

June 26, 1934.

A. A. CLOKEY  
CALL CIRCUIT RECORDER  
Filed Aug. 14, 1930

1,964,031

FIG. 1

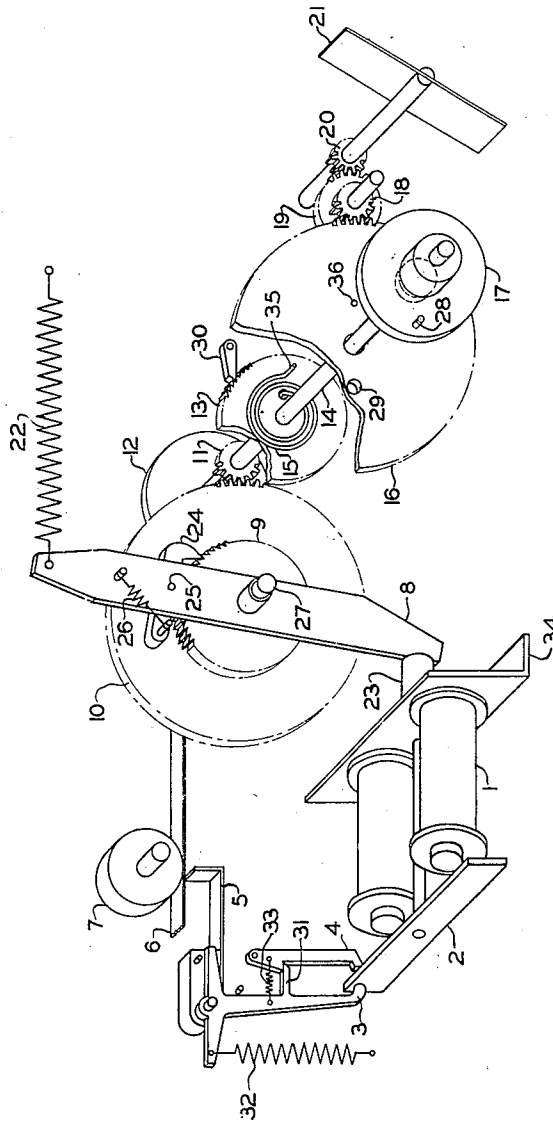


FIG. 2

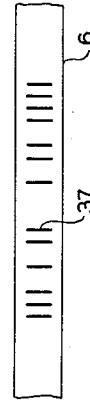
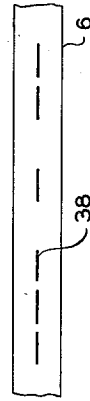


FIG. 3



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# UNITED STATES PATENT OFFICE

1,964,031

## CALL CIRCUIT RECORDER

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3 Claims. (Cl. 271—2.4)

This invention relates to recorder mechanisms for call-box circuits such as messenger call systems, fire alarms, watchman's station recorders and the like. It has particular reference to the tape feed mechanism and the marking platen for such registers.

One of the unsatisfactory features of call recorders as used heretofore is that they were generally driven by clock springs which had to be wound by hand. Such recorders required a means whereby the incoming signal would start the clockwork and feed the paper at a suitable speed for legible marking of the code signals. A further necessity was a timing device which would stop the clockwork after a set period following the last impulse received by the printing magnets.

An object of this invention is to provide a recorder mechanism of simpler type and therefore cheaper to manufacture. A further object is to make the recorder self-winding, thus avoiding the necessity of the careful supervision heretofore required.

In carrying out this invention a magnet is provided which not only actuates the marking platen, but also tensions a driving spring so that when released the tape feed mechanism may be driven by a ratchet and pawl while suitably timed by a governor in such a manner as to run the recorder for a slightly greater length of time than is required for the slowest call-box on the line to transmit its signals.

An important feature of the invention is a resilient connection in the gear train between the paper feed roller and the governor whereby the paper feed roller is allowed to start sooner, when released than would otherwise be possible, due to the inertia of the governor. Another feature of this invention is the use of a lost motion connection between the paper feed roller and the governor whereby the paper feed roller is allowed to start before motion is transmitted to the governor.

A more clear conception of the construction, operation and further objects of the invention may be had from the following specification taken in conjunction with the accompanying drawing in which:

Fig. 1 discloses an isometric view of the device.

Fig. 2 shows a section of tape as printed by the invention.

Fig. 3 discloses a section of tape as now printed.

The magnet 1 is mounted on the support 34 which forms part of the framework of the recorder. The armature 2 is provided with a plunger 23 which presses against the lever 8 in opposition to the tension of a spring 22. The pawl 24 is

pivoted at 25 on the lever 8 and is held by a spring 26 against the ratchet wheel 9. Lever 8 rotates freely on the shaft 27. The ratchet wheel 9 and the gear 10 are both secured to the shaft 27.

The gear 10 meshes with a pinion 11 which is secured to the shaft 14. Rigidly mounted on this shaft also is the tape feed roll 12, a ratchet wheel 13 and a collar 17. Thus, the tape is pushed or fed from feed roll 12 past ink roller 7. An example of this push type of tape feed roll which is in common use today is clearly disclosed in Patent No. 1,196,335 issued to applicant on August 29, 1916. Feed roll 12 corresponds to feed wheel 19, shown in Fig. 4 of this patent. Loosely mounted on the shaft 14 by means of a collar 17, as shown by the dotted lines of the figure, is a gear wheel 16 to which motion is imparted through a spiral spring 15, one end of which is secured to ratchet wheel 13 and the other end 35 engages the hole 36 in gear 16.

On the collar 17 is a pin 28 which extends into a hole 29 in gear 16. The diameter of this hole is considerably greater than that of the pin 28, so that a limited rotary motion may be imparted to the feed roll 12 before the gear 16 and its associated governor gear-train is required to move.

The pawl 30 acting against the ratchet wheel 13 prevents any back-lash of the feed roll when the lever 8 is being set by the magnet 1.

The gear train 16, 18, 19 and 20 is clearly indicated in the drawing and its function is to spin the fan blade 21 at a suitable velocity to prevent a jerky movement of the tape feed roll.

The printing member 5 is adapted to strike the underside of the record tape 6 with a sudden blow to press it against the ink roll 7 and cause an impression to be made on the upper side of the tape. This motion is communicated to the printing member 5 by the release of the arm 3 just as the armature 2 is about to complete its stroke. The arm 3 has a tooth 31 which engages with the latch arm 4 which releases arm 3 when pushed back by the armature 2.

The arm 3 when released is actuated by the spring 32 and drives the printing member 5 against the tape. On release of the armature 2 by the magnet 1, the arm 3 is restored to its latched position against the tension of the spring 32. The spring 33 connected between the arm 3 and the latch member 4 acts to hold the latter in proper position at all times.

The trigger like action of the parts 4 and 31 causes the printing member to print uniform

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recordations independent of the duration of the signal.

The printing member 5 is so formed that it strikes the tape 6 at right angles to its path of travel, thereby causing the ink roller 7 to print a signal similar to 37 in Fig. 2 instead of the usual type of signal as 38 in Fig. 3. It is obvious that a recordation of signals like those in Fig. 2 will effect a considerable saving in tape as well as form a more legible recordation.

During the printing operation the feed wheel 12 is stationary, due to the fact that when magnet 1 operates to effect the printing, the spring 22 is being tensioned by arm 8 and the pawl 24 is moving over ratchet 9 and not driving the gear train 10 and 11 to which feed wheel 12 is connected because of the locking action of ratchet 13 and pawl 30. With the tape stationary during the printing action, the signals are clearly recorded and there is no possibility of the recordations being blurred or run together.

The operation of the invention may be reviewed as follows:

Each energization of the magnet 1 operates the armature 2, releases the latch 4 from engagement with the tooth 31 of the arm 3, and causes the printing member 5 to strike the tape 6. At the same time, the lever 8 is swung in the direction which elongates the spring 22. Upon the release of the magnet 1 the spring 22 acts as a motor to drive the gear train comprising gears 10, 11, 16, 18, 19 and 20 and to rotate both the tape feed roll 12 and the fan blade 21.

The feed roll 12 is permitted, however, to begin its movement before the inertia of the fan blade

is overcome, due to the flexible connection of the spiral spring 15 between the ratchet wheel 13 and the gear 16 and due further to the allowable play of the pin 28 in the hole 29.

In practice, the movement of the tape by the feed roll 12 becomes almost continuous during the reception of marking impulses as communicated by the magnet to the printing member 5. The lever 8 does not have sufficient time to make a full stroke between the impulses of a single digit in the code signal, but its stroke is longer during the pauses between digits and the full stroke carries the paper along for a distance such as to clearly separate the signals of different calls. The impressions on the paper, therefore, are properly spaced in accordance with the time component of the impulses themselves, which makes for desired legibility.

What is claimed is:

1. In a recording mechanism, the combination of a tape feed roller with actuating means, a governor with actuating means, said governor being resiliently connected to said roller to overcome the starting inertia thereof.

2. In a recording mechanism, a tape feed roller operable by a spring actuated gear train, and a fan blade resiliently driven by said gear train for regulating the inertia thereof.

3. In a recording mechanism, the combination of a gear train, a tape feed roller actuated thereby, a second gear train, a governor actuated thereby and a lost motion connection between said trains to permit said roller to start prior to overcoming the inertia of said governor.

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