No. 770,241. PATENTED SEPT. 13, 1904.

A. N. PALMER & W. W. KIMBALL.

RIBBON FEEDING MECHANISM FOR TIME RECORDERS.

APPLICATION FILED DEC. 18, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

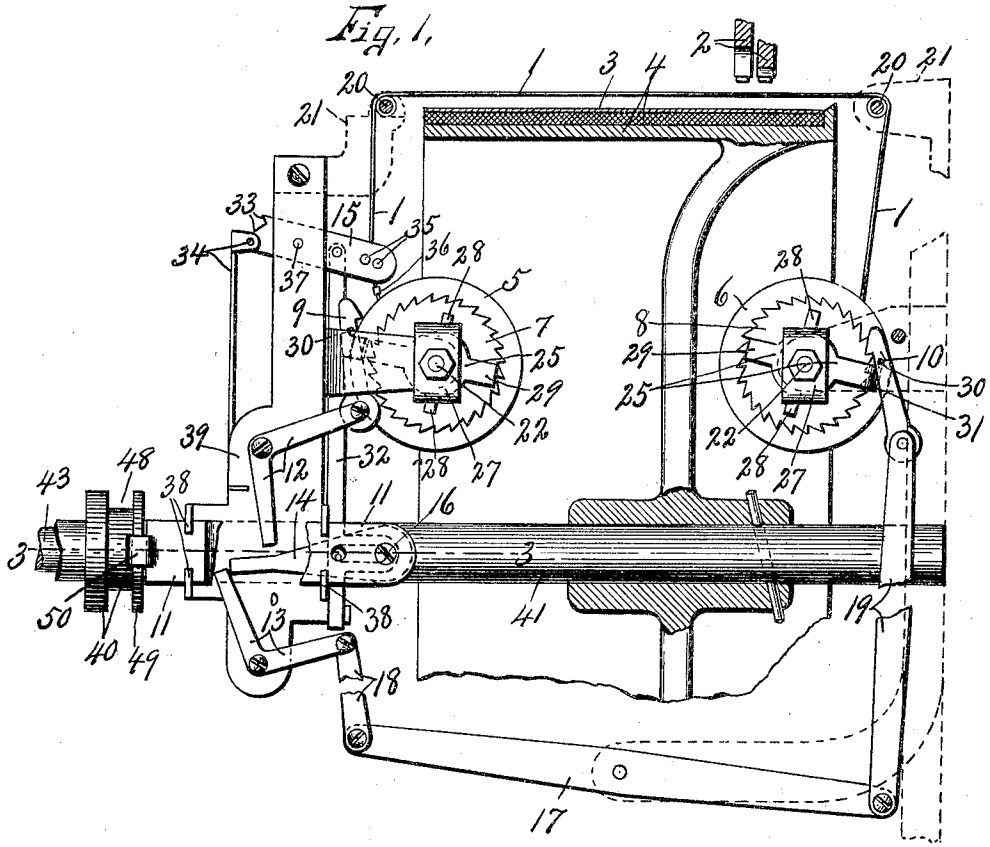


Fig. 2.

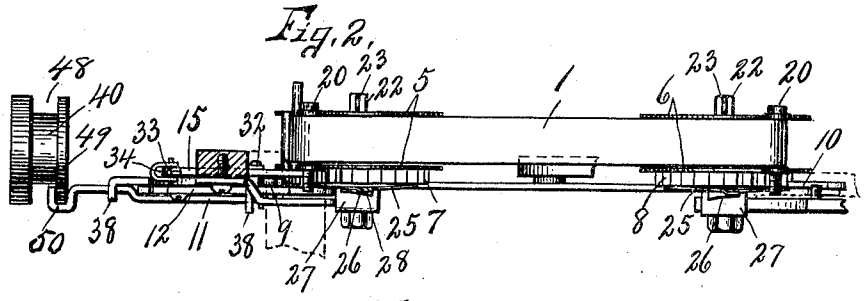
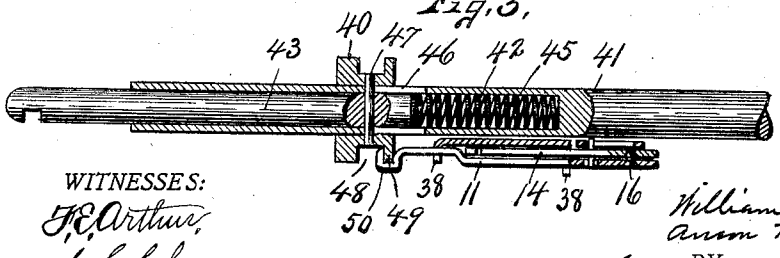


Fig. 3.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

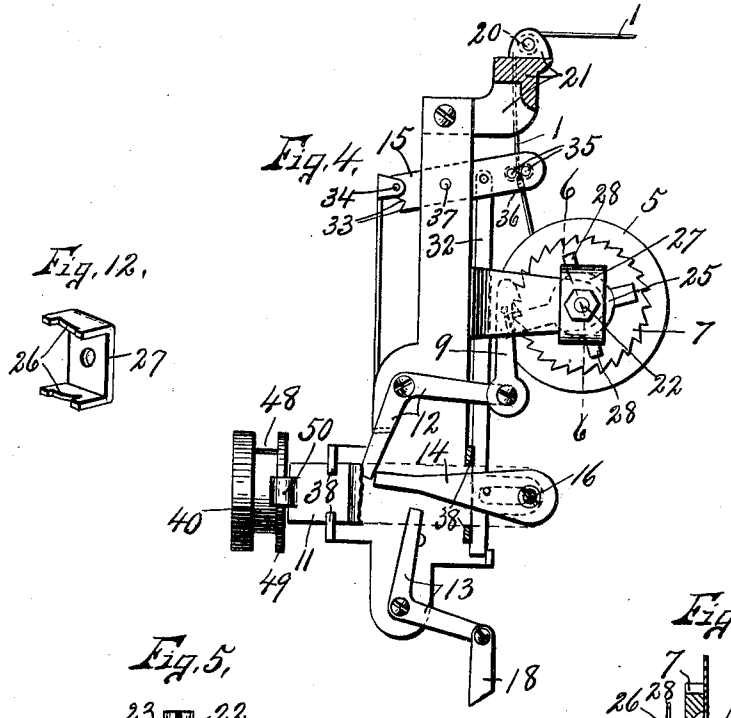


Fig. 12.

Fig. 9.

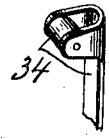


Fig. 5.

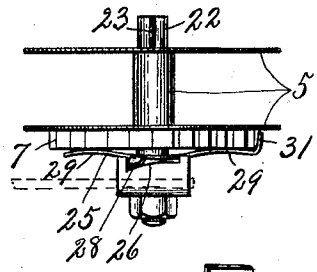


Fig. 6.

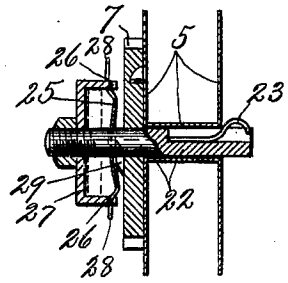


Fig. 11.

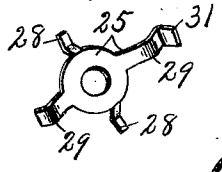


Fig. 8.

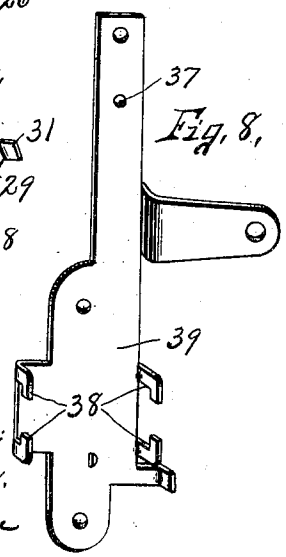


Fig. 7.

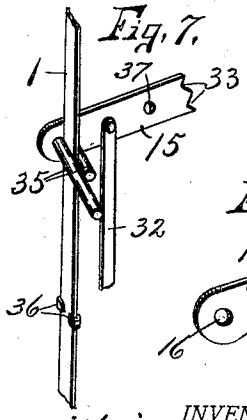
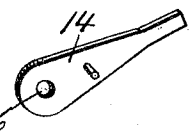


Fig. 10.



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No. 770,241. Patented September 13, 1904.

UNITED STATES PATENT OFFICE.

ANSON N. PALMER AND WILLIAM W. KIMBALL, OF SYRACUSE, NEW YORK.

RIBBON-FEEDING MECHANISM FOR TIME-RECORDERS.

SPECIFICATION forming part of Letters Patent No. 770,241, dated September 13, 1904.

Application filed December 18, 1902. Serial No. 135,761. (No model.)

To all whom it may concern:

Be it known that we, ANSON N. PALMER and WILLIAM W. KIMBALL, both of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Ribbon-Feeding Mechanism for Time-Recorders, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in time-recorders, and refers more particularly to a ribbon-feeding mechanism as employed in connection with the printing mechanism set forth in our pending application, Serial No. 75,023, filed September 11, 1901, in which a plunger movable axially of the platen is connected to operate the printing device and also serves to rotate the platen, whereby the time of arrival and departure is registered upon a suitable record-sheet carried by the platen.

The object of our present invention is to automatically shift the ribbon relatively to the printing-point and transversely of the platen at each successive operation of the printing device, as set forth in our pending application above referred to, and also to reverse the feed of the ribbon automatically when it approaches the limit of its movement in either direction.

Another object is to brake the feeding-reel automatically and to release the brake of one reel when the other is feeding.

Referring to the drawings, Figures 1 and 2 are respectively an elevation and a top plan of our improved ribbon-feeding and brake mechanism, portions of the platen and printing-wheels being shown in Fig. 1. Fig. 3 is a sectional view taken on line 3 3, Fig. 1. Fig. 4 is an elevation of a portion of the device at the left of the platen as seen in Fig. 1, the reel-operating mechanism being shown in a different position from that seen in Fig. 1. Fig. 5 is an enlarged top plan of one of the reels and the automatic brake mechanism therefor. Fig. 6 is a sectional view taken on the line 6 6, Fig. 4. Fig. 7 is a perspective view of a portion of the ribbon and the means coöperating therewith to automatically shift the direction of rotation of the reels. Figs. 8, 9, 10, 11, and 12 are detail views in perspective, showing, respectively, one of the detached upright supporting-standards as seen in Fig. 4, a portion of one of the detents for the reverse-feed pawl, the oscillating pawl for controlling the movement of the reel-rotating mechanism, the brake-spring, and the tensioning-cam for the brake-spring.

Similar reference characters indicate corresponding parts in all the views.

An inking-ribbon 1 is interposed between the printing-wheels 2 and a record-sheet 3 and is preferably arranged transversely of the platen 4, with its opposite ends attached to reels 5 and 6. This inking-ribbon is adapted to be moved intermittently transversely of the platen and record-sheet during the operation of printing, and the means for effecting this intermittent motion consists of ratchet-wheels 7 and 8, pawls 9 and 10, a reciprocating bar 11, and movable means interposed between the bar 11 and pawls for actuating said pawls to rotate the ratchet-wheels 7 and 8 alternately in reverse directions.

The means for effecting the reverse movement of the spools or reels 5 and 6 consists of bell-crank levers 12 and 13, an oscillating pawl 14, and a rock-arm 15, connected to the pawl 14 for shifting its position to engage one or the other of the levers 12 or 13. The bell-crank levers 12 and 13 are pivoted in planes above and beneath the sliding bar 11, one of the arms of each of the levers being extended toward the sliding bar 11, and the oscillating pawl 14 is pivoted at one end at 16 to the inner end of the sliding bar 11, its free end being movable into and out of the path of the adjacent arms of the levers 12 and 13, so that when the oscillating arm 14 is moved to one position and the bar 11 is reciprocated said oscillating arm will automatically rock one of the levers 12 or 13, and thereby actuate the pawls 9 or 10, connected thereto, the lever 12 being connected directly to the pawl 9 and the lever 13 being connected to the pawl 10 by a rocking lever 17 and suitable links 18 and 19.

The intermediate portion of the ribbon 1 is

mounted upon suitable studs or rollers 20, which are supported in brackets 21 at opposite ends of the upper portion of the platen 4 and form a portion of the supporting-frame. The reels 5 and 6 are detachably mounted upon studs 22 at opposite ends and preferably within the periphery of said platen and are held in position by spring-catches 23, which are secured to the studs 22 and are adapted to be automatically depressed within suitable slots 24 in said studs when the reels are inserted upon or removed from their supporting-studs. These reels, as previously stated, are adapted to feed the ribbon in reverse directions and are automatically retarded from undue movement by suitable friction-brakes 25, which are interposed between fixed inclined cam-faces 26, formed on plates 27, Figs. 5 and 6, and are so arranged that when the feeding-reel is actuated the arms 28 of the brake 25 ride upon the cam-faces 26 from their lowest to their highest points, thereby increasing the friction of the spring-arms 29 of the brake against the reel, or rather against the face of the adjacent ratchet-wheel 7 or 8. This sliding or oscillating movement of the brake member along the inclined face 26 is facilitated or positively effected by means of a pin or shoulder 30 upon each of the pawls 9 and 10, these shoulders being adapted to engage an arm 31 forming a portion of the brake, so that when one of the pawls is moved into operative position the brake member is tensioned against the surface of the ratchet-wheel for retarding the movement of the feeding-reel, it being understood that the cam-faces 26 are inclined in opposite directions, so that when one of the reels is feeding the brake of the other reel is automatically released by oscillating from the highest point of its cam-face 26 to the lowest point, this latter movement being effected automatically by the frictional contact or engagement of the brake-shoe with the adjacent reel. Although this movement of the brake member automatically releases the reel from which the ribbon is being fed, the friction between the brake member and reel is always sufficient to prevent any slack or looseness in the operation of the ribbon extending across the face of the platen.

The pawls 8 and 9 are adapted to be brought alternately into action for rotating the reels, this alternate action being controlled by the rock-arm 15 and a link 32, connecting said arm to the oscillating member 14 in such manner that when the arm 15 is rocked the oscillating member 14 is moved alternately into registration with the bell-crank levers 12 and 13. One end of the rock-arm 15 is provided with teeth 33, which are adapted to be engaged by a suitable detent 34, consisting of a spring-arm having a roller-bearing face arranged to engage said teeth and hold the rock-arm 15 in either of its adjusted positions. We preferably provide means for automatically shifting the position of this rock-arm as the ribbon is wound from one reel to the other, this means usually consisting of separated arms 35, provided on the rock-arm 15 for receiving the ribbon 1, said ribbon being provided with shoulders 36, secured to the edges of the ribbon in proximity to its opposite ends, which shoulders are adapted to engage the opposite faces of the arms 35 as the reels are rotated in reverse directions, and being of greater thickness than the space between said arms it is evident that the rock-arm 15 will be automatically rocked upon its pivot 37 as the ribbon reaches the limit of its movement in either direction.

The sliding bar 11 is mounted in suitable guides 38, formed on a bracket 39, being actuated by a collar 40, mounted on the main supporting-shaft 41 for the platen. The shaft 41 is provided with a lengthwise opening or socket 42, in which is movable a plunger 43, adapted to be actuated lengthwise of the shaft in one direction by a suitable operating member (not shown) against the action of a spring 45, also arranged in said socket. This shaft 41 is also provided with a lengthwise slot 46, and the collar 40 is mounted on the shaft and secured to the plunger 43 by a pin or equivalent fastening means 47, so that as the plunger is reciprocated in the socket 42 against the action of the spring the collar 40 is similarly moved along the shaft, this collar being provided with an annular groove 48 and a flange 49 and is rotatable with the shaft 41. The sliding member 11 is provided with a hook-shaped extremity 50, engaged with the flange 49, whereby as the collar is reciprocated along the shaft similar motion is transmitted to the sliding bar 11 and to the oscillating member 14, the spring 45 serving to retract the collar and sliding bar connected thereto. As the sliding bar 11 is moved by the operating member 43 the free end of the oscillating member 14 is moved beyond the adjacent ends of the bell-cranks 12 and 13, so as to engage the bell-crank alined therewith for operating the pawl and reels upon the return movement of the plunger by the spring 45.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In combination with a rotary platen-shaft of a time-recorder, ribbon-reels, a sliding member on the shaft, separate rotating mechanisms for the reels and means operatively connected to and actuated by the ribbon for alternately establishing operative connection between the sliding member and the rotating mechanisms for the reels.

2. A ribbon-feeding mechanism comprising a reel, a lever operatively connected to rotate the reel, an oscillatory member movable into and out of operative connection with the lever and having an independent movement to actu-

ate the lever, means operatively connected to the oscillatory member to move the latter into and out of operative connection with the lever, a detent operating to hold said means in its adjusted position, the ribbon being operatively connected to shift said means.

3. In a ribbon-feeding mechanism for time-recorders, a ribbon-reel and operating means therefor, in combination with a spring-brake and tensioning means therefor brought into action by the reel-operating means.

4. In a ribbon-feeding mechanism, the combination with a ribbon-reel, of brake mechanism brought into action by the movement of the reel to retard the movement of said reel when moved in one direction and to release said reel when it is moved in the opposite direction.

5. A ribbon-feeding mechanism in combination with a spring-brake and tensioning-cam to retard the feed of the ribbon.

6. A ribbon-feeding mechanism having rotary ribbon-reels, a brake-spring and its tensioning-cam brought into action by said mechanism for the purpose specified.

7. A ribbon-feeding mechanism for time-recorders comprising ribbon-supporting reels, independent means for rotating the reels in reverse directions, a reciprocating member, and means mounted on said member and movable independently thereof for alternately actuating each of the former means independently of the other as said member is reciprocated, said means being operatively connected to and actuated by the ribbon.

8. A ribbon-feeding mechanism for time-recorders comprising a ribbon-reel having a ratchet, a pawl to engage the ratchet and rotate the reel, a rock-arm connected to the pawl, and a sliding member having means operatively connected to and actuated by the ribbon into and out of engagement with the rock-arm for the purpose described.

9. A ribbon-feeding mechanism for time-recorders comprising a ribbon-reel having a ratchet, a pawl to engage the ratchet and rotate the reel, a lever connected to the pawl, and an operating member operatively connected to and actuated by the ribbon into and out of engagement with the lever and having an independent movement to rock the lever when engaged therewith.

10. A ribbon-feeding mechanism for time-recorders comprising a ribbon-reel having a ratchet, a pawl to engage the ratchet and rotate the reel, a lever connected to the pawl, and an operating member movable into and out of engagement with the lever and having an independent movement to rock the lever when engaged therewith, and means operatively connected to and actuated by the ribbon for moving the operating member into and out of engagement with the rock-arm.

11. A ribbon-feeding mechanism for time-recorders comprising a ribbon-reel having a ratchet, a pawl to engage the ratchet and rotate the reel, a lever connected to the pawl, an operating member movable into and out of engagement with the lever and having an independent movement to rock the lever when engaged therewith, means for moving the operating member into and out of engagement with the lever, and a detent operatively connected to and actuated by the ribbon for holding the latter means in either of its adjusted positions relative of the lever.

12. A ribbon-feeding mechanism for time-recorders comprising a ribbon-reel having a ratchet, a pawl to engage the ratchet and rotate the reel, a lever connected to the pawl, an operating member movable into and out of engagement with the lever and having an independent movement to rock the lever when engaged therewith, and means actuated by the movement of the ribbon for moving the operating member into and out of operative connection with the lever.

13. A ribbon-feeding mechanism for time-recorders comprising ribbon-supporting reels, independent means for rotating the reels in reverse directions, a reciprocating member, means mounted on said member and movable independently thereof for alternately actuating each of the former means independently of the other, and a detent operatively connected to and actuated by the lever for holding the latter means in either of its adjusted positions.

14. A ribbon-feeding mechanism for time-recorders comprising a ribbon-reel and means for rotating the same, a spring-brake to control the movement of the reel, and means brought into action by the reel to tighten and loosen the brake as the reel is rotated in reverse directions for the purpose described.

15. A ribbon-feeding mechanism for time-recorders comprising a ribbon-reel and means for rotating the same, a fixed inclined bearing, and a brake actuated along said bearing for the purpose described.

16. In combination, an ink-ribbon and reels therefor, means to rotate the reels in reverse directions, and separate automatic brake mechanisms brought into action by said means for retarding and releasing the reels.

In witness whereof we have hereunto set our hands this 6th day of December, 1902.

ANSON N. PALMER.
WILLIAM W. KIMBALL.

Witnesses:
H. E. CHASE,
MILDRED M. NOTT.