

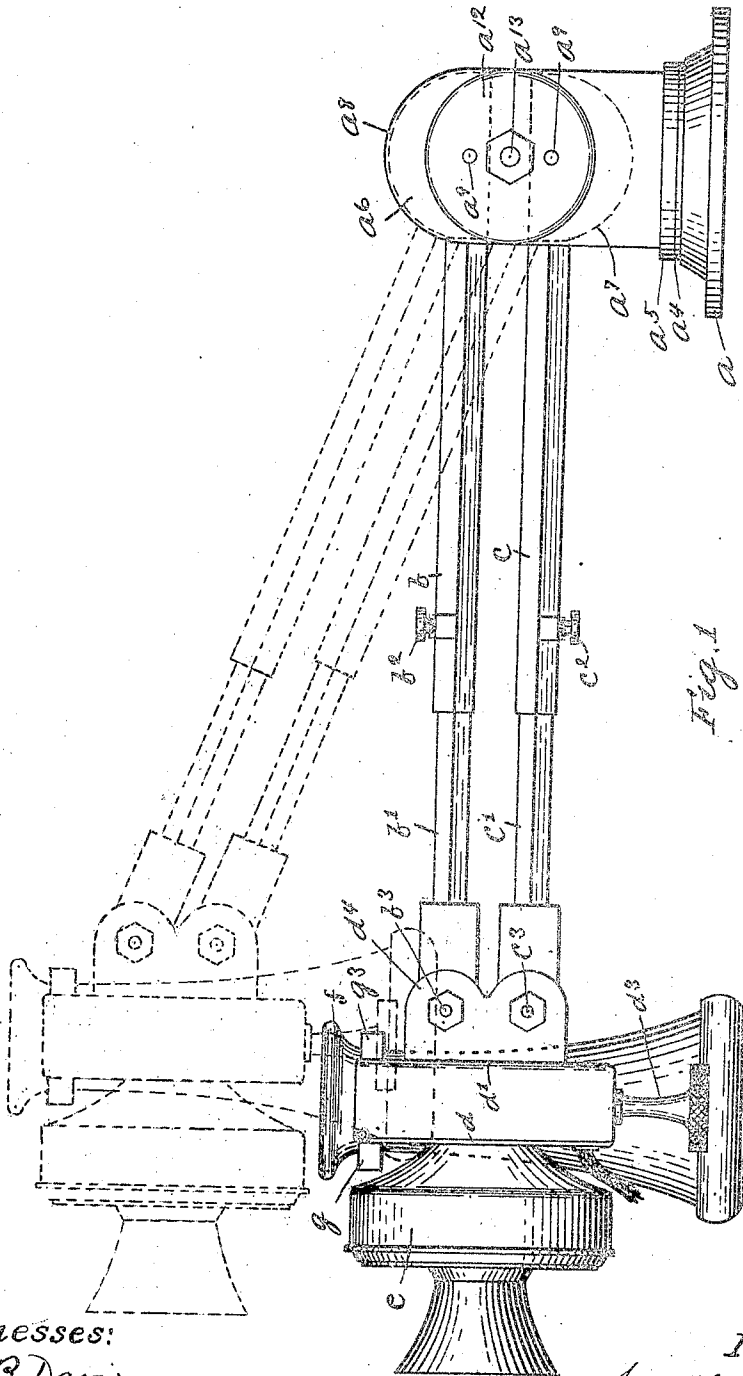
No. 827,692.

PATENTED JULY 31, 1906.

S. C. HOUGHTON.  
DESK TELEPHONE.

APPLICATION FILED OCT. 23, 1905.

3 SHEETS—SHEET 1.



Witnesses:

H. B. Davis

Cynthia Doyle

Inventor:

Stephen C. Houghton

By Hayes & Harman

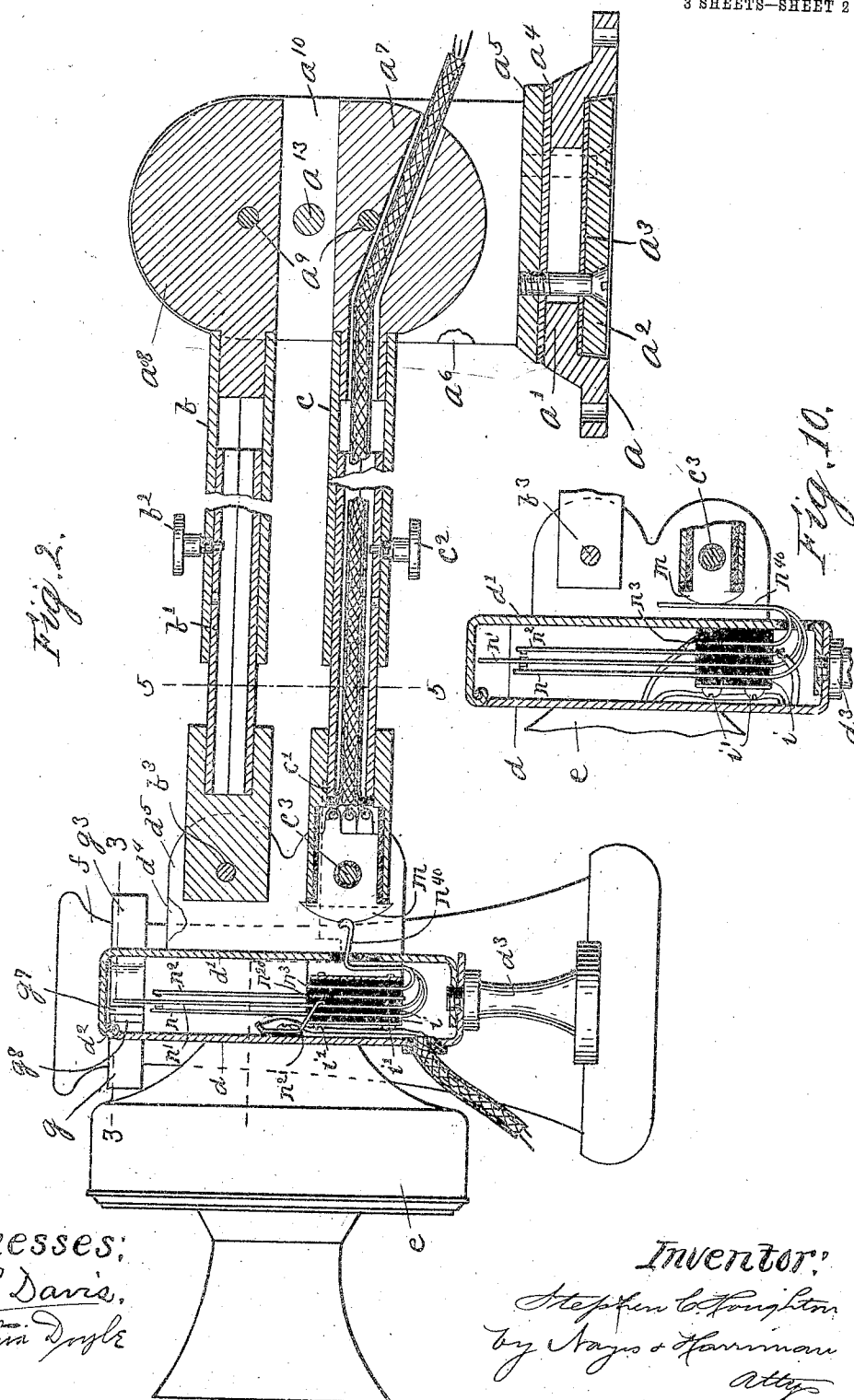
Attys

No. 827,692.

PATENTED JULY 31, 1906.

S. C. HOUGHTON.  
DESK TELEPHONE.  
APPLICATION FILED OCT. 23, 1905.

3 SHEETS—SHEET 2



Witnesses:  
H. B. Davis,  
Cynthia Doyle

Inventor:  
Stephen C. Houghton  
by Hayes & Harriman  
attys

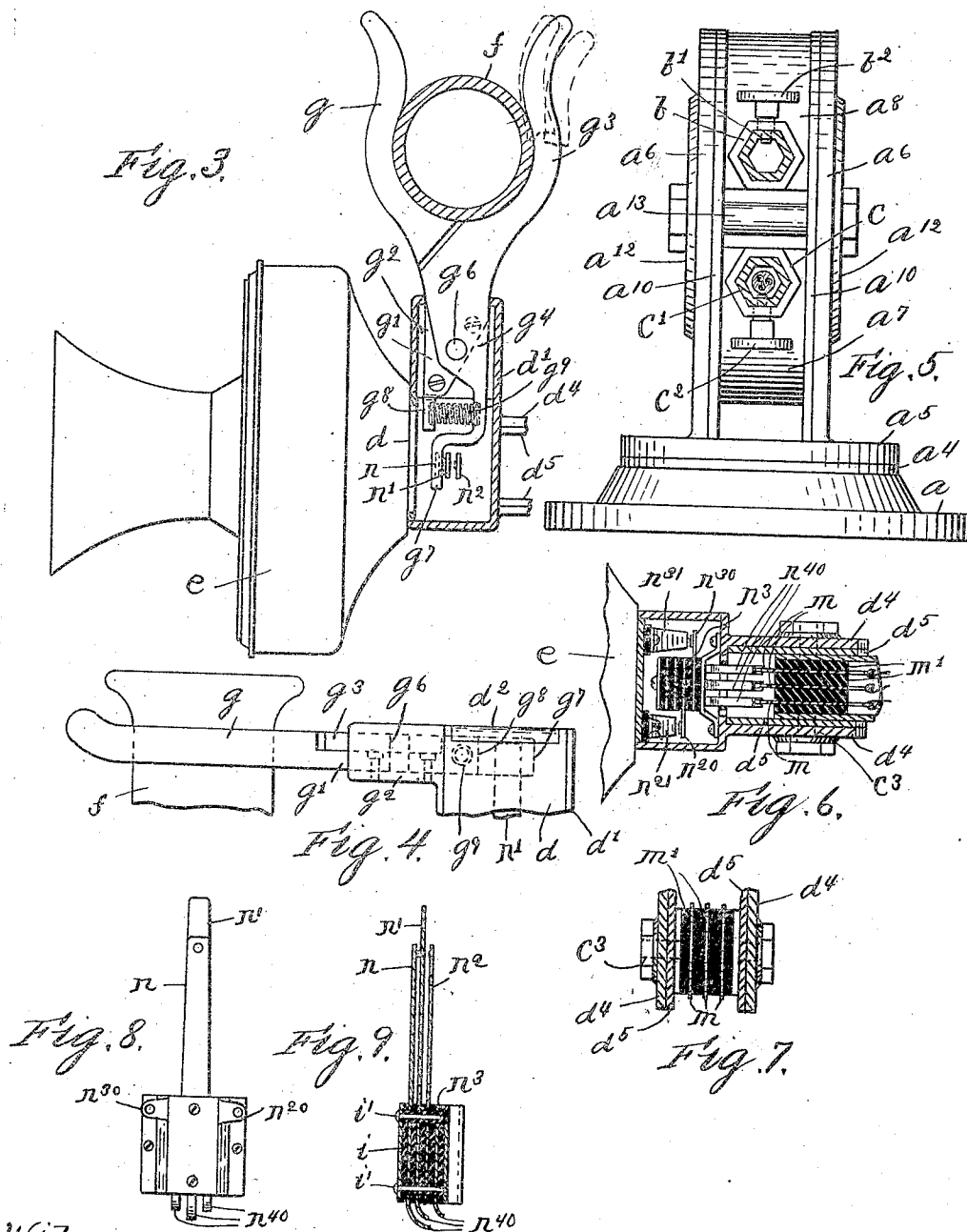
No. 827,692.

PATENTED JULY 31, 1906.

S. C. HOUGHTON.  
DESK TELEPHONE.

APPLICATION FILED OCT. 23, 1905.

3 SHEETS--SHEET 3.



Witnesses:

H. B. Davis.  
Cynthia Doyle.

*Inventor:*

Stephen C. Houghton  
by Mayes & Harriman  
Attys

# UNITED STATES PATENT OFFICE.

STEPHEN C. HOUGHTON, OF ROME, NEW YORK ASSIGNOR TO THE WIRE  
AND TELEPHONE COMPANY OF AMERICA, OF ROME, NEW YORK.

## DESK-TELEPHONE.

No. 827,692.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed October 23, 1905. Serial No. 283,909.

*To all whom it may concern:*

Be it known that I, STEPHEN C. HOUGHTON, of Rome, county of Oneida, State of New York, have invented an Improvement in Desk-Telephones, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object to improve the construction of desk-telephones, whereby the telephone transmitter and receiver are supported at the extremity of an arm, or it may be a pair of arms, pivoted to a suitable support, so that they may be held at different elevations, said arms being frictionally held in whatever position they may be set; also, to provide a support for said pivoted arms which is movable on a vertical axis and which may be held in whatever position it may be set, so that the telephone transmitter and receiver may be swung in the arc of a circle about said support as a center; also, to provide longitudinally-extensible supporting-arms for the telephone transmitter and receiver, whereby they may be moved a greater or less distance from the fixed support; also, to provide a switch-box at the extremity of the supporting arm or arms which is adapted to support the transmitter and which has connected with it a support for the receiver, said box containing switches for either the bell-circuit or talking-circuit, or both, adapted to be operated by the movable member of the receiver-support, and also containing electrical connections leading to the transmitter; also, to make the supporting-arm, or one of them if two are employed, tubular to receive the electric wires and to pivot the switch-box to the extremity of said tubular supporting arm or arms and having means for connecting the switches and the electric connections contained therein with the electric wires, which are inclosed within the tubular supporting-arm in such manner as to provide for the movement of the switch-box on its pivot with respect to said arm; also, to improve the construction of the parts in many respects, as will be hereinafter pointed out.

Figure 1 is a side elevation of a desk-telephone embodying this invention. Fig. 2 is a longitudinal vertical section of the desk-telephone shown in Fig. 1. Fig. 3 is a horizontal

section of the switch-box, taken on the dotted line 3 3, Fig. 2, showing in plan view the receiver-support and the transmitter. Fig. 4 is an end view of the receiver-support and a portion of the switch-box. Fig. 5 is a vertical section taken on the dotted line 5 5, Fig. 2. Figs. 6, 7, 8, and 9 are details showing the switches contained in the switch-box and electrical connections with the wires contained in the tubular arm. Fig. 10 is a detail showing modified form of electrical connection of the switches with the wires contained in the tubular arm.

*a* represents a circular or other shaped base-plate, which is adapted to be screwed or otherwise secured to a desk or other support. This base-plate is made as a ring having at its upper end an inwardly-extended flange *a'*. Within the ring *a* and beneath the flange *a'* thereof a circular metallic plate *a<sup>2</sup>*, with a superimposed plate or washer *a<sup>3</sup>*, of fiber or other material, is located, and upon the ring, above the flange thereof, a plate or washer *a<sup>4</sup>*, of fiber or other material, is located, upon which is placed the circular or other shaped base *a<sup>5</sup>* for the swinging or pivoted support. The base *a<sup>5</sup>* and fiber plates *a<sup>4</sup>* *a<sup>3</sup>* and the plate *a<sup>2</sup>* are rigidly secured together by screws or otherwise and will turn together in the ring-like support *a* on a vertical axis to provide for swinging or turning the support for the arms bearing the telephone transmitter and receiver. The plates *a<sup>3</sup>* *a<sup>4</sup>* serve as friction-plates and by engaging the ring-like support act to hold the movable support in whatever position it may be set.

A pair of parallel-disposed pieces *a<sup>6</sup>* *a<sup>6</sup>* are erected upon the base *a<sup>5</sup>*, which occupy vertical positions thereon, or they may be formed integral with said base, and between said pieces two semicircular or other shaped blocks *a<sup>7</sup>* *a<sup>8</sup>* are placed, one above the other, which are pivotally supported by said pieces *a<sup>6</sup>* *a<sup>6</sup>*, *a<sup>9</sup>* *a<sup>9</sup>* representing the pivot-pins of said blocks. Plates or washers *a<sup>10</sup>* *a<sup>10</sup>*, of fiber or other suitable material, are placed between the opposite sides of the blocks *a<sup>7</sup>* *a<sup>8</sup>* and the side pieces *a<sup>6</sup>* *a<sup>6</sup>*, which act as frictional plates. On the outer side of each upright piece *a<sup>6</sup>* *a<sup>6</sup>* a circular or other shaped plate *a<sup>12</sup>* is placed, and a bolt *a<sup>13</sup>* passes through said plates *a<sup>12</sup>* and the side pieces *a<sup>6</sup>* *a<sup>6</sup>*, which serves as a means of drawing said side pieces *a<sup>6</sup>* *a<sup>6</sup>* toward each other, so as to bind the friction-

plates, and thereby hold the blocks  $a^7$   $a^8$  in whatever position they may be set. The two blocks  $a^7$   $a^8$  are separated sufficiently to provide a space between them for the bolt  $a^{13}$ . The blocks  $a^7$   $a^8$  are thus pivotally supported and frictionally held.

A pair of parallel arms extend from the blocks  $a^7$   $a^8$ , which support the telephone transmitter and receiver. These arms are each longitudinally extensible, being made telescopic for this purpose. The uppermost arm, which is attached to the block  $a^8$ , consists of a tubular rod  $b$ , containing a rod  $b'$ , which is also preferably, although not necessarily, made tubular. The inner rod  $b'$  is movable longitudinally with respect to the outer rod  $b$ , and said inner rod  $b'$  will be held in any position of adjustment by a set-screw  $b^2$ . The rod  $b$  is designed to have a hole through it for the rod  $b'$ , which is made other than round, and the rod  $b'$  is made of a shape to fit said hole, being thereby prevented from twisting. As herein shown, the outer rod is made hexagonal and has a hexagonal hole through it, and a rod  $b'$  is likewise made hexagonal to fit and slide longitudinally in the hole in the rod  $b$ . The lowermost arm, which is attached to the block  $a^7$ , consists of a tubular rod  $c$ , containing a tubular rod  $c'$ , the inner rod  $c'$  being movable longitudinally with respect to the rod  $c$  and adapted to be held in any position of adjustment by a set-screw  $c^2$ . The inner rod  $c'$  is made tubular, so that, together with the tubular rod  $c$  containing it, an inclosed casing is provided for the electric wires, and the block  $a^7$ , to which said longitudinally-extensible arm is attached, is also provided with a hole through it for said wires in continuation of the hole through the supporting-arm. The rod  $c$  is designed to have a hole through it for the rod  $c'$ , which is made other than round, and the rod  $c'$  is made of a shape to fit said hole, being thereby prevented from turning. As herein shown, the outer rod is made hexagonal and has a hexagonal hole through it, and the rod  $c'$  is likewise made hexagonal to fit and slide longitudinally in the hole in the rod  $c$ . While I prefer to make the parallel arms longitudinally extensible to afford a greater range of adjustment, yet this is not an important feature of my invention.

It will be observed that by raising and lowering the arms the telephone transmitter and receiver to be described will be held at different elevations, and by longitudinally adjusting said arms they may be held at a greater or less distance from the fixed support, and, furthermore, by swinging the main support relative to the fixed support they may be moved in the arc of a circle about said fixed support as a center.

At the extremities of the pivoted supporting-arms a switch-box is supported containing the switches for the bell-circuit or talking-

circuit, or both, and said box directly supports the telephone transmitter and receiver. The switch-box consists of a shell or case made in two parts, one of which comprises, essentially, the front wall  $d$  thereof and the other the rear wall  $d'$  thereof. The front wall  $d$  is hinged at  $d^2$  to the rear wall, so that the box may be opened to expose the switches within it by moving the front wall on the hinged connection. The two parts will be secured together by a screw  $d^3$ , which passes through the overlapping sides of the box at the lower end thereof. The telephone-transmitter is rigidly secured to the front wall of the switch-box. A pair of ears  $d^4$   $d^4$  extend from the rear wall of the switch-box, between which the extremities of the supporting-arms terminate, and said supporting-arms are each pivoted to said ears, as at  $b^3$   $c^3$ , so that as the transmitter is moved to different elevations by moving the supporting-arms on their pivots  $a^9$  the switch-box and parts supported by it will continue to occupy a vertical position. Between the ears  $d^4$  and the extremities of the supporting-arms action-plates  $d^5$ , of fiber or other material, may be placed, if desired, which assist the holding of the switch-box in whatever position it may be set. The telephone-receiver is also supported by the switch-box, a forked support being provided for holding it, one arm, as  $g$ , of which has a shank  $g'$ , which projects through a hole in the side wall of the switch-box and is stationarily supported therein by being secured to a block  $g^2$ , and the other arm, as  $g^3$ , of which has a shank  $g^4$ , which likewise projects through a hole in the side wall of the switch-box and is pivotally supported upon said block  $g^2$ ,  $g^4$  representing the pivot of said arm. The shank of the pivoted arm  $g^3$  has an extension  $g^7$ , which is adapted to engage one of the switch-pens which is contained in the switch-box, and the shank of the fixed arm has a rear extension  $g^8$ , and a spring  $g^9$  is placed between the two extensions  $g^7$   $g^8$ , the function of which is to move the extension  $g^7$  away from the extension  $g^8$  when permitted to act to thereby cause said extension  $g^7$  to move the switch-pen, said spring, however, being normally held compressed by the receiver  $f$ , which is placed between the arms  $g$   $g^3$  of the forked support, and thereby holds them separated.

Within the switch-box three long slender spring-acting switch-pens  $n$   $n'$   $n^2$  are supported in vertical position and in parallelism, the middle pen  $n$  being made longer than the other pens, and said middle pen  $n'$  extends into close proximity to the extension  $g^7$  on the movable member of the receiver-support, so as to be engaged and operated by said movable member when the receiver is removed from its support. The switch-pens  $n$   $n'$  are normally in engagement with each other to close the bell-circuit, and the pen  $n^2$  is normally disengaged therefrom, and when

said middle pen is engaged and operated by the movable member of the receiver-support it will be disengaged from the switch-pen  $n$  to thereby open the bell-circuit and will be moved into engagement with the switch-pen  $n^2$  to close the talking-circuit. With this arrangement of parts the switch-pen  $n$  will be connected with a circuit-wire containing the bell, (not shown,) and the switch-pen  $n'$  will be connected with the circuit-wire containing the generator, (not shown,) and the switch-pen  $n^2$  will be connected with a circuit-wire containing the battery. (Not shown.) The three switch-pens  $n$   $n'$   $n^2$ , together with a pen  $n^3$ , to be referred to, are all connected to a support and insulated from each other, and, as herein shown, said support consists of a pile of plates  $i$ , of insulating material, arranged with the pens between them, as shown, and screws  $i'$  pass through said plates, which hold them assembled and also secure them to a yoke or frame which is secured to the rear or stationary wall of the switch-box. By thus supporting the switch-pens it will be seen that they are insulated from each other, and also conveniently arranged in the switch-box, and also, when the front wall of the switch-box is opened, are readily accessible. The pen  $n^3$  is adapted to be connected with a circuit-wire leading to the transmitter, and the switch-pen  $n^2$ , which is connected with the battery-wire, is adapted to be connected with a circuit-wire leading to the receiver, and to facilitate making these connections said pens  $n^3$   $n^2$  each have an ear projecting laterally from it, the ear  $n^{30}$  on the pen  $n^3$  projecting from one side of the pen and the ear  $n^{20}$  on the pen  $n^2$  projecting from the opposite side of the pen, and on the inner side of the front or movable wall of the switch-box two contact-pens  $n^{31}$   $n^{21}$  are secured, which are insulated therefrom and which, when the front wall is in its normal position, the box being closed, respectively engage said arms  $n^{30}$   $n^{20}$ . The circuit-wire leading to the transmitter is electrically connected with the contact-pen  $n^{30}$ . By providing these contact-pens  $n^{31}$   $n^{21}$  on the movable front wall of the switch-box it will be seen that said front wall can be swung open on its hinged connection, a result which could not be accomplished if the circuit-wires were directly connected to said pens  $n^3$   $n^2$ . Two of the switch-pens  $n$   $n'$  and the pen  $n^3$  are adapted to be connected with three circuit-wires which are inclosed within the tubular pivoted supporting-arm, and to effect this connection the lower ends of said pens are extended and bent and projected through a hole in the rear wall of the switch-box,  $n^{40}$   $n^{40}$   $n^{40}$  representing said extensions. The said extensions are held in continuous engagement with a corresponding number of plates  $m$   $m$   $m$ , which are supported by the tubular pivoted supporting-arm being used to receive said plates. The

three plates  $m$  are formed with curved ends or edges, to continuously engage the spring-acting extensions  $n^{40}$  as the supporting-arm is moved on its pivot and as the switch-box is moved on its pivot with respect to the supporting-arm. The said plates  $m$  have shanks which extend into the tubular arm. These plates are disposed in parallelism and arranged with plates of insulating material  $m'$  between them and also between the sides of the tubular arm, so that they are independently insulated from each other and from the supporting-arm, and the rear or inner ends of the shanks of the plates are respectively connected with the electric wires which are inclosed within the tubular supporting-arm. The three plates are assembled together with the plates of insulating material between them and are rigidly secured to the extremity of the pivoted supporting-arm. Thus it will be seen that the switch-box will at all times occupy a vertical position at any elevation it may be set and the electrical connections will be maintained.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a desk-telephone, a fixed base, a pair of friction-plates movably connected therewith, a support to which said friction-plates are attached, a pair of supporting-arms pivoted to said support, and a transmitter and a receiver supported by said arms, substantially as described.

2. In a desk-telephone, a fixed base, a support movably connected therewith, adapted to turn on a vertical axis comprising a pair of upright side pieces, a pair of blocks placed between said side pieces, telephone-supporting arms attached to said blocks, friction-plates located between the blocks and the side pieces, and a bolt for drawing said side pieces together, and a transmitter and a receiver supported by said arms, substantially as described.

3. In a desk-telephone, a pair of pivoted supporting-arms, one of which is made tubular to receive the electric wires, a switch-box pivotally connected to the extremities of said arms, which remains in vertical position as the supporting-arms are moved on their pivots and the switch-box thereby supported at different elevations, a plurality of plates supported by the arm containing the wires, which are respectively connected to said wires, and fingers connected with the switches contained in the switch-box which continuously engage said plates as the switch-box is moved relative to the arms, and a telephone-receiver support connected with said switch-box having means for operating the switches contained therein, substantially as described.

4. In a desk-telephone, a pair of pivoted supporting-arms, one of which is made tubu-

lar to receive the electric wires, a switch-box pivotally connected to the extremities of said arms, which remains in vertical position as the supporting-arms are moved on their pivots and the switch-box thereby supported at different elevations, a plurality of plates supported by the arm containing the wires which are respectively connected with said wires, and means connected with said switches for continuously engaging said plates as the switch-box is moved relative to the arms, and a telephone-receiver support connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

5. In a desk-telephone, a pair of supporting-arms, one of which is made tubular to receive the electric wires, a switch-box pivotally connected to the extremities of said arms containing switches for the bell-circuit or talking-circuit having yielding extensions, means supported by the arm containing the wires to which said wires are connected, adapted to be engaged continuously by said extensions as the switch-box is moved relative to the arms, and a telephone-receiver support connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

6. In a desk-telephone, a pair of pivoted supporting-arms, one of which is made tubular to receive the electric wires, a plurality of terminal plates supported at the end of said arm, respectively connected with said wires, a switch-box pivotally connected to the extremities of said arms containing switches for the bell-circuit or talking-circuit and also containing conducting-plates, fingers connected with said switches and also with said conducting-plates which continuously engage said terminal plates as the switch-box is moved relative to the arms, contact-pens attached to the switch-box which engage said conducting-plates and to which the telephone-transmitter is electrically connected, and a telephone-receiver support also connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

7. In a desk-telephone, a pair of pivoted supporting-arms, one of which is made tubular to receive the electric wires, a plurality of terminal plates supported at the end of said arm, respectively connected with said wires, a switch-box pivotally connected to the extremities of said arms containing switches for the bell-circuit or talking-circuit, and also containing conducting-plates, means connected with said switches and conducting-plates for continuously engaging said terminal plates as the switch-box is moved relative to the arms, contact-pens attached to the switch-box which engage said

conducting-plates, and to which the telephone-transmitter is electrically connected and a telephone-receiver support also connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

8. In a desk-telephone, a pivoted support having a passage for the electric wires, a switch-box pivoted to the extremity of said support containing switches for the bell-circuit or talking-circuit having extensions, a plurality of plates held by said support and respectively connected with the wires contained therein, which are continuously engaged by said extensions as the switch-box is moved relative to the support, and a telephone-receiver support connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

9. In a desk-telephone, a pivoted support having a passage for the electric wires, a switch-box pivoted to the extremity of said support containing switches for the bell-circuit or talking-circuit, a plurality of plates held by said support and respectively connected with the wires contained therein, and means connected with said switches for continuously engaging said plates as the switch-box is moved relative to the support, and a telephone-receiver support connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

10. In a desk-telephone, a pivoted support having a passage for the electric wires, a switch-box pivoted to the extremity of said support containing switches for the bell-circuit or talking-circuit having yielding extensions, means borne by said support and connected with the wires contained therein, adapted to be engaged continuously by said extensions as the switch-box is moved relative to the support, and a telephone-receiver support connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

11. In a desk-telephone, a pivoted support having a passage for the electric wires, a plurality of terminal plates held by said support and respectively connected with the wires, a switch-box pivotally connected to the extremity of said support containing switches for the bell-circuit or talking-circuit and also containing conducting-plates, fingers connected with said switches and said conducting-plates which continuously engage said terminal plates as the switch-box is moved relative to the support, contact-pens attached to the switch-box which engage said conducting-plates and to which the telephone-transmitter is electrically connected and a telephone-receiver support also connected with said switch-box, the movable

member of which is adapted to operate said switches, substantially as described.

12. In a desk-telephone, a pivoted support having a passage for the electric wires, a plurality of terminal plates held by said support and respectively connected with the wires, a switch-box pivotally connected to said support containing switches for the bell-circuit or talking-circuit and also containing conducting-plates, means connected with said switches and said conducting-plates which continuously engage said terminal plates as the switch-box is moved relative to the support, contact-pens attached to the switch-box which engage said conducting-plates and to which the telephone-transmitter is electrically connected, and a telephone-receiver support also connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

13. In a desk-telephone, a support having a passage for the electric wires, a switch-box pivoted to said support containing switches for the local circuits having extensions or fingers, a plurality of plates held by said support and respectively connected with the electric wires contained therein which are continuously engaged by said extensions or fingers as the switch-box is moved relative to

the support, and a telephone-receiver support connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

14. In a desk-telephone, a support having a passage for the electric wires, a plurality of terminal plates held by said support and respectively connected with the wires, a switch-box pivotally connected to said support containing switches for the local circuits and also containing conducting-plates, extensions or fingers on said switches and said conducting-plates, which continuously engage said terminal plates as the switch-box is moved relative to the support, contact-pens attached to the switch-box which engage said conducting-plates and to which the telephone-transmitter is electrically connected, and a telephone-receiver support also connected with said switch-box, the movable member of which is adapted to operate said switches, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

STEPHEN C. HOUGHTON.

Witnesses

F. M. POTTER, Jr.,  
H. D. POMEROY.