June 24, 1930. G. G. GLASGOW 1,766,626

AUTOMATIC RIBBON REVERSING MECHANISM

Filed Feb. 2, 1929

Fig. 1.

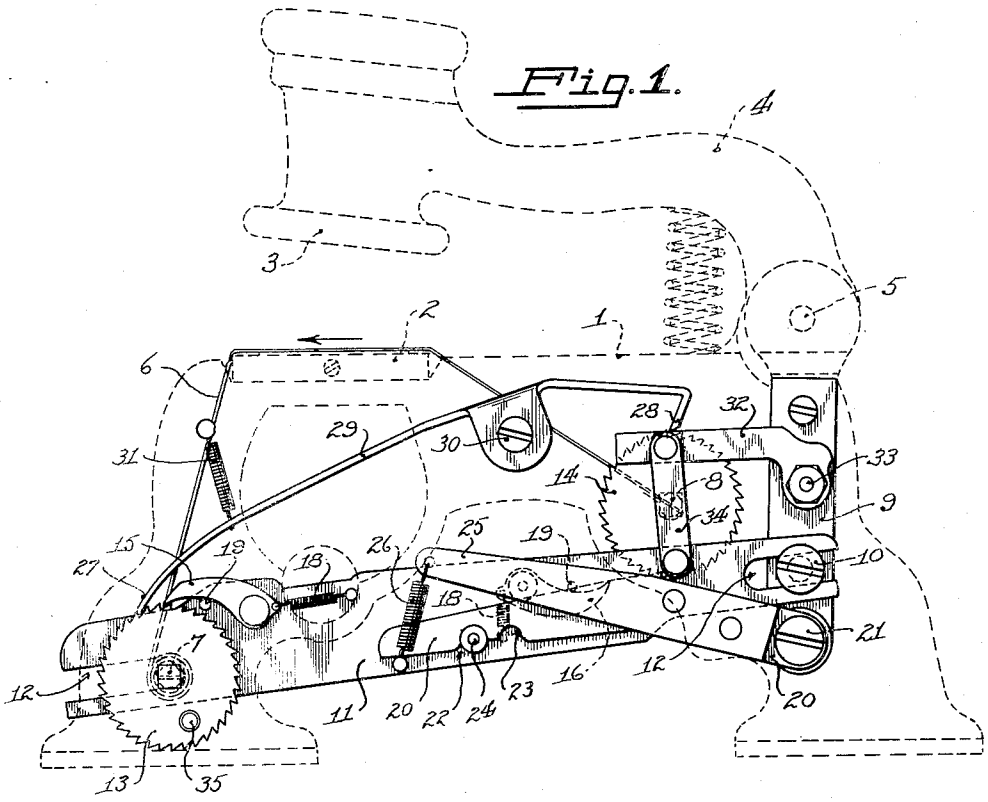
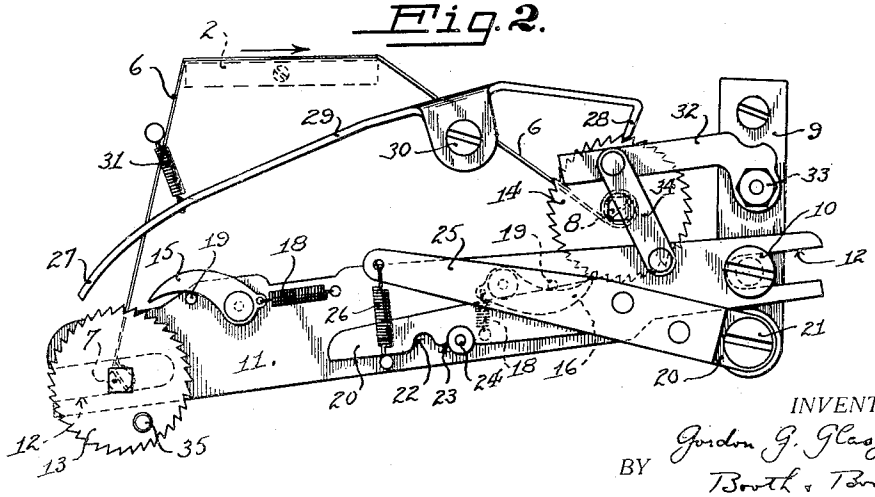


Fig. 2.



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AUTOMATIC RIBBON-REVERSING MECHANISM

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The present invention relates to printing machines in which an ink bearing ribbon is intermittently advanced between the type face or die and the platen.

For purposes of illustration, the invention is herein illustrated and described as applied to a standard form of device commonly known as a ticket dater, for which it is especially well adapted, because of its simplicity and the ease with which it can be applied even to existing devices. The underlying principles of the invention, however, may be embodied in other machines using advancing ribbons.

The principal object of the invention is to provide means for automatically reversing the ribbon when it reaches either end of its travel, so that no attention is required as long as the ribbon remains in usable condition. This also lengthens the life of the ribbon, by preventing any periods of rest at the ends of its travel.

A secondary object of the invention is to provide a simple mechanism for the described purpose, which can be applied at small cost to existing mechines, especially to ticket daters of the type herein described. In such machines it is common practice to provide means for automatically advancing the ribbon in one direction only. It must then be rewound manually, which is troublesome and frequently results in the use of only a portion of the ribbon, the operator rewinding it before it reaches the end of its advance.

It is to be understood that the form, construction and arrangement of the several parts herein described and illustrated may be varied, within the limits of the claims hereto appended, without departing from the spirit of the invention as expressed therein.

In the accompanying drawings,

Fig. 1 is a side elevation of the invention as applied to a ticket dater, the latter being shown in dotted lines.

Fig. 2 is a similar view, the dater being omitted, and the operating parts shown in position for advancing the ribbon in a direction opposite to that of Fig. 1.

The reference numeral 1 designates the body of the ticket dater, and 2 indicates the type or die. 3 is the platen, carried upon a movable arm 4 pivoted to the body at 5. 6 is the ink bearing ribbon, which passes over the die 2 and has its ends secured to and wound upon spools or spindles 7 and 8 journaled in the body. These parts are common in machines of the type described, and are illustrated merely to show the application of the invention thereto.

In applying the invention to the above outlined machine, a lever 9 is secured to the platen arm 4, and extends downwardly at one side of the body 1. A stud 10 projects from said lever. A bar 11 extends between said stud and the forward spool 7, having slots 12 in its ends for engaging said stud and the shaft of said spool. The bar 11 moves longitudinally with the lever 9, being connected therewith by mechanism to be described later.

Ratchet wheels 13 and 14 are respectively secured to the spools 7 and 8, the wheel 13 lying outside the bar 11 and the wheel 14 inside. Pawls 15 and 16 are carried by said bar for engagement respectively with the ratchet wheels 13 and 14, and are so positioned that only one of said pawls is in operative engagement with its ratchet at any given time. Thus in Fig. 1 the pawl 15 is engaging the forward ratchet wheel 13, while the rear pawl 16 is inoperative, and in Fig. 2 said rear pawl is engaging its ratchet wheel 14 while the forward pawl is inoperative. The normal movement of the bar 11, caused by the movement of the lever 9, is not sufficient to cause the rear pawl to operate when the parts are as shown in Fig. 1, nor to cause the forward pawl to operate when said parts are as shown in Fig. 2. The position of Fig. 2 is brought about by a longitudinal rearward shifting of the bar 11 with respect to the lever 9, as will be explained later. Springs 18 cause the pawls to engage their respective ratchet wheels, and pins 19 limit their movement when inoperative.

The bar 11 is operatively connected with the lever 9 by a link 20, pivoted to said lever at 21 and provided with two spaced notches 22 and 23 adapted for selective engagement

by a pin or stud 24 projecting from said bar. An arm 25 secured to said link, is connected with said bar by a spring 26, said arm and said spring acting merely to keep the stud 24 in engagement with one or the other of the notches 22 and 23.

It will readily be seen that operation of the platen arm 4, acting through the lever 9 and the link 20, causes the bar 11 to have reciprocating longitudinal motion. When the stud 24 lies in the forward notch 22, the bar is shifted forwardly so that its reciprocating motion causes the pawl 15 to turn the forward spool 7, thereby winding the ribbon 6 thereupon, and when said stud lies in the rear notch 23, the bar is shifted toward the rear so that the pawl 16 turns the spool 8, winding the ribbon in the reverse direction.

The shifting of the stud 24 from one notch to the other, which results in reversing the travel of the ribbon, is caused by the tension of ribbon itself when it reaches either end of its travel. The ends of said ribbon are attached to the spools, so that when it is completely unwound from one spool, it can travel no further and resists the continued turning of the other spool. This resistance prevents further movement, in one direction, of the bar 11, and as a result, upon the next movement of the platen arm 4, the link 20 rises and rides over the stud 24, causing said stud to engage the other notch. This shifting occurs in either direction. For example, assuming the ribbon to have traveled forwardly to its limit, as in Fig. 1, the bar 11 will be moved rearwardly upon the next downward movement of the platen arm, but will be held from its subsequent normal forward movement by the tension of the ribbon and the stoppage of the spool 7. The next upward movement of the platen arm thereupon shifts the link 20 to the position of Fig. 2, so that the succeeding operation of said platen arm moves the bar 11 to its rearward position, in which its normal reciprocative movement operates the rear spool 8, winding the ribbon thereupon. The reverse action takes place when the ribbon reaches the rearward limit of its travel. Thus the ribbon is not only advanced at each operation of the platen arm, but is automatically reversed when it reaches either end of its travel.

Holding pawls 27 and 28 are provided, operating upon the ratchet wheels 13 and 14 to prevent them from reversing upon the retracting movements of their respective driving pawls 15 and 16. Obviously only one such holding pawl can function at any given time, the holding pawl cooperating with the idling, or unwinding spool being necessarily inoperative. For this purpose the two holding pawls 27 and 28 are formed upon the ends of a single resilient rocking bar 29, pivoted to the frame of the machine at 30, and formed preferably of spring steel. A spring 31 normally holds the bar 29 with its forward end elevated, as in Fig. 2, so that only the rear holding pawl 28 functions. This position enables the ribbon to be wound upon the rear spool 8.

In order to shift the bar 29, so that only the forward holding pawl 27 functions, when the ribbon is winding upon the forward spool 7, an arm 32 is pivotally connected with the lever 9 at 33, and is extended forwardly beside the ratchet wheel 14 and beneath the rear holding pawl 28, said pawl being wider than its ratchet wheel. The arm 32 is connected with the bar 11 by a link 34, which is inclined with its lower end toward the rear when said bar 11 is in its rearward position, as in Fig. 2. When the bar 11 is shifted to its forward position relative to the lever 9 and the operating link 20, as shown in Fig. 1, the link 34 becomes vertical, thereby raising the arm 32 into contact with the holding pawl 28 and further raising said pawl out of contact with its ratchet wheel 14. This raising of the pawl 28 rocks the bar 29 to lower the forward holding pawl 27 into functional position, so that the ribbon can wind upon the forward spool 7. The resilience of the bar 29 enables the pawl 27 to ride over the teeth of its ratchet wheel. Thus the shifting of the bar 11 relative to the lever 9 and link 20 reverses the operation not only of the winding pawls 15 and 16, but also of the holding pawls 27 and 28.

It will be seen that the mechanism above described is so arranged that it can be added to existing machines at small expense, all the parts being placed upon one side of the body 1. A suitable cover plate, not shown, may be placed over said mechanism to enclose it. The ratchet wheel 13 may be provided with a crank knob 35 to enable the ribbon to be wound by hand if desired.

I claim:—

1. In a printing machine having a movable printing member and an ink ribbon; a pair of spaced spindles upon which said ribbon is wound; a ratchet wheel secured upon each spindle; a non-oscillating reciprocable elongated bar extending between said spindles; pawls mounted directly and movably upon said bar for selectively operating said ratchet wheels according to the position of said bar in its range of movement; and a connection between said bar and said printing member, said connection being shiftable to cause said bar to reciprocate, upon the movement of said member, near one end or the other of said range of movement.

2. In a printing machine having a movable printing member and an ink ribbon; an oscillating lever secured to said printing member; a pair of spindles upon which said ribbon is wound; a ratchet wheel secured upon each spindle; a reciprocable bar guided at one end by one of said spindles and at its

other end by a slidable association with said lever; pawls carried by said bar for selectively operating said ratchet wheels according to the position of said bar in its range of movement; and an operating connection between said bar and said lever, said connection being shiftable to cause said bar to reciprocate, upon the movement of said printing member, near one end or the other of said range of movement.

3. In a printing machine having a frame, a movable printing member and an ink ribbon; a pair of spindles rotatably mounted in said frame and upon which said ribbon is wound; a ratchet wheel secured upon each spindle; a reciprocable bar; pawls carried by said bar for selectively operating said ratchet wheels according to the position of said bar in its range of movement; a connection between said bar and said printing member, said connection being shiftable to cause said bar to reciprocate, upon the movement of said member, near one end or the other of said range of movement; an oscillating member pivotally mounted upon said frame independent of said bar, the ends of said oscillating member forming holding pawls cooperating respectively with said ratchet wheels; and means operated by the shifting of said connection to throw the ends of said oscillating member into selective engagement with one or the other of said ratchet wheels.

4. In a printing machine having a movable printing member and an ink ribbon; a pair of spindles upon which said ribbon is wound; a ratchet wheel secured upon each spindle; a reciprocable bar; pawls movably mounted upon said bar for selectively operating said ratchet wheels according to the position of said bar in its range of movement; a stud secured to said bar; a longitudinally reciprocating pivotal link connected with the printing member and provided with a pair of spaced notches adapted for engagement with said stud, said link and stud constituting a shiftable connection between the printing member and said bar adapted to cause said bar to reciprocate, upon the movement of said member, near one end or the other of said range of movement.

5. In a printing stamp having a base, a movable printing member pivotally mounted thereon, and an ink ribbon carried therewithin; a lever secured to said printing member near its pivot and extending downwardly beside said base; a pair of spindles upon which said ribbon is wound, the ends of said spindles extending through the side of said base; ratchet wheels secured upon the projecting ends of said spindles; a longitudinally reciprocable bar lying beside said base; pawls movably mounted upon said bar for selectively operating said ratchet wheels; and a shiftable connection between said lever and said bar adapted to reciprocate said bar and to shift its reciprocation within its total range of movement to control its selective ratchet operating function.

In testimony whereof I have signed my name to this specification.

GORDON G. GLASGOW.