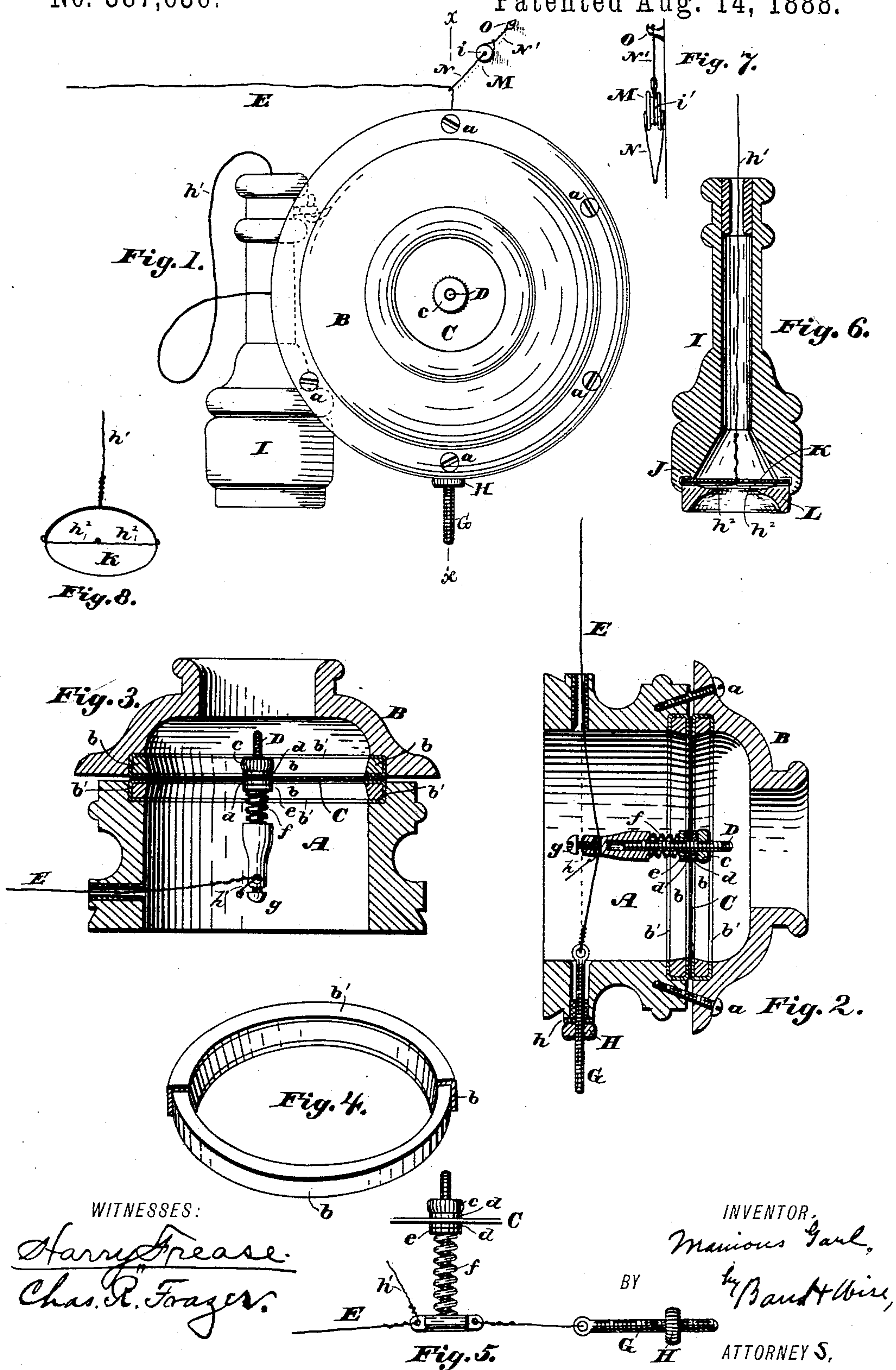


(No Model.)

M. GARL.
MECHANICAL TELEPHONE.

No. 387,636.

Patented Aug. 14, 1888.



UNITED STATES PATENT OFFICE.

MANIOUS GARL, OF CANTON, OHIO.

MECHANICAL TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 387,636, dated August 14, 1888.

Application filed October 24, 1887. Serial No. 253,248. (No model.)

To all whom it may concern:

Be it known that I, MANIOUS GARL, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have
5 invented certain new and useful Improvements in Mechanical Telephones; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings,
10 making a part of this specification, and to the letters and figures of reference marked thereon, in which—

Figure 1 is a side elevation. Fig. 2 is a vertical section through Fig. 1 at line *x x*. Fig.
15 3 is a similar section with the main wire attached directly to the post. Fig. 4 is a detached view of one of the diaphragm-rings, showing it partially insulated. Fig. 5 is a detached view of the post, showing a modification.
20 Fig. 6 is a longitudinal section of the receiver. Fig. 7 is a detached view of the insulator designed to be used in turning corners. Fig. 8 is a detached view of the receiver-diaphragm and its connecting-wires.

25 The present invention relates to telephones of the mechanical class, and has for its objects to provide novel and simple means for adjusting the tension of the main wire upon the diaphragm, also to provide means whereby
30 tension of the main wire upon the diaphragm may be altogether removed, and to provide novel means whereby every part of the telephone is properly insulated.

Similar letters of reference indicate corresponding parts in all of the figures of the drawings.

In the accompanying drawings, A represents the frame or shell, which may be substantially of the form shown in the drawings,
40 and is securely attached in the desired position in any convenient and well-known manner. To the speaking end of the frame or shell A is attached the cover B, said cover being securely held to the frame or shell A by
45 means of the screws *a*. For the purpose of securely holding the diaphragm C in proper position, the rings *b b* are provided, said rings being located substantially as shown in Figs. 2 and 3, the lower or under ring being re-
50 cessed into the frame or shell A and the top or upper ring being recessed into the cover B.

These rings *b b* are insulated by stretching rubber bands over them, or, if desired, they may be insulated with other suitable material. For the purpose of clamping the rings *b b* and
55 the diaphragm C, the cover B strikes or bears against the top or upper ring before it reaches the frame or shell A, as illustrated in Figs. 2 and 3. To the center of the diaphragm C is attached the post D. The end of the post D,
60 which passes through the diaphragm, is screw-threaded to receive the nut *e*, as shown in the drawings. On each side of the diaphragm C are located the rubber or like collars *d*, said
65 collars being located substantially as shown in Figs. 2 and 3.

For the purpose of holding the collars *d d* against the faces of the diaphragm C at all times, the metallic collar *e* and the spring *f*
70 are provided, said parts being located substantially as shown in Figs. 2, 3, and 5.

The main wire E is attached to the shell or casing and then passed through an aperture in the post D, the set-screw being loose at this stage of the proceedings and the main wire
75 free to move back and forth through the aperture in the post. When the desired tension is had on the main wire, the set-screw *g* is tightened, clamping the main wire to the post.

In adjusting the instrument, if the right tension is on the main wire the post will be at
80 right angles to the diaphragm, and if not the post will be drawn to one side, in which event the tension is adjusted until the post is straight. Thus by clamping the main wire to the post by
85 the set-screw the correct tension can be ascertained.

It will be seen that the set-screw may be used for holding one end of a main wire, if it be desired to use a third instrument, thus al-
90 lowing three instruments to be used with two main wires. The second wire if attached to the shell deadens the vibration.

The main wire E is preferably attached to the adjustable eye-bar G, as shown in Fig. 2,
95 which is screw-threaded to receive the adjusting-nut H.

The eye-bar G passes through an aperture in the frame or shell A, and is held in the desired position by means of the adjusting-nut
100 H. Between the frame or shell A and the adjusting-nut H is located the thimble or collar

h, said thimble or collar being for the purpose of insulating the eye-bar *G*, and is preferably formed of rubber.

For the purpose of adjusting the length of the post *D*, said post is preferably formed in two pieces or sections, as shown in Fig. 2, said sections being held together by screw-threads. In use the post *D* is drawn upward or toward the diaphragm by means of the screw-threaded nut *c*, until the desired amount of tension is secured on the diaphragm *C*.

The receiver *I* is substantially of the form shown in Figs. 1 and 6, and is formed of hard wood or other suitable material. The receiving end of the receiver *I* is funnel-shaped, as shown in Fig. 6, and is provided with the shoulder *J* for receiving and holding the diaphragm *K*, said diaphragm being securely held in the desired position by means of the thimble *L*, substantially as shown in Fig. 6. The diaphragm *K* is attached to the receiving-wire *h'* by means of the wires *h*², said wires *h*² passing through the center of the diaphragm *K* and extending across the face of said diaphragm, when they are bent or folded over the edges of said diaphragm, as shown in Figs. 6 and 8. The wires *h*² are attached to the wire *h'*. The wire *h'* is preferably formed of fine wires properly twisted and covered with silk.

By the above-described method of attaching the receiving-wire *h'* to the diaphragm *K* the use of a button, which is in many instances objectionable, is obviated, and by reason of the wires *h*² *h*² passing over the face of the diaphragm tension is distributed over the surface of the diaphragm and materially strengthens it.

The instrument end of the wire *h'* is attached to the post *D*, substantially as shown in Fig. 3, and as shown in Fig. 5 in case the modified form of post is used. In use the receiver *I* is placed to the ear in the ordinary manner, at the same time having a slight tension on the receiving-wire, when the vibrations of the main wire *E* will be transmitted to the receiver *I*.

It will be understood that the receiving-wire can be attached either to the post *D* or to the main wire *E*, as desired. For the purpose of turning a corner with the main wire, as illustrated in Fig. 1, the insulator *M* is provided, which is substantially of the form shown in Figs. 1 and 7. This insulator is preferably formed of hard-burned clay, and is provided in its center with the aperture *i*, and upon its periphery with the groove *i'*. The aperture *i* is for the purpose of receiving the wire *N*, and the groove *i'* is for the purpose of receiving the wire *N'*, said wire *N'* being wrapped around the insulator and looped, the opposite end of the wire *N'* being attached to the pin *O* or its equivalent. The rings *b b* are somewhat larger in diameter than the diameter of the diaphragm *C*, said parts being so arranged for the

purpose of perfectly insulating the diaphragm from the frame or shell *A*.

It will be seen that by my peculiar arrangement I am enabled to adjust the tension of the main wire *E* on the diaphragm *C*, or entirely remove the tension when the main wire assumes the position shown in the dotted line, Fig. 2, the tension being adjusted or removed by means of the nut *c*. It will be seen that by this peculiar and novel arrangement all tension can be removed from the diaphragm while the line is being placed in proper position, thereby preventing the diaphragm from being destroyed by any sudden pull or jerk. The rings *b b* are covered upon all sides, so as to perfectly insulate the rings from the frame or shell *A*.

It will be seen that very thin material can be used for the diaphragm, as the tension of the main wire *E* can be adjusted to any desired strain.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the shell or casing, the cover, and the diaphragm, of the insulated rings *b b*, clamped between the shell and cover, the adjustable eye-bar *G*, the main wire *E*, the adjustable post *D*, and the set-screw *g*, substantially as described.

2. The combination, with the shell or casing and cover, of the post *D*, provided with the nut *c*, the non-metallic collars *d d*, and the spring *f*, the diaphragm *C*, and the main wire *E*, substantially as described.

3. The combination, with the receiver and its diaphragm, of the thimble *L*, the wire *h'*, and the wires *h*² attached thereto and passing through the diaphragm across the face thereof and folded over the edges of said diaphragm, substantially as described.

4. The combination, with the shell or casing, the cover, and the diaphragm, of the post *D*, made in two sections screw-threaded together and provided with the nut *c*, collars *d d*, the collar *e*, and spring *f*, the adjustable screw-bar *G*, and the main wire *E*, substantially as described.

5. In a mechanical telephone, the combination, with the shell or casing, the cover, and the diaphragm, of the post *D*, made in two parts screw-threaded together, said post having a hole for the passage of the main wire and being provided with the spring *F*, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

MANIOUS GARL.

Witnesses:

A. J. FULMER,
FRED W. BOND.