

June 7, 1955

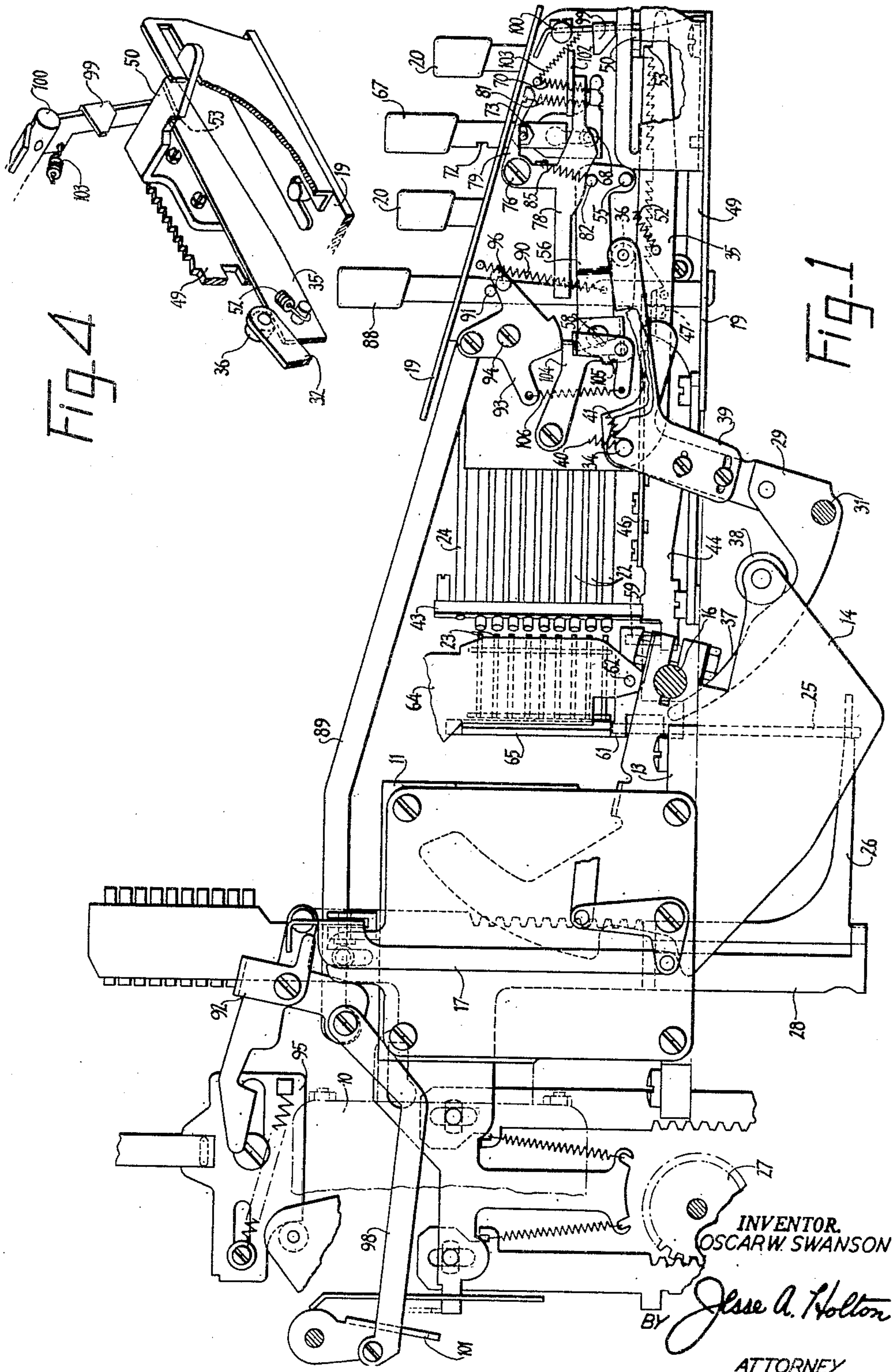
O. W. SWANSON

2,710,139

CORRECTION KEY MECHANISM FOR ADDING MACHINE

Filed Dec. 7, 1953

2 Sheets-Sheet 1



June 7, 1955

O. W. SWANSON

2,710,139

CORRECTION KEY MECHANISM FOR ADDING MACHINE

Filed Dec. 7, 1953

2 Sheets-Sheet 2

Fig. 2

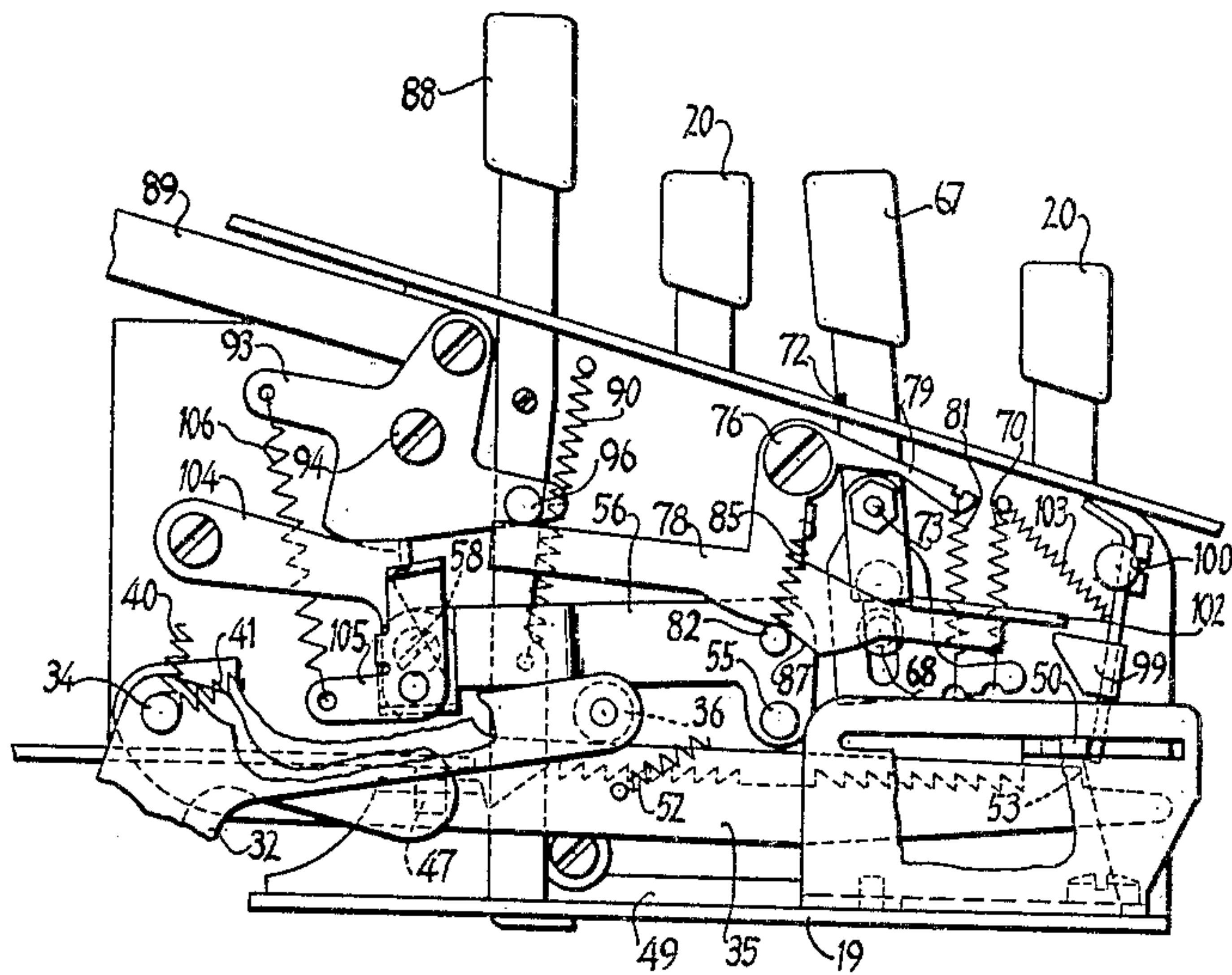
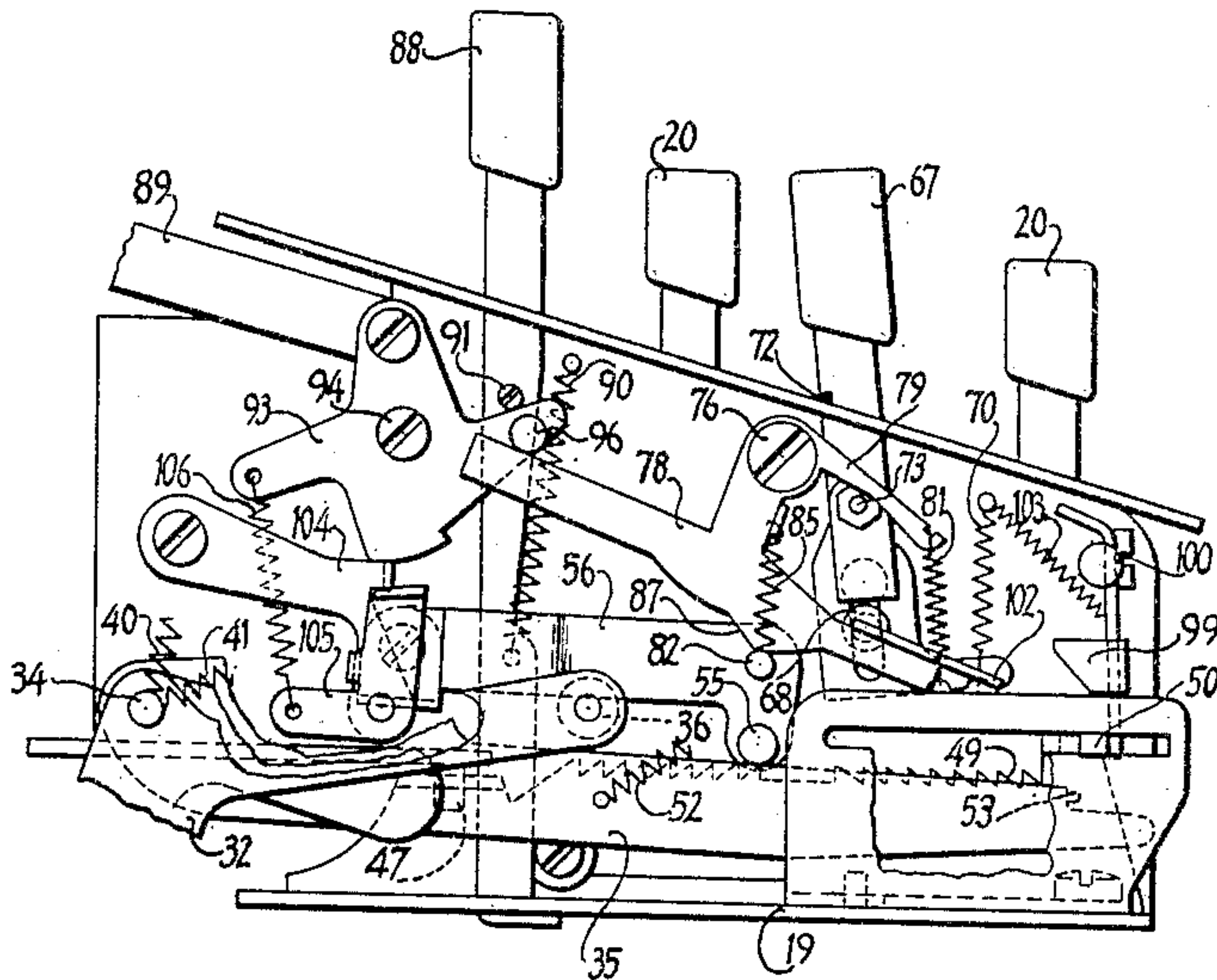


Fig. 3



INVENTOR.
OSCAR W. SWANSON

BY

Jesse A. Holton

ATTORNEY

1

2,710,139

CORRECTION KEY MECHANISM FOR ADDING MACHINE

Oscar W. Swanson, Bridgeport, Conn., assignor to Underwood Corporation, New York, N. Y., a corporation of Delaware

Application December 7, 1953, Serial No. 396,635

5 Claims. (Cl. 235—60)

This invention relates to computing or printing machines, and more particularly to entry correction means therefor. More specifically it relates to means for correcting an amount entered for repeat or multiplying operations of the machine.

Multiplication in adding machines of the well-known "Sundstrand" type requires that an amount entered therein be retained in an amount entry device for successive cyclings of the machine until the multiplication is completed. The amount entered is retained by depressing and latching down a repeat key, which renders ineffective a mechanism for normally restoring the amount entry device during each cycling of the machine.

If an erroneous amount is entered in previous machines of this type, the repeat key must first be released to again render the amount restoring mechanism effective, and a motorized correction key then depressed to restore the amount entry device in a non-addition operation of the machine. The same sequence of operations is followed when the computation is completed and clearance of the entry device is required before the answer can be printed in a total-taking cycle. Operation of the machine in such a manner requires alertness on the part of the machine operator to return the repeat key to depressed position to recondition the machine for multiplying operations, and such mode of operation, taken as a whole, retards the speed of machine operation.

An object of the present invention is to provide a mechanism that obviates the necessity for releasing the repeat key during a correction cycling of the machine to restore an amount entered for a multiplying operation.

Another object of the present invention is to provide a means to restore the machine to repeat entry condition for multiplying at the completion of a correction cycling.

A further object of the present invention is to provide a mechanism such as set out above that is simple in construction, inexpensive to manufacture and assemble in the machine, and dependable in operation.

With these and incidental objects in view, the invention consists in certain novel features of construction and combinations of parts, the important elements of which are herein described in appended claims, and a preferred form of embodiment hereinafter described with reference to the drawings which accompany and form part of this specification.

In the drawings:

Figure 1 is a fragmental left side view in vertical elevation of an adding machine embodying the present invention, showing the parts in normal position,

Figure 2 is a fragmental left side view in vertical elevation showing the repeat key latched depressed, and the machine cycling and amount restoring means in the positions they occupy at the initiation of a correction cycling, and

Figure 3 is a view similar to Figure 2 showing the repeat key latched depressed, and parts of the machine fully restored,

Figure 4 is a perspective view showing details of the amount entry device restoring mechanism.

2

The invention is disclosed herein in connection with an adding machine of the well-known Sundstrand type such as is disclosed in Patent No. 1,198,487, issued September 16, 1916, to G. D. Sundstrand, in Patent No. 1,965,611, issued July 10, 1934, to Oscar J. Sundstrand and Patent No. 2,251,100, issued July 29, 1941, to Walter A. Anderson, to which patents reference may be made for an understanding of features of construction not fully shown herein.

Referring to Figure 1 of the drawings, the machine is driven by means of an electric motor 10 connected with a gear reduction drive contained in a housing 11 mounted on a base indicated generally by the numeral 13. The gear reduction drive includes a one-revolution clutch such as is disclosed in Patent No. 2,251,100, and is connected in the manner described and shown therein with a plate 14 secured on the machine main rock shaft 16. Cycling of the machine is normally effected by the depression of the motor bar, not shown, which raises a slide 17 to release the one-revolution clutch and start motor 10.

The machine includes a keyboard comprising a frame 19 in which amount entering keys 20 are supported, which keys, when depressed, index an amount entered in the manner disclosed in the above noted Sundstrand Patent No. 1,965,611. In general, each amount entering key operates a plunger 22 to set corresponding stops 23 seriatim into the path of movement of tail pins 25 connected with a tail 26 pivoted on each type bar 28 to differentially position the type bars in printing position. The tail pins 25 are guided in a sliding block 61 to which is connected by a pin 59 a swinging arm 44. Arm 44 is urged clockwise and is normally retained by an escapement, not shown, controlled by a push rod 24 common to all rods 22 and operated when any key 20 is depressed.

During a machine cycle, the main rock shaft 16 is rocked first clockwise through a forward stroke, during which the type bars 28 are raised to printing position under the control of stops 23. The main rock shaft 16 is then rocked counterclockwise through a return stroke during which the amount entered is printed, the amount is entered in the machine totalizer 27, and swinging arm 44 is restored counterclockwise to restore stop pins 23 to their non-indexed positions.

The means for restoring swinging arm 44 and thereby destroying an amount entered by the amount keys 20 are functionally similar to those disclosed in the above Patent No. 1,198,487. In general, these means include a cradle 29 pivoted on a shaft 31 supported in the machine frame, not shown. Secured on the cradle 29 is a plate 32 carrying a pivot stud 34 on which is pivoted a restoring arm 35. Cradle 29 is provided with a cam edge 37 that is normally urged against a roller 38 in plate 14 on main shaft 16 by springs 40 and 41. Plungers 22 are slidably supported in a bar 43, vertically disposed on swinging arm 44 which is pivoted on the keyboard frame 19, and which is released for a one-stop movement upon each depression of an amount key 20 to index an amount in stops 23. Secured to the swinging arm 44 is a plate 46 carrying a pin 47 engaging a back space slide 49 slidably supported on the frame 19, and having a bent-over ear 50. Plate 32 carries a pin 36 against which the restoring arm 35 is normally pressed by the tension of a spring 52 to position a shoulder 53 on the restoring arm 35 under the bent-over ear 50 of the back spacer slide 49 when the machine is fully restored as in Figure 1.

During the entering of an amount in pins 23 by operation of keys 20, arm 44 is released step by step to align the push rods 22 with successive rows of stops 23, and the back space slide 49 is moved rearwardly space by space by the pin 47 in plate 46. During the forward stroke of the machine cycle, plate 14 is rocked clockwise, and cradle 29 counterclockwise about its shaft 31 stretching springs

3

40 and 41 and drawing the restoring arm 35 rearwardly. During this movement, pin 36 of plate 32 moves away from the restoring arm 35 which is then moved by spring 52 to bear against the under face of ear 50 until shoulder 53 of arm 35 is moved to the rear of ear 50 and then against a pin 55 in a lever 56 pivoted on a stud 58 in the keyboard frame 19 which positions the shoulder 53 in alignment with the ear 50. During the return stroke of the machine cycle, cradle 29 is restored to its normal position by springs 40 and 41, moving the restoring arm 35 forwardly and causing the shoulder 53 thereof to engage the bent-over ear 50 and restore the back spacer slide 49, and by means of pin 47 the swinging arm 44 and plungers 22. Arm 44 is connected by pin 59 with block 61 slidably supported on a shaft 62 in a frame 64 supporting stops 23. Vertically supported on the block 61 is a cam 65 which, during the restoring of arm 44, wipes across the stops 23 and restores all indexed stops 23 to their unindexed position.

Multiplication in machines of the present type is usually performed by entering an amount in the amount keys 20 and retaining the amount set up in stop pins 23 for successive cyclings of the machine, during which cyclings, the amount is added in the machine totalizer 27. To prevent restoration of stops 23 at the end of a machine cycle, a repeat key 67 is supported for vertical slidable movement on a stud 68 and in a slot (not shown) in the keyboard frame 19, and is normally tensioned to its upper position by a spring 70. The repeat key 67 is provided with a notch 72 which, by a rearward movement of the key, may be engaged with the top plate of the keyboard frame 19 to hold the key depressed, as shown in Figures 2 and 3.

Pivoted on a stud 76 in the keyboard frame 19 is a normalizing lever 78 having an arm 79 that is tensioned by a spring 81 against a stud 73 in key 67 to set lever 78 in normal position. Lever 56 carries a pin 82 that is urged against a concentric portion of the lower edge of lever 78, by a spring 85. Upon the depression, and latching down of the repeat key 67, spring 81 rocks lever 78 about stud 76 clockwise, causing a cam edge 87 of lever 78 to cam pin 82 and lever 56 clockwise, to set pin 55 against the upper edge of the restoring arm 35 and hold the arm below ear 50 of slide 49. With the restoring arm 35 held so depressed, it passes under the bent-over ear 50 on the return stroke and thus the amount entered in keys 20 and stops 23 is retained through successive cyclings of the machine.

Frequently, with the repeat key 67 latched depressed for multiplication operations, an undesired or erroneous amount is entered in the amount keys 20 or the machine is to be cleared to enable a total taking cycle to be made. To remove or correct such an entry, it has previously been necessary to release the repeat key 67 to enable the restoring lever 35 to engage the bent-over ear 50 during a cycle and clear out the amount entered and, after restoration is effected, to again latch the repeat key depressed to recondition the machine for multiplication. This requires alertness of the machine operator to avoid mis-operation of the machine and consumes operating time.

The present invention provides means for restoring or correcting an indexed amount while the repeat key is latched depressed, thus facilitating operation of the machine. To enable clearing of an indexed amount, a correction key is provided. Correction key 88 is mounted for vertical slidable movement in the keyboard frame 19 and is tensioned to its upper position by means of a spring 90. This key, when depressed, operates mechanisms to arrest movement of the type bars before they move to printing positions thereby preventing the accumulating of an undesired amount in the totalizer and preventing printing, and to prevent operation of the paper feed structure substantially in the manner disclosed in the application for U. S. Letters Patent of Walter A.

4

Anderson, Serial No. 364,334, filed June 26, 1953. It is sufficient here to say that when depressed, the correction key 88, by means of a pin 91 fixed therein, rocks a catch lever 93 pivoted on a stud 94 in the keyboard frame 19 to pull link 89 and rock a cradle 92.

Cradle 92 has a notched rearwardly extending arm which will engage a square stud on a paper feed slide 95 to prevent movement of the paper tape during a correction cycle. The cradle is also connected by a link 98 to a lock plate 101 which engages rearward extensions of type bars 28 to prevent movement of the type bars above zero which prevents accumulation and printing hammer release. A forward arm of the cradle lies under motor trip slide 17 to initiate the correction cycle upon rocking of the cradle 92 by key 88.

Catch lever 93 and cradle 92 are retained latched in their set positions until the end of the correction cycle by a latch lever 104 having a by-pass pawl 105 pivoted thereon. A spring 106 connected between catch lever 93 and pawl 105 urges latch 104 against lever 93 to retain the lever in set position during a machine cycle. Near the end of a cycle, pin 36 on plate 32 which has moved by-pass pawl 105 idly on the forward stroke, strikes a bent-off ear of pawl 105 to depress latch 104 and free lever 93 for return to its initial position.

Secured in the catch lever 93 is a pin 96 which normally overlies a rearwardly extending leg of the normalizing lever 78. With repeat key 67 latched depressed the rearwardly extending leg of lever 78 rests against pin 96 in the catch lever 93, as shown in Figure 3. A latch 99, fixed on a shaft 100 journaled in the keyboard frame 19 is normally held by the bent-over leg 50 of the back spacer slide 49 clear of a forwardly extending leg 102 forming part of lever 78, as shown in Figure 1, against the tension of a spring 103. When an amount is set up in pins 23 the amount keys 20 with consequent movement rearwardly of the back spacer slide 49, latch 99 is released by ear 50 and is rocked by spring 103 into position for engagement by the leg 102 of lever 78, see Figure 2. Upon the depression of the correction key 88 and the rocking of the catch lever 93 clockwise, pin 96 therein rocks lever 78 until the leg 102 moves above and is latched by latch 99, as shown in Figure 2. During the rocking of lever 78, pin 82 in lever 56 is released from the high sector of lever 78 allowing pin 55 to return to its normal position clear of the restoring lever 35, so that during the return stroke of the machine cycle, the amount previously set up is cleared out as hereinbefore described. In the last part of movement of the slide 49, the bent-over leg 50 of the slide strikes latch 99 and rocks it to its forward or normal position, releasing lever 78 for rotation to the Figure 3 position whereupon pin 82 is cammed by cam edge 87 of lever 78, to return pin 55 to bear on the restoring lever 35 and prevent the restoration of a desired or correct amount entered during a multiplying operation.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein disclosed, for it is susceptible of embodiment in various forms, all coming within the scope of the claims which follow.

What is claimed is:

1. A machine of the class described including cycling mechanism, indexable amount set-up means, mechanism normally operative by said cycling mechanism to restore said amount set-up means to a non-indexed condition, a repeat device operable to retain said amount set-up restoring mechanism in an ineffective position and including a member latchable in an operated position and a part yieldingly driven thereby, a set-up clearing key, means operable thereby to control said cycling mechanism and to render the yieldingly driven part of said repeat device ineffective, a latch to hold said part of

5

said repeat device in the ineffective condition and means on said amount set-up means to release said latch on restoration of said set-up means to the non-indexed condition.

2. In a machine of the class described having cycling means, an indexable amount set-up means, mechanism normally operative during a cycle of said cycling means to restore said amount set-up means to an unindexed position, the combination of a repeat key means to disable said amount set-up restoring mechanism, a correction key mechanism operable to initiate a cycle of said cycling means to restore said amount set-up means, said correction key mechanism including means to set a portion of said repeat key means to an ineffective position, a latch to retain said portion of said repeat key means in said ineffective position and means on said amount set-up means to release said latch when said set-up means is restored.

3. In a machine of the class described having a cycling mechanism, an indexable amount set-up means, and cyclically operated means to restore said set-up means to a non-indexed position, the combination of a repeat key mechanism to disable said restoring means and including a member latchable in an operated position and a disabling part yieldably connected thereto, a correction key mechanism to cause restoration of said set-up means by said cycling means, said mechanism comprising a cycle initiating member and means engageable with said disabling part of said repeat key mechanism to shift said part to a non-disabling position, a latch member to hold said disabling part in said position and means forming a part of said amount set-up means to release said latch for movement to its disabling position after restoration of said set-up means.

6

4. In a machine of the class described having cycling mechanism, indexable amount set-up means and means operated by said cycling mechanism to restore said amount set-up means to a non-indexed position, the combination of a repeat key latchable in an operated position, members yieldingly urged to follow said repeat key to disable said restoring means, a correction key, means operable thereby to initiate a cycle of said cycling means and to restore said yieldingly urged members to a non-disabling position, and a latch controlled by said cycling mechanism to hold said correction key operated means in the operated position during restoration of said amount set-up means.

5. In a machine of the class described having cycling mechanism, indexable amount set-up means and means operated by said cycling mechanism to restore said amount set-up means to a non-indexed position, the combination of a repeat key latchable in an operated position, members yieldingly urged to follow said repeat key to disable said restoring means, a correction key, means operable thereby to initiate a cycle of said cycling means and to restore said yieldingly urged members to a non-disabling position, a latch controlled by said cycling mechanism to hold said correction key operated means in the operated position during restoration of said amount set-up means and a second latch controlled by said amount set-up means to retain said yieldingly urged members in the non-disabling position until said set-up means is fully restored.

References Cited in the file of this patent

UNITED STATES PATENTS

2,194,270 Sundstrand ----- Mar. 19, 1940