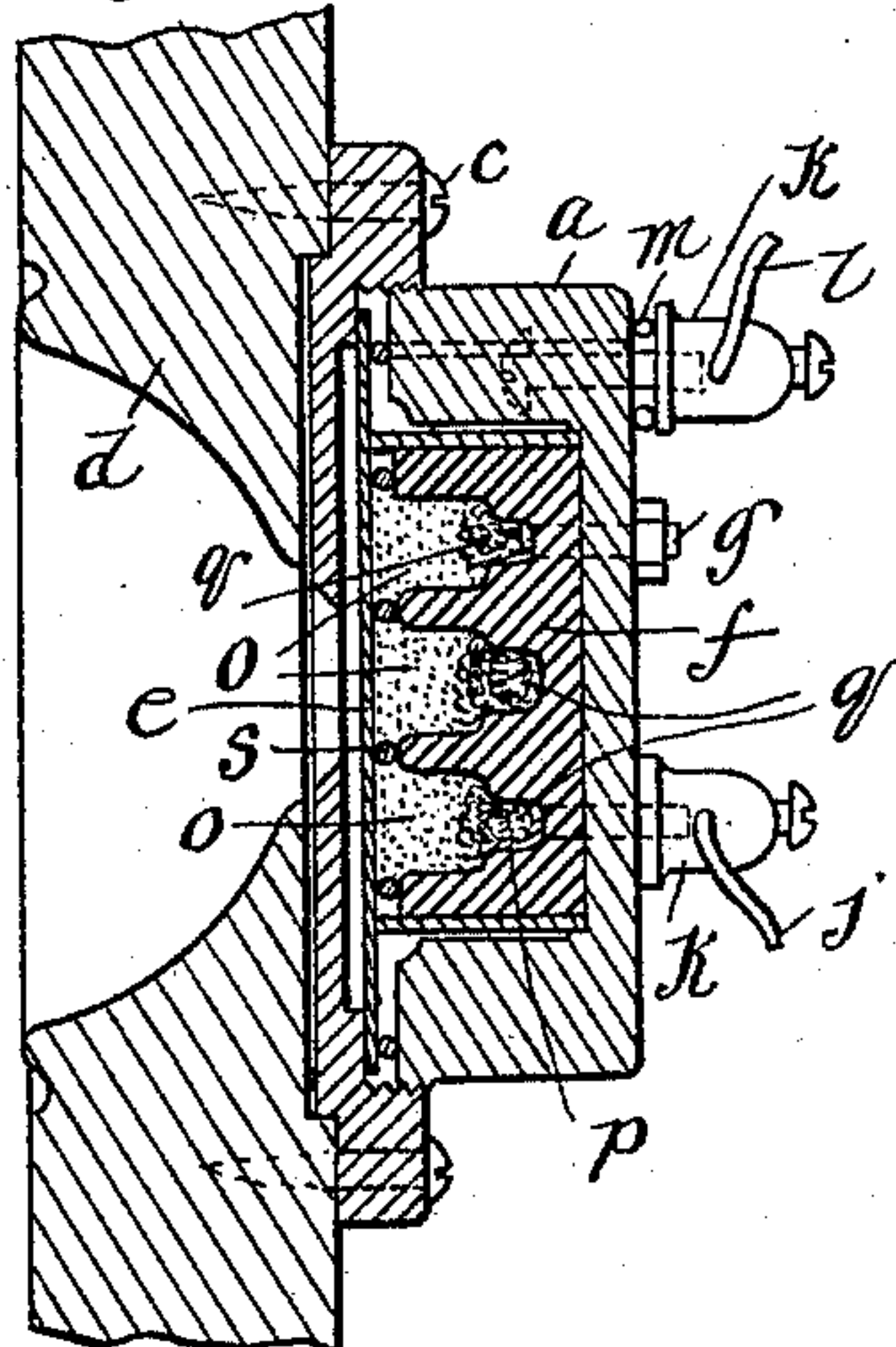


Fig. 5.

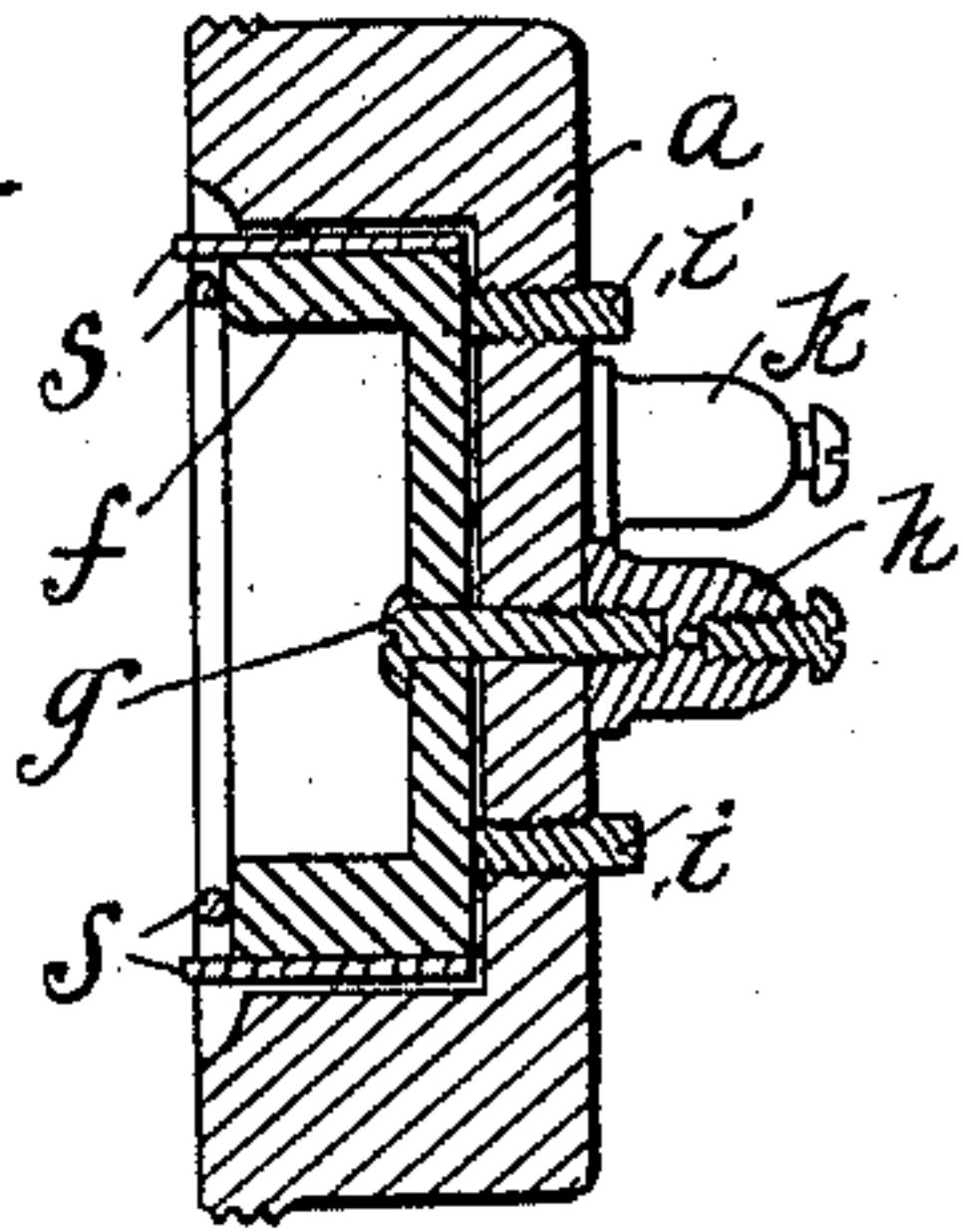
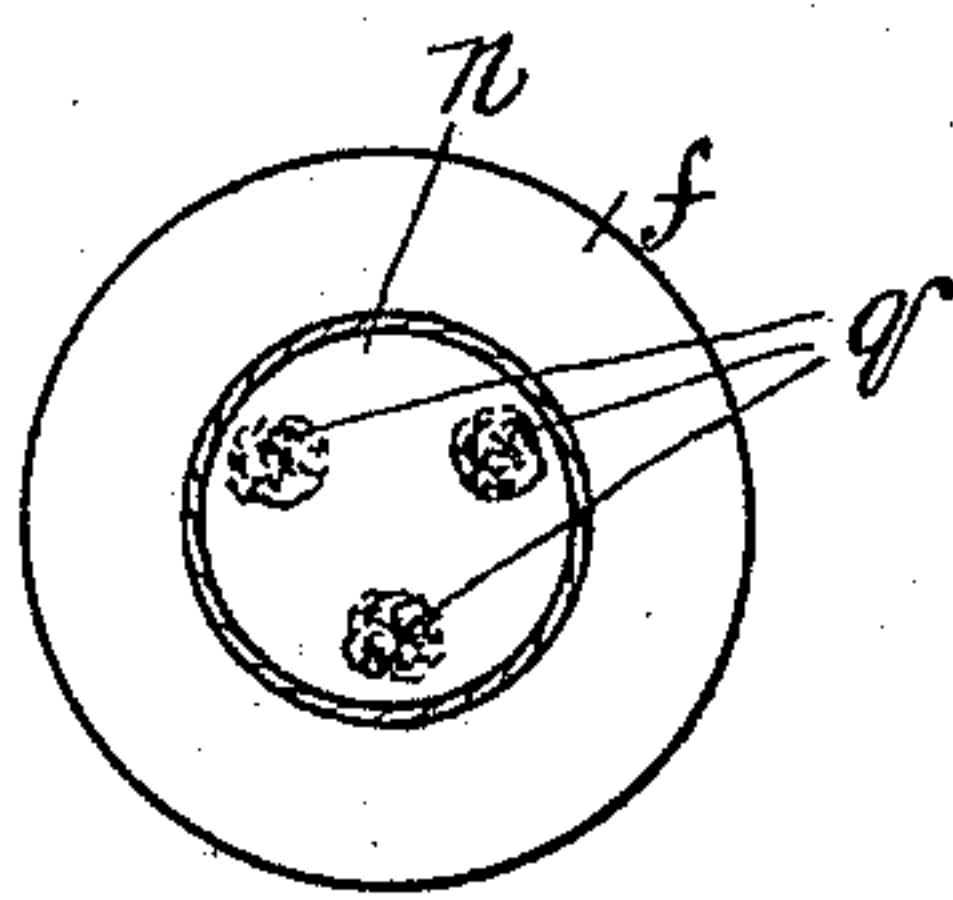


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

RUSSELL S. BARNUM, OF CHICAGO, ILLINOIS.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 584,810, dated June 22, 1897.

Application filed July 9, 1896. Serial No. 598,570. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL S. BARNUM, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Telephone-Transmitters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which the corresponding letters of reference in the different figures indicate like parts.

My invention has reference to that class of telephone-transmitters in which finely-divided particles of conducting material are employed to form an electrical connection between the diaphragm and carbon block or opposite electrode; and the primary object of my invention is to provide means whereby the granular particles may be prevented from becoming so packed and wedged between the diaphragm and carbon block as to form a solid unyielding mass, thereby preventing the free vibration of the diaphragm.

A further object is to provide simple and satisfactory means for securing accurate and certain adjustment between the carbon block and the diaphragm.

To these ends my invention consists in the combination of elements hereinafter more particularly described and claimed.

In the drawings, Figure 1 is a face view of my improved device as it would appear with the mouthpiece, diaphragm, and granular particles removed. Fig. 2 is a central vertical sectional view thereof. Fig. 3 is a vertical sectional view taken upon the line 3 3, Fig. 1, as viewed in the direction of the arrow there shown, the mouthpiece and diaphragm being added. Fig. 4 is a rear view of the case containing the carbon block. Fig. 5 is a sectional view taken upon the line 5 5, Fig. 4; and Fig. 6 represents a modification of my invention, being a face view of the carbon block as it would appear with the granules removed.

In the drawings, *a* represents the outer case of the carbon block or electrode, which case is constructed in the usual way of wood or other suitable material and adapted to screw into a front plate *b*, which is secured in turn by means of screws *c*, Fig. 3, to the main frame or door *d* of the telephone-case, in which

is formed the usual mouthpiece. Between the parts *a* and *b* is located the diaphragm *e*, which forms one of the electrodes.

Within the case *a* is located a carbon block *f*, which is attached to the case by means of screws *g g*, one of which is arranged to enter a threaded nut upon the back of the case *a* and the other a binding-post *h*. Extending through the case *a* from the back are three adjusting-screws *i*, Figs. 4 and 5, the inner ends of which abut against the carbon block *f*, as shown in the last-named figure.

In order to prevent the screws from being tampered with by unauthorized persons, I prefer to construct them without the usual slotted heads and to cause them to project from the rear, as shown, so that they may be turned with suitable pliers.

The carbon block may be adjusted in its relation to the diaphragm by first loosening the screws *g g* and then turning the screws *i*, so that when the block *f* rests against them its front face may be in the desired relation with respect to the diaphragm. The screws *g* may then be tightened. By this means it is most obvious that the most delicate and accurate adjustment may be obtained and perfect parallelism secured and maintained between the block and diaphragm.

The binding-post *h*, to which the line-wire *j* is attached, is electrically connected by means of the screw *g* with the carbon block *f*. A secondary binding-post *k* is attached to the case, to which is connected the line-wire *l*. A wire *m* is attached to the binding-post *k* and carried through, as shown in Fig. 2 and indicated in dotted lines in Fig. 3, to the front of the case *a*, where it is bent in the form of a ring, Fig. 1, against which the diaphragm is caused to rest. The ring thus forms an electric connection between the line-wire *l* and the diaphragm.

In the face of the electrode *f* is formed one or more, but preferably a series, of depressions or cavities *n*, intended for the reception of finely-divided particles of conducting material *o*, Fig. 3, preferably in the form of carbon granules. Within said cavity or cavities is formed one or more smaller holes or depressions *p*, Fig. 1, into which is inserted a tuft or tufts *q* of soft fibrous or elastic mate-

rial, such as cotton or wool, but preferably the latter. The fibrous tufts exert a constant elastic pressure upon the granules and serve to press them with a yielding pressure upon the diaphragm, at the same time preventing said granules from becoming packed.

I prefer to arrange the cavities for the reception of the granules transversely of the carbon electrode, as shown in Figs. 1 to 3, in which case I attach to the front edge of the partitions *r*, between the cavities, a cord *s* of soft material, which is adapted to rest lightly against the diaphragm, and thus prevent the passage from one compartment to another of the fine granules, but with the fine adjustment obtainable through the adjusting-screws said cord may be dispensed with.

In Fig. 6 I have shown a modification of said invention in which but a single cavity is shown in the carbon block. In said last-named construction I have shown the fibrous tufts at the middle and at or near the bottom of the cavity, it being obvious that none would be required at the top.

My improvement is especially adapted to long-distance telephones and tends, under various conditions of battery force, to prevent rattling sounds and to insure loud and clear tones.

Having thus described my invention, I claim—

1. The combination in a telephone-transmitter of an electrode provided with one or more cavities therein for the reception of finely-divided particles of conducting material, and one or more tufts of elastic fibrous

material arranged within said cavities, as and for the purposes set forth.

2. In a telephone-transmitter of the class described, the combination with a carbon block forming one electrode and having cavities in its face adjacent to the diaphragm, of finely-divided particles of conducting material and a series of elastic fibrous tufts interposed between the carbon block and said finely-divided particles, whereby said tufts may form elastic cushions to press said particles against the diaphragm with a gentle elastic pressure, substantially as described.

3. The combination with a telephone of a diaphragm forming one electrode, a block of conducting material forming the opposite electrode, securing-screws for holding said block within the case and adjusting-screws arranged to oppose said securing-screws whereby said block may be accurately adjusted in its relation to said diaphragm, substantially as described.

4. The combination with a diaphragm, the electrode *f* and the case *a*, of the securing-screws *g* extending rearwardly into the case and the coacting adjusting-screws *i* extending forwardly through the case and into contact with rear of said block, substantially as described.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 6th day of July, 1896.

RUSSELL S. BARNUM.

Witnesses:

D. H. FLETCHER,
DE WITT W. CHAMBERLIN.