

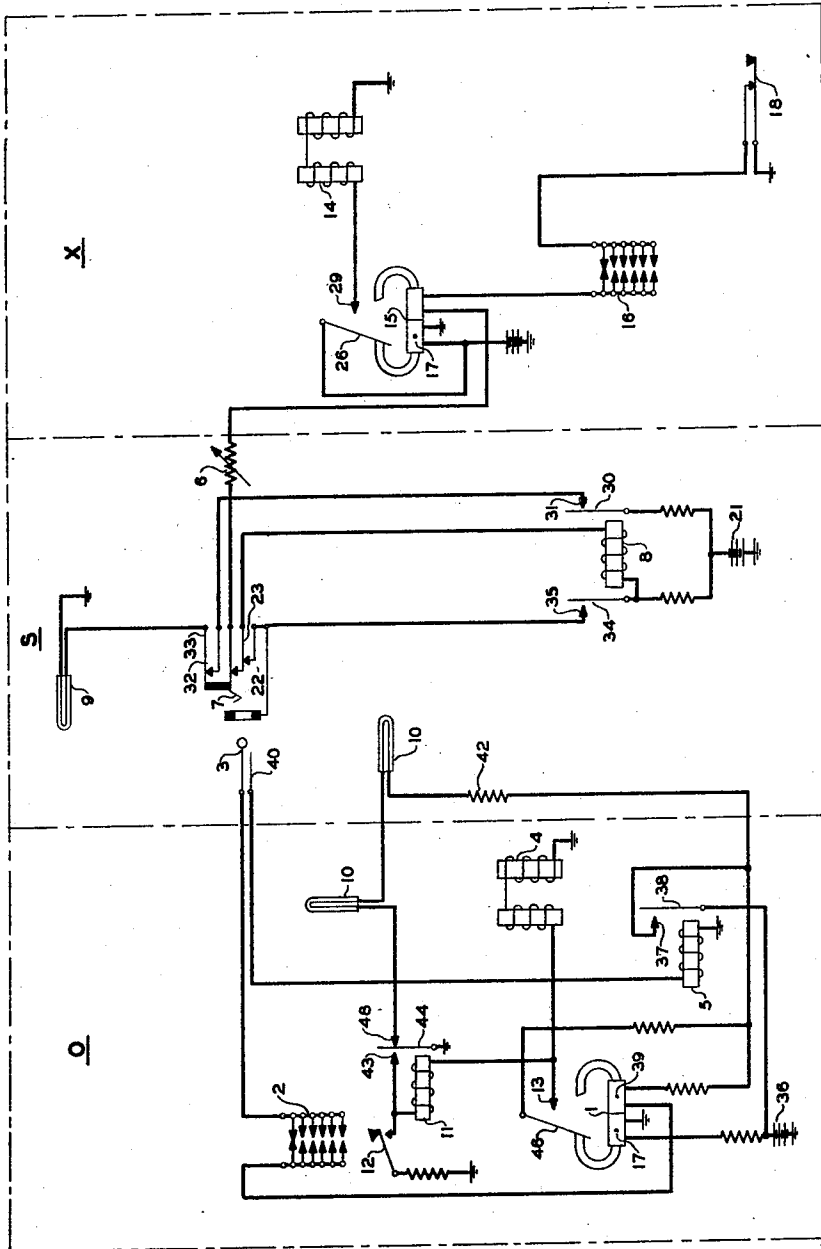
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PRINTER CONCENTRATOR SYSTEM

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PRINTER CONCENTRATOR SYSTEM

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This invention relates to telegraph exchanges and more particularly to the cord and monitor circuits by which connections are expeditiously made between a subscriber's line or trunk line and a centrally located instrument, such as a printing telegraph or a repeater.

Various devices and manual arrangements have been used heretofore in establishing connections and supervising the circuits for printing telegraph traffic. The object of this invention is to simplify the task of operating a telegraph exchange by the adoption of a novel combination of cord and monitor circuits so that the exchange operator need only watch for lamp signals to connect and disconnect subscribers' lines with cords leading to various printing telegraph or repeating instruments.

In carrying out the present invention, it will be understood that use is made of standard relays and pilot lamps in association with the usual telegraph apparatus. The essence of the invention consists in the novel arrangement of the circuits.

One embodiment of the device is shown in the accompanying drawing in which the circuits are divided into several portions as indicated by broken line enclosures as follows: the operating table for a printing telegraph is designated O, the switchboard is marked S, the subscriber's station is marked X.

The usual printer relay 1 is shown connected in series with a printer keyboard 2, and a cord tip 3. Relay 1 controls a local circuit which includes the printer operating magnet 4. A connecting relay 5 opens and closes the line circuit through the printer relay and keyboard.

At the switchboard, a subscriber's line 6 is shown connected to the cord tip spring 7 of a switchboard jack. A line relay 8 is connected to this jack in such a manner that a line lamp 9 may be lighted in response to a signal from the subscriber's station. Supervisory lamps 10 are shown, both at the printer operating table and on the switchboard, and the circuit for these lamps is controlled by a relay 11 which has connections to a signalling

key 12 and also to a contact 13 on the printer relay 1. At the subscriber's station X, there is the usual printer relay 15 in the line circuit and the printer operating magnet 14. Relay 1 and 15 are shown with biasing coils 17. The subscriber's set also includes a keyboard 16 in series with a signalling key 18.

The operation of this device is as follows:

Under normal conditions with no traffic on the line a closed circuit exists in which the line relay 8 is kept energized from the battery 21. This circuit may be traced from the battery through the winding of relay 8, through jack contact springs 23 and 7 to the line 6 and thence to the subscriber's station where the relay 15, the keyboard 16 and the key 18 are included in the circuit. This circuit is grounded through the key 18. The relay 15 will be understood to be polarized and since negative polarity is fed to the line from battery 21, the relay armature 26 will be held to the left, thus opening the circuit for the printer magnet 14.

Assuming now that the subscriber wishes to signal for a connection at the central office with an available printer, the key 18 is depressed, thereby opening the line circuit and causing the line relay 8 at the switchboard S to de-energize. This causes two circuits to be closed by the left and right-hand armatures respectively. Armature 30 in falling back against contact 31 causes a pilot lamp 9 to light, the circuit for which may be traced from the battery 21 through contacts 30 and 31, also contacts 32 and 33 of the jack and thence through lamp 9 to ground. The armature 34 in falling back against its contact 35 short-circuits the winding of relay 8 thereby preventing its re-energization when a connection is made by "plugging in", or when the subscriber releases his key 18. The switchboard operator responds to the signal, as given by the lighted lamp 9, by choosing a cord plug 3 which connects with an idle printer. This plug is inserted in the subscriber's jack and immediately potential from the battery 21 is applied to the plug-sleeve 40, whence a circuit may be traced to ground through relay 5 at the printer operating table

O. The operation of relay 5 closes a circuit from the battery 36 and thence through the front contact 37 and armature 38, the relay winding 39 and keyboard 2 to the cord tip 3. The circuit may then be traced through the tip contact 7 of the jack, line 6, and through the subscriber's set to ground. This positive potential will throw armature 26 of relay 15 against contact 29. Thereafter the printer relays 1 and 15 will operate together in response to traffic signals sent from either of the keyboards 2 or 16, and the printer magnets 4 and 14 will likewise function together. At the switchboard when the cord plug is inserted in the jack, the springs 7, 22 and 23 are separated so that battery 21 is kept off of the line 6. Furthermore, the springs 32 and 33 are separated so that the line lamp 9 is extinguished. The relay 5, however, is kept energized from battery 21 during the transmission of messages so that potential from battery 36 may be kept on the line.

The lamp circuit which lights the lamps 10 both at the switchboard and at the operating table may be traced from battery 36 through armature 38, contact 37, resistance 42, lamps 10, contact 48 and armature 44, to ground. The grounded key 12 connects with contact 43 in order to close an operating circuit initially through relay 11.

When the message transmission has been completed, the lamps 10 will be extinguished by the central office operator who simply depresses the key 12 thereby operating relay 11 which opens contact 48 and locks up to ground through contact 43 and armature 44. Thus a signal is given for the switchboard operator to withdraw the plug from the jack. Withdrawing the plug releases relay 5, breaks the operating circuits for relays 1 and 5 so that relay 11 is unlocked, but the lamps 10 are prevented from relighting by the release of relay 5, and armature 46 is moved to the left by the biasing coil 17. Hence the printer magnet 4 is deenergized and all conditions are restored to normal.

In case, however, before the plug is withdrawn from the jack, the subscriber should again engage the line with the transmission of messages, the operation of line relay 1 will immediately break the locking circuit for relay 11 through armature 46 and contact 13, thereby release relay 11 and cause the lamps 10 to be relighted.

A further result of withdrawing the plug from the jack is to cause contact springs 7 and 23 to close, thereby re-establishing the circuit through line relay 8, the line 6 and the subscriber's set, negative potential being applied from battery 21 which actuates relay 15 (aided by its own biasing coil 17) and opens the circuit through the printer magnet 14.

It will be seen from the above that the entire system is automatically restored to nor-

mal by pulling the cord plug from the jack.

What is claimed is:

1. In a printing telegraph exchange system, a concentration board provided with a cord circuit having a printer associated therewith, a cord circuit supervisory signal associated with the printer and another associated with the concentration board, a subscriber's line circuit terminating in the concentration board, a relay in the sleeve of the cord circuit operable when the cord circuit is connected to the subscriber's line circuit for effecting the operation of both supervisory signals, a receiving relay, in the tip of the cord circuit, responsive to the actuation of the sleeve relay, for conditioning a third relay for operation, and means under control of the printer operator for thereafter actuating and locking the third relay to effect the release of both supervisory signals.

2. In a printing telegraph exchange system, the combination according to claim 1, characterized in this, that the receiving relay is effective, upon an opening of the subscriber's line circuit, to release the locked third relay, thereby re-operating both supervisory signals.

In witness whereof, I hereunto subscribe my name this 12th day of August, 1930.

ANTHONY J. MOTTO.

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