

No. 855,394.

PATENTED MAY 28, 1907.

O. F. FALK.  
TELEPHONE.

APPLICATION FILED JULY 1, 1905.

Fig. 1.

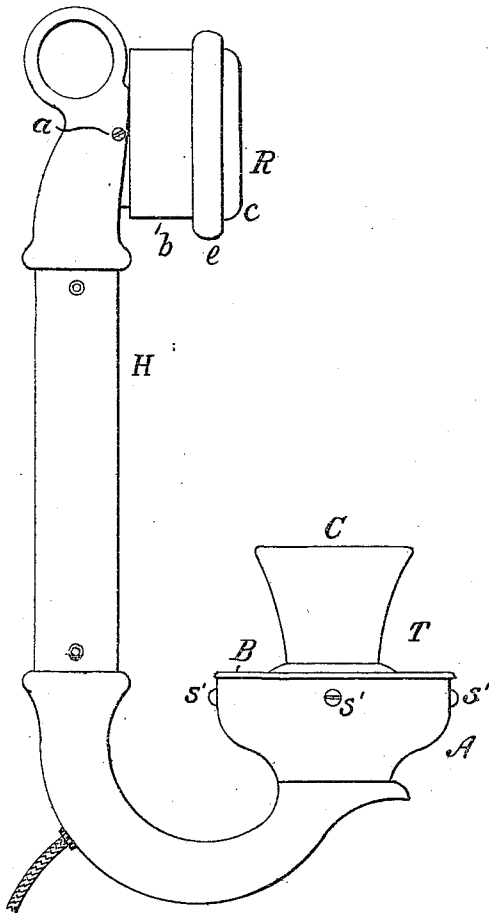


Fig. 2.

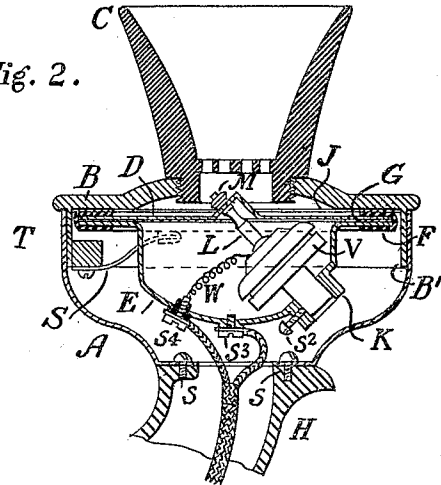
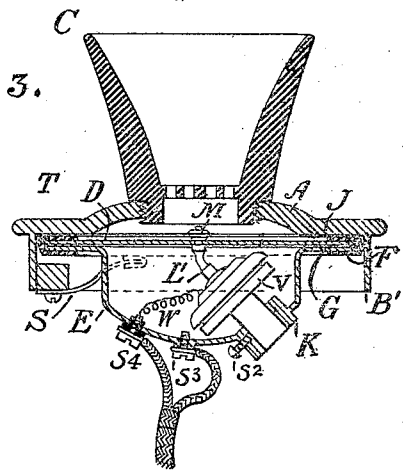


Fig. 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

OSCAR F. FALK, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

## TELEPHONE.

No. 855,394.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed July 1, 1905. Serial No. 267,962.

*To all whom it may concern:*

Be it known that I, OSCAR F. FALK, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Telephones, of which the following is a specification.

The invention relates to that class of telephones known as hand-set or combination telephones, in which a transmitter and a receiver are secured to the two ends of a handle-bar in such manner that the receiver can be held to the ear, while the mouth-piece of the transmitter, which is of the granular carbon button type, is convenient to the mouth of the user.

The transmitter of the hand-set or combination telephones now in use may be open circuited by holding the hand-set in certain positions which cause the granular powder of the button to fall entirely away from one or the other of the carbon electrodes. As the hand-set is often held or moved into such positions during conversations, it is evident that at such times the transmitter will not operate.

The object of the invention is to obviate this difficulty, and the invention consists in so attaching the transmitter to the end of the handle-bar, opposite the end to which the receiver is attached, that the mouth-piece and diaphragm of the transmitter when the hand-set is in use shall be in substantially vertical and parallel planes while the planes of the ear-piece and diaphragm of the receiver are also substantially vertical and parallel, and at right angles to the planes of the mouth-piece and diaphragm of the transmitter, the said transmitter being of the granular carbon button type and having its said button at an angle with its diaphragm, thereby maintaining the granular powder in contact with both carbon electrodes in all positions which the transmitter may take while in use.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is an elevation of the handle-bar with receiver and transmitter attached. Fig. 2 is a cross-section of the transmitter showing in detail so much of the interior thereof as is necessary to exhibit the invention. Fig. 3 is a modification.

H is the hollow handle-bar containing in

the usual manner wires and connections which is not necessary to show.

R is a receiver of the watch-case pattern, secured to one end of the handle-bar by a pivot *a* which allows to the receiver a slight movement to accommodate it to the ear of the user. The receiver consists of the customary case or shell *b* and cover or ear-piece, *c*, secured thereto by a clamping-ring nut *e*, containing the diaphragm, magnet, induction coils, receiver - circuit terminals, etc., all within said case, but not shown. T is the transmitter also substantially of the watch-case pattern, rigidly secured to the other end of the said handle-bar, which bar is so bent or formed that when it is held in the hand of the user and the receiver is placed at his ear, the mouth-piece of the transmitter will be directly in front of the mouth of the user and the diaphragms of the transmitter and receiver will both be substantially vertical and substantially at right angles to each other. A is the outer case or shell of said transmitter secured to the hollow handle-bar H by screws *s, s*, as shown. B is a cover for said case having near its outer edge a circular flange, B', fitting within the case A and secured thereto by screws, *s', s'*.

C is the mouth-piece of the transmitter screwed into the cover and furnished with a perforated protector, as shown.

D is the transmitter diaphragm secured to an inner case or metallic shell E by a dampening fastener such as an elastic rubber dampening band F, the said diaphragm and inner case being separated by a paper ring G, while J is a ring of mica, separating the assembled diaphragm, inner case and rubber band from the cover B. This combination of inner case, diaphragm, rubber band, etc., together with the granular button, next to be described, within the inner case, is held in position by a spring S secured to a block or projection on the inside of the flange B' of the cover by a screw, as shown, and forms a unitary device or portable article comprising all of the essential parts of the transmitter held compactly together, which device as a whole is readily attachable to or detachable from any standard instrument. This transmitter is claimed in a divisional application filed July 2d, 1906, Sr. No. 324,525. The bear-

ing end of the spring has a rubber hood, as shown, and presses against the rubber band F outside of the inner case. V is a variable resistance granular carbon button, consisting of a shell in two parts, containing the customary front and back electrodes and granulated carbon, which in the state of the art it is unnecessary to show in detail. A projection from the rear part of the shell of said button in conductive connection with the back electrode is set in a strengthened section, K, of said metallic case E, and there held by a screw,  $s^2$ , as shown. The case E, thus in conductive connection to the back electrode, is in conductive connection at screw  $s^3$  with one wire of the transmitting circuit, while the front electrode is in conductive connection with the other wire of the transmitting circuit at screw  $s^4$ , by means of a wire W conductively connected with the front electrode and passing through an insulated bushing in the front part of shell V and in said inner case.

L is a rigid shank projecting from the front electrode of the button V. Its outer end in one form of the hand-set, Fig. 2, projects through a slightly up-set portion of the diaphragm at the center of the diaphragm and is secured by a thumb-screw M. In the modification shown at Fig. 3, the shank L' is bent so that its end passes readily through the center of the diaphragm and is secured by a thumb-screw M' in the ordinary manner. The straight-tubed mouth-piece used in either construction allows sounds to fall

upon the diaphragm substantially free from reflection.

I claim,—

1. In a hand-set or combination telephone, a handle-bar having a receiver at one end and a transmitter at its other end, the transmitter including a granular carbon button connected and disposed at an angle to the transmitter diaphragm, whereby contact between the granulated conducting material of the carbon button and its coöperating electrodes will be maintained in all positions which the hand-set may take while in use.

2. In a hand-set or combination telephone, a handle-bar having a receiver at one end and a transmitter at its other end, the diaphragm of the receiver and transmitter being in planes approximately at right angles to each other, and the transmitter including a granular carbon button connected and disposed at an angle to the transmitter diaphragm, whereby contact between the granulated conducting material of the carbon button and its coöperating electrodes will be maintained in all positions which the hand-set may take while in use.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 29th day of June 1905.

OSCAR F. FALK.

Witnesses:

GEO. WILLIS PIERCE,  
JOSEPH A. GATELY.