April 2, 1940. J. N. ANDERSON 2,195,394

TAPE CONTROLLED CONTACT DEVICE

Filed May 14, 1938

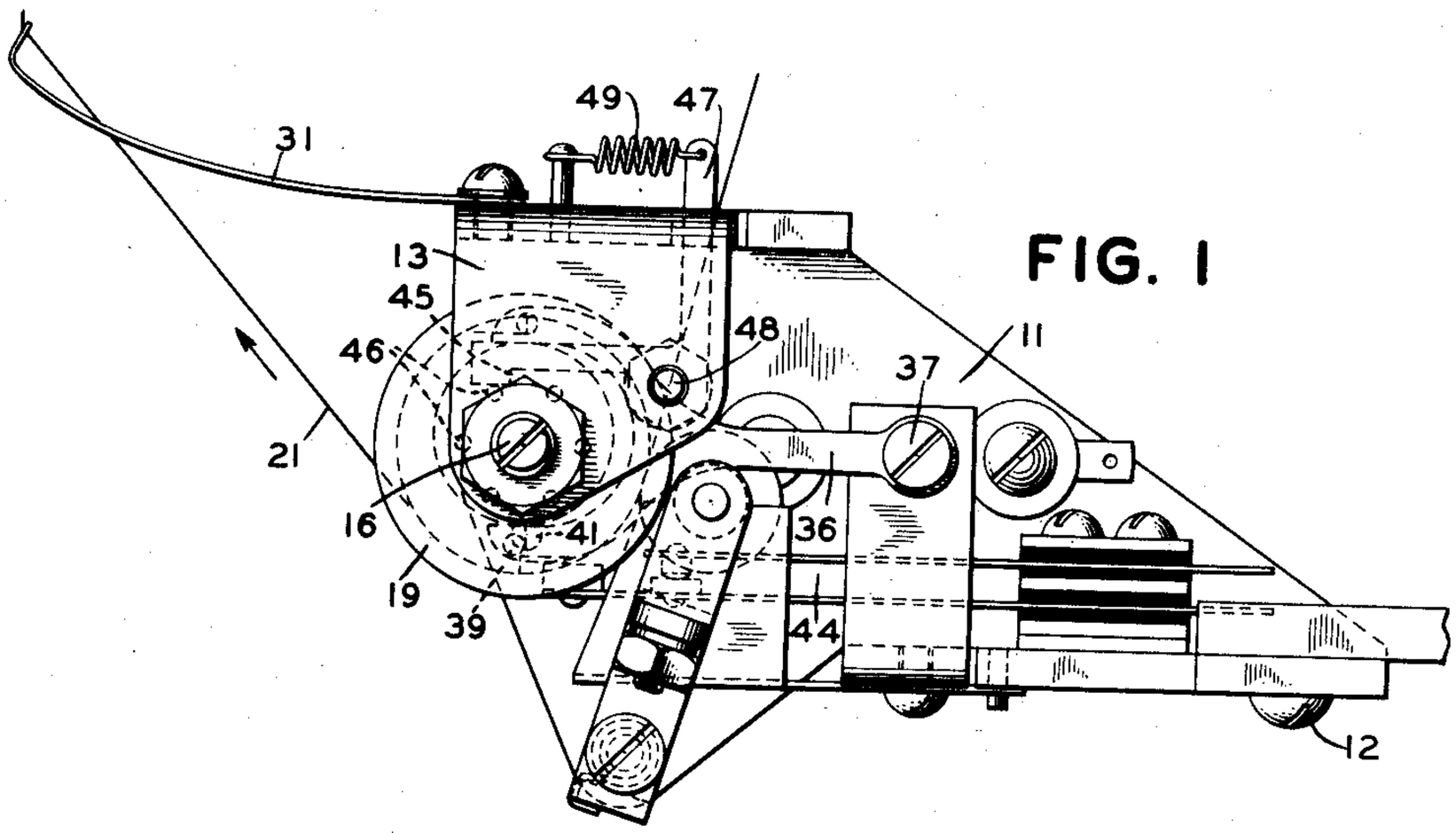


FIG. 1

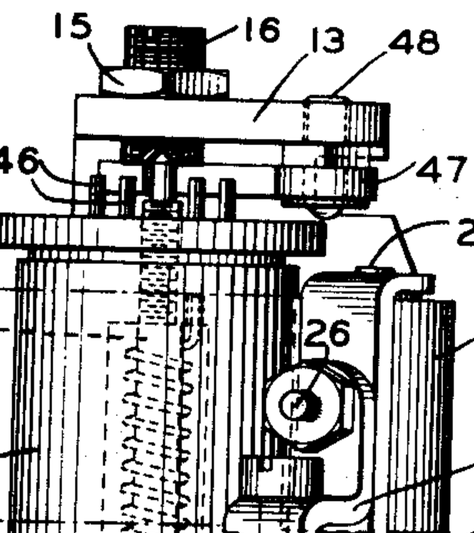
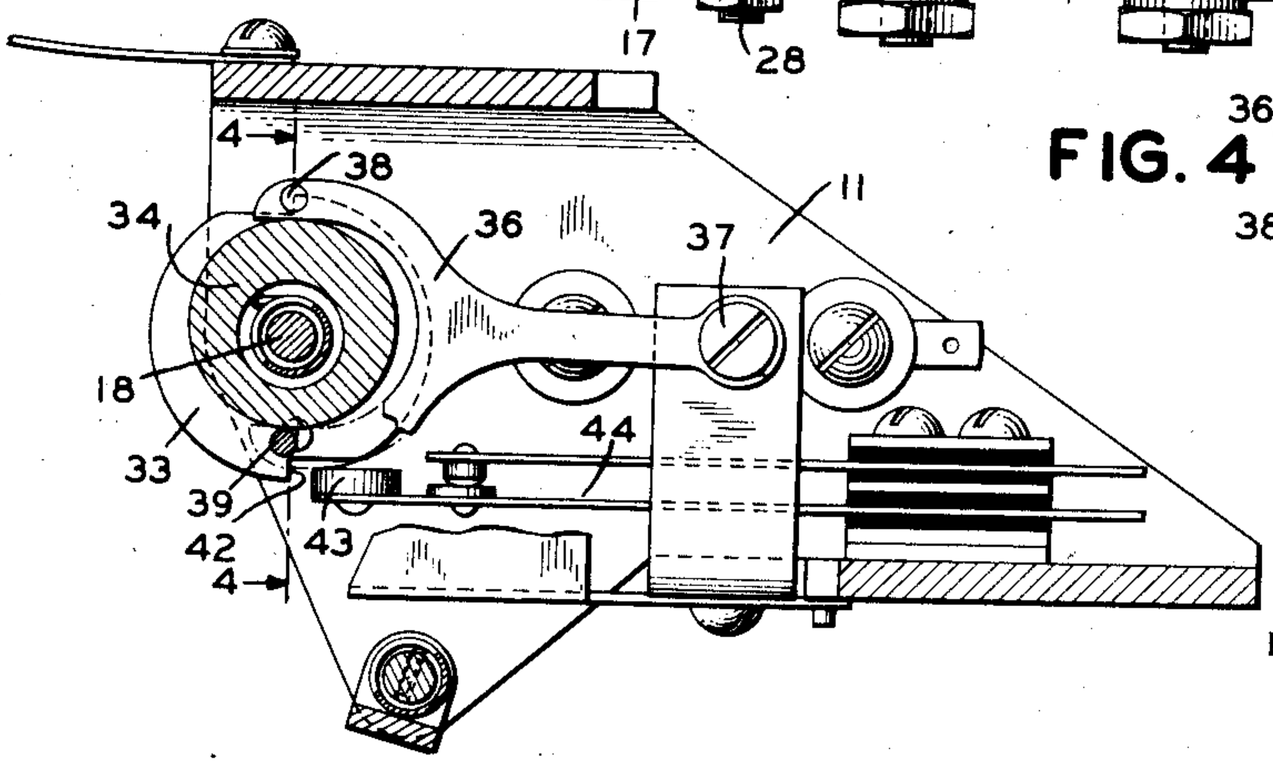


FIG. 2

FIG. 3



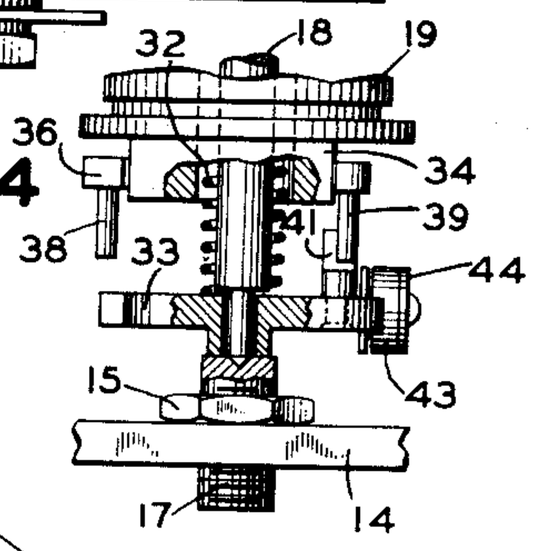


FIG. 4

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TAPE CONTROLLED CONTACT DEVICE

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8 Claims. (Cl. 200—52)

This invention relates primarily to a tape or web controlled contact device and more particularly to a mechanism adapted to operate in conjunction with telegraph machines employing recording or controlling tapes or webs such as printers, reperforators, tape transmitters, etc., to render a signalling or alarm device operative on failure of the tape or web to be properly advanced through the associated telegraph machine. However, the invention can be equally well applied to various other classes of machines where a web or tape must be advanced in conjunction with the operation of the machine.

In telegraph machines such as printers and the like, wherein a tape or web must be normally advanced in conjunction with each cycle or within a predetermined number of cycles of operation of the telegraph machine, it is obvious that a failure of the tape or web to be so advanced prevents the machine from functioning properly. Unless an attendant happens to be closely watching the machine, the failure of the tape or web to be advanced on each operation of the machine may not be immediately apparent and a considerable length of time may elapse before such a condition is noticed. Where the tape is one employed in conjunction with a reperforator upon which signals are being perforated, the failure of the tape to be advanced on each operation of the machine obviously results in all signals received in the meantime being lost, and where the tape is one used to control a tape transmitter, the failure of the tape to be advanced on each operation of the tape stepper obviously results in improper signals being transmitted during this time. Where such conditions exist for appreciable lengths of time, the results are very annoying and likely to necessitate considerable retransmission of signals and consequently delays in the telegraph service.

It is therefore an object of this invention to provide a device of novel design which will render an alarm or signalling mechanism operative on the failure of the tape or web in an associated machine to be properly advanced.

Another object of the invention is to provide a device of the above nature which is operated and controlled solely by movement of the tape or web through the associated machine.

Other objects of the invention reside in its simplicity, reliability, ease of adjustment and the minimum number of parts required to accomplish the above objects.

These and other objects of the invention will be apparent in the following detailed description when taken in conjunction with the drawing.

In the preferred embodiment and application of the device, the tape in the associated telegraph machine with which the device cooperates is adapted to engage and rotate a roller as the tape advances through the telegraph machine. A coiled spring is attached to the roller and as the roller rotates, the spring is wound up and energy stored therein. The other end of the spring is attached to a rotatable contact actuating disc which is periodically released for a portion of a revolution by means of a bifurcated member operated by an eccentric rotating with the roller. The disc cooperates during its rotation to actuate a contact and the contact in turn may be adapted to control a time delay signaling circuit to indicate the failure of the tape to be advanced through the associated telegraph machine. The time delay circuit may be of the general nature disclosed in a copending application of J. N. Anderson et al., Ser. No 179,823, filed December 15, 1937, and entitled "Tape tie-up indicating means," which is well suited to be controlled by the contact. It will be apparent hereinafter that only one of the duplicate circuits shown in the above-mentioned application will be necessary when employed in conjunction with this invention, as the contact for controlling the time delay circuit is never left in an operated condition.

A more complete and thorough understanding of the invention will be had when taken in conjunction with the following detailed description and drawing, in the latter of which:

Fig. 1 is a side elevational view of the device adapted to be operated by the tape associated therewith;

Fig. 2 is a plan elevational view thereof;

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

Fig. 4 is a detail view, partly in section, taken substantially on the line 4—4 of Fig. 3.

Referring first to Figs. 1 and 2, a mounting bracket 11 has the various elements of the invention mounted thereon and provides a means whereby the complete device may be attached to or mounted adjacent an associated machine employing the tape, by screws such as 12. Two horizontal sections 13 and 14, Fig. 2, of the bracket 11, have threaded therein two hollow ended pivot screws 16 and 17, respectively, which are held in place by associated lock nuts, such as 15. A shaft or rod 18 extends between the two screws 16 and 17 and is pivotally supported thereby. The shaft 18 has threaded to the upper

end thereof for rotation therewith a flanged tape roller 19 and a tape 21 in passing to the associated machine is adapted to pass partially around the roller 19 to rotate the same. In order to insure that the movement of the tape 21 will rotate the roller 19, a pressure roller 22 is held against the roller 19 with the tape 21 between the two rollers. The pressure roller 22 is pivotally supported on a rod 23 in a yoke 24, the yoke 24 being pivotally supported from a screw 26 on the end of a lever 27 which in turn is pivotally supported on a shoulder screw 28 extending from the section 14 of the bracket 11. A spring 29 is coiled about the shoulder screw 28 and has one end connected therein, the other end of which engages the lever 27 tending to pivot it about the shoulder screw to hold the pressure roller 22 against the tape roller 19. As the tape passes from the roller 19 it engages the center section of a U-shaped single wire spring 31. The spring 31 normally maintains a slight loop in the tape 21 and allows the tape to move more uniformly through the rollers 19 and 22.

Coiled about the center portion of the rod 18 is a helical spring 32 which has the upper end thereof anchored in the roller 19 and the lower end anchored in a rotatable notched disc 33. The disc 33 is pivotally supported at the lower end of the rod 18 which is of smaller diameter, see Fig. 4, and as the roller 19 is rotated by the tape, the spring 32 is wound up and obviously tends to rotate the disc 33 with the roller 19. However, the disc 33 is normally prevented from rotating with the roller 19 by means hereinafter described. Formed integrally with the roller 19 is an eccentric 34, Figs. 2, 3 and 4, which oscillates the free end of a bifurcated lever 36 back and forth within predetermined limits as the roller 19 revolves. The bifurcated lever 36 is pivotally supported at its other end on the shoulder screw 37 in the bracket 11. Two pins 38 and 39 are mounted on the tines of the bifurcated end of the lever 36, parallel with the rod 18, and are diametrically opposed to one another with respect to the rod 18. One or the other of the pins 38 or 39 is normally engaged with a pin 41 extending from the disc 33 and thereby prevents the disc from rotating.

Let it be assumed that the lever 36 is in the position shown in Fig. 4 with the pin 39 in engagement with the pin 41 on the disc 33, and as the tape 21 advances to rotate the roller 19 and eccentric 34 as hereinbefore described, the eccentric 34 causes the bifurcated lever 36 to be moved toward the right. After a predetermined amount of movement of the lever 36 in this direction, the pin 39 thereon moves out of engagement with the pin 41 on the disc 33, while at the same time placing the pin 38 in the path of the pin 41. On the disengagement of the pins 39 and 41 the spring 32 being tensioned as hereinbefore described, causes the disc 33 to quickly rotate half a revolution and bring the pin 41 thereon into engagement with the pin 38 on the other tine of the lever 36. This stops rotation of the disc for the time being and as the eccentric 34 continues to be rotated by the movement of the tape 21, the lever 36 is moved back to its original position, causing the disengagement of the pins 38 and 41 and allowing the disc to rotate, by the action of the spring 32, to bring the pin 41 again into engagement with the pin 39. In this manner the disc 33 is intermittently released for substantially a half revolution at a time as the tape 21 passes through an associated machine.

The disc 33 has two diametrically opposed notches therein such as 42, Fig. 3, which cooperate with an insulating member 43 on the end of one of the springs of a spring contact 44, to momentarily operate the contact during the revolution of the disc. As shown, the contact 44 is normally closed and is adapted to be momentarily opened during a half revolution of the disc 33 but it is obvious that the contact 44 could be normally open and momentarily closed during a half revolution of the disc, either arrangement being used which is best adapted for operation in conjunction with the associated circuit, such as a time delay alarm controlling circuit of the hereinbefore mentioned copending application.

Extending from the upper end of the roller 19, as shown in Fig. 1, parallel to the axis thereof are a series of pins 46 in operative relation with the hook-shaped end 45 of a bell crank 47 which is pivotally supported on a stud 48 in the section 13 of the bracket 11. A spring 49 attached to one end of the bell crank 47 holds the hook-shaped opposite end 45 thereof in engagement with the pins 46 and prevents the rotation of the roller 19 in a direction opposite to that rotated by the tape 21. The pins 46 and bell crank 47 also provide a means whereby, by holding the disc 33 from turning and manually rotating the roller 19 a sufficient initial tension may be set up in the spring 32 to insure that the disc 33 when released by the pins 38 or 39 will quickly make half a revolution.

From the above it can be seen that the invention provides a device for momentarily operating a circuit controlling contact, the device having no operating connection other than through the tape with the associated machine and that on failure of the tape to properly pass through the associated machine, the contact will never be left in an off-normal position.

Although the invention has been described as operating in conjunction with a machine employing a tape, it is obvious of course, that it may be adapted to operate in conjunction with machines employing a web or page, and that various other modifications of the apparatus shown and described herein may be made without departing from the spirit or essential attributes of the invention and it is desired therefore, that only such limitations shall be placed thereon as are imposed by the prior art or specifically set forth in the appended claims.

What is claimed is:

1. In combination with a telegraph tape normally advanced on each operation of an associated telegraph machine, a roller in engagement with said tape, and adapted to be rotated by movement of said tape, a rotary contact actuating member, an energy storing device disposed between said roller and said contact actuating member, said energy storing device being adapted to have energy stores therein on rotation of said roller and tending to rotate said contact actuating member, means operated by said roller for alternately releasing said contact actuating member to permit rotation thereof by said energy storing device for a predetermined amount and invariably bringing the same to rest thereafter, a contact and means including said contact actuating member for momentarily operating said contact during rotation of said contact actuating member.

2. In combination with a movable tape, a roller in engagement with said tape and adapted to be rotated on movement thereof, a contact, means

controlled by said roller adapted to invariably operate said contact after predetermined amounts of rotation of said roller by said tape and means whereby said contact is not maintained in an operated condition for any position and condition of said roller.

3. In combination with a movable tape or the like adapted to be moved in the direction of its length, a contact, a cyclically operable contact actuating member adapted to momentarily operate said contact during each cycle of operation thereof, and means operated by movement of said tape for invariably causing the release of said contact actuating member for a cycle of operation, once for each predetermined amount of movement of said tape.

4. In a contact device, a tape or the like adapted to be moved in one direction, a roller in engagement with said tape and adapted to be rotated by said tape on movement thereof, a contact, a rotatable contact actuating member, a resilient member disposed between said roller and said contact actuating member, said resilient member having the tension therein increased on rotation of said roller and decreased on the rotation of said contact actuating member, a stop member rotatable with said contact actuating member, a plurality of movable stop member engaging elements one of which is normally engaged with said stop member to prevent the rotation of said contact actuating member by said resilient member, means controlled by said roller after predetermined amounts of rotation thereof for withdrawing the engaged stop member engaging element from engagement with said stop element and simultaneously moving another in the path thereof whereby said contact actuating member is released for rotation by said resilient member until stopped by the engagement of said stop member with said stop member engaging element in the path thereof and means operative during said rotation of said contact actuating member for momentarily operating said contact.

5. In a contact device, a tape or the like adapted to be moved in the direction of its length, a roller in engagement with said tape and adapted to be rotated by said tape on movement thereof, a contact, a rotatable contact actuating member, a resilient member disposed between said roller and said contact actuating member, said resilient member having the tension therein increased on rotation of said roller and decreased on the rotation of said contact actuating member, means for releasing said contact actuating member for rotation by said resilient member when the tension thereof increases to a predetermined amount, means for stopping the rotation of said contact actuating member when the tension in said resilient member decreases to a predetermined amount and means operative during the rotation of said contact actuating member for momentarily operating said contact.

6. In a contact device, a tape or the like adapted to be moved in one direction, a roller in engagement with said tape and adapted to be rotated on movement of said tape, a rotatable disc upon an axis common to said roller, a spring coiled about said rod and connected between said roller and said disc, said spring being wound up on rotation of said roller and tending to rotate said disc, a stop member extending axially from said disc, a plurality of movable pins, one of which is normally engaged with said stop member to hold said disc from rotating, said pins being movable into and out of the path of said stop arm, a pivotable lever for carrying said pins, means operative on the rotation of said roller to pivot said lever to move the pin engaged with said stop member out of engagement therewith and move another of said pins into the path thereof, means including said spring whereby said disc thereupon rotates to bring the stop member thereon into engagement with the pin in the path thereof to stop the rotation of said disc, a contact, and means comprising said disc for momentarily operating said contact only during rotation of said disc.

7. In a contact device, a web movable in the direction of its length, a bracket, a rod pivotally supported in said bracket, a roller on said rod adapted to be rotated by said tape, a disc on said rod, a resilient member disposed between said roller and said disc, said resilient member being tensioned on rotation of said roller and tending to rotate said disc therewith, a stop member on said disc, a pivotable lever, a plurality of pins carried by said lever in diametrically opposed relation relative to said rod, one or the other of which is normally engaged with said stop member to hold said disc at rest, means operative by said roller to oscillate said lever to withdraw the pin engaged with said stop member and place the other in the path thereof, whereby said disc is released to rotate a predetermined amount, a spring contact and means incorporating notches in said disc to momentarily operate said contact during the rotation of said disc.

8. In a contact device, a tape movable in one direction, a bracket, a rod pivotably supported in said bracket, a roller on said rod adapted to be rotated by said tape, a disc on said rod, a resilient member disposed between said roller and said disc, said resilient member being tensioned on rotation of said roller and tending to rotate said disc therewith, a stop member on said disc, a pivotable lever, two pins carried by said lever in diametrically opposed relation relative to said rod, one or other of which is normally engaged with said stop member, an eccentric rotatable with said roller for oscillating said lever whereby the movement thereof disengages the pin engaged with said stop member and simultaneously places the other pin in the path thereof whereby said disc is intermittently released for substantially half a revolution at a time by said resilient means, a normally unoperated contact and means incorporating said disc for operating said contact only during movement of said disc.

JAMES N. ANDERSON.