W. W. LASKER.

CARRIAGE STOP MECHANISM FOR PERFORATING MACHINES.

APPLICATION FILED APR. 2, 1917.

1,287,706.

Patented Dec. 17, 1918.

3 SHEETS—SHEET 1.

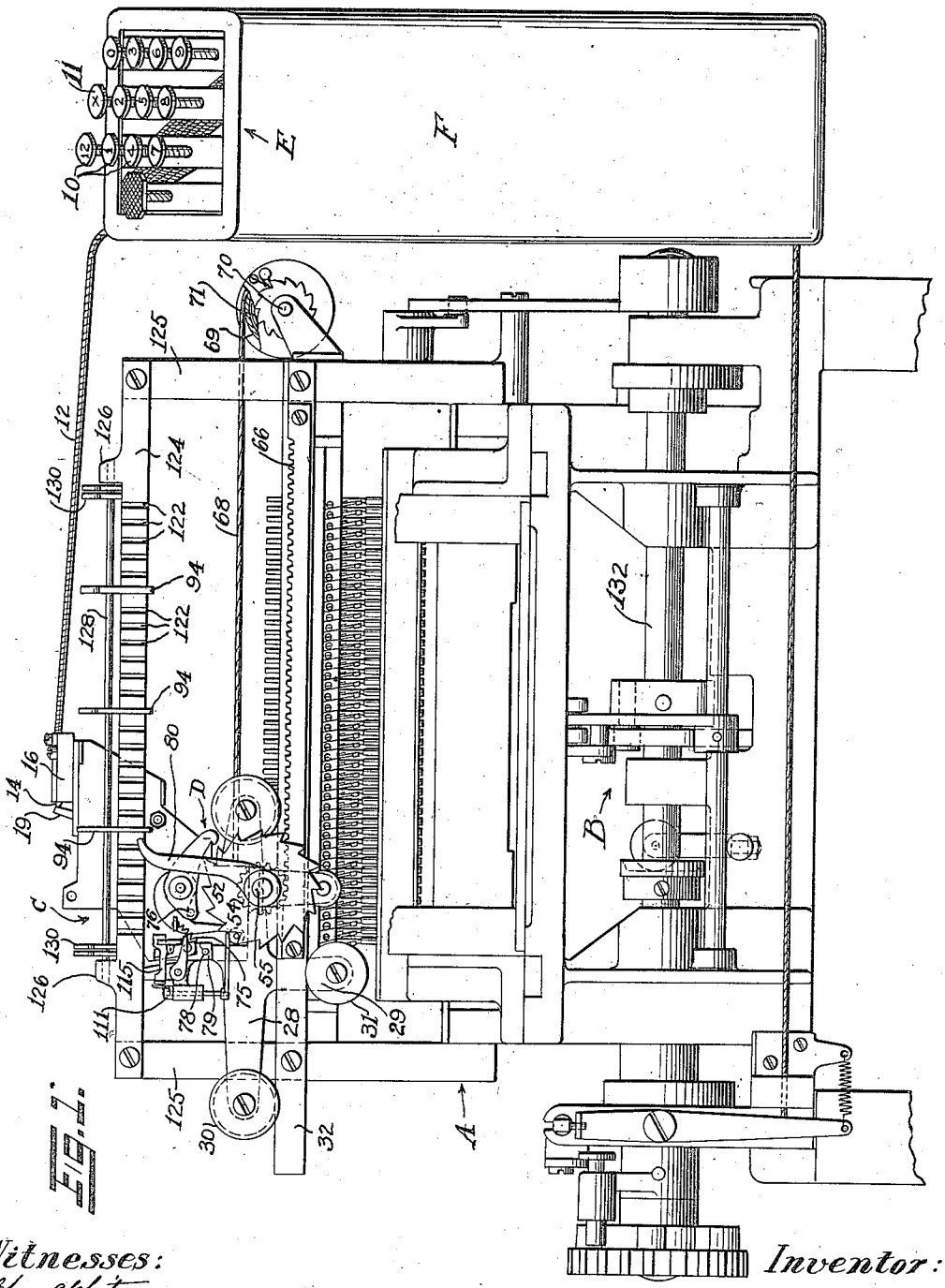


FIG. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

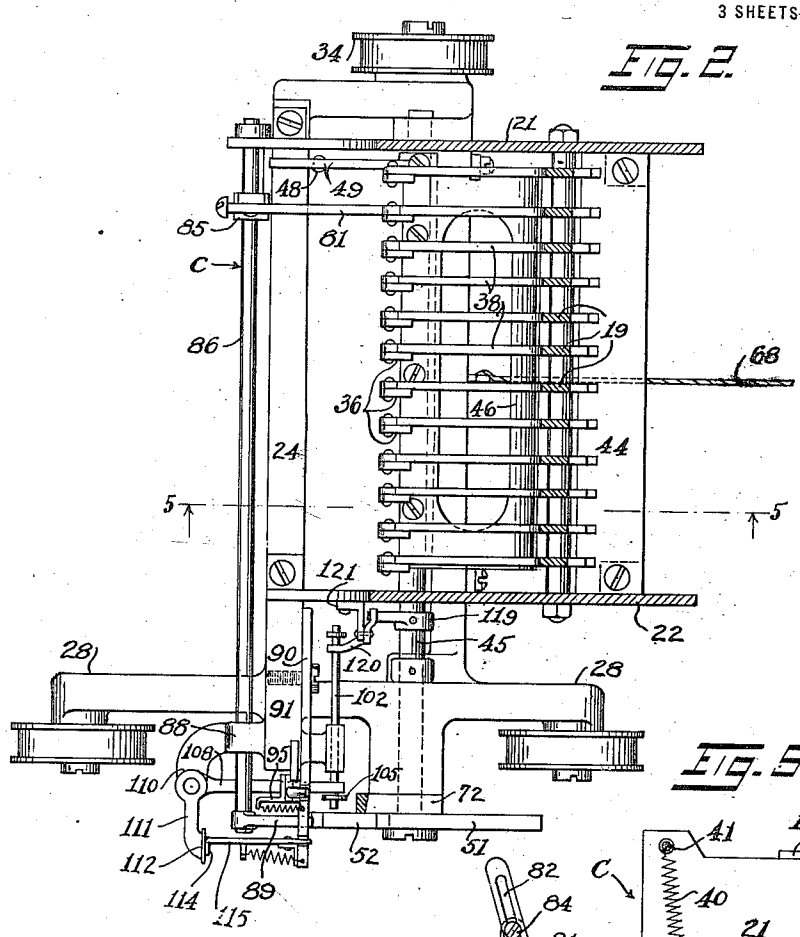


Fig. 5.

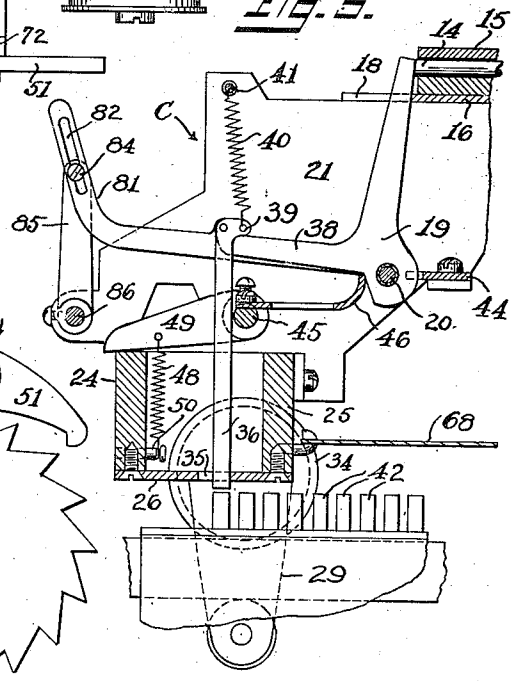
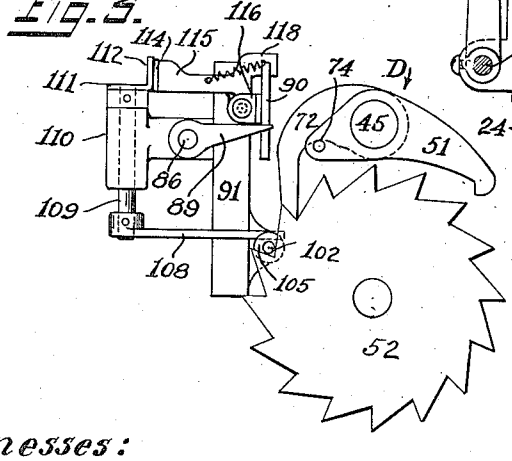


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

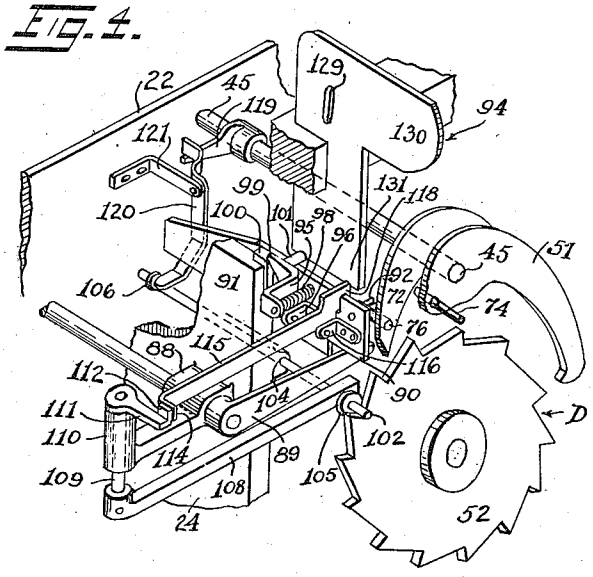


Fig. 7.

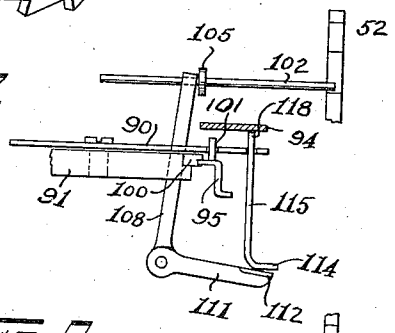


Fig. 6.

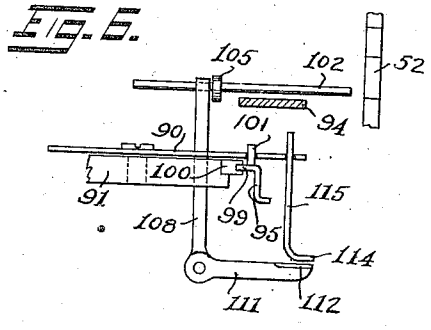
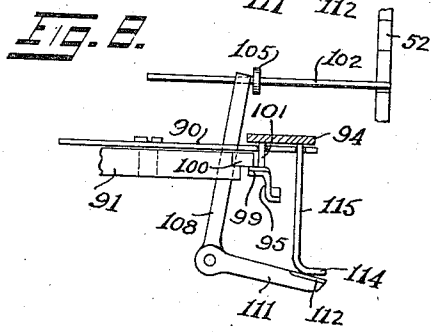


Fig. 8.



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UNITED STATES PATENT OFFICE.

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CARRIAGE-STOP MECHANISM FOR PERFORATING-MACHINES.

1,287,706. Specification of Letters Patent. Patented Dec. 17, 1918.

Application filed April 2, 1917. Serial No. 159,054.

To all whom it may concern:

Be it known that I, WILLIAM W. LASKER, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Carriage-Stop Mechanism for Perforating-Machines, of which the following is a specification.

This invention relates to escapement mechanisms for machines such as perforating machines and the like and relates particularly to machines for perforating cards for accounting purposes and the like, and more particularly to improvements on the perforating machine illustrated in my copending application, Serial No. 116957, filed Aug. 26, 1916.

In said application there is shown a keyboard, carrying the punch setting mechanism and operatively connected to the keyboard, an escapement for the carriage, and means for permitting the carriage to travel more than the normal one-tooth distance, as for instance when skips are to be made and no punch made in certain of the rows of spaces provided for the perforations.

The objects of the present invention are to provide improvements in the means for arresting the movement of the carriage at the end of these skips and to provide additional means for preventing the possibility of rebound or over spacing, no matter how carelessly the machine is operated.

These and other objects and advantages will appear in the following description showing by way of example one of many possible embodiments of the invention.

In the annexed drawings:

Figure 1 is a front elevation of the machine;

Fig. 2 is a plan partly in section of the carriage of the machine;

Fig. 3 is a detail elevation of part of the escapement and anti-rebound mechanisms;

Fig. 4 is a distorted perspective view of said mechanisms;

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2;

Figs. 6, 7 and 8 are somewhat distorted diagrammatic plans showing different steps in the operation of the anti-rebound mechanism.

The embodiment of the invention as shown is a perforating machine similar to that described in the above mentioned application and adapted to be power actuated similar to the power actuated machine illustrated in the Patent No. 1,138,314, dated May 4, 1915, to James Powers.

The machine comprises broadly a frame A, carrying a movable carriage C, provided with punch operating mechanisms B, and provided with an escapement D and connected by flexible connections to the keyboard E mounted in the housing extension F.

The keyboard comprises a plurality of keys 10 and the key 11 connected by flexible push cables 12 to the carriage C and the pins 14 slidably mounted in recesses in the block 15 of the carriage (Fig. 5).

By this arrangement pressure on the keys moves inwardly the pins 14, notwithstanding the position of the carriage.

The keys and cables are described in detail in my said copending application and form no part of the present invention.

The recessed block 15 is mounted on the plate 16 of the carriage, said plate being provided with recesses 18 to accommodate the upwardly extending arms of the bell cranks 19 pivotally mounted on the shaft 20 carried by the side plates 21 and 22 mounted on blocks 24 and 25 in turn mounted on the plate 26 of the carriage.

The blocks 24 and 25 have lateral and downward extensions 28 and 29 on which are journaled respectively the flanged rollers 30 and the rollers 31 engaging above and below the rail 32 secured to the frame A, whereby the carriage is adapted for longitudinal movement. On the back of the carriage there is provided a similar flanged wheel 34 (Fig. 2) adapted to engage a rail (not shown) similar to the rail 32.

The plate 26 is provided with a row of openings 35 (Fig. 5) through which extend the lower ends of rods 36, pivotally connected at their upper ends to the rearwardly extending arms 38 of the bell cranks 19.

The rods 36 have at their upper ends forwardly extending lugs 39 to which are connected tension springs 40 connected at their upper ends to the cross-rod 41 mounted between the plates 21 and 22. These springs yieldably maintain the lower ends of the rods 36 against the forward ends of the recesses 35.

The rods are disposed to engage the pins 42 disposed under the path of the carriage.

The pins 42 are arranged in rows so that the rods 36 will be in coöperative relation with a row of pins for each successive position of the carriage.

A recessed plate 44, supported by the plates 21 and 22, forms a comb between the teeth of which the elbows of the bell cranks 19 engage, whereby the bell cranks are held properly spaced.

When a key 10 is depressed, a pin 14 engages a bell-crank 19 and depresses a rod 36. This movement also actuates the escapement D and moves the carriage by means of the mechanism now to be described.

A shaft 45 journaled in the plates 21 and 22 has secured thereto a universal plate 46 (Fig. 5) having an upturned edge adapted to be yieldably held in engagement with and adapted to be rocked by any one of the crank-arms 38. This engagement is accomplished by means of a spring 48 secured at one end to the arm 49 fixed to the shaft 45, and at the other end secured to a pin 50 fixed in the block 24.

The shaft 45 extends beyond the plate 22 and has fixed thereto an arm 51 (Figs. 1, 3 and 4) the free end of which engages the teeth of the ratchet wheel 52, to which is fixed a gear 54 (Fig. 1) mounted on the stub shaft 55 and meshing with the rack 66 secured to the outside of the rail 32.

The carriage C is yieldably drawn forward against the action of the escapement by means of a cord 68 wound upon a spring housing 69 (Fig. 1) mounted on a shaft 70 on the front end of the frame A and rotated by the coiled spring 71 contained in the housing.

In addition to the arm 51, there is loosely mounted, on the shaft 45, a pawl 72 having its free end engaging the shouldered teeth of the ratchet wheel 52 to hold the wheel against rotation and thereby the carriage against travel.

The arm 51 has a rearwardly extending portion provided with an inwardly extending pin 74 engaging under the pawl 72, whereby depression of the plate 46 rocks the shaft 45, and the arm 51 and raises the pawl out of engagement with the teeth of the wheel 52, whereupon the wheel moves until a tooth engages and raises the free end of the arm 51, the pawl 72 is drawn back into locking engagement with the ratchet wheel by means of the spring 75 (Fig. 1) having one end secured to the pawl 72 by means of the pin 76 and its other end secured to a pin 78 on the laterally extending portion 79 of the extension 28. The movement of the ratchet wheel through the space of one tooth permits the carriage to move the distance between two adjacent rows of pins 42.

For returning the carriage to its initial position there is provided the handle 80 (Fig. 1) upwardly extending from the stub shaft 55.

To permit the carriage to be shifted independently of the escapement mechanism, it is only necessary to raise the pawl 72 by means of the finger piece formed on the outer end of the pin 76.

For permitting the carriage C to travel uninterruptedly a distance greater than one tooth space of the ratchet wheel, the mechanism now to be described is provided.

The key 11 (Fig. 1) marked "X" is operatively connected by one of the cables 12 and pins 15 (Fig. 5) to the second bell-crank lever 19 (Figs. 2 and 5) which lever is provided with a rearwardly and upwardly bent slotted extension 81 into the slot 82 of which slidably engages a pin 84 carried on the arm 85 fixed on the shaft 86 journaled in a rearward extension of the plate 21 and in a bearing 88 on the block 24.

On the forward end of the shaft 86, outside of the bearing 88 there is fixed a lever 89 (Figs. 2 and 4), the forward end of which engages under the outer end of a plate 90 pivotally mounted on the upward extension 91 of the block 24.

The plate 90 is provided near its outer end with a forwardly projecting lateral pin 92 adapted to engage under the pin 76 in the pawl 72, whereby the pawl is raised and released from the ratchet when the key 11 is depressed and the lever 89 and the plate 90 consequently raised.

This raising of the pawl releases the carriage which is then drawn forward until stopped by engagement of the plate 90 with one of the stops or abutments 94 (Figs. 1 and 4), which are adjustable in a manner to be explained.

In order to prevent the immediate release of the plate 90 and reëngagement of the pawl 72 should the key 11 be released before the plate 90 reaches the stop 94, there is provided a latch 95 pivoted to a bracket 96 on the face of the plate 90 and held in engagement with said face by the tension spring 98. When the pivotal plate 90 is raised the cam extension 99 of the latch engages over the fixed plate 100 on the extension 91 of the block 24.

When the plate 90 has almost reached the stop 94, the stop is engaged by the pin 101 on the latch 95 whereupon the latch is pushed back and the cam-extension 99 is pushed off the fixed plate 100 and the plate 90 falls and the pawl 72 reëngages the ratchet.

In order to prevent the possibility of a rebound or an over spacing of the carriage when the plate 90 strikes the stop 94, means is provided for engaging between the teeth of the ratchet wheel just as this striking takes place, whereby the ratchet wheel is positively locked against rotation in either

direction. This means, illustrated in Figs. 1, 2, 3 and 4, and shown diagrammatically in Figs. 6, 7 and 8, will now be described.

A locking pin 102 slidable in a bore 104 in the extension 91 and provided with collars 105 and 106 near opposite ends, is adapted to slide outwardly to engage between adjacent teeth of the ratchet wheel 52, and inwardly to disengage said teeth.

The locking pin 102 is forced outwardly by means of the engagement of the collar 105 by the long arm 108 fixed to the vertical shaft 109 adapted to oscillate in the vertical bearing 110 supported on the bearing 88. The upper end of this vertical shaft carries and is oscillated by a short arm 111, which carries at its free end an up turned cam 112 adapted to be engaged by the cam 114 on the end of the large arm of the lever 115 pivoted on the small bracket 116. The short arm 118 of this lever extends upwardly and through a slot in the plate 90 and projects toward the stop 94 and somewhat forwardly of the plate 90 and the pin 101.

Fig. 6 shows diagrammatically the position of the parts before the short arm 118 reaches the stop 94. As shown by Fig. 7, when the short arm 118 reaches the stop the short arm is rocked causing the cam 114 to act upon the cam 112 to rock the arm 111, the shaft 109 and the large arm 108, thus forcing the pin 102 between the teeth of the ratchet wheel, as shown in Fig. 7.

The pin 102 must be retracted before the operator of the machine proceeds further. To this end I have fixed, on the shaft 45, near the plate 22, an arm 119 adapted to engage the upper arm of the lever 120 pivoted to the bracket 121, the free end of the lower arm of the lever 120 engaging the collar 106.

When the shaft 45 is rocked, as in the normal operation of the machine, the arm 119 moves upwardly causing the lower end of the lever 120 to press the collar 106 inwardly, thus withdrawing the pin 102 from between the teeth of the ratchet wheel.

The anti-rebound mechanism just described constitutes the principal feature of the present invention.

The stops 94 may be set in any one of the notches 122 in the notched rail 124 supported on the brackets 125. When the stops 94 are disposed in their notches the carriage is stopped with the rods 36 (Fig. 5) in cooperation with a row of the pins 42, there being a notch 122 corresponding to each row of pins.

On top of each notched rail 124 near the ends thereof are a pair of lugs 126 supporting between them a rod 128 passing through slots 129 in the stops 94.

Each stop 94 comprises a plate provided with an elongated manipulating piece 130 (Fig. 4) and the stopping projection 131. When the stops are in stopping position they are disposed as in Fig. 4. On the other hand, when they are disposed in non-stopping position, they are disposed with the manipulating piece extending upwardly, the stops being moved to one end or the other of the rod 128 where they will be out of the way.

In the lower part of the frame of the machine, I mount the main shaft 132 controllably connected with a source of power and armed with cams and driving members and operably connected by cams, links and otherwise with the power driven machine members; none of which constitute my present invention and therefore need not be described here.

From the foregoing it will be observed that the extended travel of the carriage only takes place when the "X" key is depressed and that the pin 102 is only engaged between the teeth of the ratchet when the carriage is being stopped by the stops 94.

It is obvious that various changes and modifications may be made in the construction and details without departing from the general spirit of the invention.

I claim as my invention:

1. In a machine of the character described, the combination of a pair of relatively movable parts adapted to be brought into stopping engagement; and means by said relative movement caused to move into position to prevent rebound of said parts after said engagement takes place, and remain in said anti-rebounding position until the machine is again actuated to proceed in its normal operation, and a device for releasing said means as the normal operation of the machine proceeds.

2. In a machine of the character described, the combination of a pair of relatively movable parts adapted to be brought into stopping engagement; and means by said relative movement caused to move into position to prevent rebound of said parts after said engagement takes place, and remain in said anti-rebounding position until the machine is again actuated to proceed in its normal operation, and a device for automatically releasing said means on the continuation of the normal operation of the machine.

3. In a machine of the character described, the combination of a pair of parts adapted for relative movement and adapted to be brought into relative stopping engagement; a device controlling said relative movement and carrying a notch; and means adapted to be moved into engagement with said notch substantially as said stopping engagement takes place.

4. In a machine of the character described, the combination of a pair of parts adapted for relative movement and adapted to be brought into relative stopping engagement; a wheel controlling said relative movement

and carrying teeth; and means moved by said relative movement to enter into engagement with any one of said teeth substantially as said stopping engagement takes place.

5. In a machine of the character described, the combination of an abutment carrying part; a movable-stop-carrying part; means for relatively moving said parts; means for controlling said relative movement; an abutment carried by the abutment carrying part; a movable stop carried by the stop carrying part; means for moving said movable stop and releasing the controlling means whereby said parts may move until the movable stop and the abutment are brought into stopping engagement; locking means adapted to lock said controlling means; a striking means carried with the movable-stop-carrying means and adapted to strike the abutment; and an operative connection between said locking means and said striking means whereby the striking of the abutment by the striking means moves the locking means into engagement with said controlling means.

6. In a machine of the character described, the combination of an abutment carrying part; a movable-stop-carrying part; means for relatively moving said parts; means for controlling said relative movement; an abutment carried by the abutment carrying part; a movable stop carried by the stop carrying part; means for moving said movable stop and releasing the controlling means whereby said parts may move until the movable stop and the abutment are brought into stopping engagement; locking means adapted to lock said controlling means; a striking means carried with the movable-stop-carrying means and adapted to strike the abutment; an operative connection between said locking means and said striking means whereby the striking of the abutment by the striking means moves the locking means into engagement with said controlling means; and means for automatically releasing the locking means when the normal operation of the machine proceeds.

7. In a machine of the character described, the combination of an abutment carrying part; a movable-stop-carrying part; means for relatively moving said parts; means for controlling said relative movement; an abutment carried by the abutment carrying part; a movable stop carried by the stop carrying part; means for moving said movable stop and releasing the controlling means whereby said parts may move until the movable stop and the abutment are brought into stopping engagement; locking means adapted to lock said controlling means; a striking means carried with the movable-stop-carrying means and pivoted to the movable stop and comprising an upward and forward extension adapted to strike the abutment, and a rearwardly extending arm having a cammed end: a pivoted shaft; an arm fixed thereto and having a cam engagement with said cammed end; and another arm on said shaft and adapted to engage and operate said locking means when said extension strikes the abutment.

8. In a machine of the character described, the combination of an abutment carrying part; a movable-stop-carrying part; means for relatively moving said parts; means for controlling said relative movement; an abutment carried by the abutment carrying part; a movable stop carried by the stop carrying part; means for moving said movable stop and releasing the controlling means whereby said parts may move until the movable stop and the abutment are brought into stopping engagement; locking means adapted to lock said controlling means; a striking means carried with the movable-stop-carrying means and pivoted to the movable stop and comprising an upward and forward extension adapted to strike the abutment, and a rearwardly extending arm having a cammed end; a pivoted shaft; an arm fixed thereto and having a cam engagement with said cammed end; another arm on said shaft and adapted to engage and operate said locking means when said extension strikes the abutment; and means for automatically releasing the locking means when the normal operation of the machine proceeds.

9. In a machine of the character described, the combination of an abutment-carrying part and a movable-stop-carrying part adapted for relative movement; an abutment carried on the abutment-carrying part; a toothed element; a rocking means carried by the movable-stop-carrying part; detents carried by the rocking means and adapted to engage the teeth of the toothed element; a movable stop carried by the movable-stop-carrying part; means for moving the movable stop and releasing pawl detents from the teeth, whereby said parts may move until said movable stop and said abutment are brought into stopping engagement; a locking means carried by the movable-stop-carrying part; striking means carried with the movable-stop-carrying means and adapted to strike said abutment; and an operative connection between said locking means and said striking means whereby the striking of the abutment by the striking means positively moves the locking means into engagement with said teeth.

10. In a machine of the character described, the combination of an abutment-carrying part and a movable-stop-carrying part adapted for relative movement; an abutment carried on the abutment-carrying part; a ratchet wheel having operative connection with said parts for controlling said

relative movement; a rocking means carried by the movable-stop-carrying part; detents carried by the rocking means and adapted to engage the teeth of the ratchet wheel; a movable stop carried by the movable-stop-carrying part; means for moving the movable stop and releasing pawl detents from the teeth, whereby said parts may move until said movable stop and said abutment are brought into stopping engagement; a locking means carried by the movable-stop-carrying part adapted to engage between the teeth of the ratchet wheel and comprising a pin provided with a collar; a striking means carried with the movable-stop-carrying means and pivoted to the movable stop and comprising an upward and forward extension adapted to strike the abutment, and a rearwardly extending arm having a cammed end; a pivoted shaft; an arm fixed thereto and having a cam engagement with said cammed end; and another arm on said shaft and adapted to engage the collar of the pin and cause the pin to engage between the teeth of the ratchet when said extension strikes the abutment.

11. In a machine of the character described, the combination of an abutment-carrying part and a movable-stop-carrying part adapted for relative movement; an abutment carried on the abutment-carrying part; a ratchet wheel having operative connection with said parts for controlling said relative movement; a rocking means carried by the movable-stop-carrying part; detents carried by the rocking means and adapted to engage the teeth of the ratchet wheel; a movable stop carried by the movable-stop-carrying part; means for moving the movable stop and releasing pawl detents from the teeth, whereby said parts may move until said movable stop and said abutment are brought into stopping engagement; a locking means carried by the movable-stop-carrying part adapted to engage between the teeth of the ratchet wheel and comprising a pin provided with a collar at each end; a striking means carried with the movable-stop-carrying means and pivoted to the movable stop and comprising an upward and forward extension adapted to strike the abutment, and a rearwardly extending arm having a cammed end; a pivoted shaft; an arm fixed thereto and having a cam engagement with said cammed end; another arm on said shaft and adapted to engage the collar at the outer end of the pin and cause the pin to engage between the teeth of the ratchet when said extension strikes the abutment; an arm carried by said rocking means; and a fulcrumed lever adapted to be engaged by said last named arm and to engage the collar on the inner end of said pin to withdraw the pin from the ratchet when the rocking arm rocks.

12. In a machine of the character described, the combination of an abutment carrying part; a movable-stop-carrying part; means for relatively moving said parts; means for controlling said relative movement; an abutment carried by the abutment carrying part; a movable stop carried by the stop carrying part; means for moving said movable stop and releasing the controlling means whereby said parts may move until the movable stop and the abutment are brought into stopping engagement; locking means adapted to lock said controlling means; a striking means carried with the movable-stop-carrying means and adapted to strike the abutment; an operative connection between said locking means and said striking means whereby the striking of the abutment by the striking means moves the locking means into engagement with said controlling means; and a latch adapted to latch said movable stop in moved position and carrying an extension adapted to strike the abutment to release the movable means from said moved position before said striking means strikes the abutment.

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