

PATENT SPECIFICATION

536,945



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Complete Specification Accepted : June 3, 1941.

PROVISIONAL SPECIFICATION

Improvements in Telephone Systems

We, TELEPHONE MANUFACTURING COMPANY LIMITED, a British Company, of Hollingsworth Works, Martell Road, West Dulwich, London, S.E.21, and

5 LESLIE HAROLD PADDLE, a British Subject, of 92, Lancaster Road, West Norwood, London, S.E.27, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to electrical communication systems, and more particularly to telephone systems in which means are afforded by which secrecy may be obtained. Preferably

15 secrecy is obtained by means of a frequency inversion device.

In our co-pending application No. 18837/39 (Serial No. 531,318), there is described such a system, in which the subscribers, that is to say the persons between whom communication is ultimately established, are provided each with two instruments one of which is intended to be used for normal communication whilst the other is used for secret conversation.

The present invention also makes use of two instruments, but whereas in the earlier application referred to a secrecy apparatus is directly associated with the one instrument of each subscriber, thus requiring a separate secrecy apparatus for each subscriber, with the present invention there is provided an arrangement wherein the number of secrecy equipments required may be reduced without any loss of facilities.

According to the present invention the subscribers who are to be afforded secrecy, facilities are each provided with two telephone instruments having separate circuits extending to an exchange. Secrecy equipments are located at the exchange and means are provided whereby one such equipment may be inserted in the line of one of the subscriber's instruments.

This may be effected in various ways; in a manual exchange switchboard installation there may be provided lines extending from the two instruments located at the subscriber's position to separate jacks at the manual operator's

switchboard. Communication is initiated by calling the operator in the usual manner by lifting the handset of the instrument employed for normal (i.e. unconverted) speech. The call may be completely or partly established, but if at any time it is desired to change to secret communication the operator is recalled and requested to change to secret communication.

Accordingly, the operator plugs the other jack in place of the normal jack. If an inverting or similar converting device is included in the line between the "secret" instrument and the second jack, secret communication will be thereby established, but such an arrangement requires that each subscriber to be given secret communication facilities has one converting device allocated solely to his use. Such an arrangement is however uneconomical.

We prefer to arrange that the inverting or like secrecy device is arranged in a part of the circuit which is common, or may be made common, to a plurality of subscribers. Thus we may arrange that in response to the recall of the operator, or in response to a calling signal to the operator when the "secret" handset is raised, the operator plugs into the second jack a circuit which includes a secrecy device between the secret instrument and the outgoing line. Use may be made of a double plug and jack if necessary in order that certain signalling operations may be rendered possible. It will be appreciated that the normal signals and facilities may also be provided.

In the case of an automatic installation there may be provided at the switchboard a finder switch comprising a pair of wipers giving access to the secrecy device and a plurality of contacts connected to the "secret" lines of the various subscribers. When the "secret" handset is lifted the finder switch functions to connect a disengaged inverting or like device to a calling subscriber's line.

When secret communication is established, a revertive signal may be given to the subscribers to indicate that fact.

Dated this 28th day of November, 1939.

A. A. THORNTON,
Chartered Patent Agents,
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For the Applicants.

COMPLETE SPECIFICATION

Improvements in Telephone Systems

We, TELEPHONE MANUFACTURING COMPANY LIMITED, a British Company, of Hollingsworth Works, Martell Road, West Dulwich, London, S.E.21, and
5 LESLIE HAROLD PADDLE, a British Subject, of "Riverdale", St. Paul's Cray, in the county of Kent (formerly of 92, Lancaster Road, West Norwood, London, S.E.27), do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

15 This invention relates to telephone systems in which means are afforded by which secrecy may be obtained, for example through the use of a frequency inversion device.

20 In our co-pending United Kingdom Application No. 18837/39 (Serial No. 531,318) we have described such a telephone system whereby subscribers, that is to say the persons between whom communication is ultimately established, are
25 provided each with two telephone instruments, one of which is intended to be used for normal communication whilst the other is reserved for secret conversation. Furthermore in this arrangement a
30 secrecy apparatus is directly associated with one instrument of each subscriber, thus requiring a separate secrecy apparatus for each subscriber, whereas according to the present invention there
35 is provided an arrangement wherein the number of secrecy equipments required may be reduced without loss of facilities, although of course it will be understood that in order to effect secret communication the two stations concerned must have
40 complementary secrecy facilities, for example corresponding frequency inverting and re-inverting equipment at their disposal.

45 According to one feature of the present invention a telephone system enabling normal or secret communication to be effected, comprises a secrecy equipment located at an exchange and circuit means
50 whereby there can be established two separate circuits extending through and from said exchange to a subscriber who is to be afforded secrecy facilities, one of said circuits including a secrecy equip-
55 ment.

In one embodiment of the invention two

separate circuits extend from an exchange to a subscriber who is to be afforded secrecy facilities and means are provided whereby a secrecy equipment, which is
60 located at said exchange, can be introduced between one of said two circuits and an outgoing line.

The exchange installation may comprise a plurality of secrecy equipments,
65 such as frequency inverting devices, and means whereby one such equipment can be inserted in the "secret" line of a subscriber. In the case of an automatic exchange finder switches can be provided
70 for automatically connecting a disengaged secrecy equipment to the line.

By providing each subscriber, who is to be afforded secrecy facilities, with two separate telephone instruments connected
75 with the exchange by the respective separate circuits, one of these instruments together with its own circuit can be reserved for secret conversation. Thus, assuming normal communication has been
80 established by means of the "normal" telephone instrument it is possible at any time to change to secret communication by using the "secret" telephone instrument and, for example, in the case
85 of a manual exchange, requesting the operator to make the necessary circuit change, for instance the insertion of the secrecy equipment in the "secret" circuit. Alternatively, the insertion of
90 the secrecy equipment may be effected automatically as a result of using the "secret" telephone instrument.

A secrecy equipment may be permanently included in the subscriber's line
95 between the "secret" telephone instrument and the line jack at the exchange but such an arrangement is uneconomical as each subscriber to be given secret communication facilities must have a secrecy
100 equipment allocated solely to his use.

Consequently it is preferred to arrange the secrecy equipment in a part of the circuit which is common or at least can be made common to a plurality of sub-
105 scribers. Thus the arrangement may be such that in response to a recall of the operator or a calling signal resulting from the raising of the "secret" telephone instrument, a secrecy equipment can be
110 introduced between the "secret" circuit jack and the outgoing line. It will be

appreciated that the normal signals and facilities may also be provided.

The following description with reference to the accompanying drawing will enable the nature of the invention to be appreciated, this description and drawing being presented by way of example only.

The drawing shows in a schematic manner a telephone system according to the invention which comprises a manual exchange having an operator's switchboard equipment which includes a pair of subscriber's line jacks 1 and 2 terminating two separate subscriber's lines 3 and 4 provided between the exchange and two separate telephone instruments 5 and 6 situated at a subscriber's station. The switchboard equipment also includes cord line plugs 7 and 8 for the respective jacks 1 and 2, a ringing key 9, speaking/listening key 10, ringing key 11, cord line plugs 12 and 13 and co-operative outgoing line jacks 14 and 15 respectively.

The telephone instrument 5 is reserved for normal communication, that is to say unconverted speech, together with the circuit comprising the subscriber's line 3, jack 1, plug 7, plug 12 and jack 14 leading to the outgoing line 16. Communication over this circuit can be established in the normal way and permits of normal conversation between a subscriber using the telephone instrument 5 and a subscriber connected with the outgoing line 16 either via the same exchange or another exchange.

The telephone instrument 6 is reserved for secret conversation over the circuit comprising the subscriber's line 4, jack 2, plug 8, plug 13, jack 15, and a frequency inverting or other secrecy equipment 17 arranged between the jack 15 and the outgoing line 16.

Assuming communication has been established over the circuit associated with the "normal" telephone instrument 5 and the subscriber using the latter instrument desires to change to secret conversation, he can recall the exchange operator by using the "secret" telephone instrument 6, whereupon the operator can establish the desired communication over the "secret" circuit which includes the secrecy equipment 17. Facilities may in some cases be provided whereby the operator can converse with the subscriber over the "secret" line, thus enabling the subscriber to make a request over this line for secret communication. Reconstitution of the converted speech may take place through the intermediary of a frequency inverting or other appropriate equipment located at another exchange through which the out-

put from the line 16 passes or, if the other subscriber is on the same exchange, at the other subscriber's station.

It will of course be understood that any desired suitable signalling means can be incorporated in the exchange equipment for indicating to the operator the various circuit conditions. Furthermore automatic operating means may be included, either at the subscriber's station or the exchange to assure that the communication line is held during the change over from normal to secret communication.

In the case of an automatic exchange installation there may be provided at the switchboard finder switch means comprising a pair of wipers giving access to the secrecy equipment and a plurality of contacts connected to the "secret" lines of the various subscribers. Thus, when a "secret" telephone instrument is raised for use the finder switch automatically functions to establish connection between a disengaged secrecy equipment and the calling subscriber's line.

Telephone systems according to the invention may include means whereby a revertive signal may be given to the subscribers to indicate the fact that the circuit for secret conversation is established.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A telephone system enabling either normal or secret communication to be effected, comprising a secrecy equipment located at an exchange and circuit means whereby there can be established two separate circuits extending through and from said exchange to a subscriber who is to be afforded secrecy facilities, one of said circuits including the secrecy equipment.

2. A telephone system enabling either normal or secret communication to be effected, comprising two separate circuits extending from an exchange to a subscriber who is to be afforded secrecy facilities, a secrecy equipment located at said exchange and means whereby said equipment can be introduced between one of said two circuits and an outgoing line.

3. A telephone system wherein a subscriber is provided with two telephone instruments, one appertaining to normal communication over one circuit and the other appertaining to secret communication over a separate circuit, an exchange installation comprising a secrecy equipment for said latter circuit and means whereby change-over from the "normal" circuit to the "secret" circuit can be

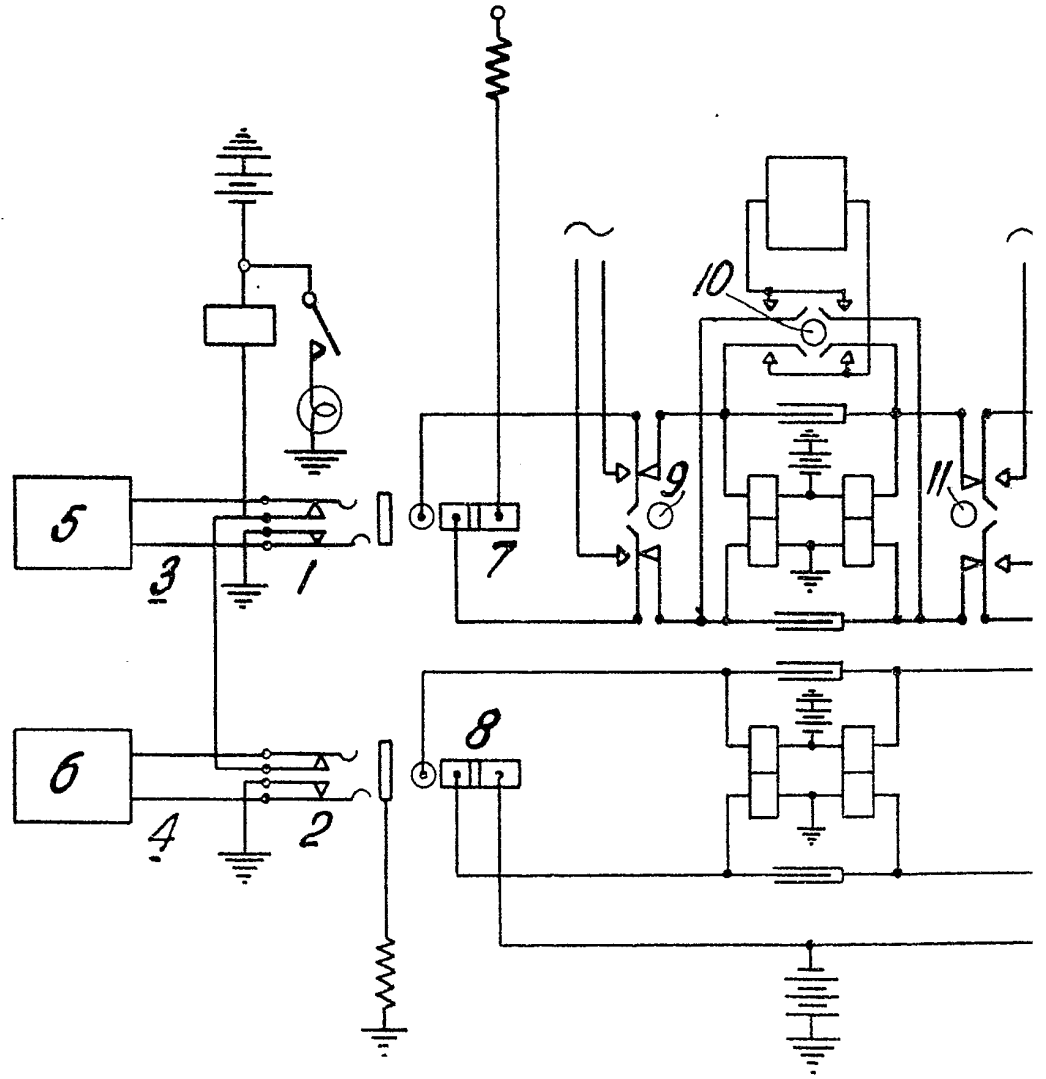
- effected at said exchange in response to a signal or request transmitted over the subscriber's line which includes the "secret" telephone instrument.
- 5 4. A telephone system according to any of the preceding claims, wherein a plurality of secrecy equipments are located at the exchange and means are provided whereby an equipment which is disengaged can be introduced into one of the two separate circuits extending to the subscriber and to whom "secrecy" is to be afforded.
- 10 5. A telephone system according to any of the preceding claims, comprising a manual exchange installation which includes plug and jack means whereby the "secret" communication circuit can be established.
6. A telephone system according to claim 4, comprising an automatic exchange installation which includes finder switch means for automatically connecting a disengaged secrecy equipment with a calling line.
- 25 7. A telephone system according to any of the preceding claims, wherein the secrecy equipment comprises a frequency inverting device.
8. Telephone systems constructed, arranged, and adapted to operate substantially as herein shown or described.
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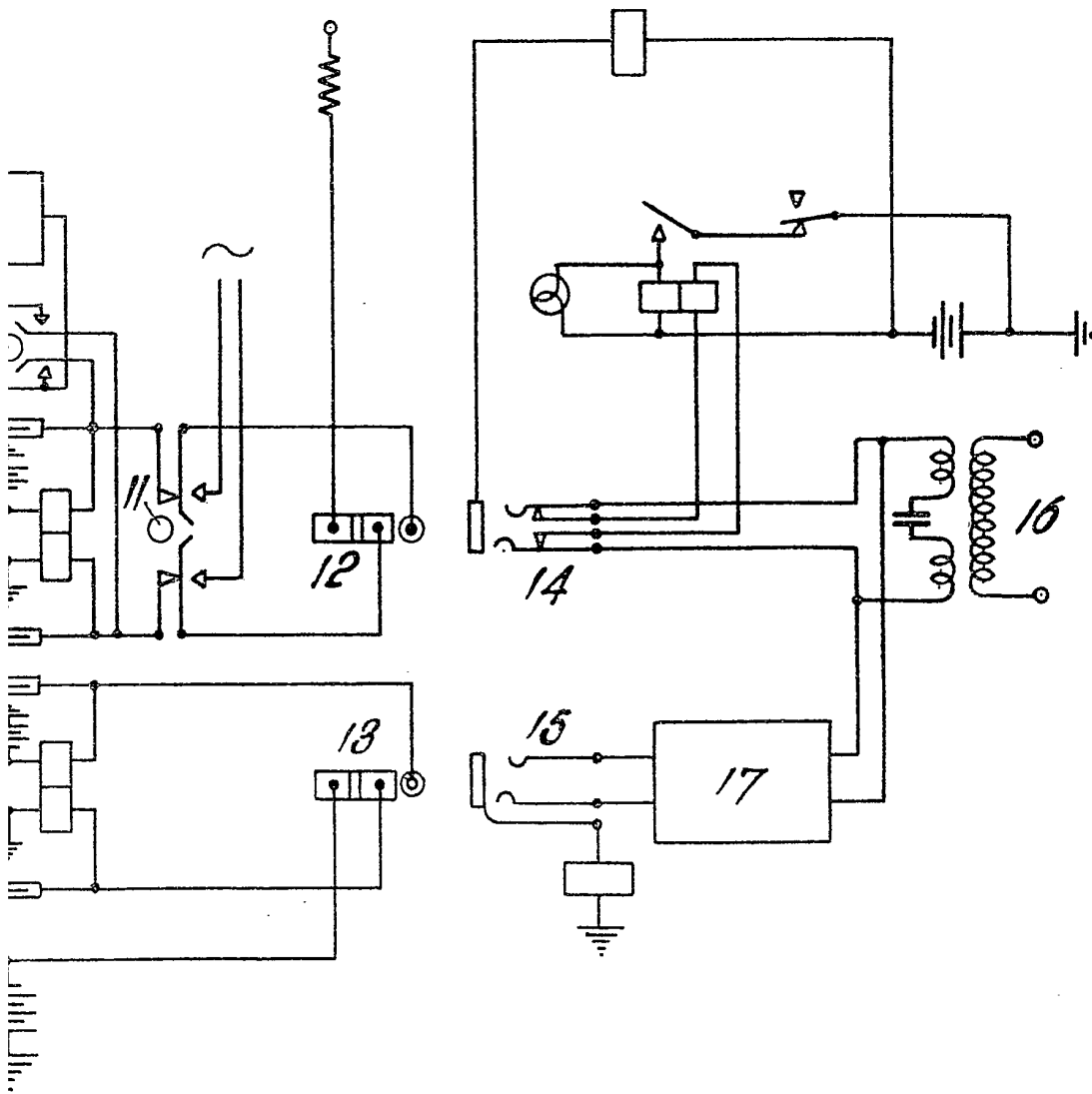
Dated this 18th day of October, 1940.

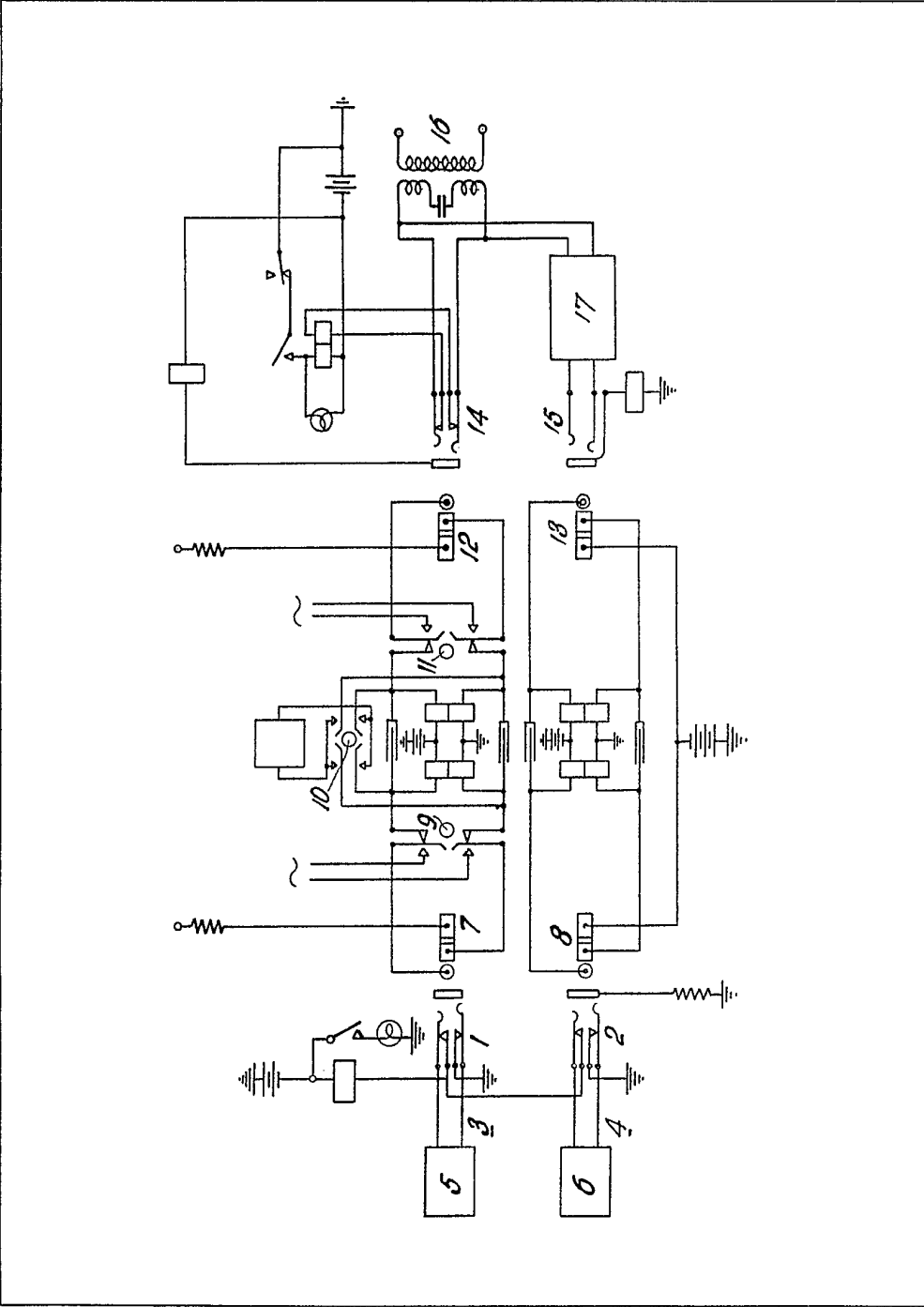
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536,945 COMPLETE SPECIFICATION

[This Drawing is a full-size reproduction of the Original.]







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