(No Model.)

W. L. BRADSHAW.

SHORT DISTANCE TELEPHONE COMMUNICATION.

No. 555,073. Patented Feb. 25, 1896.

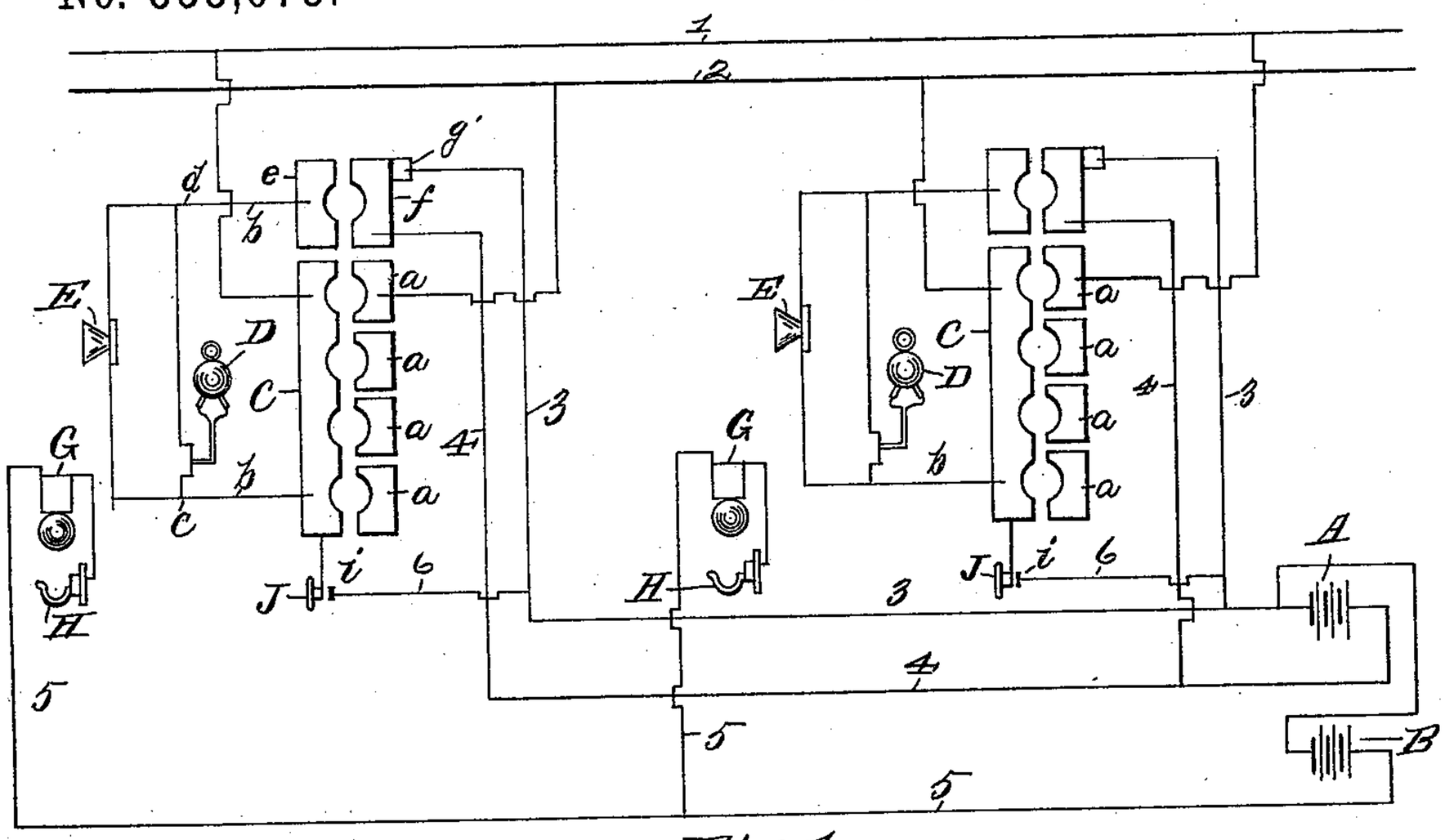
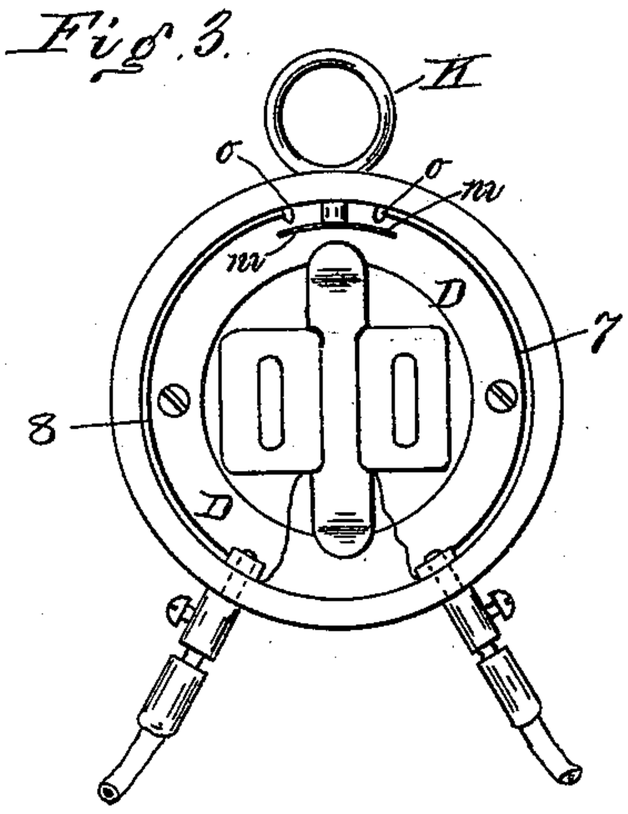


Fig. 1.

Fig. 3.



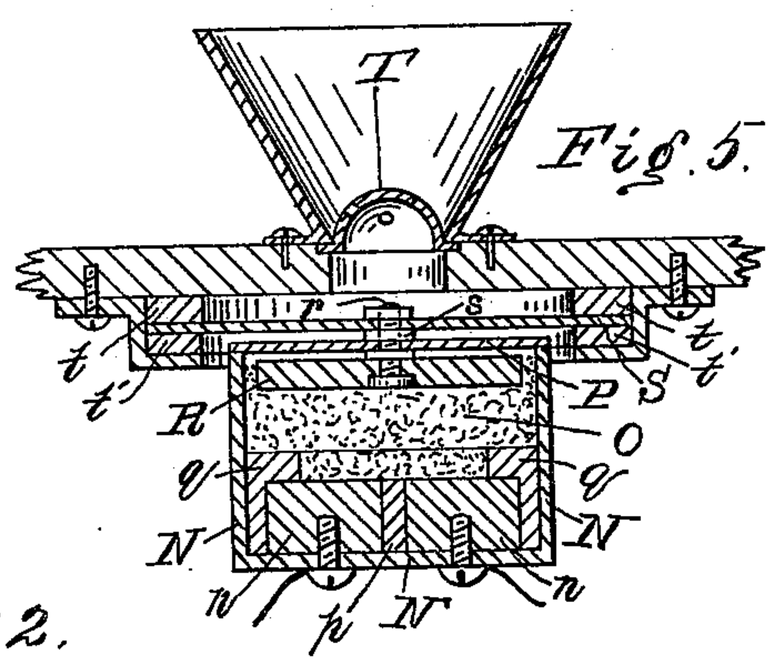


Fig. 5.

Fig. 2.

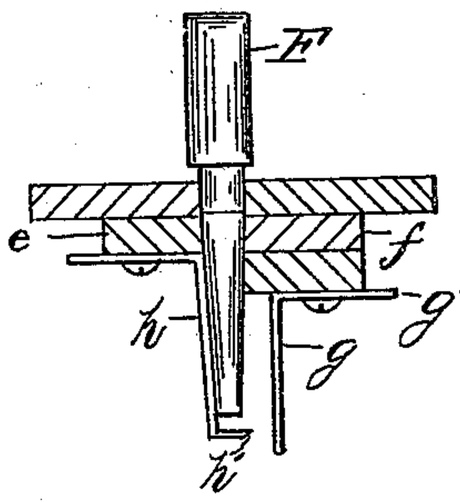
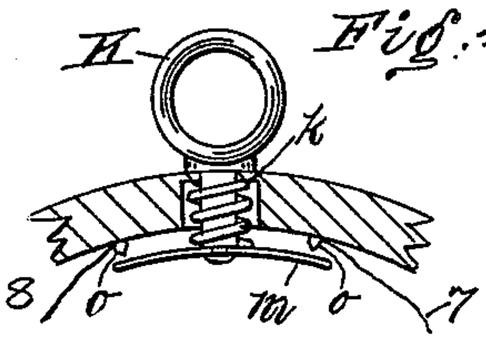


Fig. 4.



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UNITED STATES PATENT OFFICE.

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SHORT-DISTANCE TELEPHONE COMMUNICATION.

SPECIFICATION forming part of Letters Patent No. 555,073, dated February 25, 1896.

Application filed September 28, 1895. Serial No. 563,982. (No model.)

To all whom it may concern:

Be it known that I, WALTER L. BRADSHAW, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Short-Distance Telephone Communication, of which the following is a specification.

My invention relates to improvements in short-distance telephone communication adapted to use in factories, hotels, public buildings, &c., where convenient and rapid communication facilitates business.

The objects of my invention are, first, to secure circuits, talking-circuits especially, comparatively free from breaks and interruptions; second, to attain clear and distinct transmission of speech without the usual attendance of extreme sensitiveness; third, a novel means for short-circuiting the receiver, whereby low-resistance bell-circuit is made either way from said receiver. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic view showing two stations and their connection; Fig. 2, a sectional view of battery-reversing device; Fig. 3, a view showing inside construction of receiver; Fig. 4, a section showing spring controlling short-circuit device; Fig. 5, a sectional view of the transmitter.

Similar letters and numerals refer to similar parts throughout the several views.

The calling-battery B has one pole extended to each station by wire 5 and is permanently connected to one terminal of coil of each bell or other signaling device. The other terminal of coil is in turn permanently connected to rigid retaining-hook H. The other pole of battery B is permanently connected with wire 3, which has a branch wire 6 at each station permanently connected with anvil *i*, and key I is permanently connected with plate C.

Receiver D has an automatic short-circuiting device. (Shown in detail in Figs. 3 and 4.) Supporting-eye K, its shank extended through receiver-case, is keyed to prevent its turning and works loosely through coiled spring *k*. Curved metal plate *m* is forced away from contacts *o*, which are in permanent connection with binding-posts of receiver by wires 7 and 8, by tension of spring *k*, except when receiver is hung upon hook H, when gravity overcoming tension of spring causes said plate *m* to make connection between contacts *o* and short-circuits receiver-coils, giving low-resistance path either way from hook H. With plug F in section corresponding to station desired and receiver removed from hook at calling-station pressure of key I causes signal to sound at desired station, current flowing from battery B by wire 3 to branch wire 6, anvil *i*, key I, plate C, and plug F to desired line, thence to plate C, to branched wire *b*, to short-circuited receiver D, to hook H, to bell G, and thence back to opposite side of battery B by wire 5.

I use a transmitter (see Fig. 5) consisting of a circular cell of insulating material N, having two or more electrodes *n* rigidly secured to its rear wall or floor by preferably machine-screws extending through said floor, whereby necessary wire connections may be made, said electrodes consisting of the segments of a disk of carbon, said segments being insulated one from the other, the insulating material *p* filling the spaces and flush with the flat surfaces of the electrodes *n*, a circular flat elastic washer *q* lying against the face of the electrodes *n*, which prevents caking of the granular carbon and retaining within its opening a quantity of granulated conducting material, such as finely-divided carbon O, more or less of which is in constant contact with said electrodes.

An elastic retaining-cover P, preferably of thin celluloid for said cell, has a pin *r* fixed to its center and extending both inwardly and outwardly, its inner end having rigidly fixed to it a solid disk of carbon R susceptible to a slight to-and-fro movement limited in extent to the elasticity of the cover P, its outer end passing through a washer *s* and through a diaphragm S, to which it is rigidly secured by a nut. The purpose of the washer *s* is to hold the diaphragm S apart from said elastic retaining-cover. Said pin *r* supports said cell and serves to contribute to solid carbon disk R any vibrational movement that may be set up in diaphragm S by sound-waves striking same.

Diaphragm S has its entire edge rigidly

clamped between two soft-rubber rings to reduce the supersensitiveness of telephones of this class heretofore in use.

There is a slight space between the solid disk of carbon R and the elastic washer *q* partly filled with granulated carbon, so that the to-and-fro movement of disk R causes more or less of such granular carbon to come into contact with the electrodes *n*, thereby offering more or less conducting-surface between the electrodes.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. In a telephone system of the class described the hook H, in combination with the supporting-ring K, provided with a shank extending through hole in receiver-case and through spiral spring *k*, and loosely fitting but suitably held from turning and rigidly attached to near the middle of curved plate *m*, and contacts *o*, and wires 7 and 8, adapted to furnish low-resistance path either way from hook H, as described and shown, and for the uses and purposes set forth.

2. In a telephone system of the class described a transmitter consisting of the circular cell of insulating material N, having two or more electrodes *n*, composed of segments of a disk of carbon rigidly secured to the rear wall of the cell and insulated, the one from the other by insulating material *p*, filling the space and flush with the flat surfaces of the electrodes *n*, in combination with a circular flat elastic washer *q*, lying against the face of the electrodes *n*, and retaining within its opening, granulated conducting material O, more or less of which is in contact with said electrodes adapted to the formation of a pathway between the electrodes presenting more or less conducting-surface as described and shown and for the uses and purposes set forth.

3. In a transmitter of the class described the elastic retaining-cover P, preferably of thin celluloid rigidly attached around its entire edge to the wall of circular cell N, having a pin *r*, fixed to its center and extending both inwardly and outwardly its inner end having rigidly fixed to it a solid disk of carbon R, of slightly less diameter than retaining-cell N, and susceptible to a to-and-fro movement, limited in extent to the elasticity of the cover P, and the other end of pin *r*, passing through a washer *s*, and through the center of a diaphragm S, to which it is rigidly secured by a nut; in combination with diaphragm S, the entire edge of which is clamped between two soft-rubber rings *t*, and *t'*, and the granular carbon O, loosely confined within the cell N, lying against disk R, and electrodes *n*, the flat elastic washer *q*, lying between the granular carbon O, and the electrodes *n*, exposing but a limited central surface of the electrodes *n*, to the action of granular carbon O, the electrodes *n*, rigidly secured to the rear wall of cell N, slightly separated one from the other the intervening space filled with the insulating material *p*, flush with their flat surfaces, as described and shown and for the uses and purposes set forth.

WALTER L. BRADSHAW.

In presence of—
FRED W. KEAM,
EMIL KOLL.