

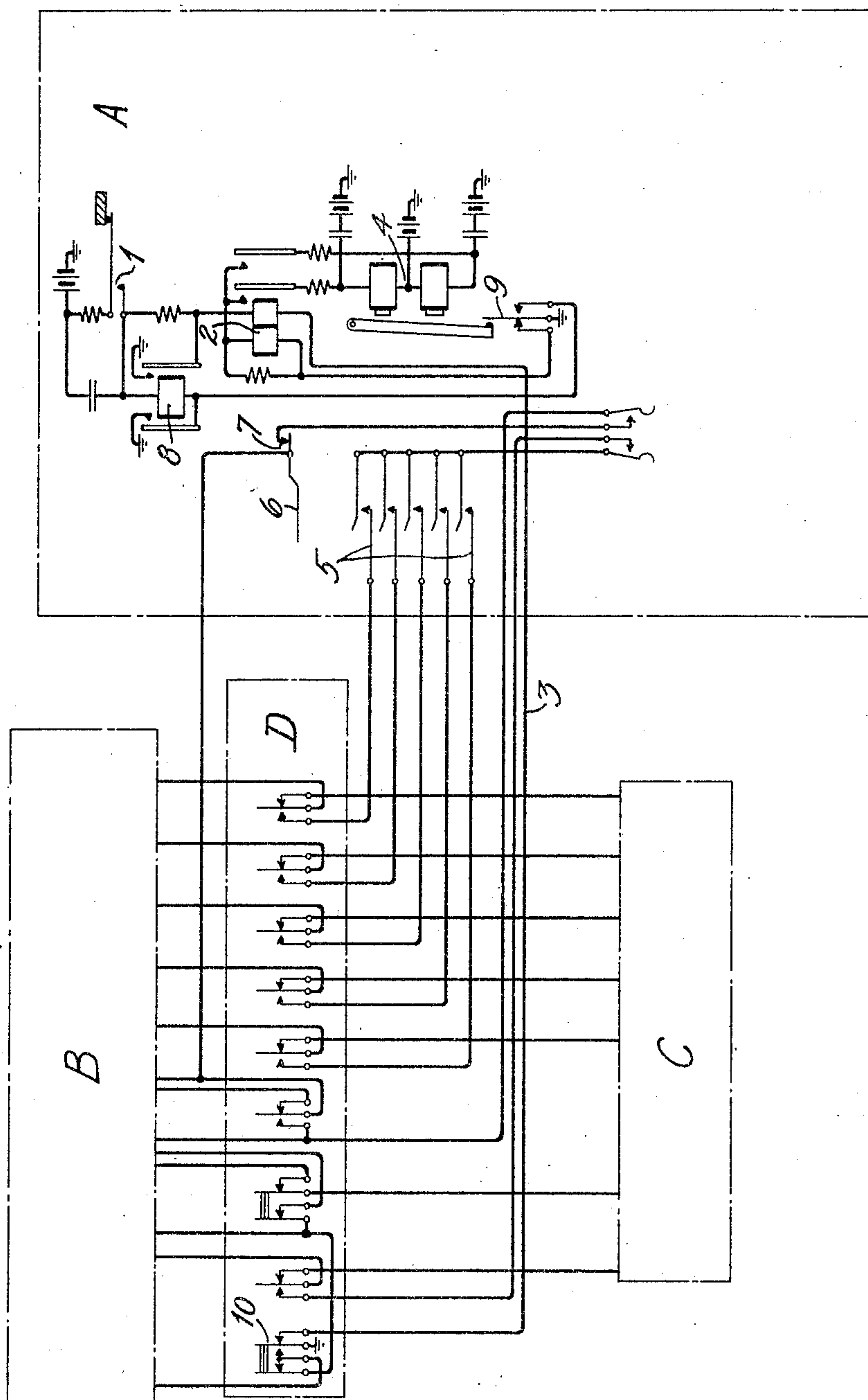
March 5, 1929.

E. F. WATSON

1,703,972

PRINTING TELEGRAPH SYSTEM

Filed April 23, 1926



Inventor:
Edward F. Watson

by

gr 406

Atty

Patented Mar. 5, 1929.

1,703,972

UNITED STATES PATENT OFFICE.

EDWARD FISK WATSON, OF LARCHMONT, NEW YORK, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

PRINTING-TELEGRAPH SYSTEM.

Application filed April 23, 1926. Serial No. 104,149.

This invention relates to signaling systems and more particularly to printing telegraph systems wherein the perforated tape method of transmitting signals is employed.

5 The principal object of the invention is to reduce current drain through the tape perforating magnet.

Another object is to provide for reliable operation of the perforating magnet of a keyboard perforator for both high speed and irregular operations of the keys.

10 In the systems heretofore employed in transmitting signals or communications in which the transmission is effected by a perforated tape, the magnet for perforating the tape was maintained in an operated condition when any of the keys at the keyboard were held depressed and the complete release of the magnet depended upon the duration of the intervals between key operations.

20 According to the present invention the magnet is arranged to release as soon as it reaches its fully operated condition, regardless of whether a key at the transmitting keyboard is held depressed for an extended period or is operated by a staccato touch. This result is effected by placing the magnet under the control of a quick-acting relay which is arranged to operate in response to the actuation of a key and to close a circuit both for maintaining itself in an operated condition and for operating the magnet. The magnet upon reaching its fully operated position opens its own operating circuit and releases, independent of the nature of the touch applied to a key.

30 A further advantage of the invention resides in the prevention of the re-operation of the perforating magnet should a key be held depressed, and in this event a second relay is arranged to energize, when the magnet reaches its fully operated position, and to close a circuit extending through the contacts closed by the operated key thereby shunting the relay controlling the operation of the magnet.

40 The above and other objects and features of this invention are set forth in the following description and appended claims and may be more readily understood if considered in conjunction with the accompanying drawing illustrating a specific embodiment of the invention, which shows a schematic of a printing telegraph transmitting set in which the transmission of signals may take place

from a tape feed transmitter or directly from a keyboard. The change from one method of transmission to the other may be made by merely turning a switch, the same keyboard used for direct sending being also used (when the switch is so set) for perforating the tape. A printer adapted for use with this invention is disclosed in a copending application of H. Pfannenstiehl, Serial No. 681,921, filed December 21, 1923.

60 Referring to the drawing there is shown only that apparatus which is necessary for a clear understanding of the invention. A designates that part of the schematic in which is contained a keyboard and perforator circuit; B designates diagrammatically the sending equipment comprising the sending selecting relays and the sending distributor; C, also shown diagrammatically, the tape transmitter; and D a cam switch by which the mode of transmission is changed from the direct keyboard to the perforated tape, or vice versa, the switch being shown in a position arranged for the latter mode of transmission. In the part designated A, is embodied the complete invention and will be hereinafter described in detail, but a detailed description of the parts designated B, C and D, is not deemed necessary inasmuch as they are well known in the art and do not enter into the present invention.

70 The invention, briefly described, embraces means for insuring the positive operation and release of a perforating magnet 4 for each operation of a key at a keyboard (not shown), the release being automatically effected when the magnet reaches its fully operated position, regardless of whether a key is held depressed or is operated by a staccato touch, and for preventing the reoperation of the magnet should a key be held depressed until after the magnet releases. These means are disclosed in the arrangement shown in the drawing in which a relay 2, having two windings, is provided as an operating link between a common contact 1 and a perforating magnet 4, the first winding serving to close an operating circuit for the magnet when the contact is closed and the second to hold the relay operated, should the common contact be subsequently opened, until the magnet has reached its fully operated position. A second relay 8, having two off-normal grounded contacts, is also provided, and should the common contact remain closed after the mag-

net has reached its operated position, this relay would operate and close at one of its grounded contacts a locking circuit for itself and at the other a circuit shunting the relay 2, the latter circuit preventing the re-operation of the magnet while the common contact is closed.

Only so much of the schematic will be described as is directly concerned with the invention as here claimed. Assuming that the set is arranged, as shown, for the perforated tape method of transmission, the actuation of any of the keys at the keyboard closes the common contact 1. The closure of this contact closes the circuit extending from battery, contact 1, through the right-hand winding of punch relay 2, conductor 3, to ground at spring 10 of the cam, or shift, switch. Relay 2 operates and closes at its right armatures a circuit arranged in parallel paths extending respectively through the two coils of the perforator magnet 4. This circuit is traceable from battery, through the windings, or coils, in parallel, of the perforator magnet 4 and the right armatures of relay 2, also in parallel, thence in a common path through the left-hand winding of relay 2, to ground at the normal contact 9 of the magnet. The closing of this circuit through the coils of the magnets in parallel insures the quick operation of the magnet, which is highly desirable to permit high speed operation of the keys. To provide against a staccato touch causing the release of relay 2 before the armature of magnet 4 has reached its fully operated position, relay 2 is locked through its left-hand winding in the above traced circuit.

The operation of magnet 4 opens the normal contact 9 and thereby releases relay 2, assuming that a key is not held depressed, and in turn the magnet itself is released. This operation is repeated for each character perforated, mechanical parts being positioned with respect to the tape so that each operation of the magnet 4 causes a corresponding combination of perforations to be made in the tape. The perforated tape is then run through transmitter C which sends the message signals, or characters, out over the line at a uniform speed. In this way with a supply of tape ahead, the line can be kept working continuously, even through the operator may stop for a short period. If the transmitter C catches up with the operator, that is, if all the tape which has been perforated, has been drawn taut from the perforator, it is automatically stopped by the tape bearing against the lever 6 causing thereby the opening contact 7 as is well known in the art.

If during the operation of the keyboard perforator, the operator should hold any of the keys depressed until the perforator magnet armature has moved contact spring 9 against its front contact, the latter will

close a circuit through relay 8, energizing it. Relay 8 locks through a front contact until the operator releases the key thus opening the circuit of relay 8 at contact 1. Another contact closed on the energizing of relay 8, short-circuits the operating winding of relay 2, thus releasing the latter relay whose locking circuit is opened at contact 9. Thus relay 8 functions to prevent more than one operation of the perforating magnet 4 for each depression of a key regardless of how long the operator holds the key depressed. Relay 2 prevents the re-energization of magnet 4 until the depressed key has been released and reactuated.

What is claimed is:

1. In a tape perforating system, a keyboard, means for making perforations in a tape in various combinations, each combination relating to a key at said keyboard, and means for causing said first means to effect its own release automatically should one of said keys be held depressed.

2. In a tape perforating system, perforating members, means for positioning said members in various combinations to perforate a tape, each combination being positioned individually, and automatically controlled means for effecting the permanent release of said perforating members of a combination after the perforation is completed when said positioning means are maintained operated continuously.

3. In a signaling system, means for transmitting signals, tape perforating means for making a permanent record of signals, and automatically controlled means whereby said tape perforating means effects its own release when the said transmitting means are maintained operated continuously.

4. In a printing telegraph system, a plurality of selecting elements, keyboard operated means for positioning selecting elements in various combinations, tape perforating means operated by said keyboard for perforating a record of said combinations, and means whereby said tape perforating means effects its own release automatically when said keyboard means is maintained operated continuously.

5. In a printing telegraph system, a plurality of selecting elements, keyboard operated means for positioning said selecting elements in various combinations, a common contact arranged to close for each combination, electromagnetic tape perforating means operated by said keyboard means for perforating a record of said combinations, and means actuated by the operation of said electromagnetic means for releasing said electromagnetic means and for preventing re-operation of the latter means when said contact is maintained closed.

6. In a printing telegraph system, a plurality of selecting elements, a keyboard trans-

mitter for positioning said selecting elements in various combinations, a contact common to said combinations, electromagnetic tape perforating means controlled by said contact 5 for making a record of said combinations, and other electromagnetic means energized by the operation of said perforating means for releasing and preventing the reoperation of said perforating means should said con- 10 tact be maintained in an operated position. means controlled by said contact for making a record of said combinations and arranged to release itself automatically, other electro- magnetic means responsive to the operation of said recorder means and arranged to pre- 20 vent re-operation thereof should the said contact remain closed, and means for maintain- ing said second mentioned electromagnetic means operated independent of said recorder means when said contact is maintained closed. 25

7. In a printing telegraph system, a plurality of selecting elements, a keyboard trans- mitter for positioning said selecting elements in various combinations, a contact common to 15 said combinations, electromagnetic recorder

In testimony whereof, I have signed my name to this specification this 22nd day of April, 1926.

EDWARD FISK WATSON.