

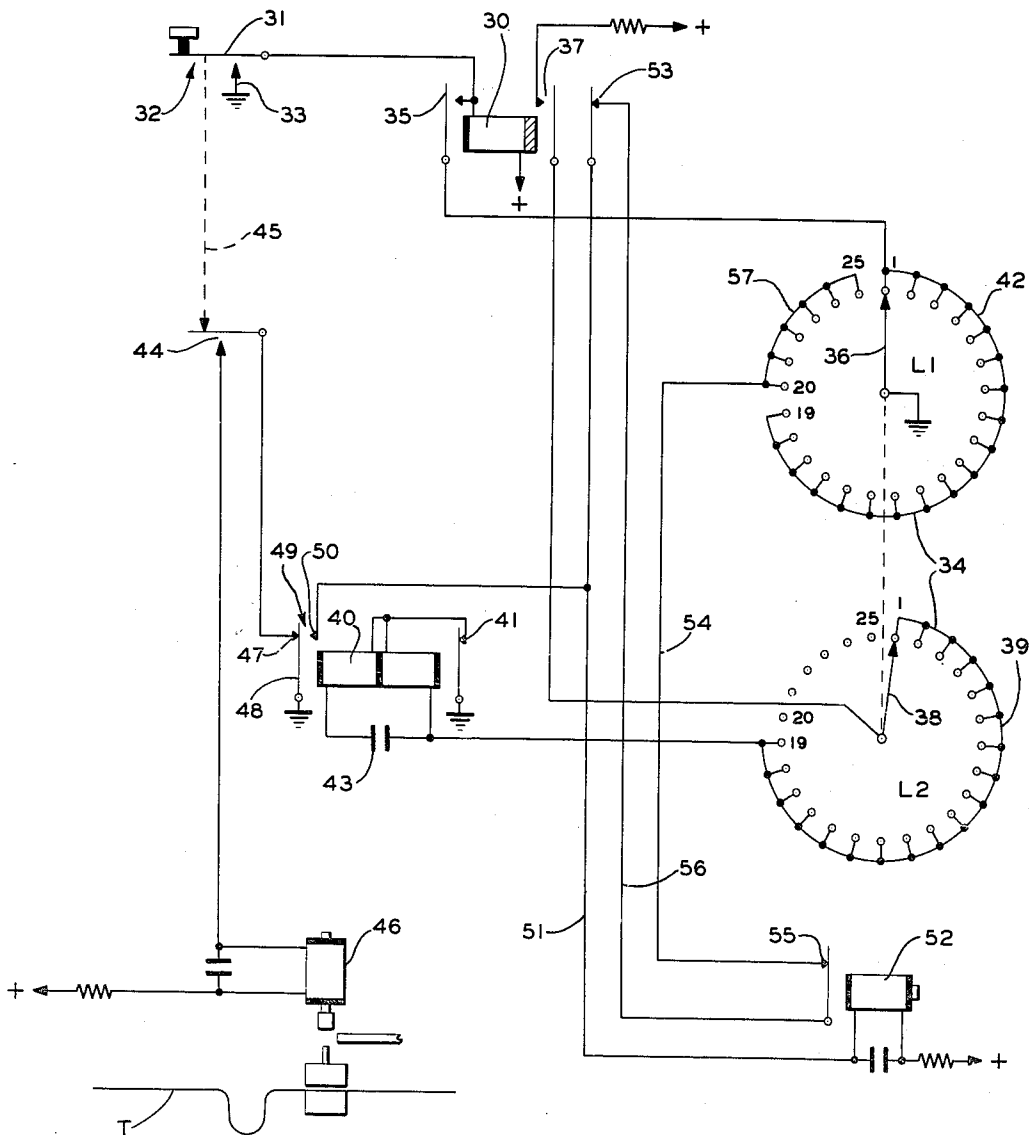
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METERED CIRCUIT FOR EFFECTING REPEATED RECORDING OPERATIONS

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METERED CIRCUIT FOR EFFECTING REPEATED RECORDING OPERATIONS

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1 Claim. (Cl. 164—113)

The present invention relates to the preparation of perforated tape for the transmission of telegraph signals, and more particularly to apparatus for automatically producing a predetermined number of desired character perforations on a tape for the transmission of telegraph signals.

In transmitting intelligence by telegraph signals for reproduction on page printing apparatus, it is frequently desired to reproduce the intelligence in tabular form. For instance, in transmitting sporting news, such as the results of a baseball game, a first column might contain the players' names and additional columns might contain such information as "at bat," "runs," "hits," "errors," etc. For proper tabulation, each column should be spaced a predetermined number of spaces from the left hand margin. In the preparation of perforated tape for the telegraph transmission of such information, operators generally perforate the tape to represent a player's name and position and then, in order to avoid counting the characters in the name, return the carriage to the margin and perforate a predetermined number of spaces, such as 20, in order to be in the proper column for tabulating additional information such as "at bat." This manual counting and perforating is a laborious operation and one in which errors frequently occur.

Accordingly, it is an object of the invention to provide apparatus for automatically producing a predetermined number of character perforations in a tape.

More specifically, it is an object of the invention to provide apparatus for automatically producing a predetermined number of permuted signal representative character perforations in a tape when a key of the perforating device is actuated in such a way as to initiate operation of the automatic counting and perforating apparatus.

Another object of the invention is to provide apparatus for automatically producing a predetermined number of character perforations in a tape when the corresponding key of the perforating device is held depressed for an interval longer than the normal operating time.

Further objects of the invention will appear from the following description.

According to the invention, these objects are achieved by providing a relay responsive to a particular operation of a key in the perforating device, a relay oscillator or other oscillator means coupled to the relay through a multi-contact switch and energized through the relay, and arranging the relay oscillator to actuate the punching solenoids of the perforating device and the stepping magnet of the switch so that the predetermined number of perforations will be made in the tape and the switch will step a given number of contacts, the stepping of the last contact causing deenergization of the relay and relay oscillator.

The invention will now be described in greater detail with reference to the appended drawing which shows one form of circuit arrangement according to the invention for

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producing a predetermined number of spacing perforations.

Referring now to the drawing, one end of the winding of a slow-to-operate relay 30 is connected to positive battery while the other end thereof is connected to a front contact 31 of a key 32. Key 32 may be a space bar of a perforating device such as, for instance, the keyboard perforator disclosed in U. S. Patent 1,769,834, issued July 1, 1930, to W. E. Harding. While key 32 might be any of the character keys of a perforating device, it will be described hereinafter as a space bar having a pair of added contacts 31 and 33.

The main contact 33 of bar 32 is connected to ground. The time of operation of slow-to-operate relay 30 is chosen so that it will operate when bar 32 is held depressed for a period appreciably longer than the normal time consumed in perforating a space. When relay 30 operates, it locks up in its operated position through a level L1 of a rotary switch 34. The locking up circuit may be traced from positive battery through the winding of relay 30, normally open contacts 35, stud 1 of level L1, and through a wiper 36 to ground.

Operation of relay 30 also closes a circuit from positive battery through a pair of normally open contacts 37, a wiper 38 of another level L2 of rotary switch 34, stud 1 of level L2, a conductor 39, one of the windings of a relay oscillator 40, and through a pair of normally closed contacts 41 to ground. For reasons which will be apparent hereinafter, studs 1 through 19 of levels L1 and L2, respectively, are interconnected by conductors 42 and 39, respectively. When the circuit through level L2 and relay oscillator 40 is closed, relay oscillator 40 will oscillate at a frequency determined by the inductance of the relay oscillator windings and the capacitance of a condenser 43 connected across the relay oscillator windings. Each time relay oscillator 40 is operated, contacts 41 open to permit discharge of condenser 43 through the relay oscillator windings.

When space bar 32 is depressed, a pair of punch solenoid contacts 44 will be closed because of a mechanical linkage 45 between bar 32 and contacts 44. While a mechanical linkage between bar 32 and contacts 44 is shown in the drawing, other means of securing substantially simultaneous operation thereof might be employed. In a preferred embodiment of the invention, contacts 44 constitute the perforator universal bail contact. In the deenergized condition of relay oscillator 40, a circuit will be completed from positive battery through a punch solenoid 46, contacts 44, and a normally closed back contact 47 and tongue 48 of transfer contacts 49 to ground. As this circuit is normally closed when space bar 32 is depressed, depressing the space bar will cause punch solenoid 46 to perforate a paper tape T with a space indication. If space bar 32 is depressed for a sufficiently long interval for slow-to-operate relay 30 to be energized, relay oscillator 40 will be energized and cause tongue 48 to leave back contact 47 and connect with a front contact 50 of transfer contacts 49. As soon as the circuit through back contact 47 is opened, punch solenoid 46 will be deenergized.

When relay oscillator 40 is in its operated position, a circuit is closed from ground through tongue 48, front contact 50, a conductor 51, and a stepping magnet 52 for rotary switch 34 to positive battery. When relay oscillator 40 oscillates back to its unoperated position, the punch solenoid circuit through back contact 47 and tongue 48 will again be closed producing another space perforation on the tape. The return of relay oscillator 40 to its unoperated position will also open the stepping magnet circuit through tongue 48 and front contact 50, thereby deenergizing stepping magnet 52 and causing wipers 36

and 38 to step to studs 2 of levels L1 and L2, respectively. Relay oscillator 40 will next oscillate to its operated position, opening the punch solenoid circuit and closing the stepping magnet circuit.

Relay oscillator 40 will oscillate and alternately actuate punch solenoid 46 and step rotary switch 34 until rotary switch 34 has completed 19 steps and wipers 36 and 38 of levels L1 and L2, respectively, are resting on studs 20. When wiper 38 is resting on stud 20 of level L2, positive battery will no longer be supplied to relay oscillator 40, so relay oscillator 40 will remain in its unoperated position. Completion of 19 steps of rotary switch 34 will correspond to 20 space perforations in the tape. That this is the case can be seen from the fact that a space perforation was made when space bar 32 was initially depressed and before the first stepping operation was carried out, and a final space perforation is made after the 19th stepping of the rotary switch because punch solenoid 46 is energized in the unoperated position of relay oscillator 40. Therefore the punch solenoid obtains one more operation than the rotary switch. Stud 1 through 19 of levels L1 and L2 are short-circuited by conductors 42 and 39, respectively, because, as the wipers rest on each of these studs, the same cycle of operations is performed.

As soon as wiper 38 is stepped away from stud 19 of level L2, it has no further function to perform.

When wiper 36 leaves stud 19 of level L1, the locking circuit for relay 30 through contacts 35 and level L1 is broken. Therefore relay 30 will be deenergized as soon as space bar 32 is opened. If space bar 32 is opened prior to the 19th stepping of rotary switch 34, relay 30 will remain energized because of the locking circuit through contacts 35. However, such premature opening of space bar 32 will open contacts 44 thereby preventing energization of punch solenoid 46 and perforation of the tape.

When wiper 36 rests on stud 20 of level L1 and when relay 30 is deenergized so that a pair of normally closed contacts 53 will be closed, a circuit is completed from ground through wiper 36, stud 20 of level L1, conductor 54, a pair of normally closed contacts 55, conductor 56, contacts 53, conductor 51, and stepping magnet 52 to positive battery. Completion of this circuit energizes stepping magnet 52, causing contacts 55 to open and stepping magnet 52 causes wipers 36 and 38 of levels L1 and L2, respectively, to step to studs 21. Since studs 20 through 25 of level L1 are short-circuited by a conductor 57, this cycle of operations will be repeated at each of studs 21 through 25 of level L1, thereby returning wipers 36 and 38 to studs 1 of levels L1 and L2, respectively. When wiper 36 rests on stud 1 of level L1, the stepping circuit through contacts 55 cannot be completed and stepping will cease. The stepping operation from studs 20 home to studs 1 will not occur until space bar 32 is opened because relay 30 must be deenergized so that contacts 53 will be closed and permit completion of the home stepping circuit. If space bar 32 is opened

prior to completion of 19 steps by rotary switch 34, the locking circuit for relay 30 through contacts 35 will keep relay 30 operated until 19 steps have been completed, that is, until wipers 36 and 38 have reached studs 20 of levels L1 and L2, respectively. Rotary switch 34 will, therefore, be stepped home to studs 1 whether the space bar is opened prior to or after completion of 19 steps.

The arrangement described provides for the punching of 20 space perforations in the tape. It is to be understood that any other desired number of space perforations or any desired number of other character perforations could be produced with an arrangement of the type described.

While the invention has been described in a particular form thereof and in a particular use, it is not desired that it be limited thereto, for obvious modifications thereof will occur to those skilled in the art without departing from the spirit and scope of the invention as set forth in the appended claim.

What is claimed is:

In a device for recording telegraphic code characters on a control tape, a keyboard having a key lever representing a particular code character, pulse generating means for producing a series of operating pulses, a recording mechanism initially controlled by operation of the said key lever and subject to further control by the output of said pulse generating means, delay means controlled by the said key lever for operatively associating said pulse generating means with said recording mechanism to cause a succession of pulses to be applied to said recording mechanism to cause a like succession of code characters represented by said key lever to be recorded on said control tape, and pulse counting means comprising a stepping switch, a stepping magnet therein having an initial position and adapted by connection to the said pulse generating means to step the said switch away from said initial position and into successive contact positions by means of the said control pulses, contacts to deenergize the said pulse generating means after a predetermined number of steps have been made and further contacts therein connected to restore the said delay means to the said initial position simultaneously with deenergizing the said pulse generating means, whereby a fixed predetermined number of said operating pulses are applied to said recording mechanism whereby depression of said key lever causes immediate recording of a predetermined code character on the control tape, and continued depression thereof throughout a delay interval initiates the successive recording of a predetermined number of like code characters thereon.

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