S. L. VAN AKIN, Jr.

TELEPHONIC INSTRUMENT.

APPLICATION FILED MAR. 10, 1908.

982,450. Patented Jan. 24, 1911.

3 SHEETS—SHEET 1.

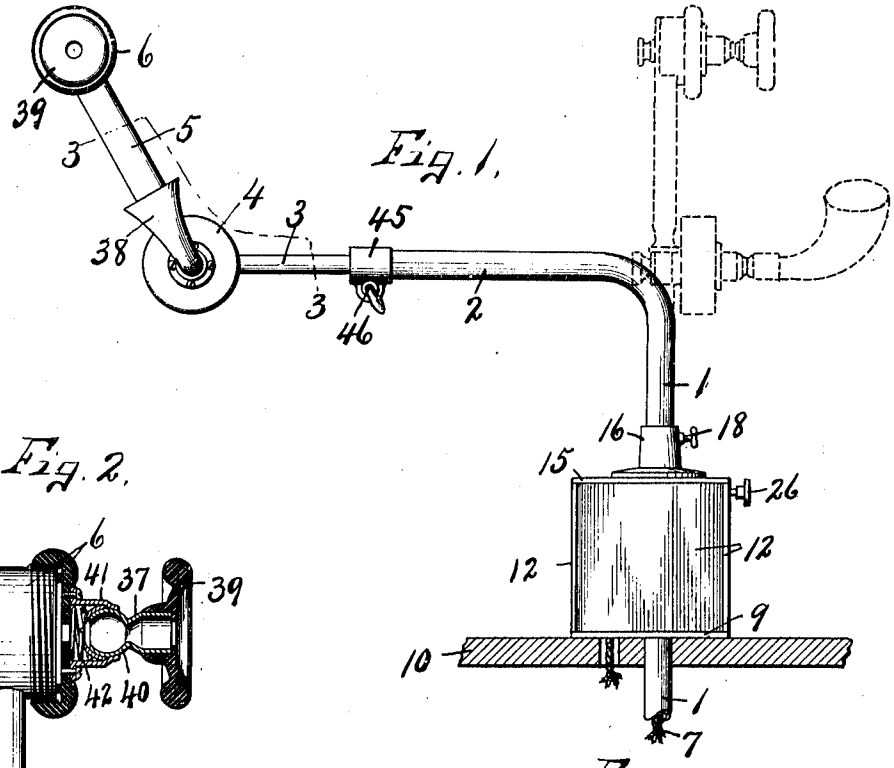


Fig. 1.

Fig. 2.

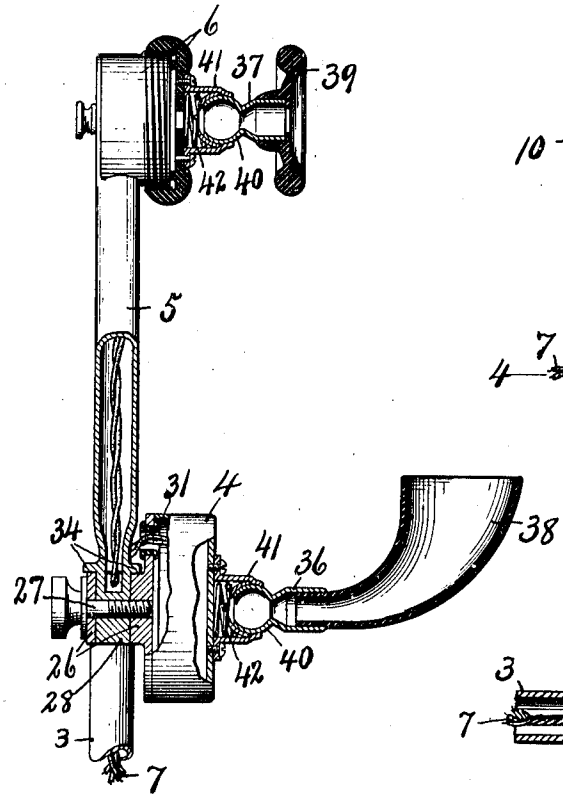


Fig. 3.

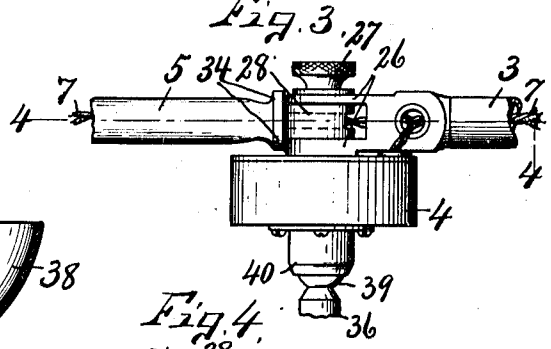
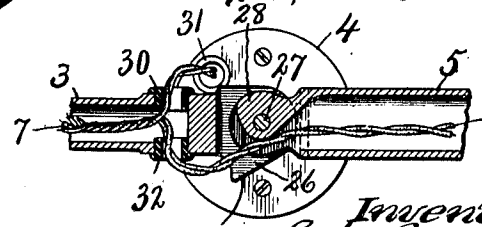


Fig. 4.



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3 SHEETS—SHEET 2.

Fig. 5.

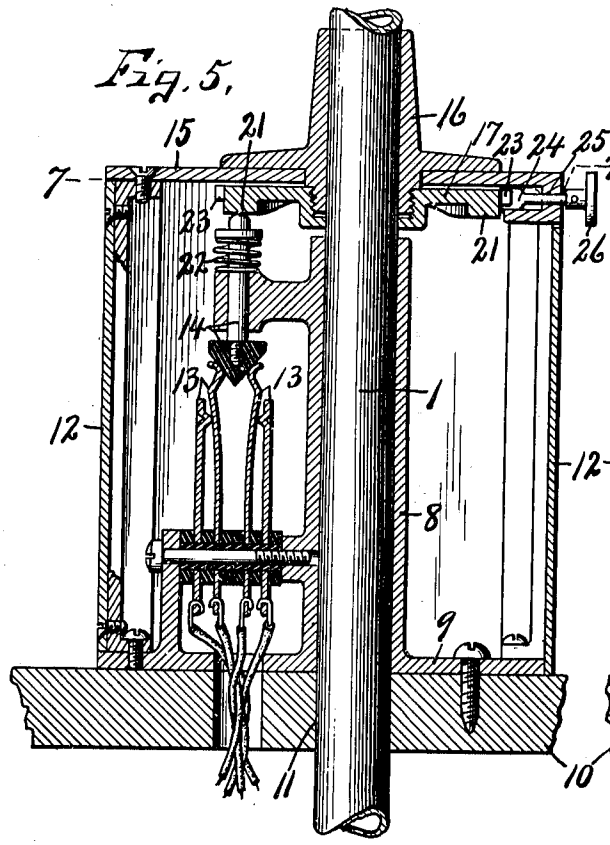


Fig. 6.

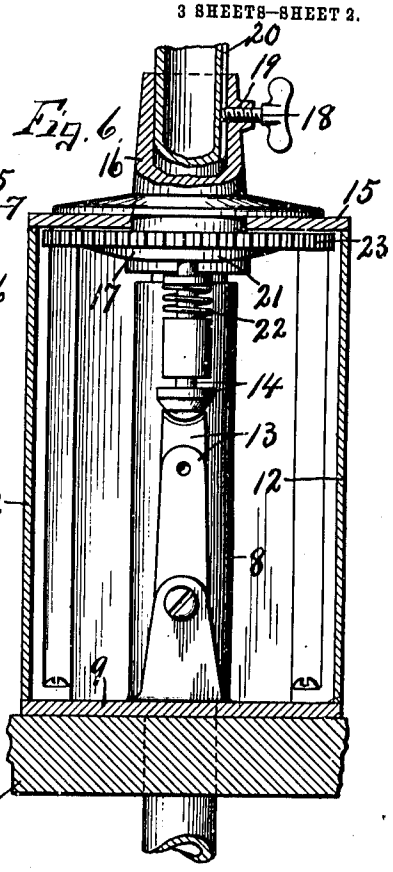
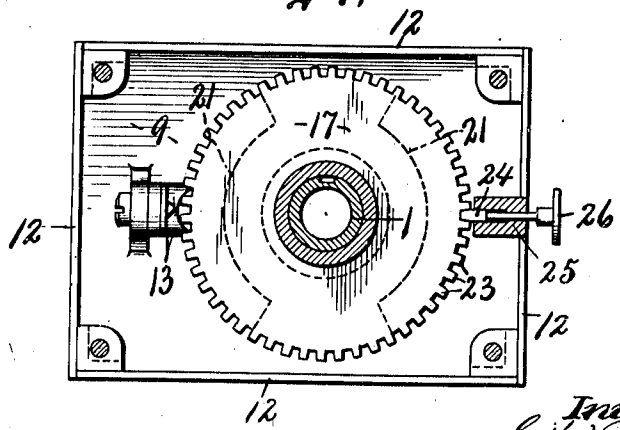


Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 8.

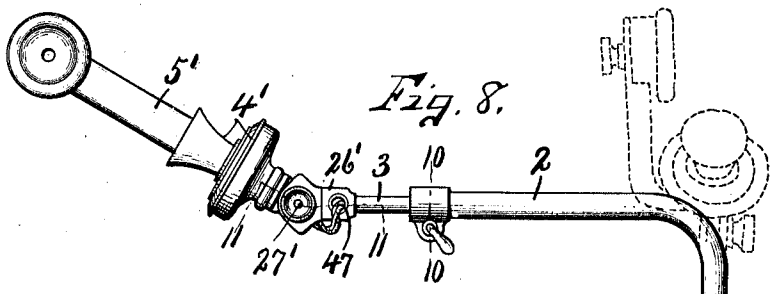
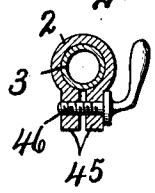


Fig. 10.



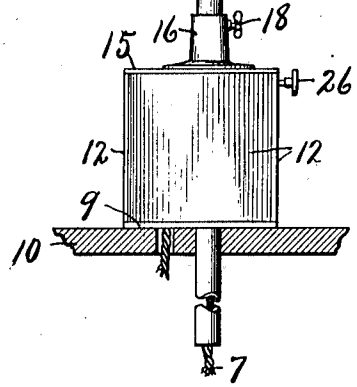


Fig. 9.

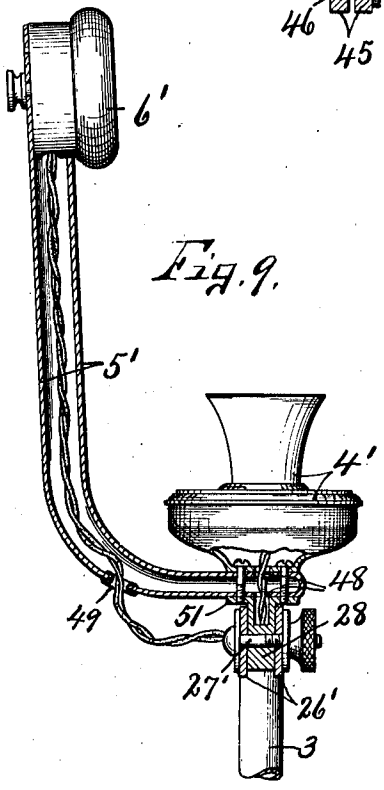


Fig. 11.

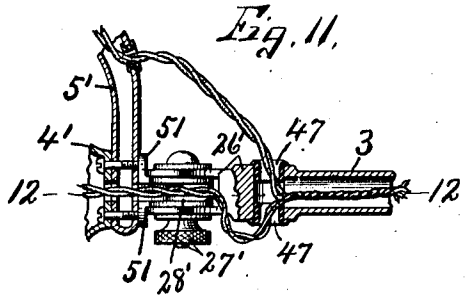
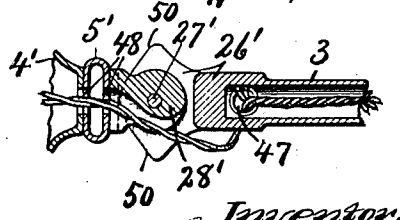


Fig. 12.



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UNITED STATES PATENT OFFICE.

SAMUEL L. VAN AKIN, JR., OF LIVERPOOL, NEW YORK.

TELEPHONIC INSTRUMENT.

982,450. Specification of Letters Patent. Patented Jan. 24, 1911.

Application filed March 10, 1908. Serial No. 420,256.

To all whom it may concern:

Be it known that I, SAMUEL L. VAN AKIN, Jr., of Liverpool, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Telephonic Instruments, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in telephonic instruments and is specially designed for train order and despatch service on railways and in similar relations where an extensive system of private communication through more or less long distance is carried on, reference being had to my pending application No. 541,588, filed February 2, 1910.

The inadequacy and inefficiency of the present system of telegraphic communication, particularly in relation to the movement of trains and other railway equipment, has long been recognized and in my present invention I have not only sought to minimize the liability to error so common in the translations of the usual telegraphic codes but have also sought to render the work of the despatcher and other operators more expeditious and certain and less laborious by bringing the communicants into direct oral communication with each other through the medium of specially designed instruments which are adapted to be installed or placed in operative position upon any suitable office desk, table or other support.

In the use of the ordinary desk telephones, receiver caps and similar portable instruments, it is customary to connect the receiver and transmitter to separate flexible cables of sufficient length to afford a reasonable range of shifting movement for such instruments to conform to shifting positions of the operator. This leaves the greater portion of the cords or cables free to twist upon themselves and to coil around or become entangled with various objects upon the desk or table so that when the instruments are brought into use, such objects as ink bottles and other articles with which the cords become entangled are upset or drawn from the desk or table and frequently results in excessive strains upon the cords or cables sufficient to break or loosen the connections with the fixed terminals or binding posts thereby rendering the service more or less unreliable and uncertain. This is particularly true of the flexible connections for the ordinary receiver which is hung upon the switch arm of the transmitter standard and which is frequently withdrawn or knocked from its support, by contact of the arm or hand with some part of the cable or receiver thereby resulting in breaking such receiver or overstraining the cord and its connections. Furthermore in the use of what is commonly known as a receiver cap, the operator will sometimes turn from or hastily leave his table beyond the length of the cord or cable without removing the cap which not only causes excessive strains upon the connections but often results in the cap with the receiver thereon being forcibly drawn from the head and thrown to the floor and in contact with some other object with sufficient force to break the instrument or its connections. Another serious disadvantage in the use of the ordinary "desk telephone" is that it is necessary to hold the receiver in one hand during a conversation thus leaving only one hand available for use in writing messages or performing other work which may require both hands while at the same time the transmitter and its supporting standard, which must of necessity be in front of the operator tend to obscure the writing or other work which the writer may wish to perform.

My main object, therefore, is to obviate these objectionable features by installing upon the desk or table a swinging support carrying both the receiver and transmitter and concealing therein, the greater portions of the connecting cables or cords and also having a reasonable range of vertical and longitudinal adjustment so that the receiver and transmitter may be readily brought into operative position for conversation by the simple swinging movement of the support.

Another object is to provide a suitable switch brought into action by the manipulation of the swinging support for making and breaking connection between the call signals, telephonic instruments and line wire or wires.

A further object is to provide means for locking the swinging support in its adjusted position and to provide the receiver with a frictionally retained flexing extension carrying an ear piece whereby the latter may be adjusted to conform to the position of the ear during conversation and also for the pur-

pose of reducing to a minimum the resonance or reverberation of sound from the transmitter to the receiver or vice versa and also from the desk to the instruments.

A still further object is to mount the receiver and transmitter upon the swinging support in such manner that both may be simultaneously reversed for use either with the left or right ear.

Other objects and uses will be brought out in the following description.

In the drawings—Figure 1 is an elevation of my improved telephonic instrument showing in section a portion of a desk or table upon which it is mounted. Fig. 2 is an enlarged front elevation partly in section of the instrument shown in Fig. 1 omitting the switch box. Figs. 3 and 4 are sectional views taken respectively on lines 3—3, Fig. 1, and 4—4, Fig. 3, the receiver supporting arm being shown as rocked downwardly to the plane of the horizontal portion of the swinging support while the joint between the receiver arm and swinging support is shown in top plan in Fig. 3. Figs. 5 and 6 are sectional views at right angles to each other through the switch box, the switch terminals and their support being shown in section in Fig. 5. Fig. 7 is a sectional view taken on line 7—7, Fig. 5. Fig. 8 is an elevation partly in section similar to Fig. 1 showing a slightly modified form of my invention. Fig. 9 is an enlarged front view partly in section similar to Fig. 2 of the device shown in Fig. 8. Figs. 10, 11 and 12 are sectional views taken respectively on lines 10—10, 11—11, Fig. 8 and 12—12, Fig. 11.

In carrying out the objects stated I provide a rotary upright tubular standard —1— with a lateral horizontal offset —2— having a telescoping tubular extension —3— carrying at its outer end a telephone transmitter —4— and a vertically swinging tubular receiver arm —5— upon which is mounted a telephone receiver —6—, the tubular parts 1, 2, 3 and 5 serving to receive and conceal the wires —7— which lead to and from the transmitter —4— and receiver —6— thereby avoiding any possibility of the wires becoming twisted or entangled around objects upon the main support upon which the entire instrument is mounted and also obviating all liability of overstraining the wire connections or injury to the transmitter and receiving instruments.

The tubular standard —1— is rotatable and adjustable axially in an upright bearing —8— forming an integral part of a bottom plate —9— which is secured to the top of a desk or table —10— having an opening —11— through which the tubular standard —1— extends. This bottom plate —9— forms the base of a suitable switch box having upright removable sides —12— rising some distance from and secured to the base plate —9— and inclosing the adjacent portion of the tubular standard —1— and a suitable electric switch —13— comprising one or more circuit closers and an operating member —14— for actuating the circuit closers —13—, the latter being electrically connected in the usual manner to cut the receiver into and out of the circuit as the standard —1— and parts carried thereby are rotated or swung to and from a normal position as will be presently described, the purpose being to cut the receiver out of circuit when the arm —2— is swung to one position and close the circuit to the receiver when said arm is swung to another position, in this instance, at substantially right angles to its normal position.

The upper end of the switch box is provided with a suitable cap —15— having a central aperture in which is journaled a collar —16— resting upon the top face of the cap —15— and having its central portion passed through the central opening in said plate and threaded for receiving a screw threaded disk —17— which rides against the under side of the cap.

The collar —16— and its underlying retaining cap —17— are, therefore, locked to each other and engage opposite faces of the cap —15— to retain them against relative axial movement although they are free to rotate upon the cap and serve as an additional support for the tubular standard —1— which is adjustable axially through the collar —16— and retaining disk —17— and is held in its adjusted position by a set screw —18— which is engaged in a threaded aperture —19— in the hub —16— and enters a lengthwise slot —20— in the adjacent side of the standard —1— so that the standard —1— and disk —17— and also the hub —16— may always be placed in the same circumferential position relative to each other for a purpose hereinafter described.

As previously stated the standard —1— with its horizontal swinging arm —2— are adapted to assume what may be termed a "normal position" and an "operative position" and I have, therefore, provided means whereby the electric switch or switches as the circuit closers —13— are opened when the arm —2— is swung to its normal position and automatically closed when swung to its operative position and comprising the disk —17— with one or more, in this instance two, diametrically opposite cams —21— so arranged that when the arm —2— carrying the receiver and transmitter is swung from its normal position to its operative position, one of the cams will be brought into engagement with the upper end of the switch member —14— thereby depressing the latter against the action of a spring —22— to bring the contact terminals of the circuit closers —13— into contact

with each other thereby closing the line circuit through the receiver and when swung to its normal position, said cams are forced out of engagement with the switch member —14— thus allowing the latter to be returned to its normal position by the spring —22— to allow the terminals of the circuit closers —13— to open and break electrical connection between the line and receiver. It is, therefore, apparent that when it is desired to use the telephonic instrument it is simply necessary to swing it from its normal to its operative position by which operation, the receiver is cut into the line circuit and when returned to its normal position, such receiver is cut out of the circuit.

The object in providing means for the vertical adjustment of the standard —1— and parts carried thereby is to permit the instrument to be used by the operator either in a sitting or standing position and the purpose of providing the disk —17— with a plurality of cams is to permit the instrument to be swung to its operative position to be used from different or opposite sides of the table and in order that it may be retained in its operative position against pressure of the ear against the receiver, I provide the periphery of the disk —17— with a series of teeth —23— which are adapted to be engaged by a movable locking member —24— as best seen in Figs. 5 and 7, said locking member being guided in a suitable bearing —25— in the side of the switch box and is provided with an external hand piece —26— by which it may be manipulated into and out of engagement with the teeth —23—.

The particular form of electric switch forms no part of my present invention, it being understood that I may employ any suitable switch or circuit closer brought into action by the swinging of the arm —2— to and from its normal position for opening and closing the circuit through the receiver.

The tubular extension —3— which carries the transmitter and receiver arm —5— is adjustable in the horizontal tubular offset —2— of the standard —1— for the purpose of varying the radius or sweep of action of the receiver and transmitter for different sizes of desks or tables upon which the instrument is mounted, the standard —1— being usually journaled centrally in the table or desk so that the receiver and transmitter may be used from either side thereof. This extension —3— is also rotatable in the tubular offset —2— of the standard —1— to permit the position of the receiver and transmitter to be reversed for either the left or right ear and for this purpose, the receiver supporting arm —5— is pivoted or hinged upon the free end of the extension —3— and is capable of being rocked vertically to opposite sides of its swinging axis.

As best seen in Figs. 2, 3 and 4, the free end of the extension —3— is provided with a bifurcated head forming opposite arms —26— between which the adjacent end as —28— of the receiver arm —5— is frictionally clamped by a clamping screw —27— which constitutes the pivot for the swinging arm —5— and also serves as a means for retaining the transmitter —4— in operative position.

The wires —7— leading to the transmitter and receiver are preferably formed into a cable and passed through the tubular standard —1—, offset —2— and extension —3—, those leading to the transmitter being brought out through an insulating bushing —30— in one side of the extension —3— near the swinging axis of the arm —5— and enter the back of the transmitter through a similar bushing —31— while the wires leading to the receiver are brought out through an insulating bushing —32— in the opposite side of the extension —3— and carried around the pivotal pin —27— and thence into the adjacent end of the receiver arm —5— through which they pass to the receiver —6—.

It will be seen from the foregoing description that a very small portion of the wires leading from the transmitter and receiver are exposed near the junction of the receiver arm —5— with the extension —3— and in order that the wires extending through the receiver arm may be free from any liability of being cut by the vertical swinging arm, I provide the latter with shoulders —34— which ride around and in close proximity to the adjacent concentric ends of the arms —26—, the edges of said arms —26— at the side of the pivot at which the receiver wires are located being provided with stop shoulders —35— which are disposed in the path of movement of the shoulders —34— to limit the swinging of the arm in this direction and thereby avoiding any possibility of unduly straining or cutting the wires at this point although the shoulders —35— are located a sufficient distance beyond the vertical plane of the swinging axis of the arm —5— to permit the latter to be moved nearly to a vertical position in this direction as for instance when the receiver and transmitter are adjusted for use with the right ear or reversed from the position shown in Figs. 1 and 2.

In order to reduce the resonance or reverberation of sounds to a minimum, both the transmitter and receiver are provided with tubular extensions —36—, and —37—, each of which is connected by a universal joint to its respective instrument so that the extension may be rocked in any direction or rotated about its axis, the extension —36— being provided with a suitable mouth piece —38— while the receiver extension —37— is provided with an ear piece —39—.

As best seen in Fig. 2, the universal connection of each extension —36— and —37— consists of a hollow ball —40— which is fitted in a suitable socket —41— the outer end of this socket being crimped around the ball —38— to retain it against endwise displacement and against which the ball is frictionally held in its adjusted position by a suitable spring —42—.

It will be seen from the foregoing description that both the transmitter and receiver are carried wholly by the tubular extension —3— which permits them to be swung horizontally to any position about the axis of the standard —1— and that the mouth piece —38— and ear piece —39— may be rocked limited distances in any direction to bring them into close proximity to the mouth and ear of the operator and that when the instrument is adjusted for use and locked by the locking member —24—, the receiver is cut into the line circuit and its ear piece readily adjusted to the ear by simply pressing the latter against it.

In the instrument shown in Figs. 1 to 4 inclusive, the transmitter is rigidly secured to the horizontal tubular extension 3— and the receiver arm —5— with the receiver —6— thereon are movable about the swinging axis or pivot —27— of said arm independently of the transmitter —4—.

In Figs. 8, 9, 10, 11 and 12, I have shown a transmitter —4'— as rigidly secured directly to a vertically swinging receiver arm —5'— which is fractionally clamped between the arms of a bifurcated head —26'— by a suitable clamping bolt —27'—, the latter constituting the pivotal pin about which the receiver arm with the receiver and transmitter thereon is adapted to turn when adjusting the instrument for use either with the left or right ear.

Aside from the differences above pointed out and that the receiver and transmitter extensions are omitted, the instrument shown in Figs. 8 to 11 inclusive is substantially the same as that shown in Figs. 1 to 4 inclusive.

In both of these modifications the horizontal offset —2— of the standard —1— terminates in a split hub —45— which is clamped upon the inclosed portion of the extension —3— by a suitable clamping screw —46— as best seen in Fig. 10 to hold the extension —3— and parts mounted thereon against turning or axial movement.

In the instrument shown in Figs. 8 to 12 inclusive, one set of the wires which are passed through the extension —3— are diverted laterally through an opening —47— in the side of the said extension near its junction with the receiver arm —5'— and are brought around one side of the pivotal pin —27'— and through suitable apertures —48— in the arm —5'— and thence into the transmitter —4'— which is secured to the arm —5'— near the pivot —27'—. The other set of wires are carried through the same opening —47— and enter a similar opening —49— in the arm —5'— near its junction with the extension —3— thereby exposing only a slight portion of the wires near said junction, the remaining portions of the wires being concealed within the standard —1— and its offset —2— and also the extension —3— and receiver arm —5'—.

When the transmitter is rigidly secured to the receiver arm in the manner previously described it is desirable to limit the vertical rocking movement of said arm to prevent the transmitter from being completely inverted which might render the action of the transmitter more or less unreliable and for this purpose I have provided the head —26'— with shoulders —50— in the path of movement of one or more shoulders —51— on the adjacent end of the lug or ear —28'— by which the receiver arm is connected to the head —26'—, said stop shoulders being arranged so as to permit a limited vertical movement of the receiver arm upon its pivot —27'— to opposite sides of the horizontal axis of the extension —3— so that the receiver may be reversed for use either with the right or left ear.

It is obvious from the foregoing description that the entire instrument is firmly supported upon the desk or table and becomes a permanent part thereof so that no part thereof can be damaged by falling upon the floor and that by concealing the cords within the tubular standard and its telescoping extension and also within the receiver arm, the liability of overstraining the wires or loosening the connections is reduced to a minimum thereby removing the possibility of interruptions from this source. It will also be observed that by providing the transmitter and receiver with frictionally retained rocking extensions, the distance between the mouth piece and ear piece may be readily adjusted to conform to the position of the head or to varying distances between the mouth and ear of different operators and that this same extension carrying the ear piece and mouth piece respectively reduces to a minimum what is commonly known as the "vibrating howl" or reverberation of sounds between the diaphragm and also reduces the liability of injury to the ear from heavy electric shocks such as lightning or any suddenly increased voltage in the circuit, said extensions of the receiver and transmitter also obviating the reverberation of vibrating noises from other instruments which may be used upon the same supporting desk or table. Furthermore, by attaching the transmitter and receiver in the manner shown in Figs. 1 to 4 inclusive, such instruments may be reversed for use

with the right or left ear without in any way impairing the service of such instruments.

In addition to the above advantages, it will be noted that when it is desired to use the instrument for receiving and transmitting messages, it is simply necessary to swing the arm —2— with the transmitter and receiver thereon from one position to another by which operation the electric switch is brought into action to cut the receiver into the circuit without the use of keys or cams and when not in use the arm may be returned to its normal position thereby cutting out the receiver from the line circuit so that the operation of making and breaking connection with the line circuit is entirely automatic and when in use the swinging parts may be locked so that considerable pressure of the ear against the receiver may be obtained without liability of breaking the electric connection and at the same time both hands are available for work which the operator may wish to perform and furthermore the mouth and ear pieces being located at one side of the swinging arm —2—, a clear vision of the work in hand may be had while the instrument is in use, the entire device being capable of use with a local or common battery set and although it is particularly adapted for train despatchers' service it is equally applicable for any desk use.

What I claim is:

1. In a telephone, hollow arms hinged to each other, a transmitter secured to one of said arms at its junction with the other arm, a receiver also secured to one of said arms a suitable distance from the transmitter, and circuit connections passing through said arms and connected to the receiver and to the transmitter.

2. In a telephone, a hollow rotary arm having a lateral offset extending some distance beyond its swinging axis, an extension on said offset a transmitter secured to the extension, a hollow receiver arm hinged to the extension at its junction with the transmitter, a receiver on the receiver arm and circuit connections passed through the hollow arms and connected to the transmitter and to the receiver.

3. In a telephone, a hollow arm having a lateral offset provided with a hollow extension adjustable lengthwise of the offset, a hollow receiver arm hinged to the extension to swing in a plane parallel therewith, a transmitter secured to the extension at its junction with the receiver arm, a receiver secured to the receiver arm, and circuit connections passed through the hollow arms and extension and connected to the transmitter and to the receiver.

4. In a telephone, a hollow rotary arm having a lateral offset provided with a hollow extension telescoping therewith and adjustable lengthwise thereof, a hollow receiver arm hinged to the extension to swing in a plane parallel therewith, a transmitter secured to the extension at its junction with the receiver arm, a receiver on the receiver arm, and circuit connections passed through said arms and extension and connected to the transmitter and to the receiver.

5. In a telephone, a switch box, a hollow arm entering the switch box and rotatable relatively thereto and provided with an extension, a switch in the box actuated by the rotation of the arm, a hollow receiver arm hinged to the extension, a transmitter secured to the extension at its junction with the receiver arm, a receiver on the receiver arm, and circuit connections passed through the hollow arms and connecting the switch to the receiver and to the transmitter.

6. In a telephone, a switch box, a hollow arm having an upright portion rotatable in the switch box and provided with a lateral offset extending some distance beyond its swinging axis, an extension on the offset a switch in the box actuated by the rotation of the arm, a transmitter mounted on the extension, a hollow receiver arm hinged to the extension at its junction with the transmitter, a receiver on the receiver arm, and circuit connections passed through the hollow arms and connecting the switch to the transmitter and its receiver.

7. In a telephone, a switch box, a hollow arm having an upright portion rotatable in the switch box and provided with a lateral offset having an extension adjustable lengthwise thereof, a switch in the box actuated by the rotation of said arm, a transmitter secured to the extension, a hollow receiver arm also secured to the extension, a receiver on the receiver arm, and circuit connections passed through said hollow arms and extension and connecting the switch to the transmitter and to the receiver.

8. In a telephone, a switch box, a switch in the box, a hollow rotary arm connected to the switch and rotatable relatively to the box, an extension on the arm, means for locking the arm against rotary movement, a transmitter on the extension, a hollow receiver arm hinged to the extension near its junction with the transmitter, a receiver on the receiver arm, and circuit connections passed through the hollow arms and connecting the switch to the transmitter and to the receiver.

In witness whereof I have hereunto set my hand this 28th day of February 1908.

SAMUEL L. VAN AKIN, Jr.

Witnesses:

H. E. Chase,

C. M. McCormack.