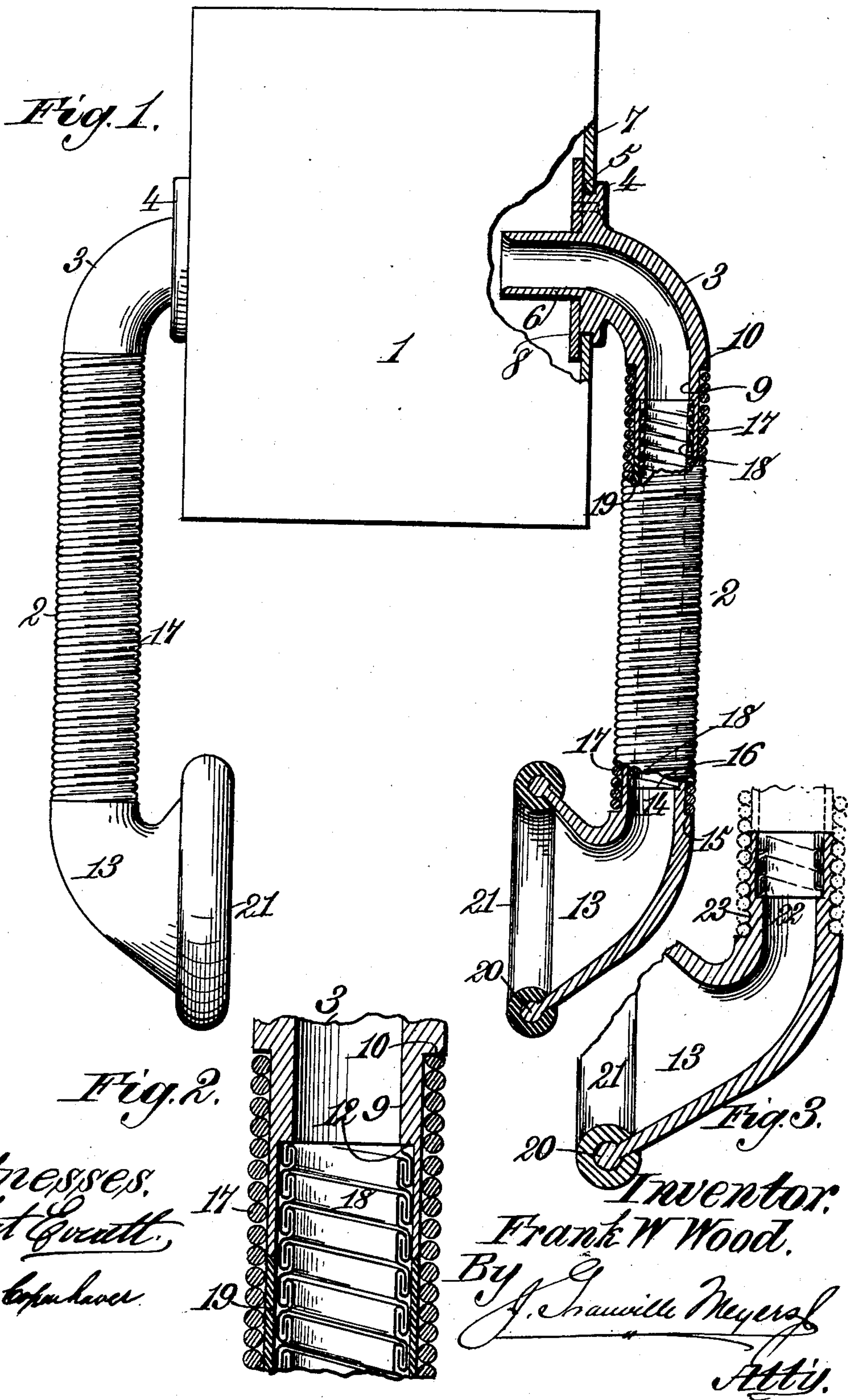


F. W. WOOD.

FLEXIBLE TUBE FOR CONVEYING AND RECEIVING ARTICULATE SOUNDS.

APPLICATION FILED JAN. 30, 1903.

NO MODEL.



UNITED STATES PATENT OFFICE.

FRANK W. WOOD, OF NEWPORT NEWS, VIRGINIA, ASSIGNOR TO CHARLES CORY & SON, OF NEW YORK, N. Y., A FIRM.

FLEXIBLE TUBE FOR CONVEYING AND RECEIVING ARTICULATE SOUNDS.

SPECIFICATION forming part of Letters Patent No. 735,645, dated August 4, 1903.

Original application filed August 1, 1902. Serial No. 117,943. Divided and this application filed January 30, 1903. Serial No. 141,161. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. WOOD, a citizen of the United States, residing at Newport News, in the county of Warwick and State of Virginia, have invented new and useful Improvements in Flexible Tubes for Conveying and Receiving Articulate Sounds, of which the following is a specification.

My present invention relates to flexible tubes for conveying and receiving articulate sounds, and is especially adapted for use as a receiving ear-tube for telephonic apparatus of the type shown and described in my pending applications for patents, numbered, respectively, Serial Nos. 117,943 and 118,824, of the former of which this application is a division.

The object of the invention is to provide a novel and simple construction of flexible tube that may be employed to receive as well as to convey articulate sounds and which will not be affected by atmospheric conditions such as exist on vessels at sea and on docks or wharves, in which places the telephonic apparatus is more or less exposed to the weather, and which will also be light, strong and durable and at the same time a good conservator of sound.

Briefly and specifically stated, the invention comprises a tubular arm having a pendent portion of slightly-reduced diameter forming an exterior shoulder, said pendent portion being bored out for a part of its length to provide an interior shoulder and an ear or mouth piece of tubular formation having a flared open end provided with a yielding guard and a cylindrical extension having exterior and interior shoulders similar to those on the tubular arm, combined with a flexible metallic tube fitted at its opposite ends within the said pendent portion and extension of the tubular arm and ear or mouth piece, respectively, a flexible tube of coiled wire surrounding the said metallic tube and fitting at its opposite ends over the aforesaid pendent portion and extension, and a non-metallic flexible tube interposed between the said flexible metallic tube and the tube of coiled wire, the whole being combined in the manner and for the purpose hereinafter described.

In order to enable others to fully understand the invention, I will now proceed to describe the same in detail, reference being had for this purpose to the accompanying drawings, in which—

Figure 1 is a front elevation, partly in section, of a telephone apparatus such as shown in my aforesaid applications with two of my improved sound-conveying tubes fitted thereto. Fig. 2 is an enlarged sectional view of one end or the tubular arm, showing the three flexible tubes in position. Fig. 3 is a similar sectional view showing a slight variation in the construction of the tubular end piece.

Referring now to the drawings, the reference-numeral 1 designates a casing in which is supposed to be located the receiver of the telephone with which the flexible tubes 2 communicate, all as more clearly set forth in my pending applications, and while I have elected to show my improved flexible tube as applied to this type of telephone I do not wish to be understood as limiting myself to this specific application, as it will be apparent that I may use the same in connection with other forms of telephonic apparatus, as well as with speaking-tubes and talking devices generally. In the present instance then my improved tube comprises a tubular arm or member 3 of elbow formation having an annular flanged portion 4, an annular shouldered portion 5, and a lateral cylindrical portion 6. The end wall 7 of the casing 1 has a circular opening therein which is of a size to receive snugly, but so as to allow of its readily turning therein, the shouldered portion 5 of the annular flange 4. A metal ring 8 is mounted upon the cylindrical portion 6 of the elbow 3 and is screwed to the said annular flange 4, as shown, the said ring 8 and annular flange 4 forming with the shoulder 5 an annular groove, which receives the edge portion of the opening in the casing 1, the shoulder 5 being journaled in said opening, while the ring 8 and flange 4 operate as the walls of the groove to prevent lateral play. It will thus be seen that the tubular elbow member may be readily rotated to bring the ear or mouth piece in position for use. The

said tubular elbow member 3 has a pendent portion or extension 9, cylindrical in formation and of slightly-reduced diameter, which affords, in connection with the lower end of the elbow, an exterior shoulder 10, and the said pendent portion is bored out for a part of its length to provide an interior shoulder 12, located about midway between the shoulder 10 and extreme end of the said pendent portion. At the lower end of the flexible tube 2 is a flared earpiece 13, having a similar cylindrical extension 14 of reduced diameter providing an exterior shoulder 15 and a central bore providing an interior shoulder 16. Extending between the elbow member 3 and the extension 14 of the earpiece is a flexible and resilient tube 17, of coiled wire, which at its opposite ends is fitted over the respective cylindrical extensions 9 and 14 and abuts against the respective shoulders 10 and 15. Within the coiled-wire tube 17 is a thin flexible metallic tube 18, which is inserted at its opposite ends in the extensions 9 and 14 and abuts against the respective interior shoulders 12 and 16. Interposed between the tubes 17 and 18 is a rubber or composition tube 19, the opposite ends of which abut against the ends of the extensions 9 and 14. A tube of this construction is both strong and flexible, while at the same time being a good conservator of sound. In addition the outer tube portion (the coiled tube 17) being resilient, the earpiece will normally be held in contact with the ear of the user without the requirement of its being held in such position by one of the hands of the user, the resiliency of the tube tending to move the earpiece to a normal position. Furthermore, the particular structure of tube shown is such that a movement of the tube in a direction to spread the coils would not affect the tube as a good conservator of sound, the inner tube 18 preserving the continuity of the interior of the tube. The earpiece 13 is provided at its edge portion with an annular enlargement 20, which is surrounded and inclosed by a rubber ear-guard 21.

In Fig. 3 of the drawings I have shown a slight variation in the construction of the tubular extensions 9 and 14, the object being to provide a better and more reliable means of attaching the coiled-wire tube 17. In this figure the numeral 22 designates a tubular extension, which may be the extension on the elbow 3 or that on the earpiece 13, or both. This extension is provided with an exterior spiral groove 23, into which the coiled-wire

tube 17 may be screwed, and when secured in this manner it will be seen that all danger of the said tube 17 being pulled away from its extensions will be overcome.

While I have herein shown and described my improved flexible tube as being provided with an earpiece through which vocal sounds are received, I wish it understood that I may employ a "mouthpiece" at the end of the tube instead of an earpiece, in which case the device would be very useful as a speaking-tube.

What I claim, and desire to protect by Letters Patent, is—

1. In a telephone, a casing, a pair of rigid hollow arms connected to opposite sides of the casing and each having a cylindrical portion projecting within the casing, a resilient tube connected to each arm, and an inwardly-facing earpiece connected to the free end of each tube.

2. In a telephone, a casing, a pair of hollow arms journaled in opposite sides of the casing, a resilient tube connected to each arm, and an inwardly-facing earpiece connected to the free end of each tube.

3. In a telephone, a casing, a pair of hollow elbows journaled in opposite sides of said casing, each elbow having a reduced end terminating in an external shoulder, a resilient tube of coiled wire surrounding the reduced end of each elbow and abutting said shoulder, a flexible lining for each tube, and an inwardly-facing earpiece of rigid material secured to the free end of each tube of coiled wire.

4. In a device of the class described, a casing, a pair of hollow arms journaled in opposite sides of the casing, each arm having an internal and an external shoulder, a resilient tube of coiled wire surrounding and secured to the end of each arm and abutting the external shoulder thereof, a tubular lining of flexible material located within each tube of coiled wire, the end of said tubular lining abutting the said internal shoulder of the tubular arm, and an inwardly-facing earpiece carried by the free end of each tube of coiled wire.

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

FRANK W. WOOD.

Witnesses:

J. E. WARREN,
G. F. MASON.