

June 13, 1944.

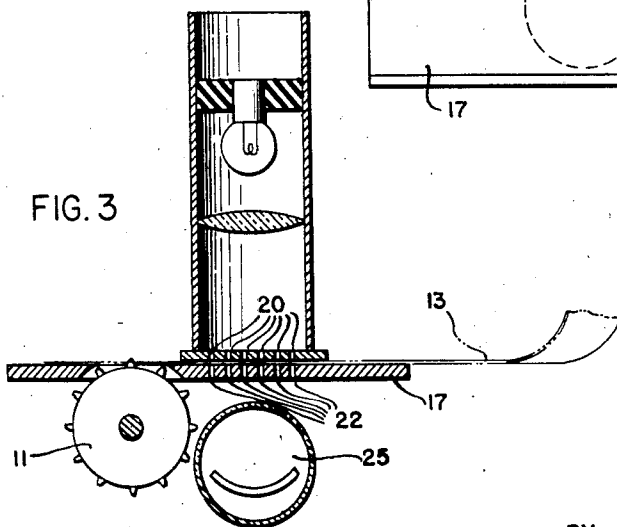
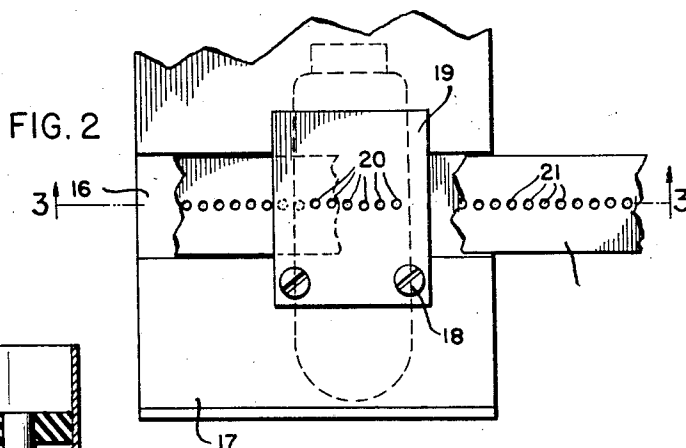
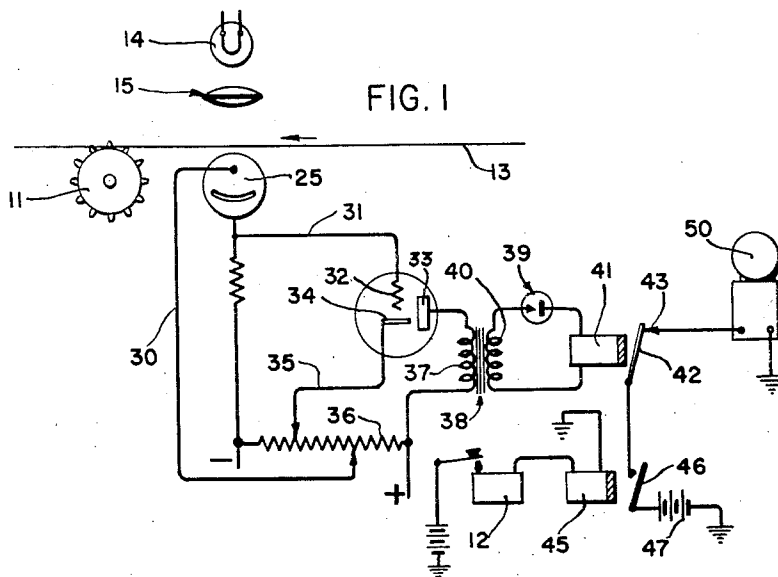
L. M. POTTS

2,351,229

TAPE FEED ALARM

Filed April 27, 1942

3 Sheets-Sheet 1



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TAPE FEED ALARM

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FIG. 5

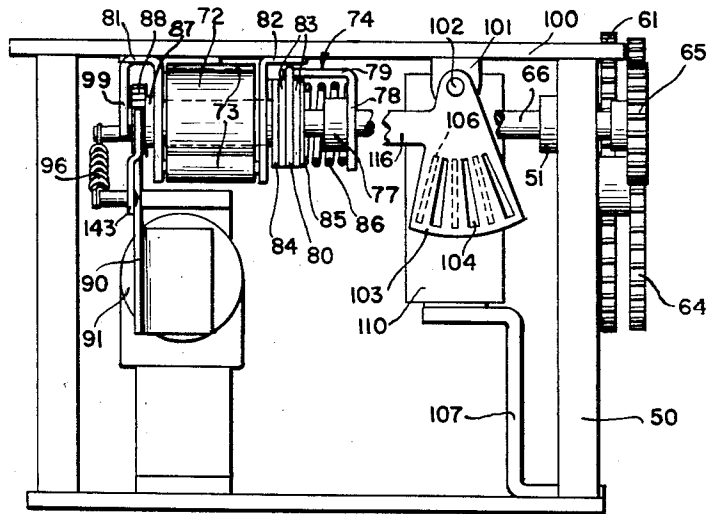


FIG. 9

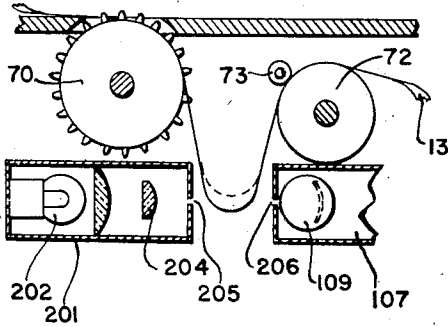


FIG. 8

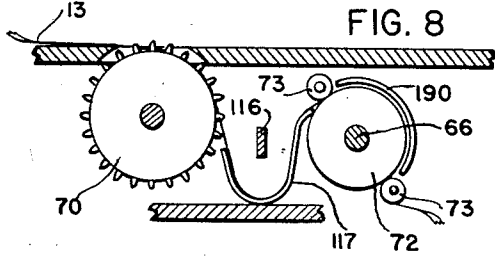
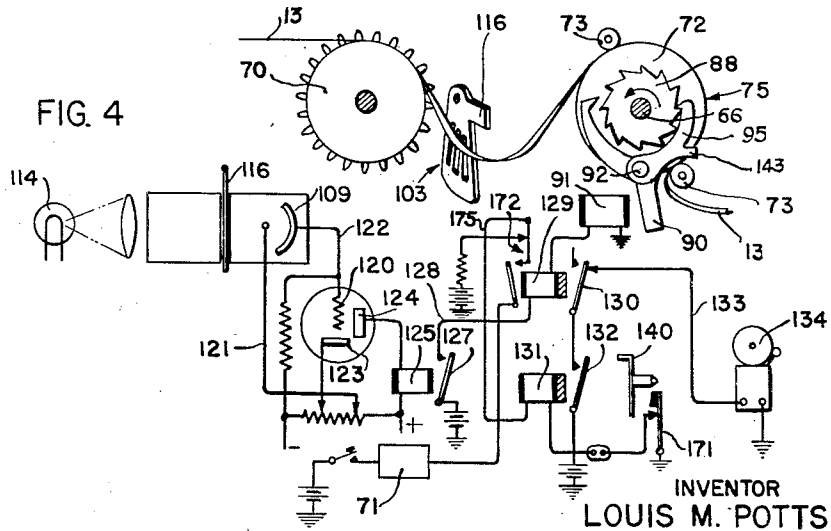


FIG. 4



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3 Sheets-Sheet 3

FIG. 6

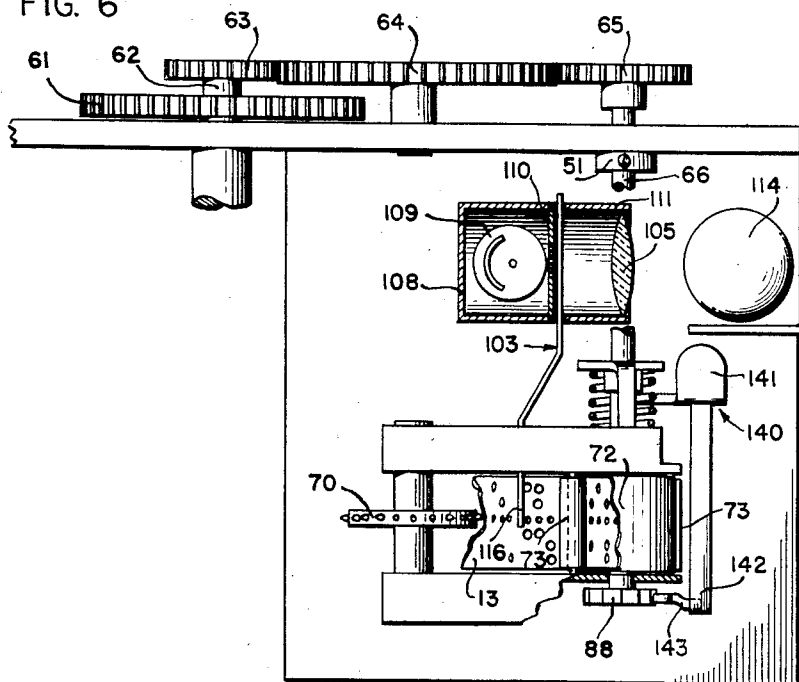
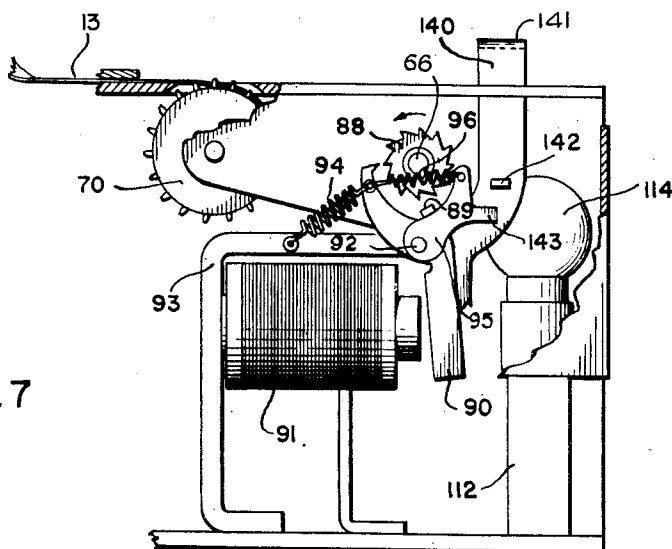


FIG. 7



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UNITED STATES PATENT OFFICE

2,351,229

TAPE FEED ALARM

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Application April 27, 1942, Serial No. 440,654

21 Claims. (Cl. 178—42)

This invention relates to telegraph apparatus and particularly to a tape feed control apparatus.

In the telegraph communication field, tape is employed as a medium for carrying indicia of telegraph signal code combinations, usually in the form of permutably arranged perforations. The tape is ordinarily first perforated either by means of a perforator or by means of a reperforator and later used in connection with a tape transmitter to send signals in code combination form over an outgoing line. The tape in performing its operating functions is subject to stresses and strains which may at times cause the tearing of the feed holes and possibly a complete rupture of the tape. It is apparent that any such undesirable condition will seriously impair the transmission of messages and cause the distortion or loss of signals, particularly so if the condition is not immediately brought to the attention of an operator who can then rectify the situation.

It is therefore the prime object of this invention to provide a tape feed alarm which immediately brings to an operator's attention the manifestation of a defective tape feeding condition.

Other objects, features, and advantages of the invention will become evident as the invention is further described.

In one embodiment of the invention it is proposed to use a light sensitive device which will automatically cause the sounding of an alarm if a defective tape feeding condition exists. In connection with the use of the light sensitive device it will be particularly observable that no extra load will be placed upon the tape and therefore the device will not cause any additional stresses or strains to be set up therein.

Another embodiment of the invention also contemplates the use of a light sensitive device which will automatically cause the operation of an alarm if an undesirable tape feeding condition exists and also provides an additional tape feeding mechanism which is controlled by the light sensitive device and reduces the strain on the tape to a minimum.

The invention will be more readily understood by reference to the following detailed description and the drawings, wherein

Fig. 1 is a schematic circuit diagram of one

embodiment of a tape detector disclosed in the present invention;

Fig. 2 is a plan view of a portion of the apparatus used in the first embodiment of the invention;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 illustrates a schematic diagram of a second embodiment of the present invention including the circuit therefor;

Fig. 5 is a rear elevational view partly in section of the mechanism embodied in the second form of the invention;

Fig. 6 is a plan view of the apparatus disclosed in Fig. 5;

Fig. 7 is an end elevational view of the apparatus shown in Fig. 6;

Fig. 8 is a side view of the tape guiding means employed in the present invention; and

Fig. 9 is a variation of the invention disclosed in Figs. 4 to 8.

Referring now to the drawings, there is shown in Figs. 1, 2, and 3 the first embodiment of the present invention which will now be described in detail. In Fig. 1 a conventional tape feeding sprocket 11 is shown, which is controlled by a stepping magnet 12 in a well-known manner to advance the tape 13 intermittently to the left as shown in Fig. 1. Positioned above the path of the tape 13 is a light source 14 which is adapted to cooperate with an optical system, indicated generally at 15, to project a beam of light towards the tape. The tape is advanced through a guideway 16 (Fig. 2) associated with the support 17 upon which is mounted, by means of screws 18, a gate 19 which has formed therein apertures 20 which are adapted to be in line with the feed holes 21 of the tape 13 when the tape 13 is in a temporary rest position in its intermittent advancement. The support 17 has formed therein apertures 22 (Fig. 3) which are in line with the apertures 20 of the gate 19. It is therefore apparent that if the tape is being properly fed, during the rest portion of its intermittent advancement, light will pass through the apertures 20 of the gate 19, then through the feed hole openings 21 of the tape, and thence through the apertures 22 of the plate 17.

Suitably mounted below the plate 17 is a photosensitive cell 25 which controls the circuit dis-

closed in Fig. 1. By an examination of the circuit shown in Fig. 1 it can be seen that, as the tape 13 is intermittently advanced, light rays will periodically pass to the photo-sensitive cell 25 which will thereby react to close the alarm control circuit. When this occurs, positive potential will be set up over the conductor 30, then through the photo-cell 25 and over the conductor 31 to the grid 32, which becomes more positive. Under these conditions current is permitted to flow from the plate 33 to the filament 34. The current is then carried over conductor 35 through the resistor 36 and through the primary winding 37 of the transformer 38. If the tape is being properly advanced, it can be seen that the photoelectric cell 25 will periodically close its circuit and cause a pulsating current to flow in the primary winding 37 of the transformer 38. This will induce a current in the secondary winding 40 of the transformer, which current causes the periodic energization of the slow-to-release relay 41, which thus keeps its armature 42 attracted in the normal operation of the tape feeding mechanism. The circuit is provided with a rectifier 39 in order that the invention may conveniently employ a direct current relay 41.

If for some reason a defective tape feeding condition is manifested, either caused by the total breakage of the tape, by the tearing of the tape feed-hole, or for some other reason, the apertures 22 will either receive a steady flow of light from the light source 14, or the light beam may be blocked entirely depending upon the position wherein the tape stops when it passes through the gate 19. Of course, it is possible that if there is a complete breakage of tape, there may be no tape at all in the guideway 16 and a steady beam of light may flow through apertures 22. If a steady flow of light shines through the apertures 22 of the plate 17 it can be seen that the photoelectric cell 25 will permanently close the control circuit and thus cause a continuous current to flow in the primary winding 37 of the transformer 38. It will therefore be evident that no current will be induced in the secondary winding 40 of the transformer 38 and therefore the slow-to-release relay 41 will become de-energized and its armature 42 will move away to close the contact 43 and cause an alarm circuit to be made, which will now be described.

In series with the stepping magnet 12 which controls the intermittent advancement of the sprocket wheel 11 is a slow-to-release relay 45 which is periodically energized as the stepping magnet 12 receives its impulses in a manner well known in the telegraph art. As relay 45 becomes energized it attracts its armature 46 and during the normal operation of the feeding mechanism maintains the armature 46 in a position to close the circuit to the battery 47; thus, when the previously outlined condition ensues wherein a steady beam of light projects upon the photo-cell 25 the armature 42 of the slow-to-release relay 41 will move to close the contact 43, and since the armature 46 is attracted normally by the slow-to-release relay 45 the alarm circuit is completed and the alarm 50 will be sounded, warning the operator that a defective feeding condition exists. Due to the fact that the slow-to-release relay 45 is in series with the stepping magnet 12, it can be seen that the alarm device is inoperative unless the feeding mechanism of the transmitter is operating, and therefore no false alarm signals may result. It will be understood that any convenient signal means may be em-

ployed in the present invention in place of the alarm bell 50 shown in the wiring diagram.

If a condition occurs whereby the tape blocks the passage of light to the photo-sensitive cell 25, no current will flow in the primary winding 37 of the transformer 38 and therefore relay 41 will receive no induced current from the secondary winding 40 of the transformer, consequently causing the alarm circuit to be completed in a manner similar to the method outlined above.

In Figs. 4 to 8 there is disclosed a second embodiment of the present invention which will now be described in detail. The apparatus about to be described might be conveniently used in conjunction with a tape transmitter such as is disclosed in the patent to M. T. Goetz, No. 2,296,845, granted September 29, 1942. The gear 74 disclosed in said Goetz patent is equivalent to the gear 61 which is best illustrated in Fig. 6 of the drawings, and it will be assumed that the gear 61 is receiving power and constantly rotating as described in the Goetz patent. As the gear 61 rotates by means of shaft 62, it drives the pinion 63 which in turn drives an idler gear 64, causing the rotation of driving gear 65 by means of which the apparatus disclosed in the present embodiment of the invention is driven. A shaft 66 is fixedly secured to the driving gear 65 and is journaled in the wall 50 of the tape transmitter. The clamping collar 51 which is pinned to the shaft 66 thereby holds the shaft against displacement in an axial direction.

In the said Goetz patent, there is disclosed a tape feeding sprocket which is equivalent to the tape feeding sprocket 70 herein disclosed, which normally intermittently advances the tape under the control of a stepping magnet 71 which appears in the circuit shown in Fig. 4. In the present embodiment of the invention, there is provided a second feeding mechanism which is controlled by the tape as will hereinafter appear. In this feeding mechanism the tape is intermittently advanced by means of a driven drum 72, and the pressure rollers 73 cooperating therewith. The pressure rollers 73 are journaled between the plates 81 and 82 which are spaced apart and have upper bent-over portions which are suitably attached to the underside of plate 100. Sleeve 87 which carries the ratchet 88 as hereinafter immediately described, extends through suitable apertures in the plates 81 and 82 out of contact therewith. A depending portion 99 of plate 81 rotatably supports the left end of shaft 66, as viewed in Fig. 5. The rotation of the drum 72 is controlled by the friction clutch indicated generally at 74, which is rendered operative by an escapement 75 to be hereinafter described in more detail. The driving shaft 66 has pinned thereto a collar member 77, which carries a disc-like member 78 having a bent-over projection 79, extending parallel to the shaft 66 and extending through a slot (not shown) on the disc 80 which is freely rotatable on the shaft 66. At each side of the disc 80 one of a pair of discs 83 of friction material and one of a pair of metallic discs 84 and 85 are mounted, the disc 85 being keyed to the shaft 66 and slidable thereon, whereas the disc 84 is fixed to the shaft and rotates therewith. Interposed between the disc 85 and the disc 78 is a coiled spring 86 which is under compression and acts to urge the disc members 80, 83, and 85 to the left as viewed in Fig. 5. The disc 84 has attached thereto the sleeve 87 which carries a ratchet member 88

indicated generally at 75.

The escapement 75 including the ratchet 88 is controlled by the armature member 90 of the escapement magnet 91 and is pivotable about a stud 92 on bracket 93 (Fig. 7) which supports the magnet 91. A spring 94 normally urges the armature lever to rotate in a counterclockwise direction as viewed in Fig. 7. Also mounted on the pivot 92 is a detent lever 95 engageable by projection 89 of armature 90 and urged by a spring 96, attached to the detent at one end and to the armature lever 90 at its other end, to move in a counterclockwise direction as viewed in Fig. 7. It is now obvious that when the stepping magnet 91 is energized, the armature 90 will be moved in a clockwise direction and its projection 89 will release detent 95 and the ratchet wheel 88 will be permitted to move one tooth forward in a counterclockwise direction as viewed in Fig. 7, due to the engagement of clutch member 74.

Attached to the top plate 100 (Fig. 5) of the tape transmitter is a bracket 101 having a depending portion which carries a pin 102 upon which is pivotally supported a fan-shaped shutter 103, which has formed therein a plurality of fan-shaped slotted apertures 104. The shutter member 103 has an extending arm 116 which is adapted to extend into the path of the tape. It is to be understood that the shutter is of very light weight in order that only a very light load is placed on the tape.

At one side of the shutter 103 there is supported from a bracket 107 a box-like member 108 (Fig. 6) in which there is suitably mounted a photo-sensitive cell 109. The front portion 110 of the box 108 has formed therein slotted apertures 106 shown in dotted lines in Fig. 5, which are of a configuration similar to the apertures 104 formed upon the pivoted shutter member 103. At the other side of the shutter member 103, there is mounted a lens supporting bracket 111 which is also supported upon the bracket 107, and which carries a lens 105. Directly in line with the lens 105 there is supported a suitable light source 114 which is mounted upon the C-shaped bracket 112 (Fig. 7). It is now evident that if the apertures 104 of the pivoted shutter 103 are in alignment with the apertures 106 of the box member 108, the light generated by the light source 109 may pass to the photo-sensitive member 109 to control the feeding of the tape as will be hereinafter described in more detail.

As the tape is intermittently advanced by sprocket 70 the shutter extension 116 is engaged by the tape 13 and the shutter is oscillated to a position wherein the apertures 104 of the shutter are in alignment with the apertures 106 of the box 108. Ordinarily the weight of arm 116 of the shutter pivots the shutter to its counterclockwise direction (as viewed in Fig. 5) with the end of arm 116 resting on the tape which at this time is in a slack condition. However, as the sprocket 70 feeds the tape forward, the slack is partially taken up and the arm 116 is lifted by the tape as the tape loop reduces in size, thereby pivoting the shutter to its clockwise position.

Referring now to Fig. 4 wherein the circuit diagram employed in the invention is disclosed, the effect of the oscillation of the shutter member 103 will now be described. When the tape is fed forward it will be apparent that the shutter 103 will be oscillated as described and a positive potential will be set up upon the grid 120 over

the conductors 121 and 122 and current will now be permitted to flow in the plate circuit from the filament 123 to the plate 124 and then through the winding of the relay 125. When relay 125 becomes energized, its armature 127 is attracted completing a circuit from battery, over conductor 128, through the winding of the slow-to-release relay 129 which becomes energized and through the winding of the escapement magnet 91, which becomes energized and attracts its armature 90, thence to ground. The projection 89 of the armature 90 acts against the detent lever 95 to release the escapement 75 as described, to permit the clutch mechanism, indicated generally at 74, to be rendered effective to rotate the sleeve 87 carrying the drum 72 forward one angular step, which due to its cooperation with the pressure rollers 73, feeds the tape forward. At this time the end of the armature lever 90 moves into the patch of the next tooth to block further rotation of the ratchet wheel, and thus to temporarily halt the feeding of the drum 72, and as the lever 90 swings again in a counterclockwise direction upon the deenergization of the magnet, the detent lever 95 falls into the path of the next tooth to block further rotation of the ratchet, all of which is a conventional escapement arrangement. At this time the shutter 103 is allowed to pivot by gravity to its counterclockwise position until the feed sprocket again operates to take up part of the slack and feed the tape forwardly thereby repeating the cycle of operations.

The feeding sprocket 70 of the tape transmitter is driven by means of a stepping magnet 71 as already described. When the slow-to-release relay 129 becomes energized it attracts its armatures to open through its armature 130 the circuit completed therethrough and through its left-hand armature to complete the make-before-break contact 172; that is, to close the circuit through the armature and to open the circuit through the other contact. A slow-to-release relay 131 is placed in series with the stepping magnet 71 over conductor 175 when relay 129 closes its front contact and opens its other contact, which constitutes a part of the make-before-break contact 172. The stepping magnet 71 drives the feeding sprocket 70, and as it receives impulses from its control device such as a distributor, the slow-to-release relay 131 is also energized, and due to its periodic energization, continuously maintains its armature 132 attracted. It is thus apparent that as long as the stepping magnet 71 is in operation and the slow-to-release relay 129 is being periodically energized due to the oscillation of the shutter 103, no circuit will be completed over the conductor 133 to the alarm device 134. However, if the stepping mechanism of the tape transmitter is operated and relay 131 is therefore periodically energized, and the slow-to-release relay 129 does not receive its periodic energization, its armature 130 will be released and a circuit will be made from battery through the armature 132 of the relay 131, which locks up as the normally closed contact of the make-before-break contact 172 is established upon the deenergization of relay 129 over the armature 130 of the relay 129, over the conductor 133, and through the alarm device 134 to ground. This will cause the sounding of the alarm and will bring to the operator's attention the fact that a defective tape condition exists. When the locking circuit for relay 131 is established due to the de-energization of

relay 129, the alarm will continue to ring until the defective condition is remedied, because battery is now received for relay 131 (which locks) over conductor 175 through the make-before-break contact 172. At this time, therefore, both the feeding drum 72 and the feed sprocket 70 will be stopped and no tape will be fed. In order to break the alarm circuit, the operator will depress a lever 140 which opens contact 171. Other functions of lever 140 will be hereinafter described in more detail.

In the operation of the alarm device embodied in Figs. 4 to 8 of the drawings it is observed that the stepping magnet 71 in the normal operation of the tape transmitter will intermittently cause the rotation of the tape feeding sprocket 70, which will therefore pull the tape 115 forward, and thus cause the pivoting of the oscillating shutter 103 which will periodically cause the operation of the control circuit, thus allowing the drum 72 to step the tape forwardly. Inasmuch as the shutter 103 is of a very light construction, and the drum 72 assists the feeding of the tape, a very light load is placed upon the tape in the employment of the alarm device disclosed in the present invention.

Prior to the commencement of transmission, when tape is being inserted into the tape transmitter, the lever 140 which has already been referred to is depressed by engagement of the finger of the operator with the bent-over portion thereof. When this occurs, the lever 140 is moved downwardly and carries a projection portion 142 thereof (Figs. 6 and 7) against the projecting portion 143 of the detent lever 95, which will cause the detent lever 95 to be pivoted in a clockwise direction, thus freeing the ratchet 88 for rotation due to the engagement of the clutch mechanism 74. The lever 140 disclosed herein is equivalent to the lever 108 which is described in detail in said Goetz patent. At this time the operator inserts the tape beneath the lower pressure roller 73 as seen in Fig. 8, and due to the fact that the drum 72 is at this time rotating, the tape is directed by means of a suitable guide 190 past the upper pressure roller 73, and is then further guided by means of the guide 117 underneath the extending arm 116 of the shutter member 103. The feed holes of the tape locate themselves upon the pins of the sprocket wheel 70 which is at this time released for rotation as described in said Goetz patent and transmission of the message in the tape commences. The invention thus provides a very convenient means for inserting the tape into the transmitter, either upon the commencement of a message or when a breakage of tape occurs.

In the present invention the frictionally driven drum 72 is designed to feed the tape forwardly slightly faster than the sprocket wheel 70. This is for the purpose of maintaining a loop between the sprocket wheel 70 and the drum 72. Due to this variation in feeding conditions the shutter 103 will at certain intervals remain in its counterclockwise position and the drum 72 will be rendered temporarily inactive until the sprocket feed roll or wheel 70 feeds a sufficient amount of tape to allow the resumption of normal operating conditions. Therefore, at times the shutter 103 will not be operated and it will therefore be understood that the slow-to-release relay 129 will be so constructed that it will hold armature 130 in its attracted position when only limited variances of tape feeding conditions be-

tween the sprocket 70 and the drum 72 exist to thereby prevent false alarms.

Referring again to Fig. 4 wherein the circuit diagram of the tape feeding mechanism is disclosed, it is observed that if a rupture of the tape occurs, the segment 103 will be pivoted in a clockwise direction, as viewed in Fig. 5, due to the weight of its extending arm 116, and no light will be transmitted to the photo-sensitive cell 109. The slow-to-release relay 129 will become de-energized, the normally closed contact of the make-before-break contacts 172 will be completed, and relay 131 will lock up and the alarm circuit will be completed as described, thereby warning the operator that a breakage of tape has occurred. A tearing of the tape feed holes may also cause a defective tape feeding condition, inasmuch as tape 115 will not be properly brought forward and therefore again the segment 103 will not be oscillated and no light will flow to the photo-sensitive cell 109, causing the alarm 134 to be sounded to warn the operator again of a defective tape feeding condition.

In Fig. 9 a variation of the second embodiment of the invention appearing in Figs. 4 to 8 is disclosed. In this variation of the invention, the shutter 103 is eliminated and the end of the tape loop is allowed to normally move from a dotted line position (as shown in the drawing) to a full line position, as the tape is fed forwardly. In this arrangement an optical apparatus 201 is provided containing a light source 202 and a suitable optical system 203 which includes a condensing lens 204. Light is emitted from the optical apparatus through a slitted aperture 205 which is in alignment with a similar aperture 206 formed in the container 207 which houses the light-sensitive cell 109. It is important to note that in the embodiment of the invention shown in Figs. 4 to 8, and in the variation shown in Fig. 9, a loop of tape is maintained by continuously rotating the sprocket feed roll 70 and the frictionally driven feed drum 72 so that the load on the feeding sprocket roll 70 is practically negligible. Thus, the strain on the tape is considerably reduced, particularly so where the shutter is not used, and there is no danger that the tape will tear at the feed holes.

In the operation of the invention as disclosed in the variation of the invention shown in Fig. 9, the end of the tape loop will normally move into and out of the path of the light emitted from housing 201 and thereby control a circuit such as disclosed in Fig. 4 in the same manner as when the shutter member 103 is employed, as already described. Due to the variation in feeding conditions between the feed sprocket and the friction drum, which feeds slightly more tape than the feed sprocket, the loop will at times be of such length that it will temporarily block the passage of light to the photo-sensitive device and the friction drum will be rendered temporarily inactive until the sprocket feed roll feeds a sufficient amount of tape to allow the resumption of normal operating conditions.

It is evident that the invention herein described in both embodiments thereof can be conveniently used to indicate when the end of a tape is reached because it is readily observed that if this condition occurs the photo-cell 109 disclosed in Figs. 4 and 9 and the photo-cell 25 disclosed in Fig. 1 at this time will respond to cause operation of the alarm devices. In the embodiment shown in Figs. 1 to 3 a continuous stream of light would flow to the photo-cell 25 and the

alarm 50 would be sounded, as previously described in detail. In the embodiment of the invention shown in Figs. 4 to 8 the shutter 103 would remain in a counterclockwise position as shown in Fig. 5 and therefore no light would flow to the photo-sensitive cell 109 and the alarm device 134 would be sounded, as described.

Various modifications and changes may be made in the invention herein described without departing from the spirit and scope thereof.

What is claimed is:

1. In a tape feed alarm, feeding means for advancing a tape, an alarm circuit, a light sensitive circuit responsive to the advancement of said tape and normally rendering said alarm circuit ineffective, and means for conditioning said alarm circuit for operation for each operation of the tape feeding means, said light sensitive circuit being operative to render said alarm circuit effective when defective tape feeding conditions are manifested.

2. In a tape feed alarm, feeding means for intermittently advancing a tape, an alarm circuit, and a light sensitive circuit periodically responsive to the intermittent advancement of said tape for normally rendering said alarm circuit ineffective, whereby said light sensitive circuit renders said alarm circuit effective only upon the failure of the intermittent advancement of said tape by said feeding means.

3. In a tape feed alarm, feeding means for intermittently advancing a web, an alarm circuit, a light sensitive circuit periodically responsive to the intermittent advancement of said web for rendering said alarm circuit ineffective, and means operative in synchronism with said feeding means for intermittently conditioning said alarm circuit for operation, said light sensitive circuit being operative to render said alarm circuit effective upon the failure of the intermittent advancement of said web by said feeding means.

4. In a tape feed alarm, feeding means for a strip, an alarm circuit, a light sensitive circuit responsive to the advancement of said strip for rendering said alarm circuit ineffective, and means for conditioning said alarm circuit for operation for each operation of the strip feeding means, said light sensitive circuit being operative to render said alarm circuit effective upon the failure of the intermittent advancement of said strip.

5. In a tape feed alarm, feeding means for intermittently advancing a tape through the feed holes therein, a light source at one side of and in alignment with said tape, an apertured member associated therewith, a light sensitive device positioned opposite said light source at the other side of said tape, an apertured member associated with said light source, the apertures of said apertured members being in alignment with the feed holes of said tape and spaced a distance equal to the spacing between said feed holes to allow a periodical flow of light to said light sensitive device, and an alarm circuit, said light sensitive device being normally periodically actuated by the intermittent pauses of tape to render said alarm circuit inoperative and being effective to operate said alarm circuit upon the failure of such tape.

6. In a tape feed alarm, means for intermittently feeding a tape, an alarm circuit, a light sensitive circuit for controlling said alarm circuit, a second feeding means also controlled by said light sensitive circuit, a light source, a pivoted light shutter having a portion engaging said

tape and being adapted to be oscillated by said tape in response to the intermittent advancement thereof to enable a periodic flow of light from said light source to said light sensitive circuit to enable said light sensitive circuit to normally render said alarm circuit ineffective and to render said second feeding means effective to intermittently advance said tape, said light circuit being operative to effect the operation of said alarm and to stop said second feeding means upon the failure of tape advancement.

7. In a strip feed device, a first feeding means for intermittently advancing a strip, a second means for intermittently advancing said strip, a light sensitive circuit for controlling said second feeding means, and means associated with said light sensitive circuit and controlled by the intermittent advancement of said strip for periodically rendering said light circuit effective to control said second feeding means.

8. In a strip feed device, a first feeding means for advancing a strip, a second feeding means for advancing said strip, a light sensitive circuit for controlling said second feeding means, and means associated with said light sensitive circuit and controlled by the advancement of said strip between said first and second feeding means for rendering said light circuit operative to control said second feeding means.

9. In a strip feed device, a first feeding means for intermittently advancing a strip, a second feeding means for intermittently advancing said strip, a light sensitive circuit for operating said second feeding means, a light source, and a light control member mounted between said first and second feeding means for controlling said light circuit, said member being engageable with said tape and oscillatable by the intermittent advancement thereof to periodically operate said circuit to thereby enable said circuit to control the intermittent advancement of said strip by said second feeding means.

10. In a tape feed alarm, a feeding means for intermittently advancing a tape, an alarm device, a light sensitive circuit for controlling said alarm device, and a control member for said circuit engageable with said tape and operable by the intermittent advancement thereof to periodically operate said circuit to render said alarm device ineffective, said alarm device being rendered effective upon the failure of tape advancement.

11. In tape feed alarm, a first feeding means for advancing a tape, a second feeding means for advancing said tape, an escapement for controlling said second feeding means, a light sensitive circuit for operating said escapement, and a control member for said circuit engageable with said tape and operable by the advancement thereof to control said light sensitive circuit to thereby render said circuit effective to control said escapement to enable the operation of said second feeding means.

12. In a tape feed alarm, means for intermittently advancing a tape, an alarm device, a pair of spaced guiding members for said tape having a plurality of apertures therein adapted to align with feed apertures in said tape when said tape is periodically advanced, a light source at one side of said pair of guide members, and a light sensitive device at the other side of said pair of guide members responsive to the receipt of light through said apertures during the advancement of said tape for controlling said alarm device.

13. In a tape feed alarm, means for advancing a tape through feed apertures therein, an alarm device, a light source at one side of said tape, and a light sensitive device at the other side of said tape adapted to periodically receive light through said tape apertures to control said alarm device.

14. In a tape feed alarm, means for advancing a tape, an alarm device, a light source radiating light to said tape, and a light sensitive device responsive to the advancement of said tape for controlling said alarm device.

15. In a strip feeding device, a first strip feeding instrumentality, a second strip feeding instrumentality for feeding said strip at a faster rate than said first strip feeding means to maintain a loop in said strip intermediate said feeding instrumentalities, an alarm circuit, a light emitting means for directing light towards said loop, and a light sensitive device cooperating with said light for controlling said alarm circuit, said loop being periodically positioned into and out of the path of said light emitting means by said feeding instrumentalities to thereby control said light sensitive device to normally render said alarm circuit ineffective.

16. In a strip feeding device, a first strip feeding instrumentality, a second strip feeding instrumentality for feeding said strip at a faster rate than said first feeding instrumentality to form a periodically movable loop in said strip intermediate said instrumentalities, an alarm device, and a light sensitive device responsive to the periodic movement of said loop to control said alarm device.

17. In a strip feeding device, a first strip feeding instrumentality, a second strip feeding instrumentality operable to feed the strip at a different rate than said first-mentioned instru-

mentality to normally maintain a periodically movable loop between said instrumentalities, and a light sensitive device responsive to the periodic movement of said loop for controlling both of said feeding instrumentalities.

18. In a strip control device, a first strip feeding instrumentality, a second strip feeding instrumentality, a strip loop extending between said instrumentalities, said instrumentalities being alternately operable to vary the position of said loop, and a light sensitive device responsive to the varying movement of said loop for controlling one of said feeding instrumentalities.

19. In a strip control device, a first feeding instrumentality, a second feeding instrumentality, a strip loop extending between said instrumentalities, said instrumentalities being alternately operable to vary the position of said loop, and means responsive to the varying movement of said loop for controlling one of said feeding instrumentalities.

20. In a strip control device, a first strip feeding instrumentality, a second strip feeding instrumentality, a strip loop extending between said instrumentalities, said strip being periodically movable by said instrumentalities, and a light sensitive device responsive to the periodic movement of said loop and the loop itself for controlling one of said instrumentalities.

21. In a tape feed alarm, a tape advancing means, an alarm device, and a light sensitive circuit means responsive to the advancement of a tape for generating impulses to normally render said alarm device ineffective and for generating a steady current to effect the operation of said alarm device upon failure of tape advancement.

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