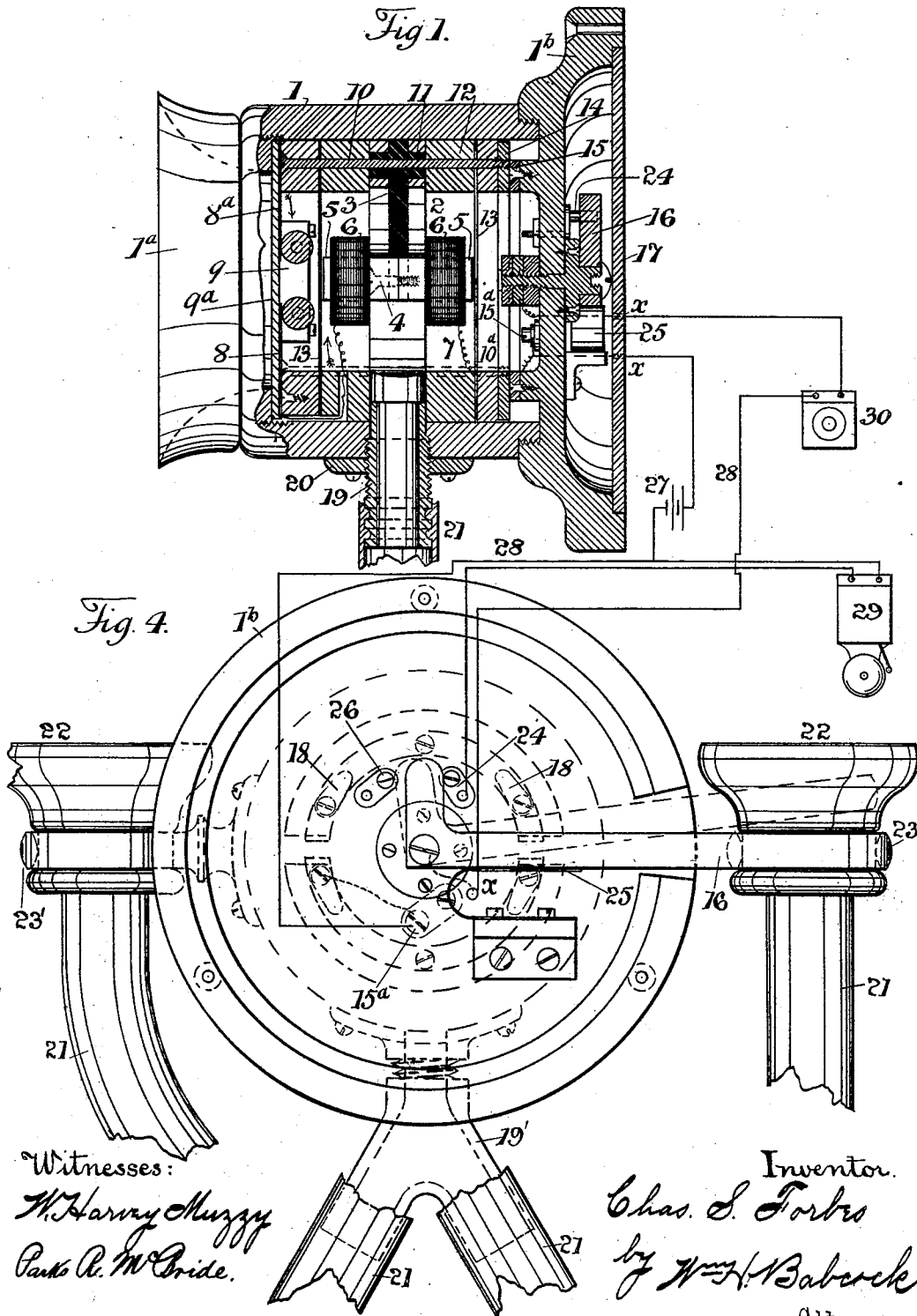


C. S. FORBES.
MAGNETIC TELEPHONE.

No. 500,481.

Patented June 27, 1893.



Witnesses:

W. Harry Murry
Charles R. McBride.

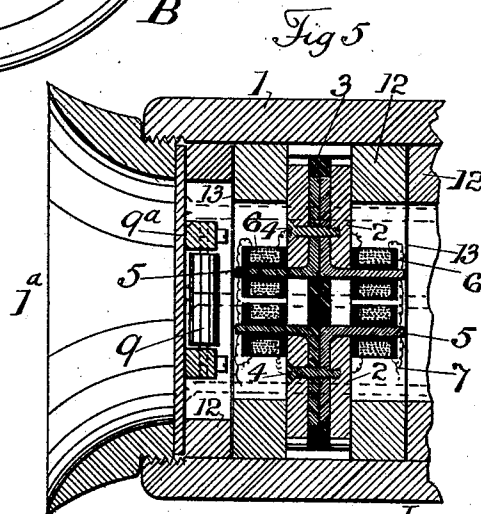
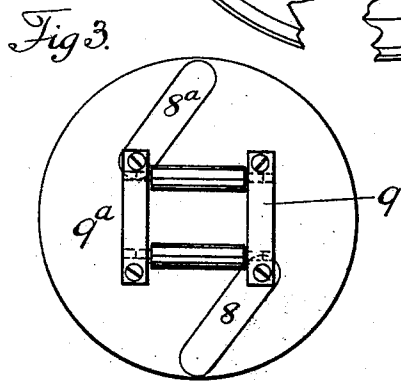
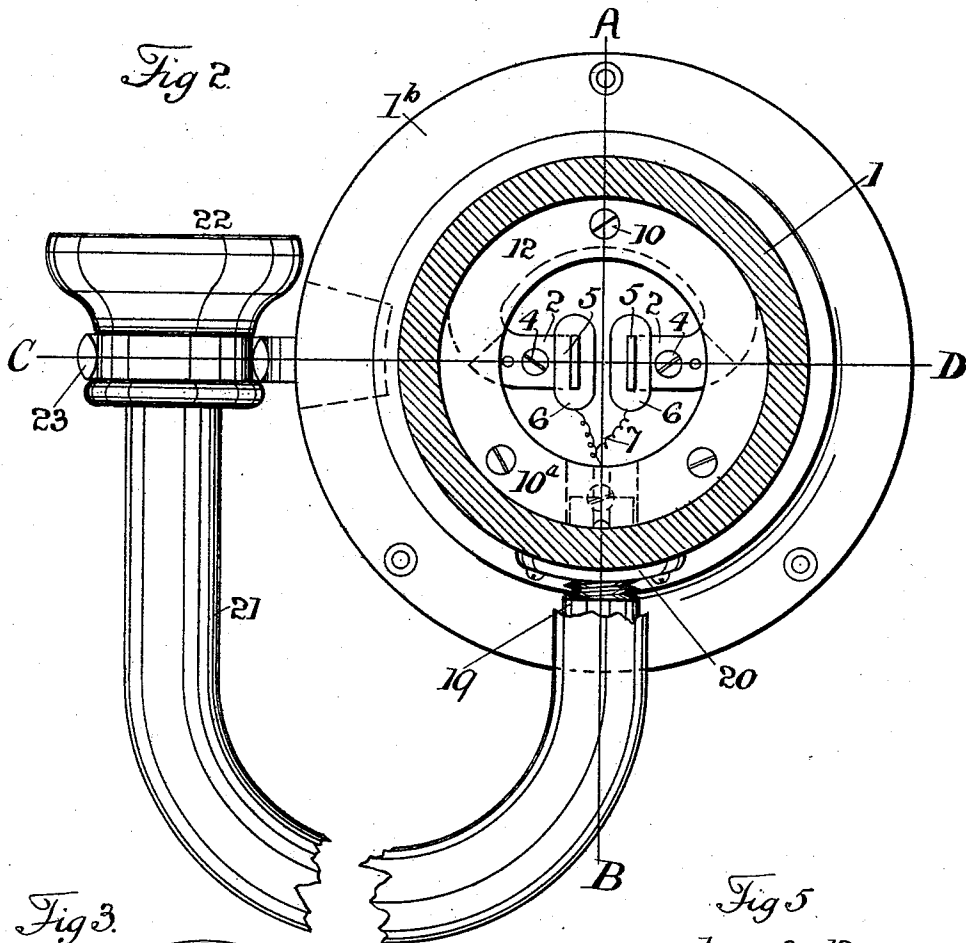
Inventor.

Chas. S. Forbes
by W. H. Babcock
Attorney.

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UNITED STATES PATENT OFFICE.

CHARLES STEWART FORBES, OF LONDON, ENGLAND.

MAGNETIC TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 500,481, dated June 27, 1893.

Application filed October 27, 1892. Serial No. 450,180. (No model.)

To all whom it may concern:

Be it known that I, CHARLES STEWART FORBES, baronet, a subject of the Queen of Great Britain, residing at 28 Queen's Gate Terrace, London, England, have invented a new and useful Improved Electro-Magnetic Telephone, of which the following is a specification.

My invention consists in an improved electro magnetic telephone, and is more particularly designed for domestic, office, or hotel use.

The object I have in view is to construct a combined telephone, and microphone with the switching device in a compact form, which can be easily fixed in any suitable position by unskilled labor, and readily taken to pieces and spare parts refitted when required.

The construction and operation of my invention will be understood by reference to the drawings in which—

Figure 1, is a sectional view on line A. B. Fig. 2. Fig. 2. is a front elevation, the microphone, wood and metal tympanans being removed, but showing the heads of cramp pins. Fig. 3. is a front view of microphone and wood tympan. Fig. 4. is a back view of the instrument used at the servants' end of line. Fig. 5. is a sectional plan on line C. D., Fig. 2, showing polar extensions and bobbins.

1, is the case, which may be formed of wood, ebonite, stone, or other ware. The mouth-piece 1^a, as well as the seating block 1^b, is united to the central part by screwing as shown.

The magnet 2, consists of two or more horse-shoe shaped steel bars, hardened, and highly magnetized, separated by ebonite or like insulating packing 3, and clamped together by brass screws 4. Soft iron polar extensions 5, carry bobbins 6, filled with insulated wire 7, united in series or parallel. The polar extensions are also fastened to the magnets by brass screws 4, the ends of the wires 7, being connected on the one side to the copper strip 8, through the microphone 9, mounted on wood tympan 9^a, strip 8^a, and cramp pin 10, and on the other to cramp pin 10^a. These cramp pins pass through insulated tubes 11, in the magnets and vulcanite, fiber, or other insulating packing rings 12, which hold the two tympanans 13, in position. The separate brass

segments 14, into which they are screwed are brought into good electrical contact with the divided ring segments 15, fastened to the seating block 1^b, when the mouthpiece 1^a, is screwed up. Binding screws 15^a, connect the segments 15, with the switch lever 16, and the line wires which pass through holes in the wooden backing and seating block 1^b. The copper strips 8, 8^a, and the heads of cramp screws 10 10^a, are tinned or platinized to secure good metallic connection and to further attain this end, spring contacts 18, see dotted lines, Fig. 4, are fastened to the ring segments 15. A metal ferrule 19, is screwed into a plate 20, fastened by screws to the central part of the case. To this ferrule is fastened a flexible tube 21, fitted with an ear trumpet 22, which collects the sound waves from both tympanans 13. When the telephone is not in use this trumpet rests in the fork 23, of switch lever 16, and causes it to rest against the idle stop 24. Upon lifting the trumpet 22, out of the fork 23, the spring 25, forces the bend of lever 16, against stop 26, thereby putting the microphone and telephone into the circuit of the battery 27. Wires 28, connect the instrument just described with that shown in Fig. 4, at the other end of the line which differs only from that just described in having a bifurcated ferrule 19', and two tubes 21, having ear trumpets 22, one of which rests in a rigid fork 23', the other resting in the fork 23, of switch lever 16, which when in the position shown rests against the bell contact, which in this instrument replaces the idle contact. An ordinary electric bell 29, is inserted between this contact and connected by a separate wire to the battery 27.

The operation of my invention is as follows:—When the telephone described under Figs. 1, 2, 3, 5, is not in use the bent end of lever 16, rests against the idle stop 24, and the connection with the other end of the line is severed. When it is desired to speak, the tube 21 and ear-piece 22, are lifted out of the fork 23, of lever 16. The spring 25, now forces the bent arm of lever 16, against contact 26, and since the switch lever 16, in the instrument shown in Fig. 4, at the kitchen or other end of the line is resting against the bell contact 24, the current from the battery flows

through the microphone 9, the coils of magnet 2, and those of the bell 29, causing it to ring. The attendant now lifts both ear tubes out of the forks 23, 23' and the spring 25, reacting puts the telephone and microphone into circuit. Conversation can now be carried on. When a number of instruments are connected with that shown in Fig. 4, I employ an indicator or annunciator 30, of any form, having coils of low resistance, whereby the number of the speaker may be identified. It will be observed that by means of my arrangement no separate bell push is required. Moreover the attendant cannot listen to conversation passing in the caller's room, since when not in use the circuit is broken.

I am aware that telephones have been constructed in which two tympana are employed, the sound waves being collected by means of an ear trumpet from between them and I do not broadly claim such except when combined and connected as described.

I claim—

1. In telephonic devices, the double horse-shoe permanent magnets 2, having polar extensions 5, in combination with bobbins 6 carried by said extensions, insulated wires 7 within the said bobbins, the cramp-pins 10 and 10^a to which the said wires suitably coupled are connected, the microphone 9 in connection with one of the said wires through cramp-pin 10, the metallic tympana 13, the packing rings 12 the segmental plates 14 and 15 and the mouth piece 1^a constructed to be screwed up for forcing the said segmental plates together substantially as and for the purpose set forth.

2. In telephonic devices the double horse-shoe permanent magnets 2, having polar extensions 5 in combination with the bobbins 6 carried by said extensions, insulated wires 7

within the said bobbins, the cramp-pins 10 and 10^a to which the said wires suitably coupled are connected, the microphone 9 in connection with one of said wires through cramp-pin 10, the metallic tympana 13 the flexible tube 21 having an ear piece 22 and ferrule 19, the switch lever 16 which supports the said ear piece when out of use and circuit closing mechanism operating on the said lever when it is relieved of the said ear-piece to bring the microphone and telephone into circuit substantially as set forth.

3. In telephonic devices a receiver and transmitter a microphone 9, a signal and the necessary electrical conductors in combination with a spring actuated switch-lever provided with contacts, whereby according to position, it makes circuit through the signal or through the telephone and microphone or through none of these, two ear pieces normally suspended from the said switch-lever, by removing one of which the current is diverted as described, the metallic segments 14 the tympana 13 attached thereto, the divided ring segments 15 and the operating magnets substantially as set forth.

4. A pair of permanent magnets in combination with wire helices in circuit on extensions thereof, tympana, metallic segments adjustable into electrical contact with each other and arranged to hold the said tympana and the cramp screws and necessary electrical connections substantially as set forth.

In testimony whereof I have set my hand in presence of two witnesses.

CHARLES STEWART FORBES.

Witnesses:

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