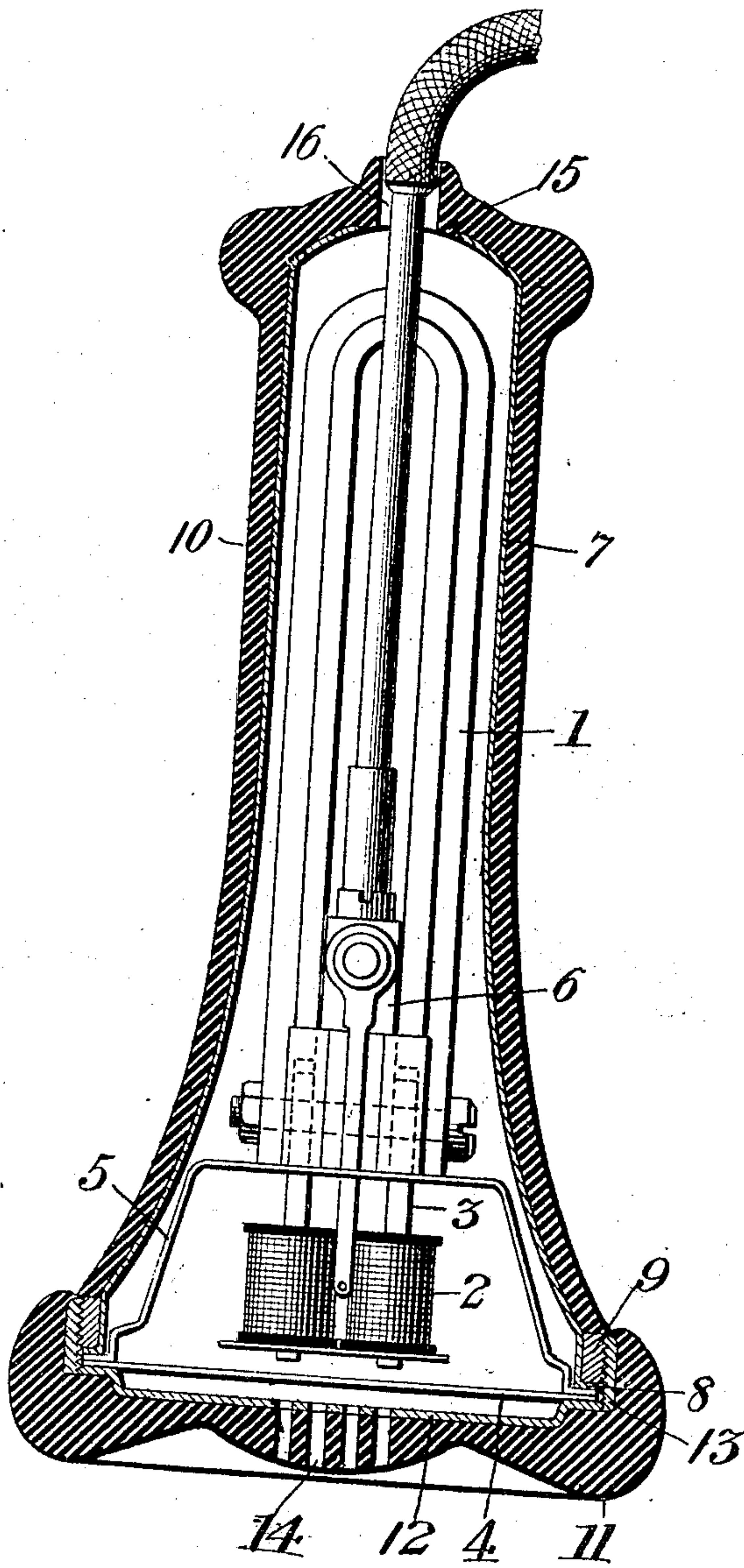


966,247.

E. SCHWARTZ.  
TELEPHONE RECEIVER.  
APPLICATION FILED APR. 20, 1907.

Patented Aug. 2, 1910.



Witnesses  
W. W. Edelin.  
Edmondson

Inventor  
Edward Schwartz  
By Edward E. Clement  
Attorney

# UNITED STATES PATENT OFFICE.

EDWARD SCHWARTZ, OF ANTWERP, BELGIUM, ASSIGNOR OF ONE-THIRD TO EDWARD E. CLEMENT, OF WASHINGTON, DISTRICT OF COLUMBIA.

## TELEPHONE-RECEIVER.

966,247.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed April 20, 1907. Serial No. 369,265.

### *To all whom it may concern:*

Be it known that I, EDWARD SCHWARTZ, a subject of the King of Belgium, residing at Antwerp, Belgium, have invented certain  
5 new and useful Improvements in Telephone-  
Receivers, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to telephone re-  
10 ceivers.

The object of the invention is to provide a casing for the operating parts of the receiver which will be cheap to construct, neat in appearance and of sufficient strength to  
15 withstand the hardest usage to which receivers are subjected, also to properly insulate the parts from the user's hand.

Heretofore, telephone receiver shells have been constructed of hard rubber and while  
20 the rubber has many advantages, it also has many disadvantages, the principal among which is its frangibility. Most receivers have their operating parts held in operative position in the casing by the hard  
25 rubber cap, and if this or the main casing becomes broken, the parts are exposed, and are liable to fall apart. Again, all metal receiver shells have been proposed. This type also has its disadvantages and, while  
30 it possesses sufficient strength to withstand the hardest use to which it may be subjected, it has no insulating property and users of the receiver are liable to get shocks from accidental contact of operative parts  
35 with the shell. By combining the advantages of both types and eliminating their disadvantages I am enabled to construct a practical and efficient receiver.

Briefly stated, my invention comprises an  
40 inner hard drawn seamless brass shell over which is vulcanized a hard rubber coating. The cap is made in the same manner and the threaded portion of the shell and the cap are of a metal suitable for such purpose  
45 and are secured to the lining of each by soldering or shrinking.

My invention is illustrated in the accompanying drawing, wherein I show a longitudinal central section of the receiver casing with the operating parts in full lines therein.

In the figure, 1 designates a permanent magnet carrying at its upper end the windings 2 with their pole pieces 3 located adjacent the usual diaphragm 4, which in this

instance is supported upon a non-magnetic cup 5 held upon the end of the permanent magnet in any suitable manner. The terminals are secured to an insulating block 6 and project up through the cup 5 where  
60 they are connected to the windings 2.

Surrounding the operating parts of the receiver is a hard drawn seamless brass shell 7 open at both ends and flared at one end thereof to conform with the usual shape of  
65 receivers of this type. The flared end of the receiver is also flanged at 8 to receive a threaded metal reinforcing ring 9 secured to the shell in any suitable manner as by shrinking or soldering. Over the shell 7  
70 is flowed or molded an insulated coating 10, preferably of hard rubber, but which may be of any material adapted to thoroughly insulate the parts, such as porcelain, enamel, etc. The cap 11 is formed in the same manner and is provided with a lining 12 of brass or other suitable material, which has connected to it a threaded ring 13 so as to engage with the ring 9 carried by the shell 7.  
75 The ring 13 may either be formed separately 80 from the lining 12 or may be an integral part thereof. It is shown herein as a separate part. The cap is provided with an opening or openings 14 which extend through the rubber 11 and the lining 12 for  
85 the passage of sound waves from the diaphragm. At the opposite end of the receiver the shell is apertured at 15 so as to register with an aperture 16 in the insulating coating 10 to permit the passage of the  
90 cord conductor.

In constructing the article I may use several different methods, but I herein describe only two, the first one of which involves the following process: A  
95 disk of metal, such as brass or other suitable material, having a consistency adapted to be easily worked, together with requisite strength, is placed in a die press and gradually worked in the form of a cylinder through successive stages of operation, fully understood by those versed in the art. After the cylinder is formed with one flaring end it is tapped out at 15. The shell  
100 is then placed in a flanging machine and the flange 8 is formed on its upper end so as to receive and limit the movement of a ring 9 which may be either soldered or sweated upon the shell. This ring may be either threaded prior to its attachment with the  
110



shell, or, it may be threaded afterward, according to the desire of the manufacturer. The shell is then placed in a mold and rubber is molded around it and is vulcanized  
5 with the aperture 16 registering with the aperture 15. The lining 12 of the cap is formed of sheet metal and is stamped up in one operation and the threaded ring 13 attached thereto. The rubber is then vul-  
10 canized over the whole in any desired manner.

The second method employs the following process: A metal tube of suitable diameter is flared out at one end where it is flanged  
15 in a flanging machine or by a spinner. The opposite end has an inwardly extending flange formed in any suitable manner which defines the aperture 15. The cap is made in the same manner as described in the former  
20 process and each part has then flowed over its surface a coating of enamel, porcelain, or other suitable insulating material.

It will be understood that the material and mode of application of the insulating  
25 material described in the first process might be used with the shell described in the second process or the material and mode of applying the insulating material described in the second process might be used with the  
30 shell described in the first process, the kind of insulating material being immaterial for the results produced.

It will be seen from the above that I have provided a receiver shell which will with-  
35 stand the hardest usage without destroying the article for practical purposes. The rubber may become broken and fall away from the metallic shell but the operating parts will still remain intact. This is not liable,  
40 however, because with a receiver constructed in this manner the insulating coating is

uniformly and continuously supported and does not readily break or chip off.

I have described in a simple way the method of manufacturing the article so that 45 it may be clearly understood, but I do not wish to be limited to the exact procedure, nor do I desire to be limited to the exact construction shown, as some modifications might be resorted to without departing from 50 the scope of the invention, and I consider and contemplate such modifications as within the purview of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Pat- 55 ent is:

1. In a telephone receiver, a continuous integral thin metallic shell having a flared end, a reinforcing ring secured to the flared end, a metallic cap, and a ring connected 60 with the cap so that it will engage with the said reinforcing ring on the shell, means to secure said rings and thereby the shell and cap together, insulating material molded over the shell, and an insulating coating for 65 the cap.

2. A telephone receiver comprising a continuous integral thin metallic shell having a flared end, a threaded reinforcing ring secured to the flared end, a metallic cap, and 70 a threaded ring connected with the cap so that the convolutions thereof will engage and lock with the threads of the reinforcing ring, insulating material molded over the shell, and an insulating coating for the cap. 75

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD SCHWARTZ.

Witnesses:

ED. SUTMANN,  
J. HOLAMINE.