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HIGH SPEED SET UP DEVICE FOR A TEN KEY ADDING OR LIKE MACHINE

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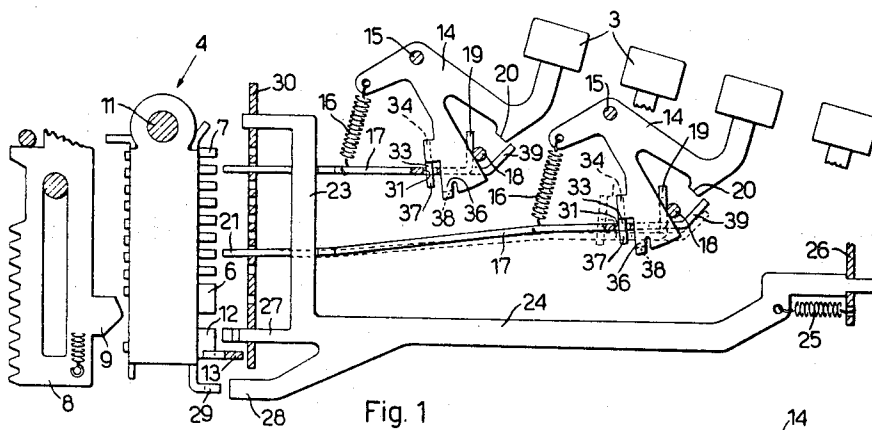


Fig. 1

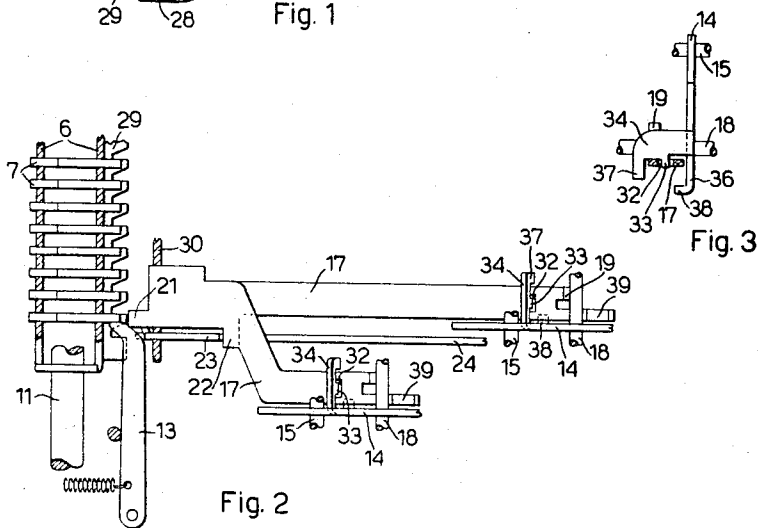


Fig. 2

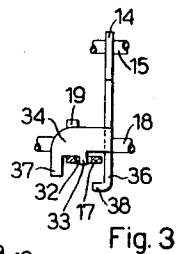


Fig. 3

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HIGH SPEED SET UP DEVICE FOR A TEN KEY ADDING OR LIKE MACHINE

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This invention relates to a high speed set up device for a ten key adding or like machine comprising a set up carriage provided in each order with a column of settable stop pins and adapted to be transversely displaced step by step, under the control of means cooperating with a predetermined one pin of said columns upon setting up each order of an amount, and comprising a group of setting members individually connected with a corresponding numeric key stem and adapted to be moved from a rest position to an operated position for setting a corresponding stop pin plus said predetermined one pin of each one of said columns.

There are known various set up devices of the above type. In a known set up device, fulcrumed on each key stem is a setting lever having a projection adapted to set up the corresponding stop pin of the carriage. The lever is disabled by being rocked upon advancing the carriage. However, if the key is held depressed said projection lies on the path of the stop pin of the next lower order of the carriage, which therefore cannot be set before releasing the previous depressed key.

In another known set-up device, attached to the stem of each key is a compression spring adapted to set up the stop pin of the carriage. This spring upon advancing the carriage is laterally bent whereby the above disadvantage occurs.

In a further known set up device, each set up member is operated by a lever pivoted on an intermediate member connected to the key stem. Therefore, this device comprises a remarkably high number of parts, which make the device very intricate and expensive in the manufacture and unadapted for a high speed setting device.

These and other disadvantages are obviated by the setting device according to the invention, which is characterized in that a projection integral with each one of said key stems normally enters a notch provided on the corresponding setting member to positively move this latter to said operated position at the depression of the corresponding numeric key, each setting member being integral with a cam element adapted to engage a stationary member for disengaging said notch from said projection when said setting member approaches said operated position to cause a spring tensioned between said setting member and the corresponding key stem to restore said setting member independently from said key stem.

This and other characteristics of the invention will become apparent from the following description of a preferred embodiment thereof and from the accompanying drawings, wherein:

FIG. 1 is a left hand partial longitudinal sectional view of a ten key adding machine incorporating a high speed set up device according to the invention;

FIG. 2 is a partial plan view of the set up device;

FIG. 3 is a transverse sectional view of a detail of the set up device.

The set up device is incorporated in a conventional ten key adding machine and comprises a group of ten keys 3 (FIG. 1) adapted to set up an amount order by order on a set up carriage 4. This latter is provided in each order with a column of settable stop pins, comprising a pin 6 for the figure zero, eight pins 7 for the figures

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from one to eight, and a settable escapement pin 12. The set pins 6 and 7 are adapted to differentially arrest a projection 9 provided on each one of a set of actuators 8, which are cyclically movable upwards. The carriage 4 is transversely slidably on a stationary bar 11 and is urged leftwards (downwards in FIG. 2) by a spring not shown in the drawing to contact with the leftmost unset pin 12 an escapement dog 13.

Each key 3 (FIG. 1) is secured to a stem formed of a lever 14 pivoted on a stationary shaft 15, four shafts 15 being provided for the ten keys 3. Each lever 14 is connected to a corresponding setting member or a slide 17 having a rear end guided in a corresponding notch of a stationary comb plate 30, which is located near the carriage 4. The slides 17 are movable rearwards from the rest position shown in the drawing to an operated position.

The rear end of each slide 17 is provided with a finger 21 (FIG. 2), all the fingers 21 being vertically aligned in front of the first left hand unset column of pins 6, 7 and 12. Each slide 17 is also provided with a shoulder 22 adapted to cooperate with a vertical universal bar 23 (FIG. 1) integral with a slide 24. This latter is longitudinally slidable on the comb plate 30 and on a stationary plate 26 and is normally urged by a spring 25 to contact the plate 26. The bar 23 is provided with a finger 27 adapted to engage an escapement pin 12 and with a projection 28 adapted to engage a rack 29 (FIG. 2) provided on the carriage 4.

Tensioned between each lever 14 and the corresponding slide 17 is a spring 16 normally urging the lever 14 to contact one side of a stationary bar 18. The forward end of each slide 17 is provided with a bent lug 19 normally urged by the spring 16 to contact the opposite side of the same bar 18. Furthermore, the bar 18 is adapted to arrest a shoulder 20 of the lever 14 when the corresponding key 3 is depressed.

Each slide 17 is also provided with a notch 32 normally entered by a projection 33 (FIG. 3) integral with a bent lug 34 of the lever 14 and adapted to engage a rear edge 31 (FIG. 1) of the notch 32. The rear end of each slide 17 is provided with a cam element formed of an inclined bent lug 39 adapted to engage the bar 18 when the slide 17 is displaced rearwards to its operated position.

Finally, the lever 14 is provided with a pair of elements, comprising a tooth 36 and a projection 37 (FIG. 3) of the lug 34, which normally embrace the slide 17 so as to guide same longitudinally and to prevent its transverse displacement. The tooth 36 is also provided with a lug 38 adapted to limit the downward movement of the slide 17 about the corresponding notch of the comb plate 30.

The high speed step device operates as follows:

When a key 3 is depressed the corresponding lever 14 is rocked clockwise about the shaft 15 until the shoulder 20 contacts the bar 18, thus tensioning the spring 16. Then the tooth 33 of the lug 34 engages the edge 31 of the notch 32 and displaces the slide 17 rearwards. In turn the shoulder 22 displaces the universal bar 23 rearwards.

Now the finger 21 of the displaced slide 17 sets up the pin 6 or 7 of the carriage 4 corresponding to the figure of the depressed key, while the finger 27 of the bar 23 sets up the corresponding escapement pin 12 and the projection 28 engages the rack 29. The carriage 4 is now moved leftwards through a part of one step until arrested by the projection 28 of the universal bar 23.

Near the end of the rearward displacement of the slide 17 (FIG. 1), the lug 39 engages the bar 18, thus causing the slide 17 to rock about the corresponding notch of the comb plate 30, until disengaging the projection 33 from the notch 32 of the lever 14, whereby the slide 17

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is released. The slide 17 is now quickly restored to return forwards by the spring 16, while the spring 25 restores the universal bar 23, even though the key 3 is held depressed, whereby the slide 17 is restored independently from the key 1.

When the slide 17 is restored forwards, its top surface slightly slides under the projection 33 of the lever 14 and is brought into the position shown by broken lines in FIG. 1 wherein the lug 19 contacts the bar 18.

When the universal bar 23 returns forwards its projection 28 (FIG. 2) disengages the rack 29, thus causing the carriage to effect a second part of the step, till the next following escapement pin 12 encounters the escapement dog 13, whereby the carriage 4 is step by step advanced independently from the restoring of the depressed key 3. The carriage 4 is thus ready for setting up the next order of an amount upon depressing another key 3, even though one or more numeral keys are held depressed. Similarly a machine cycle may be started even though one or more keys 3 are held depressed, whereby the operation of the machine is very speedy.

When a depressed key 3 is released, the spring 16 restores the lever 14 counterclockwise till contacting the bar 18. Then the lever 14 returns the projection 33 over the notch 32, whereby the slide 17 is returned upwards by the same spring 16, thus causing the notch 32 to be entered by the projection 33.

It is intended that many changes, improvements and additions may be made to the device without departing from the scope of the invention as defined by the appended claims.

What I claim is:

1. A high speed up device for a ten key adding or like machine, having a group of numeric keys, a set up carriage provided in each order with a column of settable stop pins, means adapted to cooperate with a predetermined one pin of said columns for controlling a step by step movement of said carriage upon setting up each order of an amount, a group of setting members movable from a rest position to an operated position for setting a corresponding stop pin plus said predetermined one pin of each one of said columns, a key stem secured to each one of said numeric keys, and comprising in combination:

- (a) a notch provided in each one of said setting members,
- (b) a projection integral with each one of said key stems and normally entering said notch to positively operate the corresponding setting member at the depression of the corresponding numeric key,
- (c) a spring tensioned between each setting member and the corresponding key stem for urging each setting member and said key stem toward said rest position,
- (d) and a cam element integral with each setting member and adapted to engage a stationary mem-

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ber for disengaging said notch from said projection when said setting member approaches said operated position, whereby said setting member is restored by said spring independently from the corresponding key stem.

2. A high speed set up device for a ten key adding or like machine, having a group of numeric keys, a set up carriage provided in each order with a column of settable stop pins, means adapted to cooperate with a predetermined one pin of said columns for controlling a step by step movement of said carriage upon setting up each order of an amount, a stationary comb plate adjacent to said carriage, a group of setting slides longitudinally slidable from a rest position to an operated position for setting a corresponding stop pin plus said predetermined pin of each one of said columns, each setting slide being guided with one end on said comb plate, a key stem secured to each one of said numeric keys and pivotally mounted on the machine frame, and comprising in combination:

- (a) a notch provided in each one of said setting slides,
- (b) a projection integral with each one of said key stems and normally entering said notch to positively operate the corresponding setting slide at the depression of the corresponding numeric key,
- (c) a stationary bar,
- (d) a first bent lug integral with each one of said setting slides at the other end thereof,
- (e) a spring tensioned between each setting slide and the corresponding key stem to normally hold said first lug and said key stem to rest in contact with opposite sides of said stationary bar,
- (f) and a second lug integral with each one of said setting slides at said other end and adapted to engage said stationary bar when said setting slide approaches said operated position, said second lug having a camming effect on said setting slide so as to disengage said notch from said projection, whereby said setting slide is restored by said spring independently from said corresponding key stem.

3. A set up device according to claim 2, comprising in combination:

- (g) a pair of elements on each one of said key stems and normally embracing said other end of the corresponding setting slide for longitudinally guiding same upon disengagement of said notch from said projection.

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