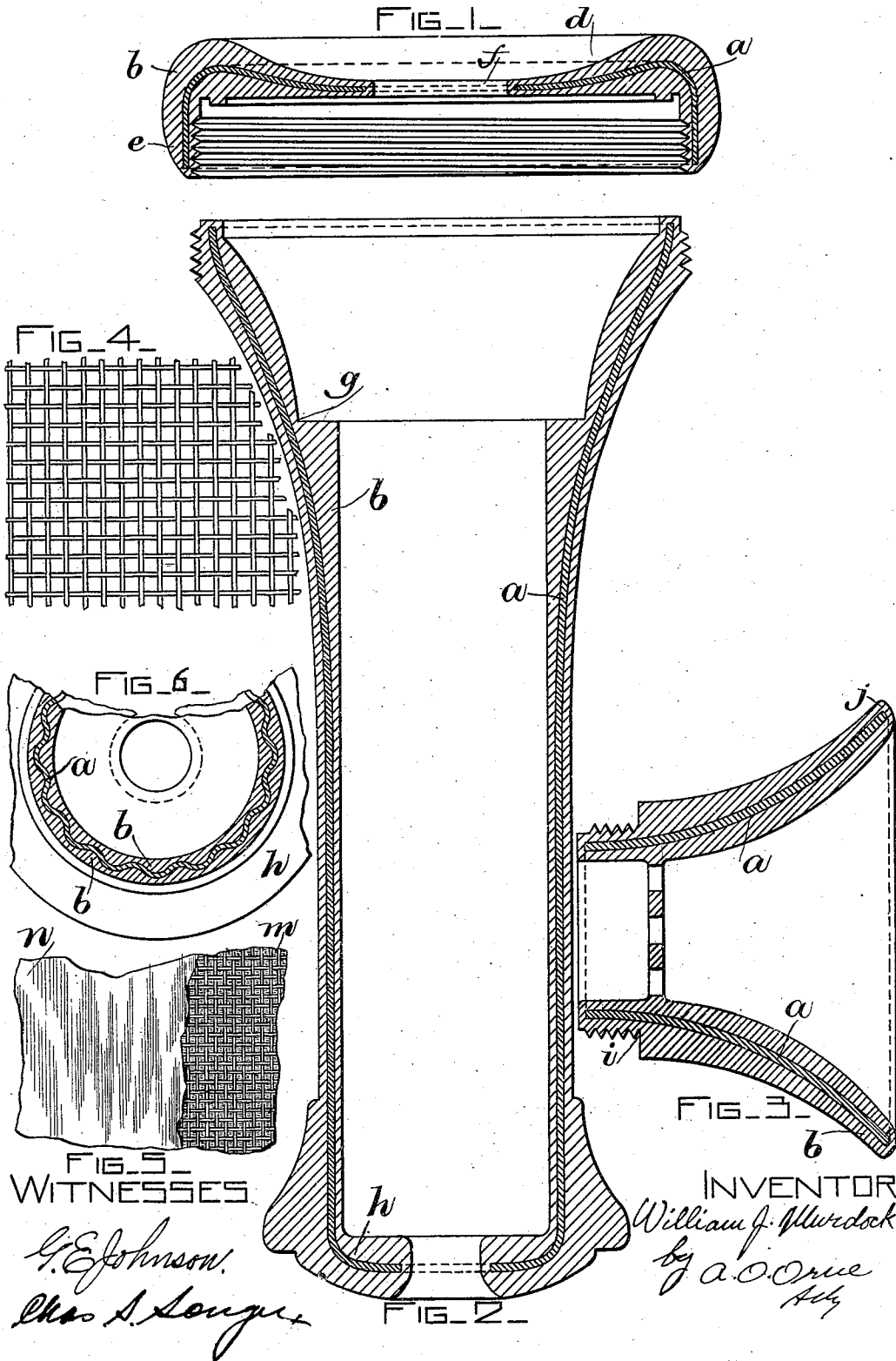


No. 853,186.

PATENTED MAY 7, 1907.

W. J. MURDOCK.
TELEPHONE.

APPLICATION FILED MAY 26, 1902.



UNITED STATES PATENT OFFICE.

WILLIAM J. MURDOCK, OF BOSTON, MASSACHUSETTS.

TELEPHONE.

No. 853,186.

Specification of Letters Patent.

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Application filed May 26, 1902. Serial No. 109,085.

To all whom it may concern:

Be it known that I, WILLIAM J. MURDOCK, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Telephones, of which the following is a specification.

My invention relates to composite structures for parts of telephones, and concerns constructions in which the various molded parts are formed with a stiffening core of tough substance to prevent the usual materials of which such parts are made from being fractured.

It is customary to make many of the parts of telephones of hard rubber, "composition," and other rather brittle materials, because of their usual insulating properties, convenience of manufacture, and the finished effect given to the instrument thereby. The rough usage often received by instruments frequently mars or destroys some part, this happening perhaps because the appearance and design of the instrument requires the part to be thin and hence of deficient strength, or often because it is connected to some rigid unyielding part that acts as a hammer or anvil to crush the brittle material of the part when it receives a blow. It happens that the parts most affected in this manner are generally flat or of hollow shape, being parts of the casing of the instrument, or else some projecting part, in either case the natural remedy that is to increase the thickness of the part is not available as the part would become thereby unwieldy or unduly expensive.

To meet the above conditions I have retained the usual size and shape of the parts, formed them principally of the usual materials, but strengthened them with a reinforcing core.

My invention then consists in composite parts of a telephone made of the ordinary more or less brittle material formed about, attached and intermingling in more than surface contact with a core of some tough, fibrous substance. An ordinary material or "composition" in common use consists of powdered mica and talc mixed with shellac. All the materials may be mixed dry in any convenient manner and then pressed repeatedly between heated rolls which soften the shellac and incorporate all the ingredients thoroughly, the "composition" leaving the rolls finally to fall on a cold slab in a thin sheet so it may be afterward easily softened

on a steam heated iron plate for use in the molds as ordinarily practiced. To reinforce such "composition" fibrous substances usually of vegetable origin as thread, twine, canvas, or other textile substances which preferably may be first impregnated or coated with some stiffening or binding agent such as shellac or its substitutes in some cases may be used. The reinforcing substance need not be continuous, it may be sufficient if it mingles or interlaces with itself and the material to be strengthened, and may constitute the core only or may constitute the entire part of the instrument. For economical reasons the byproducts of other manufactures are utilized in the reinforcing core when available, and hence cotton, manilla or jute flocks, spinner's and weaver's wastes, etc., or any suitable tough, fibrous substance preferably filamentary in structure, or capable of being shredded, may be mixed with shellac (wood fiber, cellulose leather scrapings, etc., sometimes being added) and then incorporated and rolled into sheets as above merely as a convenient form for the succeeding softening process by heat before shaping the reinforcing core by some ordinary means as in a mold. The tough fibrous ingredients could be mixed with "composition" to form core sheets with advantage, as in very thin parts the core may push out near the surface of a part and if the core varied much in color from the exterior covering the appearance of the part might be affected.

In my preferred way of carrying out my invention I make a reinforcing core of some such substance as above described, and after shaping the core I render some suitable material as described plastic by heat or a solvent and apply it to the softened core in sufficient quantity to complete the part, then I put the crudely assembled part in a mold and apply pressure which will make the material flow along the core, so the core will become embedded in and united to the plastic material, and when cooled enough to be firm or when the material has attained a permanent set the part is removed from the mold, and if the material of the part is of a nature such that a finishing operation is required it may now be performed. As the ordinary materials described above used in making these parts of telephones are not easily made liquid and are generally worked in a softened, plastic or semi-fluid condition, they flow with some difficulty in thin layers, and unless great care

is taken may form cold shuts or perhaps voids. The insertion of the core in such parts renders the space still less for the material to flow into or along in the mold, and hence to prevent damage to the fibers of the tough substance it is heated only enough to soften the adhesive, while the exterior material made of mineral constituents is preferably heated considerably more than the core and becoming fluid in the mold will be evenly distributed over the core and giving up some of its heat thereto the parts intermix more or less and becoming firmly united form a strong, thin slightly elastic structure without charring or damaging the filaments of the fibrous substance.

To more particularly disclose my invention I furnish the accompanying drawings, in which:

Figure 1, shows the ear piece of a receiver of a telephone. Fig. 2, shows the body casing of a telephone receiver. Fig. 3, shows the mouthpiece for a transmitter. Fig. 4, shows a piece of fibrous netting. Fig. 5, shows a piece of canvas suitably stuffed or coated. Fig. 6 shows a fluted core for the body casing.

The core *a* is preferably made of some such substance as heretofore described which is readily molded to any shape, is sufficiently tough to resist any ordinary usage, easily worked with tools and very cheap. About this core the body *b* which may be made for ordinary commercial purposes of mica tale composition is formed, the material passing along both sides of the core and when pressed in a mold the core and body may while still hot touch and intermingling coalesce and thus become firmly united. The ear piece *d* often breaks at the flange *e* and about the opening *f*, so the core is carried close to the opening *f* and bent down to reinforce the flange *e*. The body of the instrument may crack at *g*, at an edge as near the threads, or near the end *h* of the instrument, particularly if this end is a separate piece connected to the body, the tubular core *a* which in this case may extend throughout the body *b* prevents fracture at *g*, or near the threads, and as the core is closed over toward the end *h* of the instrument it greatly strengthens the said end of the instrument. Sometimes the core of the body is fluted as in Fig. 6, to give additional longitudinal strength, or it may be corrugated concentrically or indented to strengthen a part against crushing, as the threaded flange *e* of the ear piece. The mouthpiece shown in Fig. 3, often breaks at the base *i* of the threads, while the rim *j* is frequently chipped along its edge, and to remedy these defects the core *a* extends from the rim *j* past the base *i* of the threads, to reinforce these weak places.

Although some substance such as described is preferred for the core, fibrous netting or other like material as shown in Fig. 4, is a good

substitute, it being easy to shape and offering little obstruction to the flow of the brittle material in the mold. Canvas *m* particularly when stuffed or soaked in some substance as shellac which when heated becomes a thick pasty liquid capable of hardening upon cooling to form a coating *n* is a useful substance for cores as it then retains any shape in which it may be formed, and if the heat of the brittle material when plastic is sufficient to soften the stuffing of the canvas the members of the parts will adhere, and form a strong composite structure.

Having described my invention, I claim and desire to secure by Letters Patent of the United States:

1. In a composite structure for a telephone, a part made of the ordinary brittle materials used for such purposes, reinforced by tough, fibrous substances incorporated as a core with the said ordinary materials, and a binding agent capable of being rendered pasty to unite the parts, substantially as described.

2. In a composite structure for a telephone, a core of tough substances of fibrous textile characteristics impregnated with agents capable of being made pasty, combined with ordinary brittle materials used for telephone parts applied in pasty condition covering the said core, and united therewith in more than surface contact, substantially as described.

3. In a composite structure for a telephone, a part made of ordinary brittle materials used for such purposes, combined with tough fibers, filaments or threads impregnated with thick pasty stiffening agents, the said fibrous substances permeating the said brittle materials in permanent union therewith, substantially as described.

4. In a composite structure for a telephone, a core of fibrous substance for a part, thick pasty liquids capable of hardening permeating and coating the said substance, and material ordinarily used for the part inclosing, covering and uniting with the said fibrous substance, substantially as described.

5. In a composite structure for a telephone, a core of fibrous textile substance impregnated and coated with pasty liquids capable of hardening, combined with materials as the ordinary composition used in this trade to form a part of the instrument, so that the said material and substance intermingle or coalesce at the place of union to form an integral structure, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses.

WILLIAM J. MURDOCK.

Witnesses:

D. R. MURDOCK,
W. J. BARRETT.