

Jan. 11, 1944.

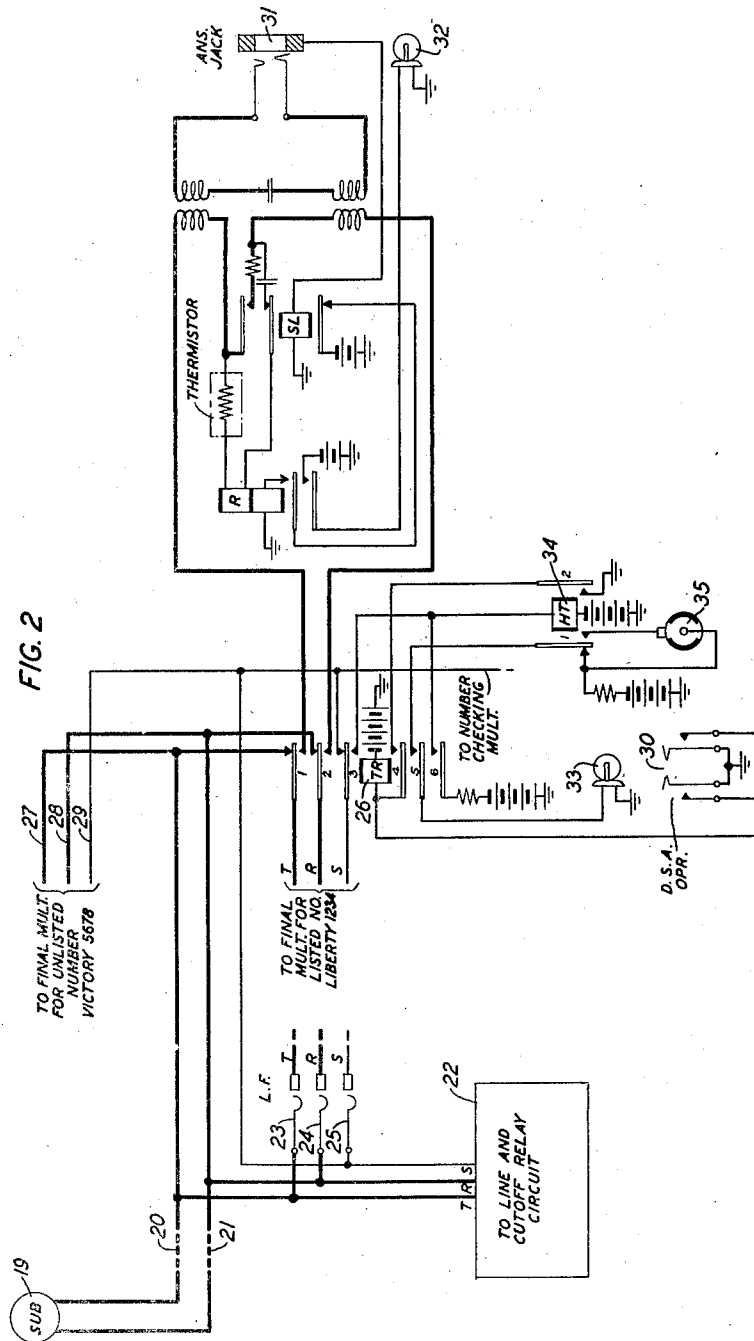
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2,338,997

COMMUNICATION SYSTEM

Filed Aug. 4, 1942

2 Sheets-Sheet 2



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2,338,997

COMMUNICATION SYSTEM

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Application August 4, 1942, Serial No. 453,536

5 Claims. (Cl. 179—27)

This invention relates to communication systems and particularly to special service telephone systems.

The object of the invention is to provide means for changing the normal switching arrangement of a subscriber's line so that unwanted incoming calls may be diverted while still providing normal outgoing service. Under certain traffic conditions it sometimes happens that the load of incoming service increases to the point where serious interference with the use of a line for outgoing service is established. Where it is important that outgoing service be maintained the present arrangement will provide means for temporarily rearranging the switching facilities so that all incoming calls will be diverted to a special operator. At the same time the line is switched to another line appearance so that the subscriber may have normal outgoing service. Furthermore, this other line appearance may be in the nature of an unlisted number known only to those whom it is important to have incoming service to the line.

In its simplest form the present invention consists of a relay forming part of an auxiliary line circuit under manual control of a responsible person such as a DSA operator. Upon proper orders the DSA operator will place this relay in operation whereupon the normal line appearance of the listed line will be disconnected from the subscriber's line and connected to a line extending to an intercepting operator's position, so that normally directed traffic will flow to the intercepting operator instead of to the subscriber's line. At the same time the subscriber's line is switched to an unlisted line appearance so that normal outgoing service may be had and emergency incoming service provided for those entrusted with the actual number of such unlisted line appearance.

In an alternative form of the invention the subscriber's line is permanently connected to an unlisted or secret point of access to the line whereby trusted individuals may gain access to the line at all times. At the same time the line is connected to a listed point of access so that the public may gain access to the line in the regular way. However, means is provided so that if the line becomes overburdened with calls by the listed number that point of access may be cut off and diverted to an intercepting operator's position so that the line may only be reached by way of the unlisted number. Outgoing service from the line may be had at all times through

regular facilities, permanently associated with the line.

A feature of the invention is an auxiliary line circuit for a line served by machine switching means for temporary operation during periods when it is important to prevent the line from being monopolized by relatively unimportant incoming calls.

The drawings consist of two sheets of circuit diagram, somewhat schematic in character but showing the essential features of the invention in detail.

Fig. 1 shows a circuit diagram in which the line is normally associated with a listed number termination in the switching apparatus which may be diverted to an intercepting operator's position while the line itself is switched to an unlisted number termination.

Fig. 2 shows a circuit diagram in which the line is permanently connected to an unlisted number termination over which the line can at all times be reached. The line is also connected normally to a listed number termination in such manner that such termination may be cut off and diverted to an intercepting operator's position.

A subscriber's station 1 is extended from a central office over conductors 2 and 3. Normally these conductors are connected through the contacts of a relay 4 to conductors 5 and 6, respectively, which lead to the incoming and outgoing switching facilities for line number 1234, by way of example. The subscriber at station 1 will then be listed in the directory as having telephone number 1234. If the incoming calls to this listed number become too numerous and interfere with the outgoing service from station 1, then the subscriber thereat may notify the DSA operator that he wishes the normal traffic to be diverted. The DSA operator will then operate key 7 to operate relay 4. As long as key 7 is operated and relay 4 responds the signal lamp 8 associated with the key 7 will burn as a signal that the service to the subscriber listed under telephone number 1234 is on an emergency basis. At this time the line conductors 2 and 3 will be disconnected from the line conductors 5 and 6 and transferred to conductors 9 and 10 associated with the switching facilities for line number 5678. This line number will not be listed but may be known to persons to whom it is important to establish communication with the subscriber at station 1. This subscriber, of course, can have outgoing service from station 1 over the regular facilities of line 5678.

Incoming service toward the subscriber at sta-

tion 1 will be provided by connection established between conductors 5 and 6 and conductors 11 and 12, respectively, leading to an intercepting operator's position. On an incoming call ringing current flowing through thermistor 13, upper winding of relay 14 and condenser 15 will first heat up the thermistor until sufficient current flows through relay 14 to cause its operation. Relay 14 then locks through its lower winding to the back contact of armature 3 of relay 16 and lights the signal lamp 17. When the intercepting operator, who may be the DSA operator, answers the call by plugging into jack 18, the relay 16 is operated. A bridge circuit closed by armature 1 of relay 16 trips the machine ringing over line 1234 and the operator then communicates with the calling subscriber.

While this invention has been illustrated in a simple manner it will be understood that the principle may be applied in a variety of ways. The line extending to the substation 1 may be one of a large group serving a private branch exchange and like facilities may be given to other lines of such a group so that a subgroup of lines within such group may be held free of the normal incoming traffic.

Fig. 2 shows an alternative arrangement. Here the station 19 is connected to the central office by the line conductors 20 and 21. The usual line and cut-off relay arrangement for initiating outgoing service is indicated by the rectangle 22 and the usual line-finder arrangement is indicated by the brushes 23, 24 and 25. The line extends through the contacts of relay 26 to the final multiple designated as the listed number Liberty 1234, over which the line may be reached by the public generally. The tip ring and sleeve conductors 27, 28 and 29, respectively, are also permanently connected to the final multiple designated as the unlisted number Victory 5678. It will be noted that the listed and unlisted numbers may belong in different exchanges so that the unlisted number may even be more difficult of detection than if both were in the same exchange.

The unlisted number will be known only to trusted individuals who may have need to reach the station 19 at any time. If the traffic over the terminals reached by the listed number becomes too great or if there is special need to hold the line open for calls over the unlisted number the DSA operator will be instructed to operate the key 30, which will result in the operation of relay 26. Thereupon the listed number terminals will be disconnected from the line leading to station 19 and connected to the intercepting operator's position indicated by jack 31 and lamp 32. During the operation of relay 26, signal lamp 33 will burn steadily as an indication to the DSA operator that the associated line is on an emergency basis.

If during this interval a call should come in over the listed number terminals the ground on the sleeve will operate relay 34 which changes the steady burning of lamp 33 to a flashing signal controlled by the interrupter 35. At the same time relay 34 will lock relay 26 so that if key 30 should be returned to its normal position while the intercepting operator is in communi-

cation with a calling party, such connection will not be broken and the party at station 19 disturbed.

The operation of the intercepting operator's circuit is the same in both arrangements.

What is claimed is:

1. In a communication system, switching means for interconnecting a plurality of lines, lines appearing in said switching means, a listed number line, an unlisted number line, a subscriber's station, said station being normally accessible over said listed number line, an intercepting operator's line, means for switching said listed number line from said subscriber's station to said intercepting operator's line, and means for establishing a connection to said station over said unlisted number line.

2. In a communication system, switching means for interconnecting a plurality of lines, a subscriber station, lines appearing in said switching means, a first and a second line appearance in said switching means individual to said subscriber station, an intercepting operator's line, and operator controlled means for diverting calls over one of said line appearances from said subscriber station to said intercepting operator's line.

3. In a communication system, switching means for interconnecting a plurality of lines, lines appearing in said switching means, a listed number line, a relay, a subscriber's line normally connected through said relay to said listed number line, an intercepting operator's line, an unlisted number line, and means controlled by said relay for transferring said subscriber's line from said listed number line to said unlisted number line and for connecting said listed number line to said intercepting operator's line.

4. In a communication system, machine switching means for interconnecting a plurality of lines, lines appearing in said switching means, an operator's position for extending connections to said lines, a subscriber's line, a listed number line normally connected to said subscriber's line, switching control means associated with said line, an unlisted number line, a line extending to said operator's position, and means controlled by said switching control means for transferring said subscriber's line from connection with said listed number line to connection with said unlisted number line and for transferring said listed number line from connection with said subscriber's line to connection with said line extending to said operator's position.

5. In a communication system, machine switching means for interconnecting a plurality of lines, lines appearing in said switching means, a subscriber's line, a listed number line, an unlisted number line, said subscriber's line being normally connected to said listed number line for normal incoming and outgoing service over said switching means, and means for transferring said subscriber's line from connection with said listed number line to connection with said unlisted number line for normal outgoing service from said subscriber's line and for emergency incoming service to said subscriber's line.

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