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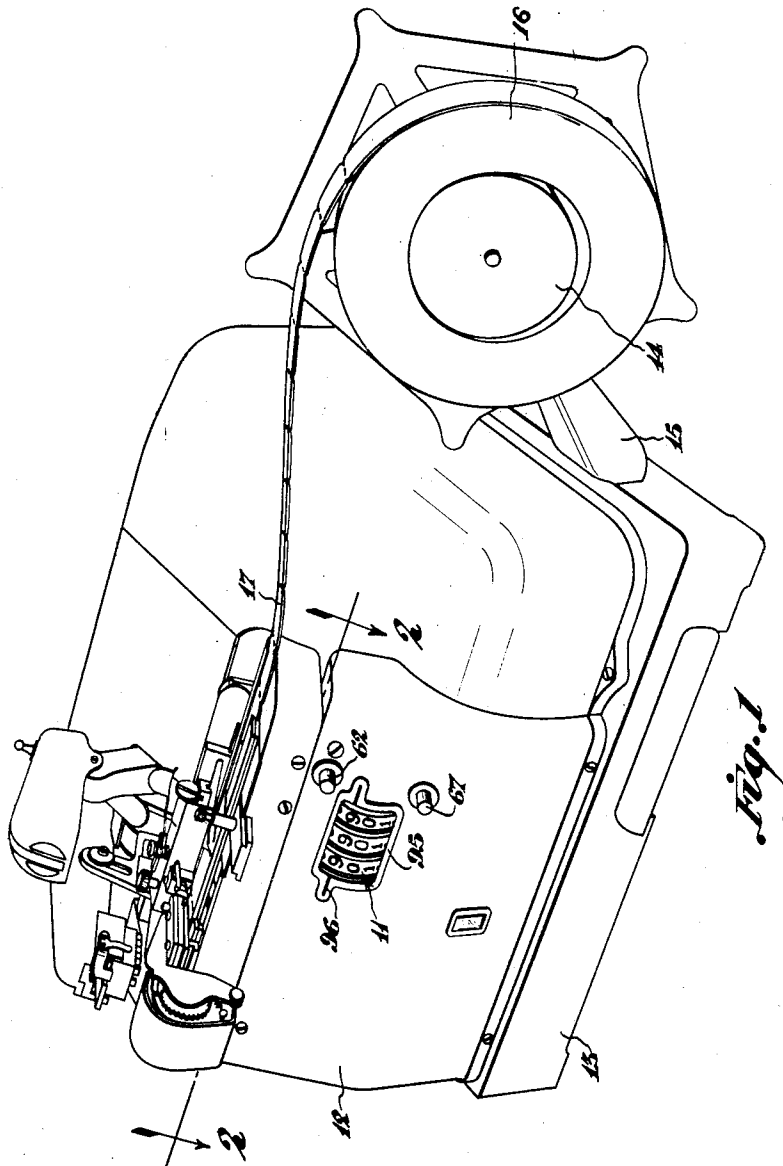
T. G. TURNER

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COUNTING AND CONTROLLING MECHANISM

Filed Jan. 11, 1941

4 Sheets-Sheet 1



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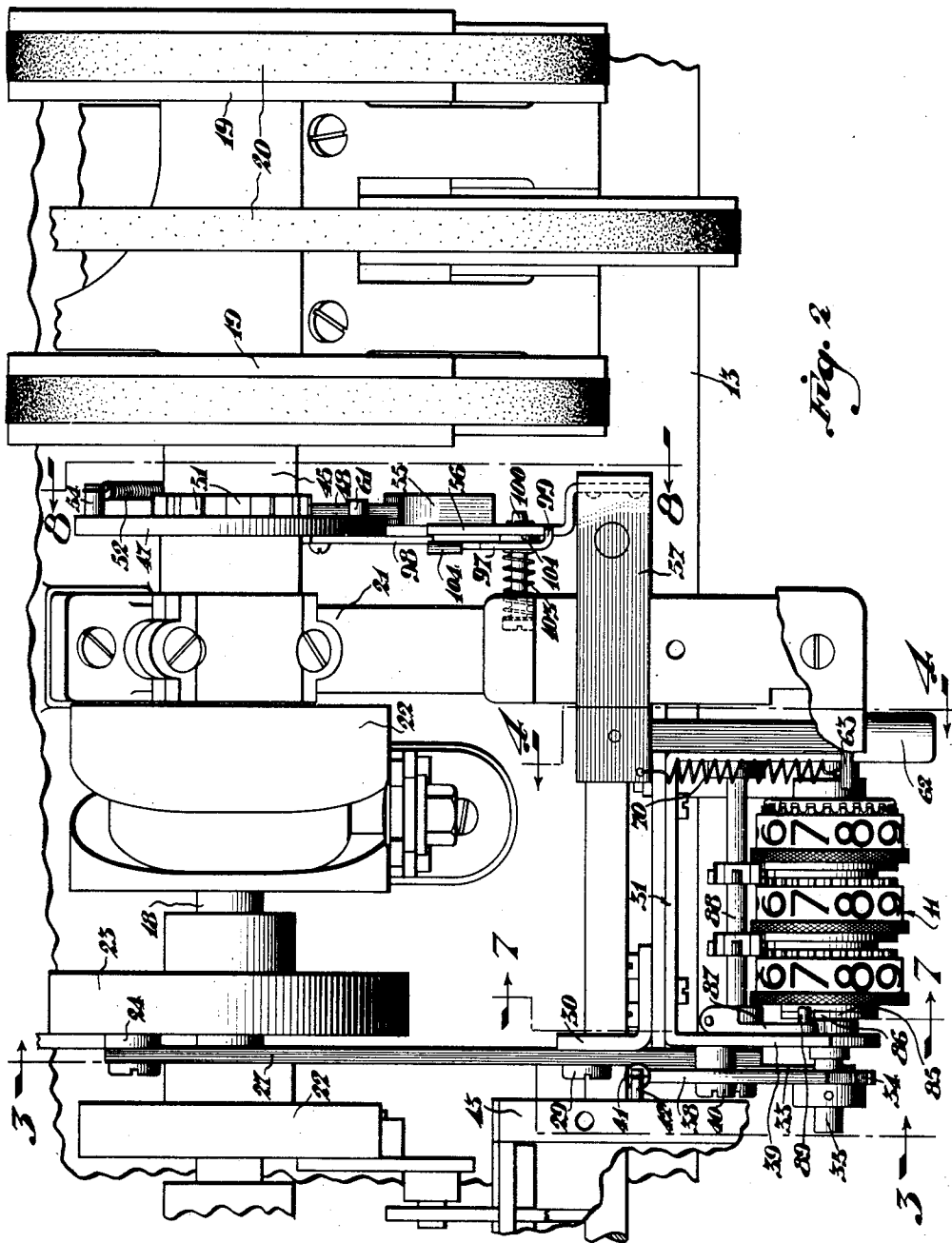
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4 Sheets-Sheet 2



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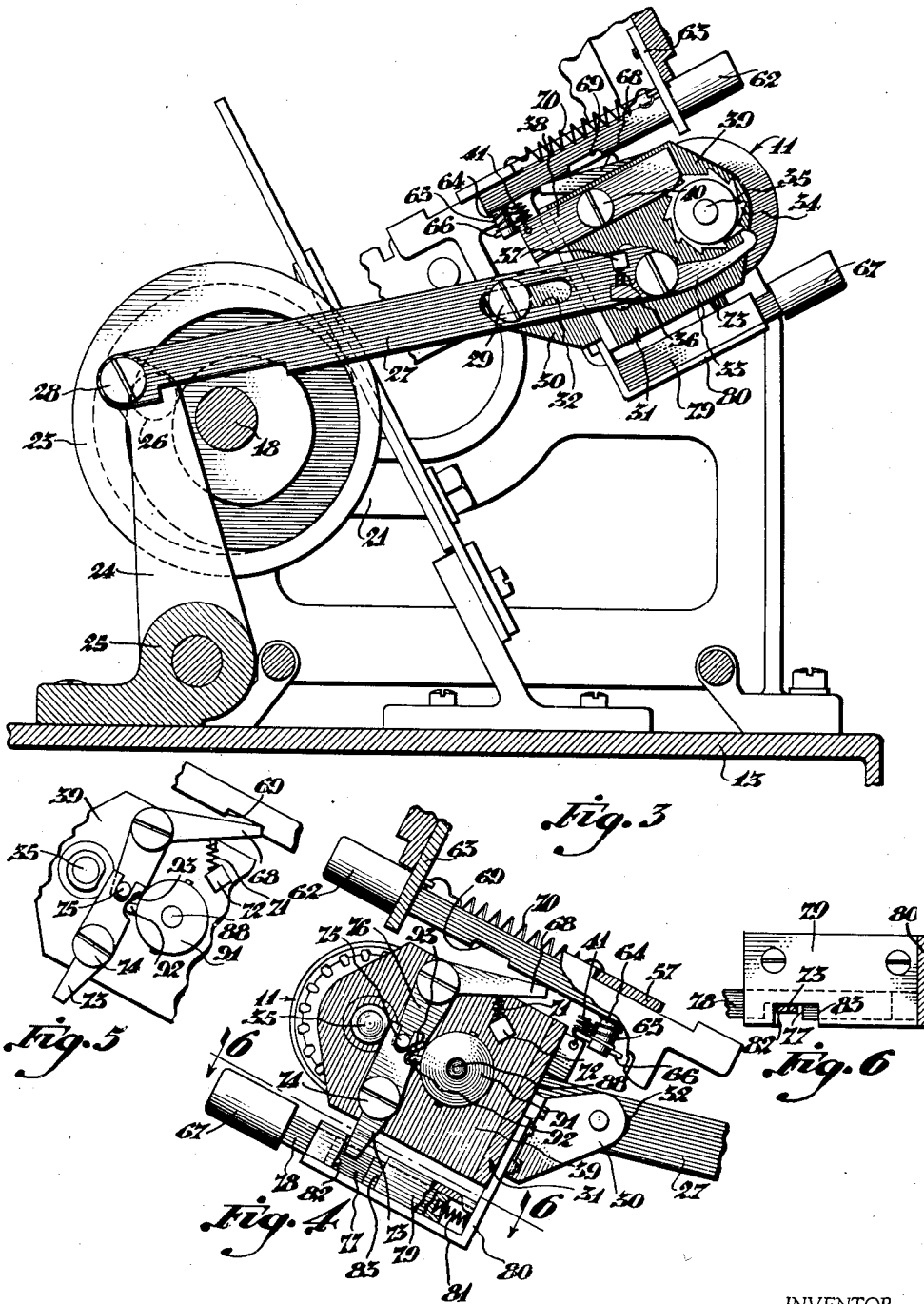
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4 Sheets-Sheet 3



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COUNTING AND CONTROLLING MECHANISM

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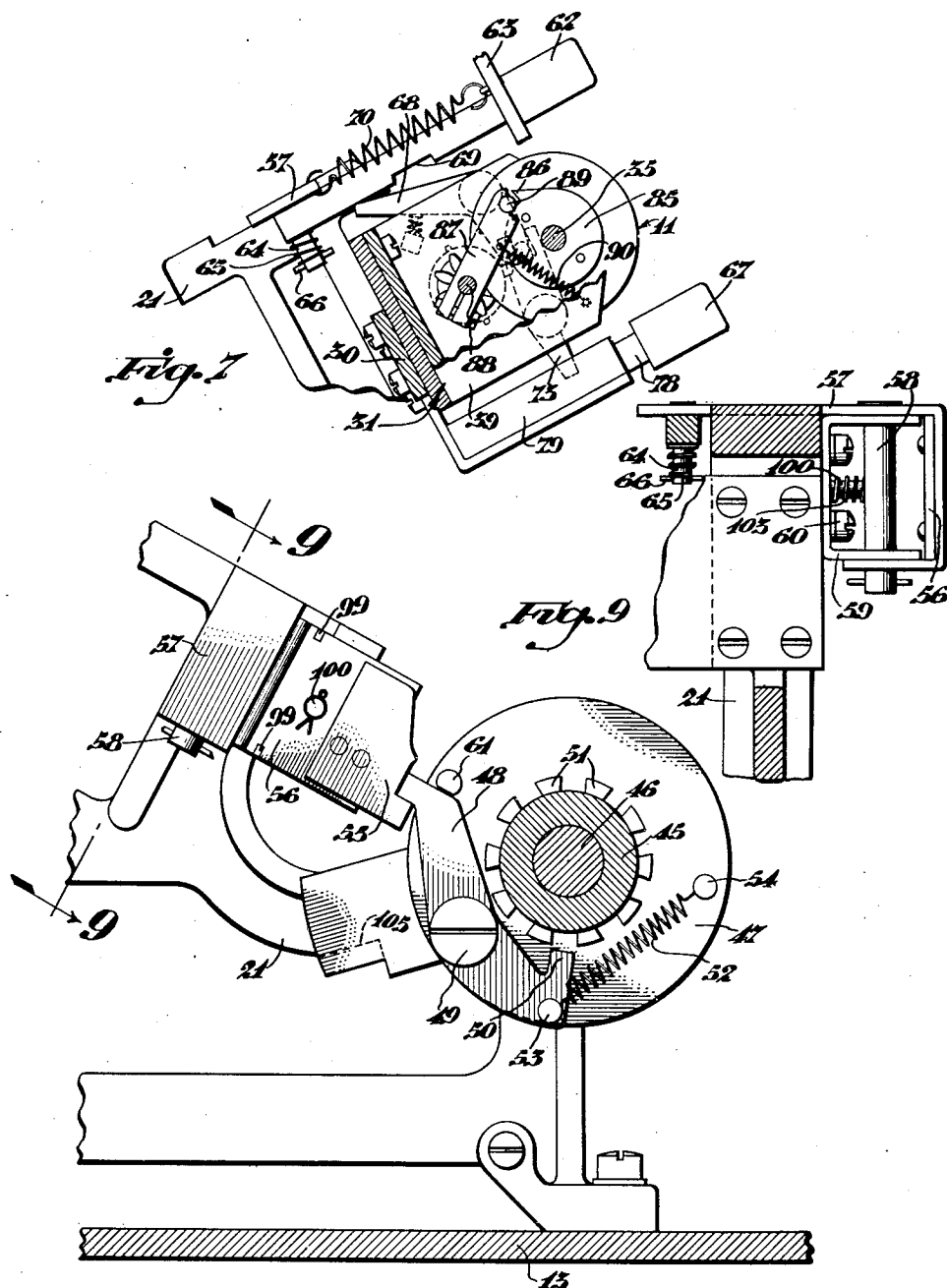


Fig. 8

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UNITED STATES PATENT OFFICE

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COUNTING AND CONTROLLING MECHANISM

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4 Claims. (Cl. 235—132)

This invention relates to counting mechanism as well as to mechanism for starting and stopping a machine after a predetermined number of operations have been performed. The mechanism may be adapted to various types of machines. In the present disclosure, the mechanism has been applied to a machine for marking prices on price tags. In this type of machine, the tickets are fed to a printing station in strip form and after printing, are severed and delivered. The operations of advancing, printing, and severing a ticket constitute a cycle.

It is, of course, highly desirable to make this type of machinery automatic; that is, to make it possible to start the machine, print, and deliver a certain number of tickets, and automatically stop the machine when the count is complete. For this reason, it has been an object of the present inventor to provide a counting and controlling device adaptable to use in certain types of machines such as price tag marking machines, which device includes a counting mechanism adjustable to indicate a certain number of tickets to be printed, whereby the machine upon being started, will proceed to print and deliver the indicated number of tickets and will, when the count is completed, automatically stop with the counting mechanism returned to starting position.

More specifically, the object has been to provide a dial arrangement easily adjustable to the number of tickets to be printed and arranged relative to a push-button type of control, whereupon when the operator presses a starting button, the machine will run through a given number of cycles and when the number of price tags originally indicated has been printed and cut, will operate to declutch the mechanism. Further, it has been the object to provide a mechanism of this sort which can be operated at any time for stopping the printing and cutting prior to completion of the count in the event that this is desirable.

Another object has been to provide a mechanism of this type which will be effective for slowing down or braking the movement of the machine in each cycle just prior to the position at which the machine is declutched, whereby the machine will not overrun normal stopping position when it is declutched.

Other objects and certain advantages of the invention will be more fully apparent from a description of the drawings in which:

Figure 1 is a perspective view illustrating a price tag marking machine incorporating the

counting and controlling mechanism of this invention.

Figure 2 is a sectional view taken on line 2—2, Figure 1, showing a portion of the machine with the cover plates removed and the counting and controlling mechanism exposed.

Figure 3 is a sectional view taken on line 3—3, Figure 2, illustrating in detail the connection from the machine to the counting mechanism for operating the counting mechanism.

Figure 4 is a sectional view taken on line 4—4, Figure 2, illustrating in detail the latching mechanism, the release of which causes stopping of the machine when the counting mechanism returns to starting position or when the operator desires to stop the machine arbitrarily.

Figure 5 is a fragmentary view of a portion of Figure 4, depicting the latching mechanism in set position as when the clutch is engaged.

Figure 6 is a sectional view taken on line 6—6, Figure 4, illustrating in detail the connection of the latching mechanism to the stopping button.

Figure 7 is a sectional view taken on line 7—7, Figure 2, illustrating in detail the cam means for causing tripping of the latch when the counting mechanism has been returned to starting position.

Figure 8 is a sectional view taken on line 8—8, Figure 2, showing the connection from the counting and controlling mechanism to the clutch.

Figure 9 is a sectional view taken on line 9—9, Figure 8, showing details of the connection from the counting and controlling mechanism to the clutch.

The counting and controlling mechanism of this invention, as stated, has been applied in the present disclosure to a price tag marking machine. It is mounted at the front of the machine and is visible at 11 in Figure 1 through an opening in the casing 12 of the machine. It has two connections to the machine itself, one being the connection for moving the counter each time a cycle of machine operation is completed; that is to say, each time a ticket is printed and cut off. The other connection is to the clutch of the machine and is for the purpose of connecting and disconnecting the clutch depending upon the position of the control buttons.

Referring more in detail to the drawings, the base of the marking machine is indicated at 13. A reel spool 14 is supported on a bracket 15 attached to the base. A roll of tickets 16 is mounted on the reel and the strip of tickets 17 is fed through the feeding mechanism to the printing station and cut-off station. The various mech-

anisms of the machine do not constitute a part of this invention and accordingly, are not fully illustrated or described except insofar as Figures 1 and 2 show the general arrangement.

The main shaft 18 is driven by means of pulleys 19 and belts 20, from a motor not shown. One of the main brackets 21 supports the shaft and various cams 22 are fixed along this shaft for operating the various mechanisms. A cam 23 is fixed to the shaft. An arm 24 (Figure 3) is pivoted on a bracket 25 on the base 13 of the machine and carries a roller 26 at its upper end engaged in the cam track of the cam 23. An operating link 27 is flexibly connected to the upper end of the arm 24 by means of a screw 28. The forward end of this link 27 is supported on a screw 29 carried in an angular bracket 30 fixed to the frame 31, supporting the counter mechanism. The screw traverses a longitudinal slot 32 in the link. Thus the link may move back and forth on the support afforded by the screw.

The forward end of the link carries an actuating finger 33. The hook end of this finger is adapted to engage with successive notches of a notched wheel 34 fixed on the shaft 35, carrying the counters. The wheel is held on the shaft by means of a pin (Figure 2). Accordingly, each time the drive shaft makes a complete revolution to complete one cycle of operation of the machine with the resultant tag printing and cutting operation, the ratchet wheel is moved one notch or the equivalent of one number on the counter. This finger 33 is held in engagement with the ratchet wheel by means of a coil spring 36 under compression between the inner end of the finger and a lug 37 on the end of the link 27.

A detent arm 38 is pivotally mounted on a screw 40 on an end plate 39 of the frame supporting the counter mechanism. This detent arm 38 is held in operative engagement with the ratchet wheel by means of a coil spring 41 under tension between the end of the arm and a pin 42 fixed to a bracket 43 of the machine (Figure 2).

The counter mechanism used here need not be described in detail since it represents a standard construction. It is used in reverse order; that is to say, is to be set to a figure, for example 10, and then rotates backwards under the actuation of the cam 23 until eleven printed tickets are dispensed at which time the clutch is tripped and the mechanism stopped. The reason for delivering one more ticket than necessary is fully explained later on page 9 of this specification.

The clutch (Figure 8) consists of a driving element 45 fixed to the motor shaft 46 and abutting a driven disc 47 fixed to the driven shaft 18. A clutch finger 48 is pivotally mounted on a screw 49 carried by the driven disc 47. This finger includes an extension 50 on its inner end adapted to cooperate with the teeth 51 of the driving clutch element 45 and normally pulled into engagement therewith by means of a coil spring 52 under tension between a pin 53 on the finger 48 and a pin 54 on the disc 47.

The clutch finger is held out of engagement by means of an abutment plate 55. This abutment plate is riveted to the inner end of an arm 56, the arm 56 in turn being riveted to the vertical portion of a lever 57. This lever 57 is pivotally mounted on a pin 58 carried in the arms of a bracket 59 fixed by means of screws 60 to the side of the bracket 21. The pin traverses portions of the lever 57 lying against the upper and lower arms respectively of the bracket 59. Thus,

the abutment plate 55 has a lateral swinging motion for clearing the finger and permitting the spring 52 to pull the clutch finger into clutching engagement. Unclutching movement of the finger is limited by means of a pin 61 on the disc 47.

The arm 57 is actuated by means of the starting push-button 62 slidably mounted at its forward end in a hanger 63 and attached at its inner end to the end of the lever 57 by means of a pin 64. A coil spring 65 is disposed around the pin 64 between a cross pin 66 thereof and the push-button extension for providing a certain amount of friction between the push-button extension and the lever 57. Thus, when the push-button is depressed, the abutment is swung laterally and the clutch finger is freed for clutching engagement.

The counting and controlling mechanism includes the push-button 62 for starting and the push-button 67 for stopping. The starting button is held in depressed or clutching position by means of a latching mechanism either released automatically when the counting mechanism returns to starting position, or released manually by operating the stopping button. As will be apparent in Figure 4, this latching mechanism consists of a finger 68 engageable with a notch 69 in the underside of the stopping push-button extension. A spring 70, disposed under tension between the arm 57 and the hanger 63, normally holds the starting button in outward or declutching position. A small coil spring 71, under compression against a lug 72 on the end plate of the bracket supporting the counting mechanism, is engaged against the finger 68 normally urging the finger in the latching direction. Accordingly, the finger will move into the groove 69 when the groove is adjacent the tip of the finger, and thus, will hold the starting button in clutching position.

As stated, this finger is either tripped automatically or manually. The manual means consists of a pivoted lever 73 mounted on a pivot screw 74. One arm of the lever 73 is bifurcated and engages about a pin 75 on the end of an extension 76 of the finger 68. The other arm of the lever 73 is engaged in a slot 77 in the slidably mounted extension 78 of the stopping button. A guide block 79 is supported beneath the supporting frame of the counting mechanism on a hanger bracket 80. This block provides a groove within which the stopping button is slidably mounted. A coil spring 81 is disposed under tension between the inner end of the slot; that is, against the hanger and against the inner end of the stopping button extension, thus, normally urging the button outwardly. Outward movement is limited by means of a pin 82 in the slot 77 extending outwardly for engagement with the forward wall of a slot 83 (Figure 6) of the guide block 79. Thus, when the stopping button is depressed, it is effective for swinging the lever 73 through the engagement of the forward end wall of the slot 77 with the extension 76 of the finger. This swings the finger, and the starting button is then permitted to snap into released position.

The starting button is unlatched automatically by means of a mechanism operated from the countershaft. The countershaft (Figure 7) carries a cam 85 rotatively journaled thereon and fixed to the third or "hundreds" counter dial by pins as shown in Figure 7. This cam includes a raised or tripping portion 86 which is effective when the counting dial is returned to starting po-

sition for swinging an arm 87 fixed to a shaft 88 of the counting mechanism journaled in the respective end walls of the main bracket. The outer end of this arm carries a pin 89, resting upon the periphery of the cam 85 and therefore, is effective for swinging the arm when the raised portion of the cam engages it.

A coil spring 90, under tension between the outer end of the arm 87 and a pin on the frame normally holds the pin 89 of the arm tightly against the periphery of the cam, whereupon the pin will drop off the edge of the raised portion of the cam, abruptly tripping the latching mechanism.

The shaft 88 (Figure 4) carries a disc 91 on its end adjacent the latching mechanism. This disc has a pin 92 projecting radially from its periphery adapted to contact an inclined face 93 on the end of the arm 76 of the bell crank lever, this inclined face being immediately adjacent the disc.

As stated, it is not believed necessary to describe the details of the counting mechanism. As indicated in Figure 1, the setting dials project through an opening 95 in the cover plate 12. A mark 96 enables the operator to align the selected numbers. If the operator wishes to print, let us say, 12 tags, he sets the counter at 12. As the machine operates, the counter moves backwards until starting point is reached, at which time, the counter will appear as indicated in Figure 1, and the tripping will take place for stopping the mechanism.

A spring cushioned braking plate 97 is provided on the plate 56 for cooperation with a hard-fiber aligner plate 98 carried on the driven clutch disc 47 to slow the driven disc slightly just prior to disengagement of the clutch, either by hand or automatically. As a secondary function, the two plates 97 and 98 serve to align positively the abutment plate 55 with the clutch throw-out finger when the clutch is disengaged.

The braking plate 97 is pivoted at its outer end on a pair of ears 99 which extend into slots in the plate 56. A pin 100 extends through the braking plate and the plate 56 near the upper end of the brake plate. A washer 101, slidable on the pin, is mounted between the brake and the plate 56 to maintain them in spaced relationship. A spring 103, mounted on the pin between the brake and the head of the pin, cooperates with a washer fastened to the other end of the pin to lie against the back of the plate 56 to provide a cushion for absorbing the shock when the aligner plate 98 comes into contact with the brake. The upper edge of the inner end of the brake plate 97 is turned over to provide a cam surface 104, and the contacting edge of the aligner is beveled at 105 so that the aligner is forced into the space between the brake plate 98 and the plate 56, when they meet.

In view of the fact that the machine stops in a position leaving a printed, unsevered ticket on the platen, it is necessary that the counter move one ticket beyond zero, which brings it to 999, as shown in Figure 1. In other words, when the machine starts to operate, the first cycle moves the previously printed ticket out of the machine and moves the counter one notch. Therefore, assuming that the counter has been set at 12, only 11 tickets would be delivered if it stopped at zero.

Accordingly, it has been arranged to move past zero one ticket thus delivering 13 tickets in a run of 12. This is, of course, necessary where a different type set-up is being used and the first ticket is unusable.

Having described my invention, I claim:

1. In a machine, a main shaft for operating the mechanisms of the machine, a driving shaft, a clutch adapted to connect the driving shaft to the main shaft, said clutch including an operating finger having a radially projecting portion, a tripping lever adapted to be interposed in the path of movement of said projected portion of the operating finger, a push-button for moving the tripping lever laterally for this purpose, a blade carried by said main shaft adjacent the clutch, and a braking plate carried by the tripping lever and providing a slot in conjunction with the tripping lever adapted to be entered by the blade on the main shaft, said braking plate spring-urged toward the lever for exerting a friction on the blade as it passes between the braking plate and the tripping lever for slowing the main shaft just prior to declutching operation.

2. A counting mechanism for a machine, comprising, a series of counting wheels including means for manually setting said wheels to a predetermined number, which wheels are adapted to be returned to starting position, a shaft for said wheels, a ratchet wheel carried by said shaft, means for indexing said wheels, a pawl operated by the machine for rotating said ratchet wheel and counting wheels to move the counting wheels in reverse direction one number at a time, a cam carried by the counting wheel shaft, a starting means for starting the machine, a latching finger adapted to engage the starting means for holding it in starting position, and a tripping means operated by the cam for releasing the finger for stopping the machine when the counting wheels return to starting position.

3. In a machine, a main shaft for operating the mechanisms of the machine, a driving shaft, a clutch adapted to connect the driving shaft to the main shaft, a clutch throw-out means, a lever for operating said means, a blade carried by said main shaft adjacent the clutch, a braking plate carried by said lever and providing a slot in conjunction with the lever adapted to be entered by the blade on the main shaft, said braking plate spring-urged toward the lever for exerting a friction on the blade as it passes between the braking plate and the tripping lever for slowing the main shaft just prior to declutching operation.

4. A counting and controlling mechanism for a machine comprising, a main shaft for driving the mechanism, power means for driving said shaft, means for controlling said power means for discontinuing the drive, a counting mechanism operated by said main shaft, an operating lever extending from said counting mechanism to said power controlling means for discontinuing the drive to said main shaft when the counting mechanism completes the count, and a braking mechanism on the main shaft for slowing down the main shaft just prior to discontinuance of the drive.

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