

July 25, 1933.

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1,919,607

TELEGRAPH SYSTEM

Filed July 28, 1931

2 Sheets-Sheet 1

FIG. 1.

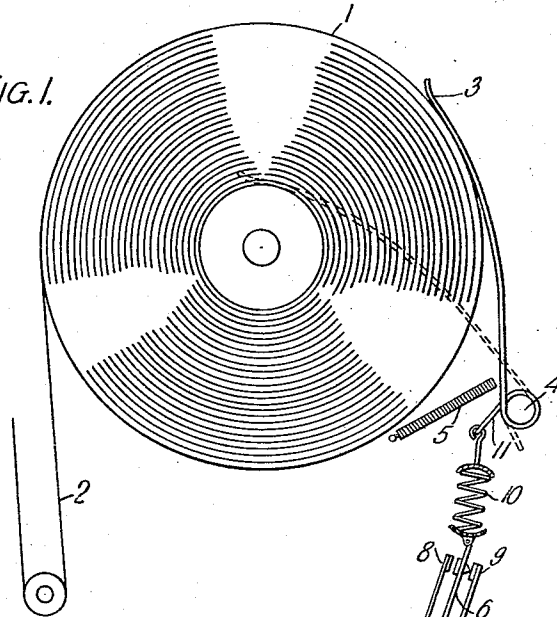


FIG. 2.

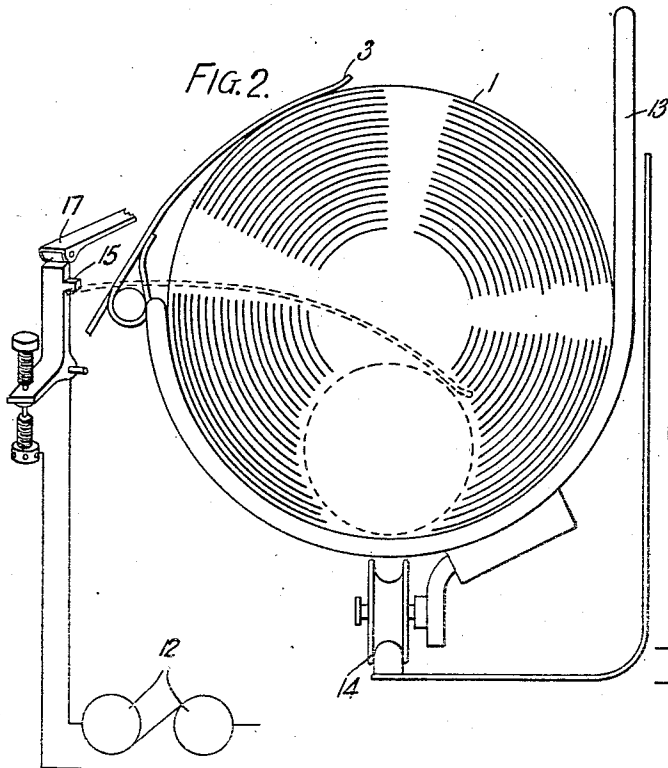
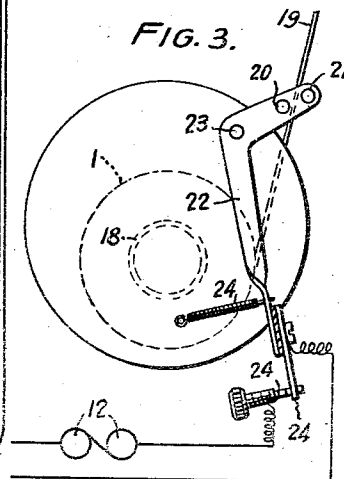


FIG. 3.



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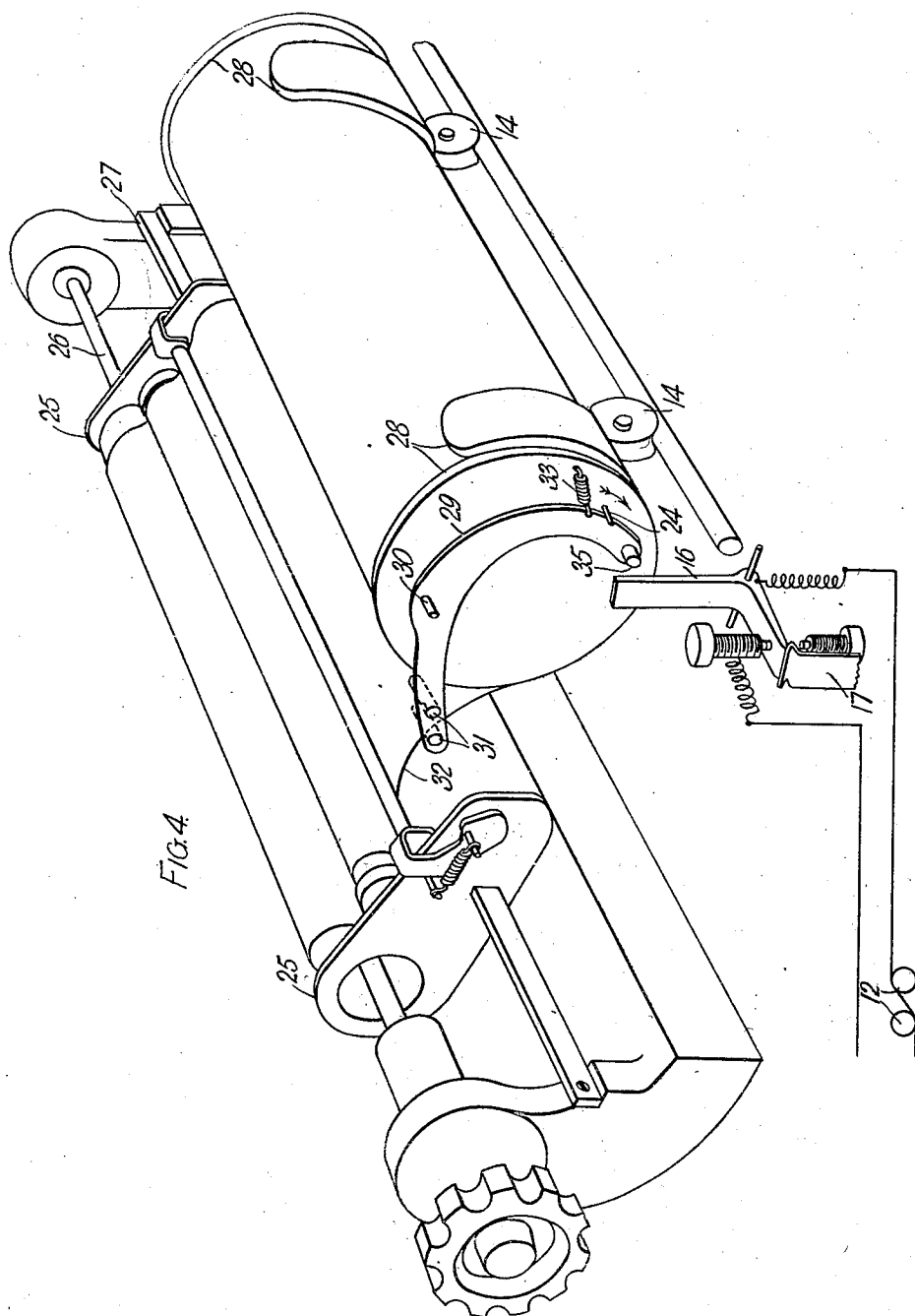
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TELEGRAPH SYSTEM

Application filed July 28, 1931, Serial No. 553,516, and in Great Britain June 11, 1931.

This invention relates to printing-telegraph systems and has reference more particularly to those systems in which telegraphic communication is intermittent and the operations consequent upon the reception and printing of a message are effected automatically without the necessity for the attention of an operator at the receiving end of the line.

10 In page printing apparatus for telegraph systems of the class referred to it is usually most convenient for the messages to be printed on forms or blanks fed in a continuous web from a roll. A paper roll of this nature will normally supply sufficient forms for a large number of messages but where the operations consequent upon the reception and printing of messages are effected automatically it is very desirable to provide means operable on or near the exhaustion of the paper supply for giving a warning indication either near the receiving apparatus, or to the distant transmitting apparatus from which the telegraph signals are being received, or at both places if desired.

In telegraph exchange systems, for instance in which a connection to a called subscriber's station is effected at a central station and a great feature is that a message can be received and printed at a called subscriber's station in the absence of the subscriber to await attention at a subsequent period, it is very desirable that the transmitting operator be given notification if due to failure of the paper supply a message is not capable of being received at the called subscriber's station. A local warning at the receiving subscriber's station is also very desirable at the same time in order that immediate attention can be drawn to the necessity for supplying a fresh roll in order that telegraph communication can be maintained.

45 According to the present invention, therefore, in a page printing telegraph system in which successive messages are printed on a continuous web of paper from a roll, switch-means is provided operable when the paper is becoming or has become exhausted,

to control means for giving a warning indication.

In a large number of telegraph systems to which the invention is applicable telegraph communication is only required to be effected in one direction at a time and in such cases transmitting contacts and receiving relays at both ends of the line circuit are connected in series in simple circuit. Under these conditions the receiving apparatus at the transmitting end responds to the outgoing signals and serves as a home record of the messages transmitted. If the line circuit is broken the receiving apparatus at the transmitting station fails to record the signals and the operator has therefore an indication that attention is required. Similar arrangements are known in the art as "break-in signals" whereby a signal is sent in the opposite direction to that of the incoming telegraph signals. The simplest and the preferred method for the purposes of the present invention is for the switch contacts under control of the paper roll to open the line circuit or otherwise change its electrical condition. It will be appreciated, however, that many other methods of returning a suitable indication to the transmitting operator may be employed if desired, the control of which may be conveniently effected by the switch means previously referred to.

It will also be appreciated that any convenient form of warning means either visual or audible can also be operated at the same time as the signal is sent to the distant transmitting station, for indicating locally that immediate attention is required at the receiving station. These warning means can be controlled by a separate contact means operated together with the first mentioned contacts by an arm of which the movements are under the control of the paper roll.

In the four figures of the accompanying drawings are illustrated two methods of effecting the control of the switch contacts from the paper roll and as applied to two different cases. The first method consists of employing an arm one end of which

bears under spring tension on the periphery of the paper roll so that as the diameter of the roll is reduced on the paper becoming exhausted the arm is gradually moved towards an opposite position at which position the switch contacts are actuated. The second method consists of affixing the inner end of the paper web of the roll to a spool centre such as a cardboard tube or the like by pasting or any other suitable means, so that on the paper becoming exhausted the spool centre is drawn against guide pins through which the web is normally threaded on a pivoted arm to actuate the arm more positively to an operated position for effecting the actuation of the switch contacts. In the first of the two cases the paper roll is located on a relatively stationary portion of the apparatus, the paper web being fed to a movable platen carriage of the printing apparatus in a long flexible loop. In the second case the paper roll is mounted close to the moving platen carriage of the printing apparatus and moves laterally with the carriage.

Fig. 1 shows the first method as applied to the first case and will be readily comprehended from the foregoing remarks and explanation. A paper roll 1 is mounted by any convenient means on a suitable fixed portion of the apparatus, not shown, the web 2 being drawn therefrom in a loop to the platen carriage, also not shown in this case. An arm 3 pivoted at 4 is actuated by spring means 5 to bear at its long free end on the periphery of the roll 1. A switch contact blade 6 pivoted at 7 is adapted to be actuated from one position to another as limited by stops 8 and 9 respectively, by snap-action means comprising spring 10 attached to the ends of a short arm 11 of pivoted arm 3 and contact blade 6 respectively. Contact blade 6 and stop 9 in the example shown constitute a contact making and breaking device in the line circuit over which the telegraphic communication is effected, the receiving relay being represented at 12. When signals are being received and printed the line circuit will be closed between blade 6 and contact 9. As the paper becomes exhausted, however, the arm 3 will move towards the position shown in dotted lines and at about this position the contact blade 6 is actuated with a snap action to its opposite stop 8 to open the line circuit and warn the distant transmitting operator as previously described.

Fig. 2 shows the first method as applied to the second case above outlined. The roll 1 in this case is shown supported in a cradle moving on suitable means such as roller 14 with the platen carriage. As is well-known the platen carriage moves step-by-step in a direction parallel to the axis of the roll for printing successive characters and re-

turns to its initial position at the end of each line of print. Arm 3 pivoted at 4 on the moving cradle bears at one end on the periphery of the roll as before but when the paper is becoming exhausted short end of lever 3 is moved towards a position opposite a projection 15 on a contact bell crank lever in the line circuit. A jockey roller 17 or similar means is employed to hold the bell crank contact lever in one or the other of its two positions. On movement of the cradle when arm 3 has reached the position shown dotted, short arm of lever 3 actuates bell-crank lever to its opposite position to open the line circuit. Contact bell-crank lever is replaced manually on the insertion of a fresh roll of paper.

Fig. 3 shows the second method as applied to the first case. A cardboard or other spool centre 18 is attached to the inner end of the web of the paper roll as previously mentioned, the web 19 being led through guide pins 20 and 21 on a bell-crank lever 22 pivoted at 23. A spring 24 normally maintains the line circuit closed through contacts 24. When the paper roll is becoming exhausted the spool centre 18 is drawn against pins 20 and 21 and causes lever 22 to open the switch contacts 24.

Fig. 4 shows the second method as applied to the second case in which the moving platen carriage 25 is shown as sliding on stationary members 26 and 27 and the paper roll is carried in a cradle 28 supported on rollers 14, the cradle being preferably connected to the platen carriage 25 through spring means yielding in the direction of motion of the carriage, as fully described in copending U. S. application No. 519,037 and therefore not shown or further described here. A bell-crank lever 29 pivoted at 30 carries guide pins 31 through which the paper web is drawn by the platen from the roll which has a spool centre attached to the inner end of the roll as described with reference to Fig. 3. A spring 33 normally maintains lever 29 against a stop pin 24 so that a projection 35 on the extension of lever 29 is out of line with a contact bell-crank lever 16. A spring jockey means 17 maintains lever 16 in its one or other position. When the spool centre is drawn against stop pins 31 on the paper becoming exhausted projection 35 is brought into line with lever 16 and on return of the platen carriage and cradle at the end of the line of print, for instance, the contact lever is actuated to its opposite position for actuating the warning means. As in the arrangement described with reference to Fig. 2 the contact lever 16 may be replaced manually on the insertion of a fresh roll of paper.

Various modifications and other possible arrangements within the scope of the appended claims will suggest themselves to

those skilled in the art and after consideration of the foregoing remarks.

What is claimed is:

- 5 1. In a page printing telegraph receiver, a movable platen carriage, a paper roll movable with said platen carriage, an arm pivoted on said carriage and cooperating with said paper roll to be moved to an operated position when the paper is becoming exhausted, and switch means on a relatively stationary portion of the apparatus and engaged by a projection on said pivoted arm on the return movement of the carriage when the arm is in an operated position.
- 15 2. In a page printing telegraph receiver, a paper roll, a spool centre for said roll and to which the inner end of the paper web of the roll is affixed, a pivoted arm, guide pins near one end of said pivoted arm and through which the web of paper from said roll is adapted to be drawn, and switch means operated by said pivoted arm when said spool centre engages the guide pins on exhaustion of said roll.
- 25 3. In a page printing telegraph receiver, a movable platen carriage, a paper roll movable with said carriage, a spool centre for said roll and to which the inner end of the paper web of the roll is affixed, an arm pivoted on said carriage and adapted to be moved to an operated position by said spool centre on exhaustion of said paper roll, switch means on a relatively stationary portion of the apparatus and adapted to be engaged by said pivoted arm on movement of said carriage when the arm is in an operated position.
- 35 4. In a telegraph receiver, a paper roll, a spool centre for said roll to which the inner

end of the paper web of the roll is affixed, switch means for giving a warning indication of the exhaustion of the paper, and switch operating means actuated by a movement of said spool centre brought about by the pull of the paper on said spool centre when the paper is exhausted. 70

5. In a telegraph receiver, a spool cradle, a paper roll supported therein having a spool centre to which the inner end of the paper web of the roll is attached, switch means for giving a warning indication of the exhaustion of the paper, and a member positively actuated by said spool centre on its withdrawal from said cradle on exhaustion of the paper supply for causing the actuation of said switch means. 75

6. In a page printing telegraph receiver, a spool cradle, a paper roll supported therein and having a spool centre to which the inner end of the web of said roll is affixed, a pivoted arm engageable at one end by said spool centre on its withdrawal from said cradle on the exhaustion of the paper, and switch contacts actuated by movement of said arm. 80

7. In a page printing telegraph receiver, a spool cradle, a paper roll supported therein and having a spool centre to which the inner end of the web of said roll is attached, a member normally held in one position in operative relation with said paper web and positively actuated to another position by said spool centre on withdrawal from said cradle on exhaustion of the paper roll, and switch contacts controlled by said member for effecting a warning indication. 85

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