

Nov. 10, 1942.

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2,301,831

APPARATUS TO INDICATE TELETYPEWRITER SKIPPING

Filed March 19, 1941

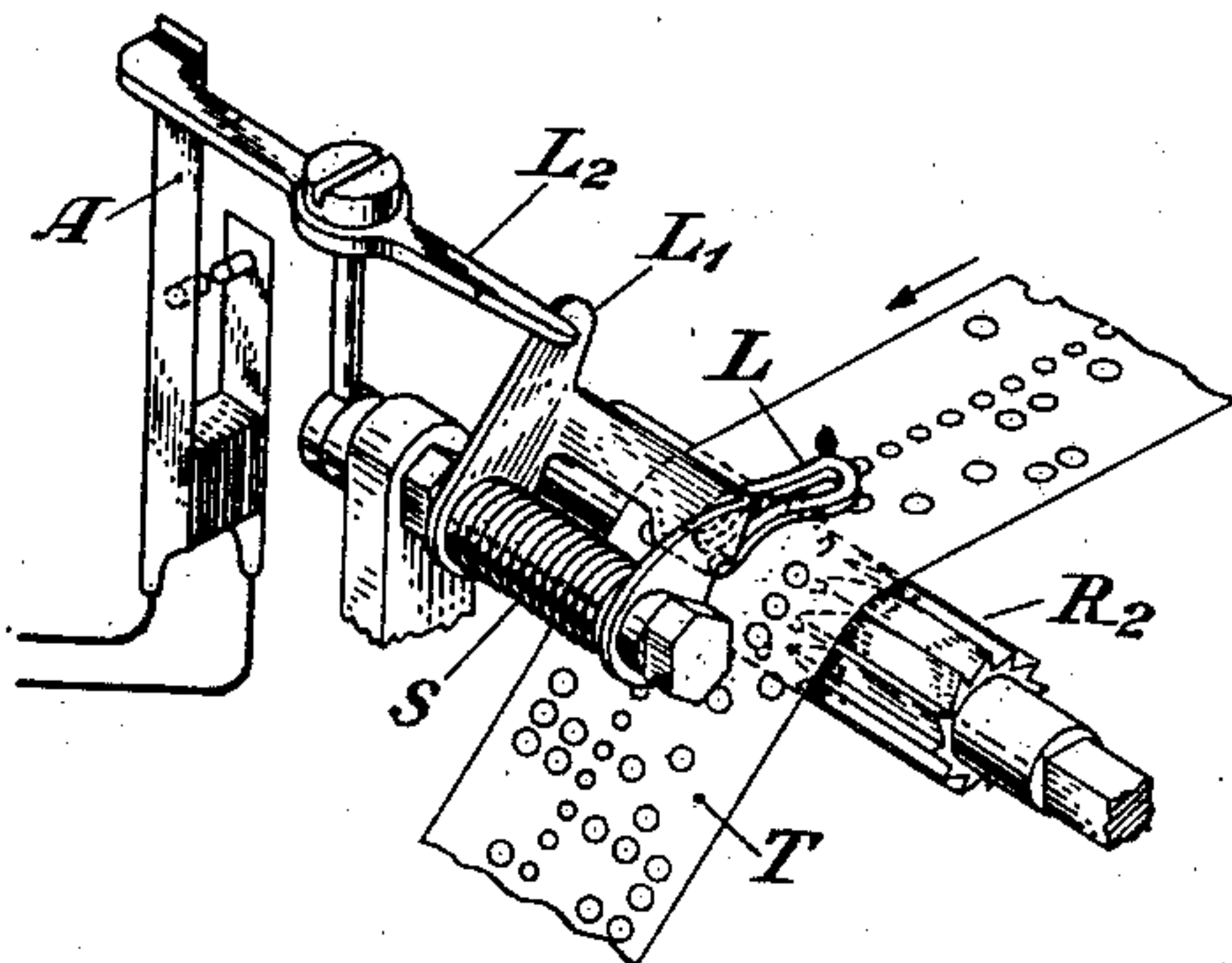


Fig. 1

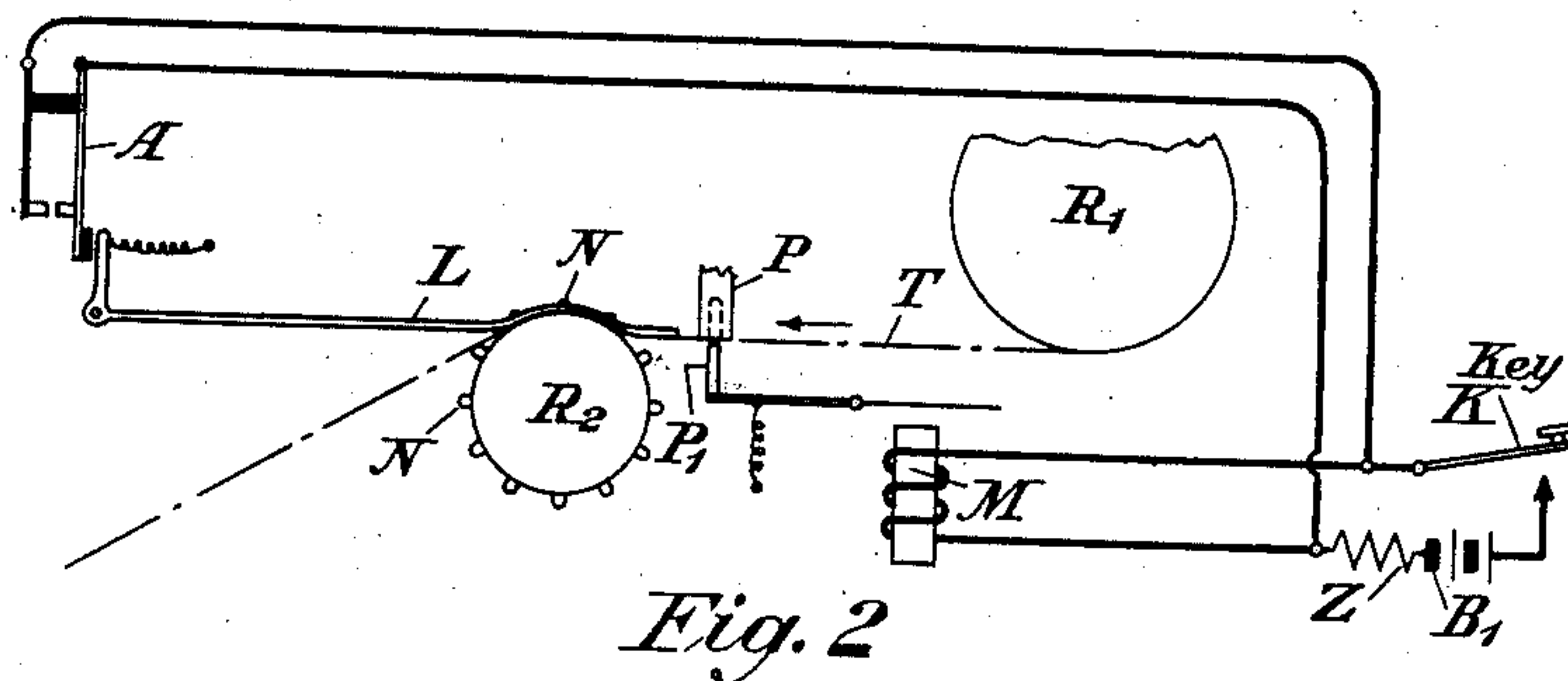


Fig. 2

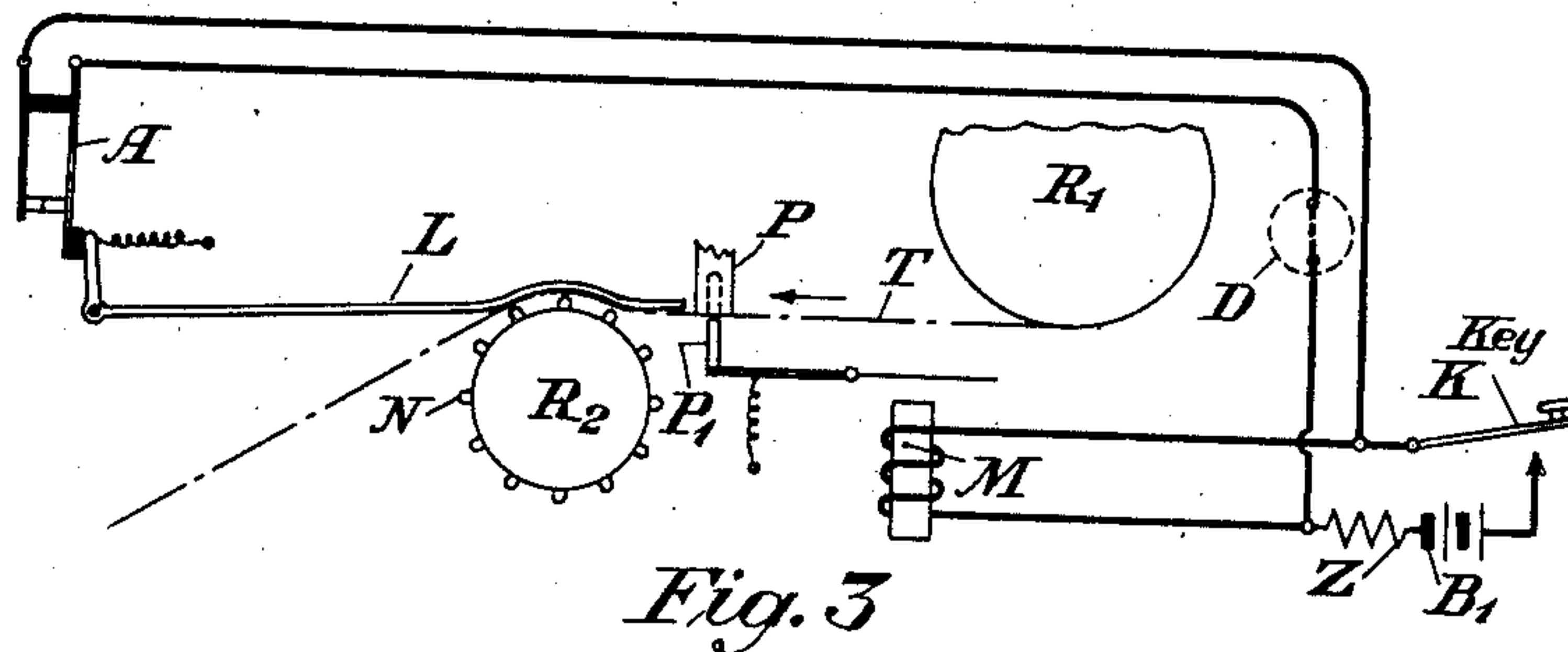


Fig. 3

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## UNITED STATES PATENT OFFICE

2,301,831

APPARATUS TO INDICATE TELETYPE-  
WRITER SKIPPING

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Application March 19, 1941, Serial No. 384,046

4 Claims. (Cl. 164—113)

This invention relates to teletypewriter perforator apparatus. More particularly this invention relates to improvements in teletypewriter perforator systems which are designed to prevent the transmission of incorrect signals or characters as a result of "skipping" of the tape of such systems.

As is well known in the teletypewriter perforating art, special codes may be punched in the tape of the teletypewriter perforating apparatus by depressing the various keys of the apparatus. These codes generally provide for the letters of the alphabet, for various numerals and for several miscellaneous symbols of common use, as well as for special operations such as switching one or more teletypewriters into or out of the circuit under the control of the operator. Many of the latter switching operations are performed by combining a "blank" signal with some letter or numeral. Errors in these switching operations may occur when the tape "skips," that is when the punch pins do not perforate the tape. When a "skip" occurs due, for example, to the lightness or the "staccato" character of the operator's touch, or for other reasons, a blank signal may be transmitted, which together with any one of several subsequent letters or numerals will act either to disconnect a distant teletypewriter or several teletypewriters, or connect one or more teletypewriters to the circuit. Such errors result in confusion and are costly.

According to the present invention errors due to "skipping" of the teletypewriter tape are prevented. This is accomplished by locking the perforator or punch magnet of the teletypewriter apparatus after the tape has skipped, and preventing the perforator or punch magnet from re-operating until the operator has back-spaced the tape sufficiently and removed the blank characters before they are transmitted to a distant point.

This invention will be better understood from the detailed description hereinafter following when read in connection with the accompanying drawing in which Figure 1 shows one embodiment of this invention in perspective merely for the purpose of illustration, and Figs. 2 and 3 show part of the circuit arrangement which may be operated to control the apparatus of this invention.

The drawing shows part of the apparatus of a tape teletypewriter perforator apparatus. Here a section of tape T is unrolled from a reel R<sub>1</sub> shown in Figs. 2 and 3, and guided over a feed roll R<sub>2</sub>, shown in all of the Figs. 1 to 3, the tape

moving in the direction indicated by the arrow. The tape T passes between the punch block P and the punch pins P<sub>1</sub>, shown in Figs. 2 and 3, and over the feed roll R<sub>2</sub>. The tape T is moved step-by-step under the control of the keys of a teletypewriter perforator keyboard of the usual type, only one key being shown for illustrative purposes and designated K. The key K controls the operation of a punch magnet M, which is included in circuit with a battery B<sub>1</sub> and a current-limiting resistor Z. The punch magnet M controls the operation of a plurality of punch pins such as P<sub>1</sub>. In general, the punch magnet M may control the operation of six punch pins. One of these punch pins, known as the feed hole punch pin, perforates the tape T with each depression of the key K, the other five punch pins being arranged in groups of two and three on opposite sides of the feed hole punch pin, the five punch pins being selected by the apparatus in different combinations in accordance with a code corresponding to the particular key depressed by the operator. As the tape T is moved along its normal path and feed holes are punched therein at regular intervals, the pins N progressively engage the feed holes in the tape, the pins N being arranged along the periphery of the feed roll R<sub>2</sub>, these pins N being equally spaced from each other along the outer surface of the feed roll R<sub>2</sub>.

In Fig. 1 there is shown a spring S which normally holds the lever L lightly against the tape T and one of the functions of spring S and lever L is to assure substantially positive engagement of the pins N with the feed holes of tape T. The metal piece L<sub>1</sub> forming a part of the movable lever L is linked by means of lever L<sub>2</sub> to the armature and contact arrangement A.

The punch pins such as P<sub>1</sub> are selected under the control of the key K and magnet M, and the selected pins together with the feed hole punch pin, which are aligned perpendicular to the direction of travel of the tape T, are operated to perforate the tape. After each depression of a key such as K of the teletypewriter perforator keyboard the feed hole punch pin and the other selected punch pins, such as P<sub>1</sub>, will be withdrawn from the tape, and the perforated tape will be moved along the surface of the feed roll R<sub>2</sub>, the feed holes engaging the peripheral pins N of the feed roll R<sub>2</sub>. The tape thus perforated will in due course be passed along to a transmitting device (not shown) which may convert the characters corresponding to the tape perforations into pulses of current and transmitted to a distant point.



When the tape T skips, as would be the case when the punch pins controlled by the key K and magnet M fail to perforate the tape T in accordance with the key manipulations, a blank space may appear on the tape T without any holes whatever punched therein. When the feed hole is unperforated due to failure of the apparatus, this is generally an indication of a failure of the character or code perforations having failed to be perforated. After the blank or unperforated tape has been passed along, the operator may then depress one of the keys corresponding to a letter or numeral, which together with the blank space may result in the formation of a code combination which may switch one or more teletypewriter devices into or out of the circuit. This will result in considerable error and confusion as already pointed out.

In order to eliminate this difficulty, the lever L and the contact arrangement A—which are shown in exaggerated scale for illustrative purposes—are brought into play, the lever L resting continually against the tape T and bearing against the feed roll R<sub>2</sub> as already stated. An unperforated portion of the tape will not engage the feed roll pins N and will consequently bear against the top of one or more of the feed pins N. This will raise the tape from the normal position as shown in Fig. 3. The tape being raised will raise the lever L and close the contact of armature A.

The closure of the contact of armature A will complete a circuit in shunt with the punch magnet M. The flow of current from battery B<sub>1</sub> will now traverse the armature A and its contact instead of the punch magnet M, and hence the punch magnet will be unoperated. The punch magnet M will remain unoperated until the shunt circuit closed by armature A is subsequently opened.

The locking of the punch magnet M by the shunt circuit of armature A will at the same time prevent any further forward transmission of the tape T as will be apparent to those skilled in the teletypewriter art. There will be no further tape perforation by the punch pins associated with the magnet M with any subsequent operation of the keyboard. This condition of the apparatus will be manifest to the operator due to the fact that the perforating function no longer responds to the keyboard action. The operator will then reverse or back-space the tape in the usual way through a sufficient distance, so that the unperforated tape may be canceled, as for example by depressing the key designated "LTRS" of the keyboard, or by depressing any other such key character that the operator prefers to use. Thereafter the punch magnet M may be operated in the usual way.

The device above-described has been used successfully to lock the perforator magnet M and prevent further perforations of the tape when "skips" have occurred. Errors due to tape "skipping" have thus been eliminated. The operation of the punch magnet M will not be stopped by any action of lever L and armature A as long as the feed holes are punched regularly.

An indicating device D, shown in dotted lines in Fig. 3, may be added to the circuit if so desired. Such a device may be included in series with the armature A and its contact to indicate

that the punch magnet has been shunted out of the circuit by the armature A. The device D may be an audible or visible indicator of any well-known type. If desired the arrangement for locking up the perforator may be omitted and then the device D may be the only indicator provided. This invention makes use of the fact that when the feed hole is not perforated there is provided an indication to the perforator attendant that a correction should be made.

While this invention has been described as applied to an electrical or magnetic type of perforator, it will be understood that the invention is equally applicable to other types of perforators as, for example, mechanical tape perforators.

While this invention has been shown and described in certain particular arrangements merely for the purpose of illustration, it will be understood that the general principles of this invention may be applied to other and widely varied organizations without departing from the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. In tape teletypewriter perforating apparatus, the combination of means including a punch pin for perforating feed holes successively in the tape, a spring device continually held against the tape under tension, means responsive to the failure of said punch pin to perforate the tape to elevate the spring device, and means responsive to the elevation of said spring device to prevent further operation of said punch pin.

2. A tape teletypewriter perforating apparatus including a device continuously held against the tape, means for punching feed holes in said tape at regular intervals, means responsive to the failure of said punching means to perforate said feed holes to displace said device, and means responsive to the displacement of said device to render said punching means inoperative.

3. Tape teletypewriter perforating apparatus including a lever held against the tape continuously at constant pressure, means for perforating the tape step-by-step at regular intervals, means responsive to the failure of said means to perforate the tape to deflect said lever, and a circuit controlled by said lever and energizable for rendering said perforating means inoperative, said circuit being energized upon the deflection of said lever.

4. In a tape teletypewriter perforating apparatus, the combination of a first roll from which the tape is unrolled, a second roll upon which the tape is subsequently rolled, a magnet device for perforating the tape according to codes as the tape moves from said first roll to said second roll, said device being positioned between said first and second rolls and also perforating feed holes at regular intervals in the tape, said second roll having a plurality of peripheral pins for engaging the feed holes, a spring-pressed lever held against said tape, said lever being positioned adjacent to said second roll, a circuit controlled by said lever for de-activating said device, said lever being activated by unperforated tape to operate said circuit, said magnet device remaining de-activated until the tape is moved back toward the first roll.

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