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W. F. H. GERMER.
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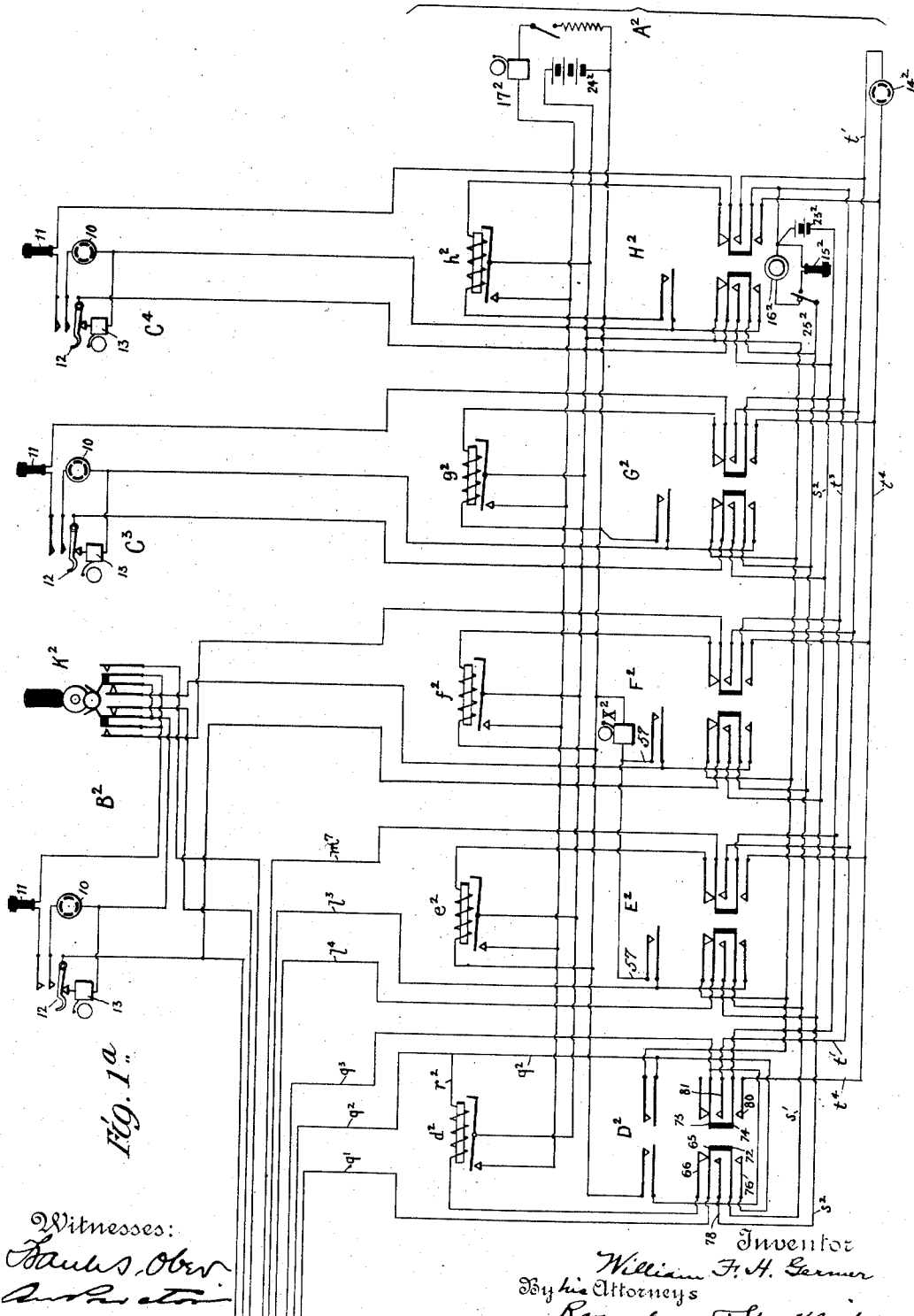


Fig. 1a.

Witnesses:
Pauls. Ober
Rosenbaum

Inventor
William F. H. Germer
By his Attorneys
Rosenbaum & Stockbridge

UNITED STATES PATENT OFFICE.

WILLIAM F. H. GERMER, OF NEW YORK, N. Y., ASSIGNOR TO GENERAL ACOUSTIC COMPANY,
A CORPORATION OF NEW YORK.

DICTOGRAPH.

No. 927,230.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM F. H. GERMER, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Dictographs, of which the following is a full, clear, and exact description.

My invention relates to what is known as a dictograph, being a telephonic system or apparatus by which a person, for example, the manager of an office, may dictate a letter to any one of his corps of stenographers without requiring them to leave their place at their own desks. Apparatus of this class forms the subject of Letters Patent Nos. 843,186, 875,081, and 880,537, the last-named patent being adapted to installations where there are two or more managers' stations and any number of stenographers' stations.

In the practical operation of the apparatus, certain traffic conditions, such as a possible false signal, might occasionally arise and cause a certain annoyance or inconvenience in the system.

It is the purpose of my present invention to provide an apparatus accomplishing the general purposes of the above Patent No. 880,537, but in which all traffic conditions are taken care of so perfectly that conditions will never arise where false signals or other improper effects are produced. I also provide stenographers' stations of varying characters in addition to the plurality of managers' stations, some of the stenographers' stations being adapted to communicate only with one manager's station, and others being adapted for selective intercourse with either of two managers' stations.

With these and other objects in view, the invention consists in the features of construction and arrangement of circuits as hereinafter set forth and claimed.

In the drawings: Figure 1 is a diagrammatic view of part of the circuits of a dictograph system having two managers' stations. Fig. 1^a is a view of the remainder of the circuits of the system; this figure is to be used in connection with Fig. 1 for the complete diagram.

As has been fully set forth in the prior patents above mentioned, one of the essential principles of a dictograph apparatus is the provision of separate talking circuits between any two communicating stations so that the conversation will not be echoed or thrown back into the room from which it proceeds. In my prior patents I have shown plans making use of four wires and three wires between the communicating stations, and which attain this independence of the respective talking circuits. In the present application I have used the general principles of the three-wire line connections, adapting them to a plurality of managers' stations, and to stenographers' stations of different characters. It is to be noted that the communication between two managers' stations is necessarily more complex than that between a manager's station and a stenographer's station, because each manager's station is equipped with a separate battery for its own talking circuits, and, when two managers' stations are in communication with one another, it is clear that the battery of one must be cut out or silenced. If the batteries of two managers' stations were both in the talking circuit at the same time, they would either neutralize one another to reduce the current flow, or assist one another to increase the current flow, both of which conditions are almost equally objectionable, since the instruments are adjusted to work with a certain current and do not operate as well with other current values.

Referring to the drawings, in which like parts are denominated by the same reference sign, two managers' stations are shown, and respectively denominated A' and A².

B' and B² designate what I shall term selective stenographers' stations, being equipped with apparatus adapted to communicate selectively with either of the two managers' stations.

C', C², C³, and C⁴ designate ordinary stenographers' stations which are adapted to communicate only with a single manager's station. It is evident that as many stations of each character may be provided as de-

sired, but those shown are sufficient to illustrate the principles of the invention. Each manager's station has keys or jacks or other suitable circuit-controlling means by which
 5 communication may be had with any stenographer's station of its own group, or any remote selective stenographer's station of another manager's group, or any other manager's station. The actual telephonic
 10 instruments of the system may be of any desired character, for example, they may be identical with those of the above mentioned patents.

10 denotes the transmitter, and 11 the receiver at a stenographer's station.

12 is the usual switch hook, and 13 is a call bell.

14' is the transmitter at the manager's station A', and 15' and 16' are a pair of telephone receivers, of which 15' is of the ordinary character, while 16' is a very sensitive instrument and may be termed a "loud ear piece."

17' is a call or night bell at the manager's station A', and which is operated in conjunction with the visual drops or signals in the usual way, which need not be described. The instruments and devices at the manager's station A² are exactly like those of station A' and are denominated by the same reference characters, except that index "2", instead of the prime mark, is used in denominating the parts at the station A². These particular instruments may be of any
 35 desired character, but it is best to employ the acousticon transmitter and other apparatus described in the above mentioned patents.

The keys or jacks at manager's station A' are denominated D', E', F', G', H', and each is associated with corresponding drop signals d', e', f', g', h'. Manager's station A² has corresponding keys D², E², F², G², H², and drop signals d², e², f², g², and h². The managers' stations have talking batteries respectively denominated 23' and 23², and signal batteries respectively denominated 24' and 24². There are also switches 25' and 25² at the respective managers' stations, for
 50 throwing the ordinary receiver or loud ear piece into the talking circuit.

I will now describe the various conditions and operations which take place and the electrical circuits which are completed in the normal operation of the apparatus.

The diagram of circuits shows the apparatus in its normal or passive condition when no one is talking. I will suppose the manager at station A' wishes to dictate a letter
 60 to the stenographer at station C'. Under these circumstances the key or jack G' is operated so as to elevate the elongated blade 30 which establishes the following ringing circuit: battery 24', wire l', wire l², blade 31,
 65 blade 30, wire l², call bell 13 at stenographer's

station C', switch hook 12, wire l⁴, blade 32, blade 33, wire l⁵, wire l⁶, and wire l⁷, back to battery 24'. The stenographer at station C' is therefore notified that communication is desired, and she accordingly removes the receiver from the hook 12. The manager at the same time displaces his key or jack G' so as to interrupt the contact between blades 30 and 31, and depress the blades 32, 35, 36, and 37. In this way a pair of separate talking
 75 circuits are established between the manager's station A' and the stenographer's station C' as follows: manager's transmitter 14', wire m', blade 39, blade 37, wire m², wire m³, wire m⁴, talking battery 23', wire m⁵, wire m⁶, blade 40, blade 32, wire l⁴, switch hook 12, contact blades 42 and 43, stenographer's receiver 11, wire m⁷, blade 36, blade 44, wire m⁸, wire m⁹, back to the manager's transmitter 14'. This circuit includes the manager's
 85 transmitter, stenographer's receiver, talking battery, and the wires l⁴ and m⁷. At the same time a talking circuit is established from the stenographer's station to the manager's station as follows: stenographer's
 90 transmitter 10, wire l³, blade 45, blade 35, wire n', wire n², manager's receiver 15' or 16' (depending on the position of the switch 25'), talking battery 23', wire m⁵, wire m⁶, blade 40, blade 32, wire l⁴, switch hook 12, and
 95 blade 42, back to the transmitter 10. This circuit includes the stenographer's transmitter, the manager's receiver, the talking battery 23', and the wires l³ and l⁴. This talking circuit is distinct from that previously traced in accordance with the principles fully
 100 set forth in Patent No. 880,537, which has already been referred to. I will now assume that the stenographer's station C' desires to call up the manager's station A'. Under
 105 these circumstances, the position of the switch blades at the manager's station is as shown in Fig. 1, so that, when the stenographer takes her receiver off the hook 12, a circuit is completed from battery 24', wire l',
 110 wire o', manager's visual signal g', wire o², blade 47, blade 36, wire m⁷, receiver 11, blade 43, blade 42, wire l⁴, blade 32, blade 33, wire l⁵, wire l⁶, wire l⁷, back to the battery 24'. The manager's signal is accordingly displayed
 115 to indicate that communication is desired.

The communication of manager's station A' with stenographer's station C² is made in exactly the same way as that already described, through the key or jack H'. In like
 120 manner communication from manager's station A² to stenographers' stations C³ and C⁴ is established through the keys or jacks G² and H² respectively.

The stenographers' stations B' and B² have been termed "selective" stenographers' stations, and are adapted for communication with either manager's station. Each of these stations has a switch K' and K² respectively
 125 which, in the normal condition of the apparatus

tus, is in the position shown in the drawings, corresponding to a condition of the circuits adapted to receive signals from either manager's station. Assuming that manager's station A' desires to communicate with selective stenographer's station B', the key or jack E' is operated in the same manner as has been described with the key G'. It will be observed that the wires l^3 and m^7 of stenographer's station B' are interrupted at the points 50 and 51 respectively, instead of being continuous, as with stenographer's station C'. The terminals p^1 and p^2 , which are thus produced in the wire l^3 , are carried to switch blades 52 and 53 respectively, and these switch blades are in contact in the normal position of key K'. In like manner the terminals p^3 and p^4 , formed by the interruption of the wire m^7 , are carried to the blades 54 and 55 which are not in contact with one another in the normal position of key K'. Inasmuch as the calling circuit from a manager's station to a stenographer's station takes place through the wires l^3 and l^4 , it is evident that the stenographer B' is free to be called by the manager A' when he operates his key or jack E'. When the call is received, the selective stenographer B' removes the receiver from the hook and presses the key K' to the left in Fig. 1, thereby establishing the circuit of wire m^7 through blades 54 and 55. Thereafter the communication proceeds exactly as has been described with stenographer's station C'. When selective stenographer's station B' desires to call up manager's station A', the key K' is obviously pressed to the right in the same way, after which the call is made by taking the receiver off the hook as has already been described for station C'.

The manager's station A² has a key E² adapted to call and establish talking circuits with the same selective stenographer's station B', which has been above referred to. For this purpose the circuit wires l^3 , l^4 , and m^7 of key E² are continued to join with the wires l^3 , l^4 and m^7 from the key E' of manager's station A', but the continuity of the wires l^3 and m^7 is designed to be interrupted by the switch K'. Wire l^3 from station A² is attached to switch blade 58 which is adapted to engage blade 59 connected to wire l^3 of stenographer's station B', as already described. In like manner wire m^7 is connected to a blade 60 which engages a blade 61 connected to wire m^7 of stenographer's station B', as already described. In the normal position of the key K', the wire m^7 from the key or jack E² is interrupted at blades 60, 61 in the same manner that wire m^7 from key or jack E' is interrupted at blades 54, 55. The complete circuit connections are, however, established through the other two wires in each case for making a call to stenographer

B' from either manager's station. The signaling is done by a code, so that the stenographer knows which manager's station is calling. For example, manager A' may have a predetermined code or signal of one ring, and manager A², two rings, or conversely. If it is manager's station A', the key K' is moved to the left, as has been already described. If the manager's station A² is calling, the key K' is moved to the right, whereupon the three circuit wires from manager's station A² will be put in a continuous circuit with selective stenographer's station B', but the circuits from the manager's station not in communication will be so interrupted that a call is made impossible as long as the line is busy.

I provide a busy test by which an indication is given to the calling manager under the above circumstances; that is to say, an indication by which one manager's station is advised when a selective stenographer's station B' or B² is already in communication with another manager. For this purpose I arrange the wires 57 leading from the upper blade of keys E' F' and E² F² to extend through bells X' and X², in place of being directly connected to the wires l^1 , as is done with the corresponding connections from the other keys. As a result of this arrangement, the bell X' or X² at the manager's station is rung whenever he signals to a selective stenographer's station B' or B², the particular code or signal given thereat being exactly reproduced in this way at the home station. If, however, a selective stenographer's station is busy, its signaling circuits to any other manager's station or stations are interrupted, so that such other manager will not receive the audible indication at his bell X' or X² when he makes a call. By this fact the manager is advised that the line is busy.

The circuits of the selective stenographer's station B² are exactly the same, and controlled in the same way, as the circuits of selective stenographer's station B'. The calls are made through the keys F' and F² respectively, and the stenographer's selective manipulation accomplished by the key K². It is not necessary to consider the details of the circuits and switch connections in this case, as they are identical with those already described for the selective stenographer's station B'.

In addition to the circuits thus far considered, I provide means by which either manager's station may call up and communicate with the other. For this purpose the managers' stations have keys D' and D² respectively, the line wires q^1 , q^2 , and q^3 of which are joined together. Supposing that manager's station A' desires to call up manager's station A². Key or jack D' is operated to connect blades 60 and 61; and 62 and 63 respectively. A calling circuit from man-

ager's station A' to station A² is established under these circumstances as follows: ringing battery 24', wire l', blade 61, blade 60, wire r', wire q', to manager's station A², blade 65, blade 66, visual signal d², wire r², wire q², back to manager's station A', blades 62 and 63, wires l² and l', back to battery 24'. A call from manager's station A² to manager's station A' will be made through circuits exactly corresponding to the foregoing in all respects, except over lines q² and q', by the manipulation of his key or jack D². I regard the arrangement by which different circuit wires are employed in making a call from station A' to station A² from those employed in calling from station A² to station A' as important. I have found in practice that, where the same circuit wires are used for calls in both directions, the calling battery is short circuited when both managers happen to call each other at the same time. It has also happened in practice that the shutters of a number of managers' stations are simultaneously exhibited, entirely improperly, when two managers' stations happen to call each other at the same time, unless their calling circuits are made over separate lines. This difficulty is caused by current being put through chance circuits where it is not intended to circulate, when two managers' stations simultaneously call each other, assuming that calls are not made over separate line wires, as is provided for by the present invention. After the call is made, both managers are put in telephonic communication by manipulating their keys or jacks D' and D², so as to depress the blades 68, 69, 70 and 71, and 65, 72, 73, and 74, respectively. The talking circuit from manager's station A' to manager's station A² is as follows: transmitter 14', wire m', blade 75, blade 71, wire q², to manager's station A², blades 76, 72, wire s', receiver 15² or 16² of manager's station A², battery 23², wire s², blade 78, blade 65, wire q', back to manager's station A', blade 68, blade 79, wire m², back to transmitter 14'. This circuit includes transmitter at station A', receiver at station A², and one talking battery 23². The line wires q', q² are made use of in this circuit. The talking circuit from manager's station A² to manager's station A' is as follows: transmitter 14², wire t', blades 81, 73, wire q², to manager's station A', blades 70, 84, wire m², receiver 15' or 16' at station A', wire n², blades 69, 85, wire q', back to manager's station A², blades 65, 78, wire s², battery 23², wire t², blades 74, 80, wire t', back to the transmitter 14². This circuit includes transmitter at station A², receiver at station A', and the talking battery 23². It makes use of circuit wires q' and q², as distinguished from q' and q² used in the communication in the opposite direction. The talking circuits are therefore each made

through a battery at one manager's station and over separate line wires, as is required.

The foregoing circuits are believed to include all the normal calling and talking conditions which arise in practice. It will be evident that the circuits enumerated accomplish all of the necessary functions for calling and talking purposes. These circuits are designed with a view of avoiding any improper signals or other effects from any special or peculiar coincidences in the conditions of the various instruments and circuit controlling devices of the system. It is believed that this result is perfectly accomplished, and that no conditions can arise to produce improper effects or signals. It is, however, unnecessary to consider in detail the characteristics of the circuits by which they are prevented from giving improper indications or effects under such special or peculiar conditions, which might arise under certain conceivable circumstances or coincidences.

What I claim is:

1. In a telephone system or apparatus, a plurality of managers' stations, a stenographer's station, a three-wire circuit extending from said stenographer's station to each of the managers' stations, and a key normally opening one wire in each such three-wire circuit and adapted to open another wire of each three-wire circuit to non-communicating managers' stations when talking circuits are established to any particular manager's station.

2. In a telephone system or apparatus, a stenographer's station having a call bell, a manager's station having a battery and a two-way key, a pair of blades movable into contact with one another by a displacement of said key in one direction to complete a ringing circuit including said battery and said call bell, and blades for establishing two separate talking circuits when the key is displaced in the other direction.

3. In a telephone system or apparatus, a manager's station having keys with separate blades adapted to be displaced for ringing, and establishing talking circuits respectively, a calling battery at the manager's station, a stenographer's station having a receiver, a transmitter, and a call bell, means for completing the circuit from said battery through said call bell when the first mentioned blades of said key are displaced, and means for completing separate talking circuits from the manager's station to the stenographer's station and from the stenographer's station to the manager's station when the last mentioned blades of said key are displaced.

4. In a telephone system or apparatus, a stenographer's station, a plurality of managers' stations, connections therefrom to said stenographer's station, a selective key at the stenographer's station, whereby signaling

circuits, other than that of the manager with whom communication is established, are interrupted, and an audible signal at each manager's station, included in the signal circuit therefrom to said stenographer's station, whereby a busy test is given by the silence of said audible signal.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

WILLIAM F. H. GERMER.

Witnesses:

WALDO M. CHAPIN,
JAMES D'ANTONIO.