

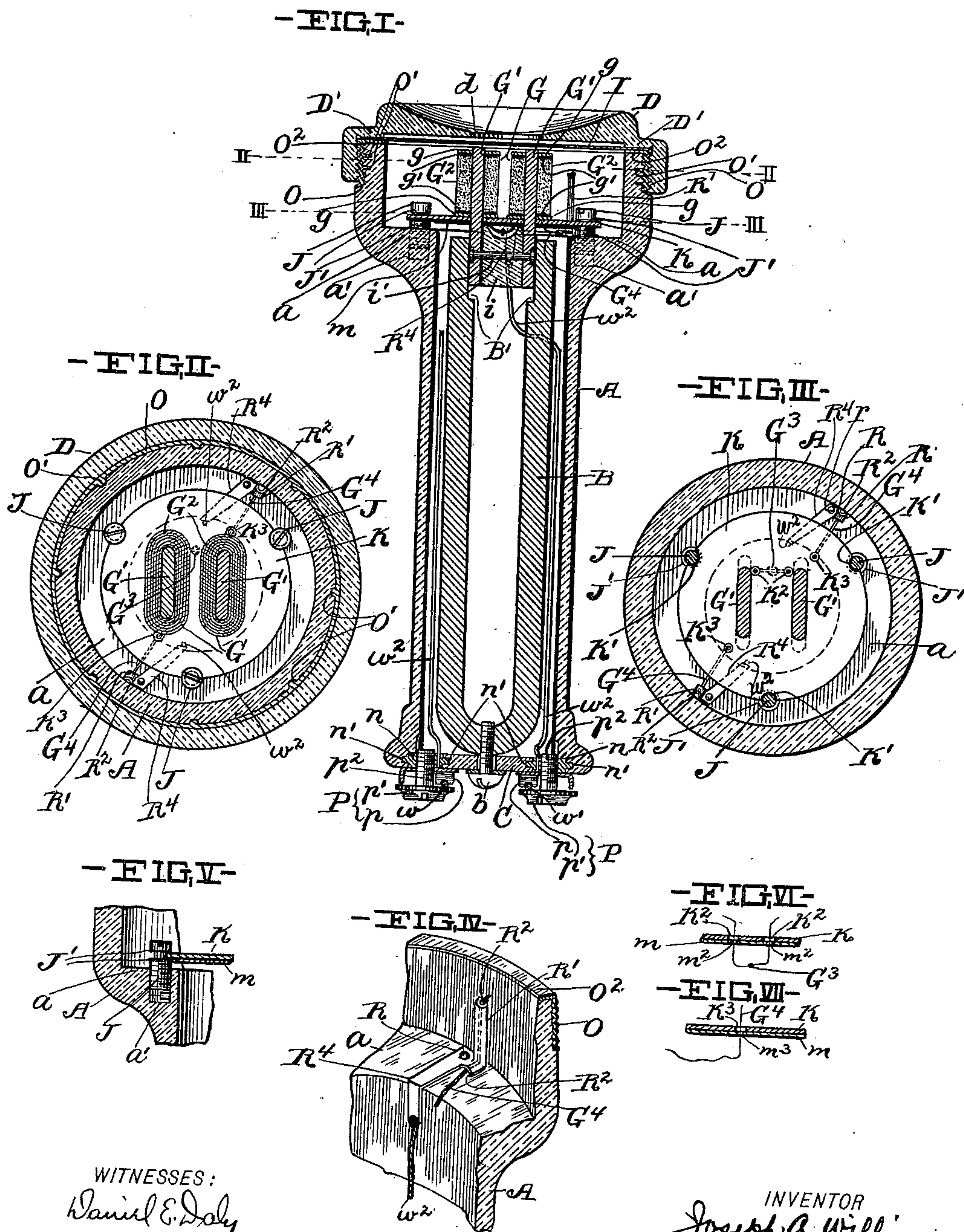
No. 631,355.

Patented Aug. 22, 1899.

J. A. WILLIAMS.
TELEPHONE RECEIVER.

(Application filed Dec. 28, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 631,355, dated August 22, 1899.

Application filed December 28, 1898. Serial No. 700,490. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. WILLIAMS, of Cleveland, Cuyahoga county, Ohio, have invented certain new and useful Improvements in Telephone-Receivers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in telephone-receivers; and it consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure I is a side view, mostly in longitudinal section, of an instrument embodying my invention. Fig. II is a transverse section on line II II, Fig. I, looking inwardly. Fig. III is a transverse section on line III III, Fig. I, looking inwardly. Fig. IV shows one of the devices employed in concealing and protecting one of the bobbin's terminal wire ends and coupling the said end with a wire electrically connected with one of the instrument's binding-posts. Fig. V is a sectional view illustrating the connection of screws J with the bobbin-bearing disk K. Fig. VI is a sectional view of portions of disks K and *m* and illustrates the registering wire-receiving perforations *K*² and *m*² of the said disks. Fig. VII is a sectional view of portions of disks K and *m* and illustrates the function of registering perforations *K*³ and *m*³ of the said disks.

Referring to the drawings, A designates the hollow case of the instrument, which case is preferably made of polished ebonite or vulcanite in the usual manner.

B represents a U-shaped permanent magnet that is suitably arranged within and centrally and longitudinally of the case A and is secured at its central portion, preferably by means of a screw *b*, to and centrally of the binding-post bearing-head C of the instrument's case.

G designates a double bobbin that is arranged within the case's end that bears the earpiece D and has two parallel cores G and G' arranged a suitable distance apart and wound, respectively, with suitably-insulated wire G² in the usual manner. The cores of

the bobbin are composed, respectively, of suitable magnetic material—such, for instance, as soft iron—and extend inwardly a suitable distance beyond the inner end of the bobbin between the opposing inner surfaces of the free ends of the permanent magnet, that is cut away upon the opposing sides of the said ends, as at B', to accommodate the location of the two cores that engage the different magnet ends, respectively. Insulating material *i* is interposed between the inner ends of the cores and secured in place by a brass pin *i'*.

The instrument's earpiece D is provided with a centrally-located aperture *d* in the ordinary manner.

The instrument's diaphragm I is interposed between the earpiece D and the adjacent end of the case A.

The bobbin is adjustable toward and from the diaphragm to accommodate the formation of the space required between the diaphragm and the cores of the bobbin. Each core of the bobbin is provided with two brass or non-magnetic heads *g g*, that are fixed upon the core at opposite ends, respectively, of the wire-wound portion of the core.

g' designates insulation between the coils and heads *g* and is indicated by heavy black lines.

A disk K is fixed upon the two cores at the inner ends of the wire-wound portions of the cores and preferably contiguous to the outer surfaces of the inner heads *g* of the cores.

The disk K is engaged at its surrounding edge by three screws J J J, that support the disk and the latter's load (the bobbin) and engage correspondingly-threaded holes *a*, formed in and longitudinally of case A, as shown in Fig. V, and by dotted lines, Fig. I.

The said screws J J J are arranged equidistant apart around the edge of disk K, and each screw has two annular shoulders J' J' closely overlapping opposite sides, respectively, of the disk, and the screws between the said shoulders snugly engage the disk, that in its surrounding edge has slots K', having arc-shaped walls that partially and snugly embrace the screws. Fig. V illustrates the connection of a screw J with the disk K. By this construction it will be observed that the

bobbin is supported within the earpiece-bearing end of the instrument's case at three different points arranged equidistant apart, so that the bobbin is rigidly and accurately supported within the said portion of the case and its adjustment relative to the diaphragm is not affected by contraction and expansion of the case, as would be the consequence of a rigid connection between the bobbin and the adjacent end of the permanent magnet.

A disk m of insulating material is fixed upon the cores G' at the inner side of the bobbin-bearing disk.

P designates the binding-posts with which the head C of the instrument's case is provided. The two wires w and w' that lead to the instrument engage the different posts, respectively, and each post consists, preferably, of two jaws p and p' . The jaw p of each post is fastened to the head C in any approved manner, whereas jaw p' of the post is formed by the head of a screw p^2 , that engages a nut n , fixed within the head C . The nuts n are molded into the head C in the process of molding the instrument's case and are provided, respectively, with external lugs or ribs n' , that are embedded within the vulcanite or material of the head C , so that the nuts are positively fixed within the head and are not liable to displacement from rough usage of the instrument.

Two ends of the wire of each coil extend inwardly through the disk K and through the insulation m and are soldered together at G^3 at the inner side of the said disk, that has two perforations K^2 arranged a suitable distance apart for accommodating the extension therethrough of the said wire ends, and the insulating-disk m has perforations m^2 registering with the said perforations in the disk K . Perforations m^2 are just large enough to easily receive the wire; but the perforations K^2 are considerably larger, as shown very clearly in Fig. VI, so that the insulation of the wire will not be abraded or worn by the surrounding walls of perforations K^2 , and the necessity of using insulating-bushings within perforations K^2 is avoided. Each of the other ends of the wire of the coils, or, more properly, the terminal wire ends G^4 of the bobbin, extend inwardly through registering perforations K^3 and m^3 , formed in the bobbin-bearing disk K and insulating-disk m , respectively, and into the channel or groove R^2 , formed in the outwardly-extending arm R' of a coupling-forming metallic piece R , that is interposed between the said terminal end of the bobbin and one of the wires w^2 , leading inwardly from a binding-post. A perforation K^3 and the perforation m^3 , registering with the said perforation K^3 , are shown very clearly in Fig. VII. The perforation m^3 is just large enough to easily receive the engaging wire; but the perforation K^3 , registering with the said perforation m^3 , is considerably larger, so that its surrounding wall will not injure the wire and not necessitate the employment of an insulating-

bushing in the perforation. Two wires w^2 are electrically connected with the different binding-posts, respectively, and extend inwardly from the posts at opposite sides, respectively, of the permanent magnet. The wire-coupling devices R are secured in any approved manner to the internal shoulder a of case A . One of the wires w^2 electrically connects with an inwardly-extending arm R^4 of one of the wire-coupling devices, and the other wire electrically connects with the inwardly-extending arm R^4 of the other wire-coupling device. The wire-coupling devices are arranged at opposite sides, respectively, of the bobbin. The arms R' of the wire-coupling devices are in close proximity to and have their wire-receiving grooved or channeled sides facing the surrounding wall of the bobbin-receiving chamber of the case A .

It is obvious that my improved manner of arranging or disposing of the terminal wire ends of the bobbin is meritorious, because it removes the said ends into a safe place, where they will not be harmed by careless handling of the instrument or by the use of a screw-driver employed in adjusting the bobbin-supporting screws. I would remark, also, that heretofore receivers having a vulcanite case or shell had the earpiece screwed onto external threads formed directly upon the shell. The threading of vulcanite or similar material is not very practical, and the frequent screwing on and off of the earpiece soon wears away or mutilates the threads. I have therefore molded into the outer side of the bobbin-receiving end of the case A a metal shell or ring O , that has short inwardly-extending projections O' embedded in the shell A , so as to positively fix the said annular band of metal to the case A . The ring O is externally screw-threaded to accommodate the attachment of the corresponding internally-threaded earpiece and at its outer end has an internally-smooth annular flange O^2 , that forms a seat for the diaphragm, that is held to the said seat by the internal annular shoulder D' of the earpiece.

It is obvious that my improved construction effectually avoids the objection of forming the threads directly upon the vulcanite case or shell.

What I claim is--

1. In a telephone-receiver, the combination with the case or shell enlarged at one end to form the bobbin-receiving chamber and having an internal annular shoulder at the inner end of the said chamber: of the double bobbin within the said chamber; a disk having the bobbin fixed to its outer side, and three screws arranged equidistant apart along the surrounding edge of the disk and having, respectively, two annular shoulders closely overlapping opposite sides, respectively, of the disk, which screws are screwed into the aforesaid shoulder.

2. A telephone-receiver having a vulcanized shell or case provided with binding-posts

formed, respectively, of two wire-clamping jaws, whereof one is the head of a screw and a nut engaging the said screw and molded into the case or shell.

5 3. In a telephone-receiver, the combination with the vulcanized shell or case provided with binding-posts formed, respectively, of two wire-clamping jaws, whereof one is the head of a screw: of nuts engaging the jaw-
10 forming screws and molded into the case or shell and ribbed externally, substantially as and for the purpose set forth.

4. In a telephone-receiver, the combination with the case or shell having an enlarged end
15 forming the bobbin-receiving chamber, and having two binding-posts at its opposite end, and two wires leading inwardly from the different binding-posts, respectively, and the bobbin within the said chamber; of two wire-cou-
20 pling devices arranged at opposite sides, respectively, of the bobbin and electrically connected with the different aforesaid wires, respectively, and also electrically connected with opposite terminals, respectively, of the
25 bobbin.

5. In a telephone-receiver, the combination with the case or shell enlarged at one end to form the bobbin-receiving chamber, and hav-
ing two binding-posts at its opposite end;
30 two wires leading inwardly from the different binding-posts, respectively; a disk supported within the inner end of the aforesaid chamber, and the bobbin fixed to the disk at the latter's outer side, said bobbin having the
35 terminal-forming ends of its wire extending inwardly through the disk: of two wire-cou- pling devices supported at opposite sides, re- spectively, of the bobbin and electrically con-
40 nected with the different terminals, respec- tively, of the bobbin, and electrically con- nected, also, with the different binding-posts, respectively.

6. In a telephone-receiver, the combination with the case or shell enlarged at one end to
45 form the bobbin-receiving chamber, and hav- ing an internal annular shoulder at the inner end of the said chamber, a disk within the inner end of the said chamber, the bobbin supported from the disk at the latter's outer
50 side, and having its terminal wire ends ex- tending through the disk, and the two bind- ing-post connecting-wires extending into the aforesaid shell or case a suitable distance; of
55 two wire-coupling devices supported from the aforesaid shoulder at opposite sides, respec- tively, of the bobbin, and electrically con- nected to the different terminals, respectively, of the bobbin, which coupling devices are electrically connected, also, with the differ-
60 ent binding-posts, respectively.

7. In a telephone-receiver, the combination of the case or shell enlarged at one end to form the bobbin-receiving chamber, a metal-
lic disk supported within and transversely of

the inner end of the said chamber; an insu- 65 lating-disk at the innerside of the first-men- tioned disk; a bobbin fixed to the said disk at the latter's outer side and having its ter- minal-forming wire ends extending through comparatively large holes formed in the me- 70 tallic disk and through comparatively small holes formed in the insulating-disk; the two binding-posts; two wires electrically con- nected with the different-posts, respectively, and extending into suitable proximity to the
75 inner side of the insulating-disk, and wire- coupling devices supported from the shell or case, which coupling devices are electrically connected, respectively, to the different ter- minals of the bobbin and electrically con- 80 nected, also, with the different binding-posts, respectively.

8. In a telephone-receiver, the combination with the case or shell enlarged at one end to form the bobbin-receiving chamber; a disk 85 within the said chamber and bobbin sup- ported from the said disk and having the ter- minal-forming ends of its wires extending in- wardly through the disk; the binding-posts, and the wires extending into the instrument 90 from the different posts, respectively; of two wire-coupling devices supported at opposite sides, respectively, of the bobbin and having arms electrically connected to the different terminals, respectively, of the bobbin, and 95 other arms electrically connected with the different binding-posts, respectively.

9. In a telephone-receiver, the combination with each terminal wire end of the bobbin, and the binding-post-connecting wire elec- 100 trically connected with the said terminal; of a wire-coupling device interposed between the said wires and having an inwardly-extending arm electrically connected with the binding-
105 post-connecting wire, and having an out- wardly-extending arm provided with a groove or channel engaged by the aforesaid bobbin- terminal.

10. A telephone-receiver having a vulcanite case or shell provided with an externally- 110 screw-threaded band or ring molded into the outer side of the earpiece-receiving end of the case or shell, substantially as shown, for the purpose specified.

11. A telephone-receiver having a vulcanite 115 case or shell provided with an externally- screw-threaded metal band or ring O molded into the outer side of the earpiece-receiving end of the case or shell, and having the pro-
120 jections O' embedded in the case or shell, sub- stantially as and for the purpose set forth.

Signed by me at Cleveland, Ohio, this 17th day of December, 1898.

JOSEPH A. WILLIAMS.

Witnesses:

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