

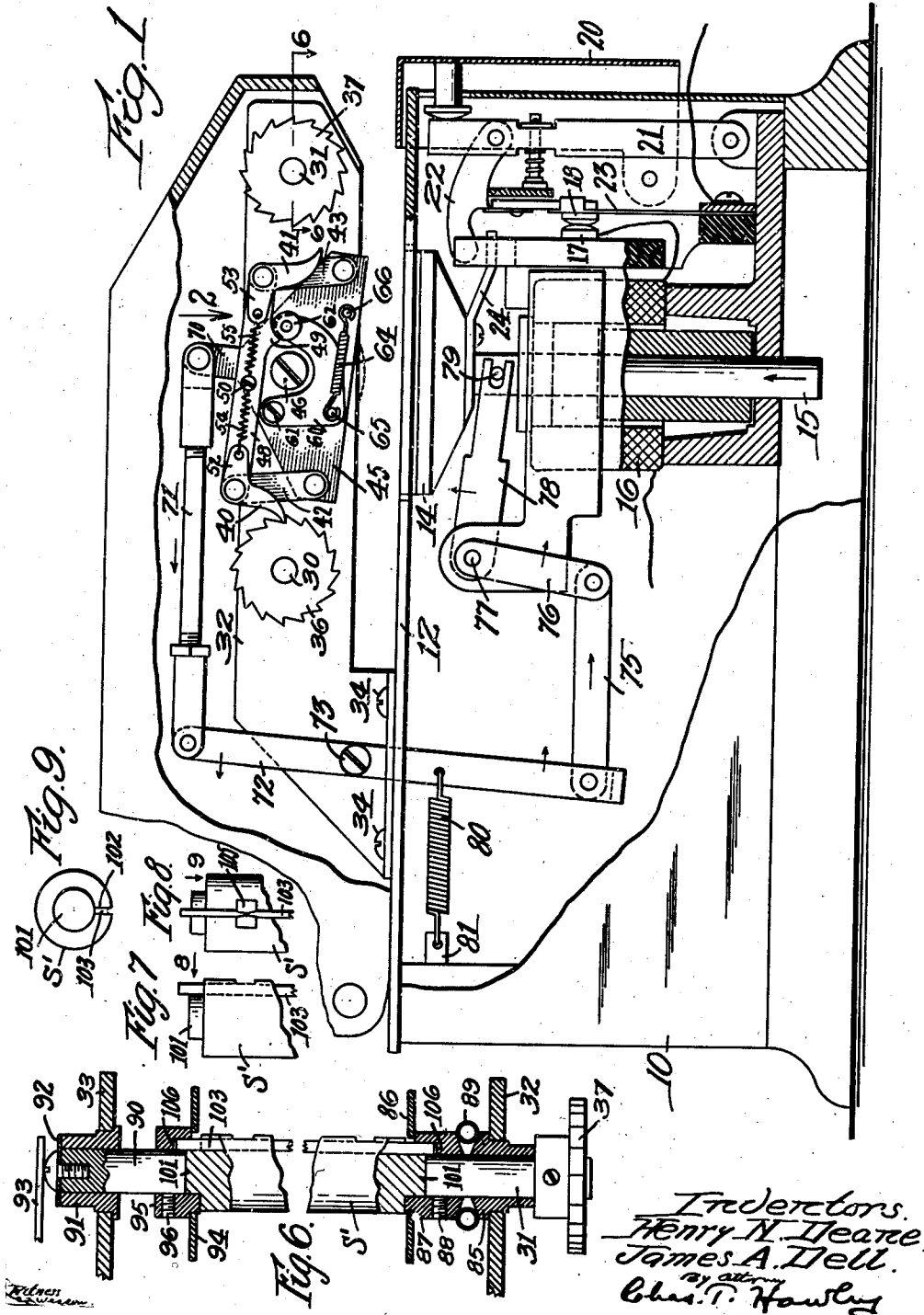
July 5, 1938.

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RIBBON FEED MECHANISM

2,122,518

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

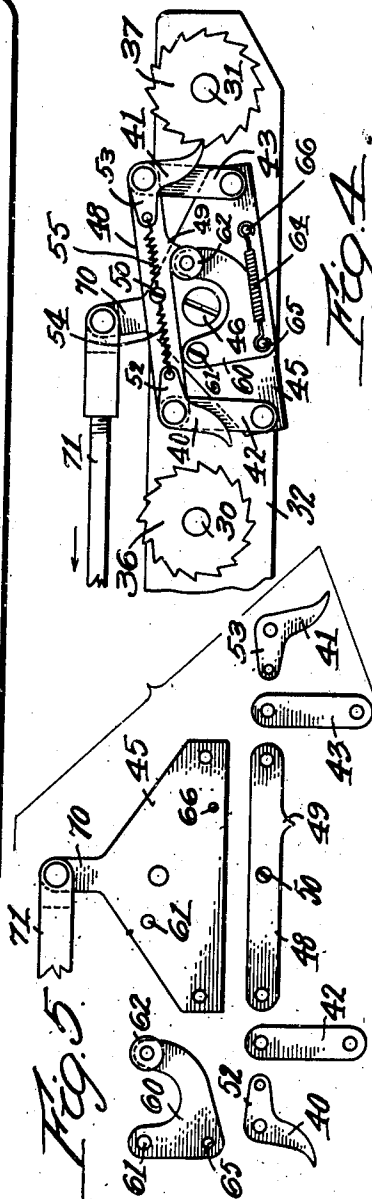
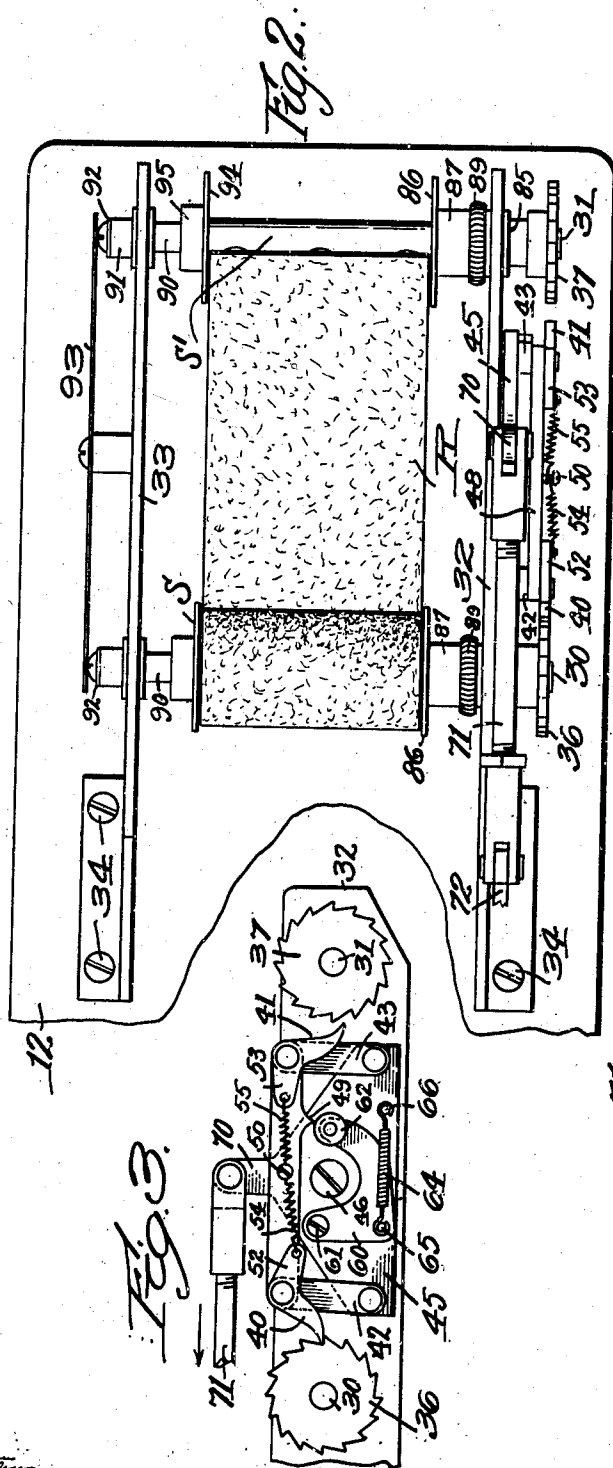


Fig. 4.

Fig. 5.

UNITED STATES PATENT OFFICE

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RIBBON FEED MECHANISM

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This invention relates to mechanism for feeding and reversing the ink ribbon in time stamps, time recorders and other similar machines, it being desirable that such ribbon mechanism shall operate to automatically reverse the direction of feed at the end of ribbon travel in either direction.

It is an important object of our invention to provide improved and simplified devices for effecting such automatic reversal. With these improved devices, the reversal of ribbon travel is controlled by the resistance of the ribbon to further feed in a given direction after it has been fully unwound from either spool.

A further object of our invention is to provide a ribbon feed mechanism which can be easily and economically manufactured and which will be exceptionally reliable in use.

Our invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a side elevation, partly in section, of a time stamp embodying our improved ribbon feed;

Fig. 2 is a partial plan view, looking in the direction of the arrow 2 in Fig. 1 and with the cover removed for clearness;

Figs. 3 and 4 are side elevations of certain parts shown in Fig. 1 but in different successive operative positions;

Fig. 5 is an exploded view of our improved mechanism, with the parts separated for clearness;

Fig. 6 is a plan view, partly in section, of one of the spool shafts and ribbon spools, taken along the line 6-6 in Fig. 1;

Fig. 7 is a partial plan view of a ribbon spool;

Fig. 8 is a partial side elevation, looking in the direction of the arrow 8 in Fig. 7; and

Fig. 9 is an end view, looking in the direction of the arrow 9 in Fig. 8.

Referring to the drawings, we have shown a time stamp comprising a base 10 and an upper casing or cover portion adapted to contain type wheels for imprinting a time or numeral record or other desired data on a record sheet placed on the table 12 above a platen 14. The platen 14 is mounted at the upper end of a plunger 15 slidable within a solenoid coil 16 and moved forcibly upward when the solenoid coil is energized.

The circuit through the coil 16 is completed by forcing the normally separated contacts 17 and 18 into engagement. Such engagement is effected by manual pressure on a pivoted push

plate 20 which is operatively connected through a lever 21 and latch 22 to the upper end of a spring arm 23 on which the contact 18 is mounted. As the plunger moves upward, an offset arm 24 lifts the outer end of the latch 22, thus disengaging the spring arm 23 so that the circuit is promptly broken.

The parts thus far described form no part of our present invention and for a more complete description thereof reference is made to the prior application of Edward G. Watkins et al., Serial No. 637,082, filed October 10, 1932.

Our improved ribbon mechanism comprises spool shafts 30 and 31 by which ribbon spools S and S' are alternately rotated. The shafts 30 and 31 are rotatable in a bracket 32 secured to the table 12 by screws 34.

Ratchet wheels 36 and 37 are mounted on the front ends of the shafts 30 and 31 respectively, and are adapted to be engaged by feed pawls 40 and 41, pivotally mounted at the upper ends of links 42 and 43. These links are pivoted at their lower ends to a rocking plate 45, which in turn is pivoted at 46 to the bracket 32.

The upper ends of the links 42 and 43 are connected by a third and substantially horizontal link 48 having a V-shaped projection 49 on its lower edge and having a screw or stud 50 at its longitudinal center. The pawls 40 and 41 have offset arms 52 and 53 which are connected by tension springs 54 and 55 to the stud or screw 50 on the link 48.

A holding arm 60 is pivoted at 61 to the rocking support 45 and is provided with a roll 62 at its free end which is pressed against the under side of the link 48 by a tension spring 64 which connects a stud 65 on the arm 60 to a stud 66 on the rocking plate 45.

An arm 70 projects upward from the rocking plate 45 and is connected by a link 71 to an upright lever 72, pivoted at 73 on the bracket 32. The lower end of the lever is connected by a link 75 to an arm 76 on a cross shaft 77 which is mounted in fixed bearings in the base 10 and which has a forked arm 78 engaging a crosspin 79 in the plunger 15.

As the plunger 15 and platen 14 are raised to stamp a record, the connecting parts just described will be moved in the directions of the arrows shown in Fig. 1, thus rocking the plate 45 in an anti-clockwise direction. Return of the parts to normal position is facilitated by a spring 80 which connects the lower portion of the upright lever 72 to a fixed lug 81.

The operation of our improved feeding mecha-

nism will now be described, it being assumed that the ribbon R has been unwound from the spool S' and has been wound on the spool S until the end of the ribbon has been reached. For the purposes of our invention, the ends of the ribbon must be firmly and positively secured to the spools S and S'.

When a further operation of the time stamp and a further upward movement of the platen 15 occurs after the ribbon R has been entirely unwound from the spool S', the plate 45 will be rocked in an anti-clockwise direction as previously described. Normally such movement would swing the feed pawl 40 downward while in engagement with the ratchet wheel 36, as in Fig. 1, thereby partially rotating the ratchet wheel 36 in a clockwise direction. However, when the ribbon R has been completely unwound but is still firmly attached to the barrel of the spool S' on the shaft 31, no such angular movement of the ratchet wheel 36 is possible. Consequently the links and feed pawls mounted on the plate 45 are held from movement to the left in Fig. 1 but rocking movement of the plate 45 to the left continues, thus causing a shift of the links and feed pawls to the right relative to the rocking plate.

The parts are shown in Fig. 3 in the position assumed when the relative shift to the right has been partially completed. As soon, however, as the point of the V-shaped projection 49 passes the center of the roll 62, the shift to the right will be accelerated by the force of the spring 64, and the parts will snap to the position shown in Fig. 4, with the feed pawl 41 in position to engage the ratchet wheel 37.

As the rocking plate 45 is thereafter returned in a clockwise direction to its normal position by the combined action of gravity and the spring 80, the ratchet wheel 37 will be partially rotated in an anti-clockwise direction, thus initiating re-winding of the ribbon on the spool S'.

When the winding of the ribbon R on the spool S' has been completed, resistance of the ribbon to further travel toward the spool S' will cause a second reversal and restoration of the parts to the relation shown in Fig. 1.

It will thus be seen that we have provided a very simple and effective mechanism by which the ribbon will receive a feeding movement at each actuation of the platen and by which the direction of travel will be automatically reversed when the end of the ribbon is reached.

The specific construction of the ribbon spools S and S' and the way in which they are supported and rotated by the spool shafts 30 and 31 is shown in detail in Figs. 6 to 9 inclusive, the disclosure as to the shaft 31 and spool S' applying equally to the shaft 30 and spool S.

The spool shaft 31 (Fig. 6) is rotatable in a bearing bushing 85 fixed in the front bracket 32. A spool head comprising a disc 86 and hub 87 is secured to the inner end of the spool shaft 31 by a screw 88. A coil spring ring 89 is mounted in a V-shaped annular groove between the adjacent ends of the bushing 85 and hub 87 and provides friction to prevent too free rotation of the spool shaft 31.

A stud 90 is slidable and rotatable in a bearing bushing 91 in the rear bracket 33 and is axially aligned with the spool shaft 31. A washer 92 limits inward movement of the stud 90 in the bushing 91 and the stud is yieldingly pressed inward by a flat spring 93 (Fig. 2) fixed to the bracket 33. A second spool head is mounted on

the stud 90 and comprises a disc 94 and hub 95, the latter being secured to the stud 90 by a screw 96.

The ribbon spool S' is mounted between the spool head flanges 86 and 94, and is formed with reduced end portions 101 adapted to be received in the inwardly projecting inner ends of the spool head hubs 87 and 95.

The spool S' is preferably formed of metal and is slotted at one side as indicated at 102 in Fig. 9 to receive a rod or key 103 which is fixed in the slot 102 and which projects beyond the end portions 101 of the spool. The key 103 may be secured in the slot 102 by staking the metal over the key at each side, as indicated at 105 in Fig. 8. When the parts are assembled, the ends of the key 103 extend into recesses 106 in the hubs 87 and 95.

One end of the ribbon R is permanently secured to the spool S' in any convenient manner, as by cement or shellac, and the other end is similarly secured to the spool S. It has been stated that the construction and method of driving the spool S (Fig. 2), rotated by the spool shaft 30, are the same as herein described for the spool S'. Either spool may be easily removed or replaced by manually moving the corresponding stud 90 to rearward inoperative position.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what we claim is:—

1. In a machine for making records in which the ends of an ink ribbon are secured to a pair of ribbon spools, a ribbon mechanism comprising a pair of shafts on which said spools are mounted, oppositely disposed ratchet wheels mounted on said shafts, a frame member in which said shafts are rotatably mounted, a rocking plate pivotally mounted between said shafts, means to rock said plate each time a record is made, a feed pawl for each ratchet wheel, links pivoted to said rocking plate and pivotally supporting said pawls, a third link connecting the free ends of said first-named links, and a member engaging said third link and holding said link yieldingly in one or the other of two positions, in each of which one or the other of said feed pawls is placed in operative relation to its associated ratchet wheel.

2. In a machine for making records in which the ends of an ink ribbon are secured to a pair of ribbon spools, a ribbon mechanism comprising a pair of shafts on which said spools are mounted, oppositely disposed ratchet wheels mounted on said shafts, a frame member in which said shafts are rotatably mounted, a rocking plate pivotally mounted between said shafts, means to rock said plate each time a record is made, a feed pawl for each ratchet wheel, links pivoted to said rocking plate and pivotally supporting said pawls, a third link connecting the free ends of said first-named links and having a depending projection thereon, a roll engaging said third link, an arm pivoted on said rocking plate and supporting said roll, and a spring operative to force said roll against said third link at one side or the other of said projection, thereby placing one or the other of said pawls in operative relation to its associated ratchet wheel.

3. In a machine for making records in which the ends of an ink ribbon are secured to a pair of ribbon spools, a ribbon mechanism comprising a pair of shafts on which said spools are mounted, oppositely disposed ratchet wheels mounted on said shafts, a frame member in which said shafts

are rotatably mounted in spaced relation, a rocking plate pivotally mounted on said frame member between said shafts, means to rock said plate in one direction each time a record is made, a
5 spring to return said plate to initial position, a feed pawl for each ratchet wheel, links pivoted to said rocking plate and each pivotally supporting one of said pawls, a third link connecting the free ends of said first-named links and having a

depending projection thereon, a roll engaging said third link, an arm pivoted on said rocking plate and supporting said roll, and a spring operative to force said roll against said third link at one side or the other of said projection, thereby
5 placing one or the other of said pawls in operative relation to its associated ratchet wheel.

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