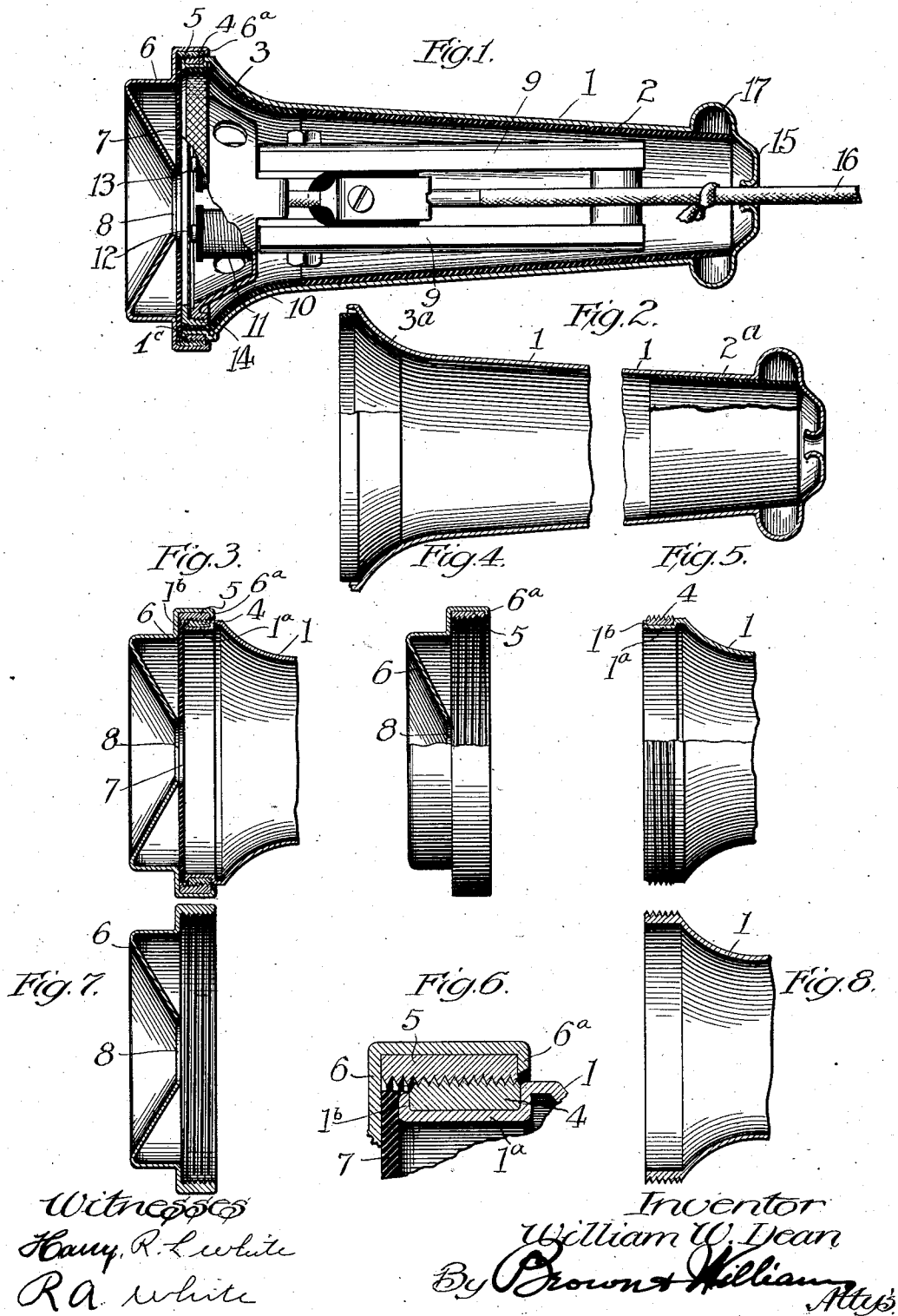


W. W. DEAN.
 TELEPHONE RECEIVER.
 APPLICATION FILED OCT. 8, 1908.

1,021,920.

Patented Apr. 2, 1912.



UNITED STATES PATENT OFFICE.

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TELEPHONE-RECEIVER.

1,021,920.

Specification of Letters Patent.

Patented Apr. 2, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM W. DEAN, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented a certain new and useful Improvement in Telephone-Receivers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to telephone receivers and has for its object the construction of a receiver shell of metal, which shall accomplish all of the purposes heretofore secured in connection with shells for such instruments and having the additional advantage of lightness, durability, improved appearance and cheapness.

Receiver shells have commonly been made heretofore of insulating material of one form or another which, generally speaking, is very brittle in nature and therefore easily broken. To avoid this difficulty the shells have usually been constructed of considerable thickness, with the result that they are both clumsy and heavy. By my invention I construct these shells of thin sheet metal and secure thereto a threaded ring of heavier metal, adapted to cooperate with the threaded portion of the receiver cap. This receiver cap may be constructed in one piece, or it may be constructed in a manner similar to the body portion of the shell. That is, it may consist in a main portion formed of thin sheet metal, secured to which is a threaded ring of heavier metal. If preferred, a cap of insulating material may be used in connection with the metal shell instead of the metallic cap just referred to.

In constructing my improved receiver shell I make use preferably of forming dies to form suitable sheet metal into the desired conformation. In order to be readily manipulated so as to assume the form required, the sheet metal used must be preferably relatively thin. This thin material, however, is not adapted to be threaded, since the threads would be so fine necessarily as to be of no use. Furthermore, the threaded portion would not possess sufficient rigidity to readily engage the cooperating threaded

member. By my invention I eliminate this difficulty by securing to the thin metal forming the body portion of the shell a separate ring, which is preferably of metal, although other material may be used if desired. This ring serves to permit the forming of threads of suitable size to be practical, and also serves to reinforce the threaded end of the shell, so that it may be readily engaged by the cooperating threaded member. A further advantage secured by this construction is that the receiver shell is comparatively light. In the event of forming the shell of material thick enough to be properly threaded, the shell would be so heavy as to practically prohibit its use.

A further advantage secured by my improved construction is to be found in the case in which the main portion of both the shell proper and the cap are formed, for the sake of cheapness, of thin sheet steel. The construction used which is above described and forms the subject matter of this invention permits the use of threaded rings of other material in connection with the formed steel members, as a result of which the possibility of corrosion of the threads engaging each other may be eliminated. If a steel shell had formed directly thereon the threads for engaging the cap, serious difficulty would result from the corrosion of the steel threads and in many cases would make it practically impossible to remove the cap from the receiver after the same had been in use for some time. This result would occur particularly in the case in which both the receiver and the cap were made of steel, each having the threads carried thereby formed directly in the steel itself.

In connection with the use of sheet steel for forming the main portion of the shell proper and the cap I employ a protecting varnish or coating, as for example enamel or japan, to thoroughly protect the steel from the contact of moisture. This means could not be used satisfactorily to protect the steel screw threads above referred to, since evidently the screw threads in order to properly perform their function must be clean and free from any foreign matter. In addition to the insulation thus secured by the

enamel coating within the shell, I employ separate insulating means between the shell and the cooperating mechanism of the receiver contained therein. I find that vulcanized fiber answers admirably for this purpose, although other insulating material may be used if desired.

The several drawings illustrating my invention are as follows:

10 Figure 1 is a longitudinal sectional view taken through the receiver shell proper and the receiver cap and shows the cooperating mechanism contained within the shell. Fig. 2 shows a modified form of
15 insulating partition that may be used in place of that shown in Fig. 1. Fig. 3 shows in a longitudinal sectional view the details of the construction of the cooperating parts of the threaded portions of
20 the receiver shell proper and the receiver cap. Fig. 4 shows partly in longitudinal sectional view and partly in side view the receiver cap. Fig. 5 shows in a view similar to Fig. 4 the portion of the receiver shell
25 proper adapted to engage the receiver cap. Fig. 6 shows in enlarged sectional view similar to Fig. 3, the cooperating threaded rings and the means employed to secure them to the receiver shell proper and the receiver cap; and Figs. 7 and 8 are detail sectional views of a modified construction of
30 the receiver cap and the body portion of the receiver shell, respectively.

Similar numerals refer to similar parts
35 throughout the several views.

As shown in the several drawings, the receiver shell 1 is of tubular conformation, having a slight taper, as indicated, and is enlarged at its left-hand end to support the
40 threaded ring used to engage the receiver cap. At this enlarged end, as shown more clearly in Fig. 6, the material of the shell 1 is formed at 1^a to a smaller diameter than the material of the adjacent portion of the
45 shell. The portion 1^a is adapted to fit within the threaded ring 4, and after this ring 4 has been placed upon the portion 1^a, the outer end of the shell 1 is turned outward, as shown at 1^b, to securely hold the ring 4 in
50 place. The shell is crimped at 1^c forming an abutment for the ring and preventing its sliding upon the shell. The smaller end of the shell 1 has an enlarged annular portion 17 formed thereon, which is adapted to en-
55 gage the receiver hook when the receiver is not in use. The material of the shell is continued around the smaller end and has an opening 15 formed in the end, through which the conductor cord 16 is adapted to
60 pass. The edges of the opening 15 are formed inward, as indicated, so that the sharp edge of the opening cannot come in contact with the conductor cord.

The cooperating mechanism of the re-

ceiver is of the well known type in which
65 such mechanism is completely assembled independently of the receiver casing. As shown in the drawings, it consists essentially of permanent magnets 9, 9 having secured to their left-hand ends a metal cup 10
70 within which the receiver coils 11, 11 are located. The outer edge of the cup 10 is threaded and adapted to cooperate with a threaded ring 14, the diaphragm 13 of the receiver being clamped between the thread-
75 ed ring 14 and the cup 10 in operative relation to the poles 12 extending through the coils. The cooperative mechanism just described is insulated from the shell 1 by means of tubes 2 and 3 of insulating mate-
80 rial, such as vulcanized fiber or the like, which effectually prevent contact between the metal of the shell and any part of the cooperating mechanism. While I find it desirable in practice to form this insulating
85 lining in two parts, it is, however, not essential that this be done and I may use a one-piece lining in place thereof.

The cap used to close the larger end of the shell 1 and to secure in position therein
90 the cooperating mechanism, consists of a main portion 6 of thin sheet metal formed as indicated and adapted to contain within its larger end a ring 5, which is secured in
95 such position by turning the larger end of the portion 6 down against the ring as indicated at 6^a in Fig. 6. The ring 5 and cap 6 are so proportioned that the ring just fits within the larger cylindrical portion of the cap. An insulating disk 7 of fiber or simi-
100 lar material is used to prevent contact between the cooperating mechanism of the receiver and the receiver cap. This disk also serves as a barrier between the space occupied by the telephone diaphragm and the
105 hollow space in the convex part of the ear cap. As will be seen from the drawing, the center of the cap is depressed forming a crater like receptacle for the ear and a hollow portion on the interior. The sound
110 waves emanating from the diaphragm would pass into this hollow space and be dissipated unless some means were employed to bar them out.

As shown in Figs. 7 and 8, the reinforcing
115 rings formed on the receiver cap and on the body portion of the receiver shell to receive the threads formed therein to secure the cap to the shell may, if preferred, be made by thickening the metal of the cap and shell,
120 as indicated, by upsetting the metal in suitable dies. This construction, while it may not be desirable in all cases, is particularly applicable to the construction of receiver shells of metals or alloys that do not readily
125 corrode.

As shown in Fig. 2, the insulating lining of the receiver shell may consist in two

short portions, one of which is adapted to prevent contact with the shell of the cup 10 and the other of which is adapted to be contained in the smaller end of the shell to prevent the magnets 9, 9 from coming into contact with the shell.

While I have shown my invention in the particular embodiment herein described, I do not, however, limit myself to this construction, but desire to claim broadly any equivalent modification that will suggest itself to those skilled in the art.

What I claim is:

1. In a telephone receiver shell, the combination of a body portion, a separate threaded ring sunk into said body portion and secured thereto and a cap engaging said ring.

2. In a telephone receiver shell, a body portion and a cap portion, a threaded ring adapted to fit within the end of one of said portions, the edge of the portion being bent over to retain the ring and threads on said other portion and adapted to engage the threaded ring to unite the parts.

3. In a telephone receiver, the combination of a metallic receiver shell, a cap therefor, receiver mechanism mounted in said shell and an insulating member between the cap and mechanism to insulate each from the other.

4. In a telephone receiver shell, the combination of a main portion, a cap, and a threaded ring mounted on said main portion and adapted to engage said cap to secure said parts together, said body portion being folded over to form an abutment for said ring.

5. A telephone receiver consisting of a body portion formed from thin sheet metal, and a separate threaded ring secured thereto by forming a part of the body portion around it and adapted to engage the receiver cap.

6. A telephone receiver shell consisting of a body portion and a cap, such cap comprising a perforated member formed from thin sheet metal and adapted to communicate sound waves from the receiver to the ear, and a separate threaded ring secured thereto by forming a part of the perforated member around it and adapted to engage the body portion of the receiver shell.

7. A telephone receiver shell consisting of two elements one of which is the body portion of the shell and the other a cap, one of such elements comprising a main member formed from thin sheet steel and a threaded ring of other material secured thereto by forming such element around it, such ring being adapted to engage the other element.

8. A telephone receiver shell consisting of two elements one of which is the body portion of the shell and the other a cap, each

of such elements comprising a main member formed from thin sheet steel and a threaded ring of other material secured thereto by forming such element around it, such rings adapted to engage each other.

9. A telephone receiver shell consisting of two parts, one of such parts formed from thin sheet metal, and a separate externally threaded ring secured to such part by forming it within and around the ends of the ring, such ring being adapted to engage the other part.

10. A telephone receiver shell consisting of two parts, one of such parts formed from thin sheet metal, and a separate internally threaded ring secured to such part by forming it outside of and around the ends of the ring, such ring being adapted to engage the other part.

11. A telephone receiver shell consisting of two parts, one of such parts formed from thin sheet metal and a separate externally threaded ring secured to such part by forming it within and around the ends of the ring, and the other part formed from thin sheet metal and a separate internally threaded ring secured to such other part by forming it outside of and around the ends of the ring, such rings adapted to engage each other.

12. In a telephone receiver shell, the combination of a main portion crimped near its edge to form an abutment and extended from the crimped portion to the edge substantially parallel to the axis of the shell, a threaded member set in the extension, abutting against said crimped part and secured to said shell, and a cap adapted to engage said threaded member to secure it to said main portion.

13. A telephone receiver shell consisting of two elements one of which is the body portion of the shell and the other a cap, one of such elements comprising a main member and a threaded ring of other material secured thereto by forming such element around it, such ring being adapted to engage the other element, and such body portion conformed to prevent chafing of the conductors extending therethrough to the cooperating mechanism of the receiver.

14. In a telephone receiver, the combination of a receiver shell, a sheet metal cap therefor, having a concave inner portion and an insulating diaphragm to close said concave portion.

15. In a telephone receiver, the combination of a receiver shell, a sheet metal cap therefor, the metal of the cap being depressed at the center thereof to form a crater like receptacle for the ear and an insulating disk clamped between the cap and shell.

16. In a telephone receiver, the combination of a receiver shell, a sheet metal cap

therefor, the metal of the cap being depressed at the center thereof to form a crater like receptacle for the ear, said cap having a concave inner portion and an insulating
5 member clamped between the cap and shell closing the concave portion of the cap.

In witness whereof, I hereunto subscribe

my name this 5th day of October A. D., 1908.

WILLIAM W. DEAN.

Witnesses:

A. D. T. LIBBY,
W. B. MANSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."