

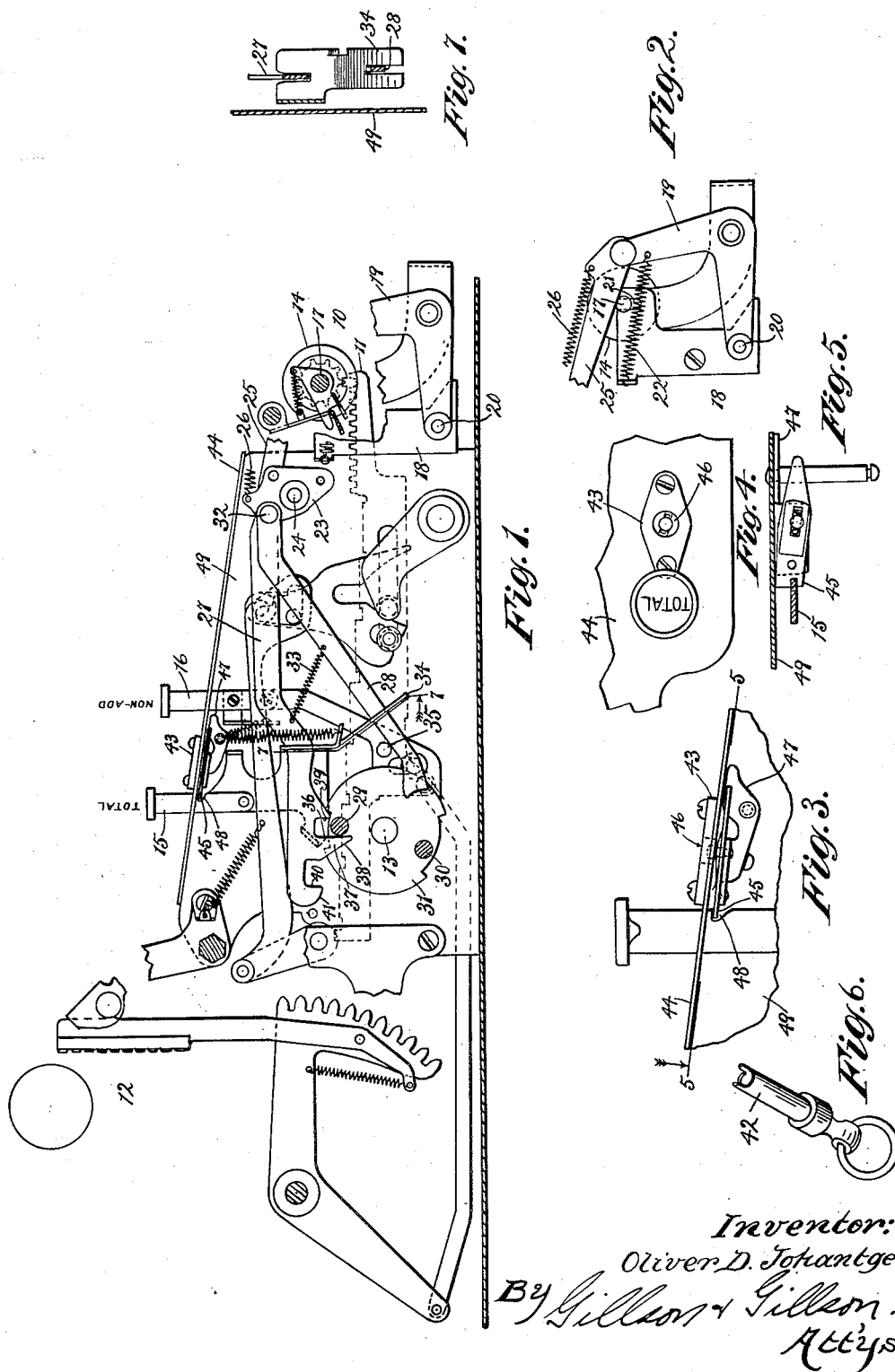
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NONADD AND TOTAL KEY MECHANISM FOR LISTING MACHINES

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NONADD AND TOTAL-KEY MECHANISM FOR LISTING MACHINES.

Application filed September 25, 1922. Serial No. 590,386.

To all whom it may concern:

Be it known that I, OLIVER D. JOHANTGEN, a citizen of the United States, and resident of Lake Bluff, county of Lake, and State of Illinois, have invented certain new and useful Improvements in Nonadd and Total-Key Mechanism for Listing Machines, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to listing machines, and has for its object to simplify and improve the mechanism employed for controlling the movements of the accumulator into and out of engagement with the actuating racks. For the purpose of illustrating the invention the improved mechanism has been applied to the listing machine commercially known as the Victor Adding Machine, as shown in Patent No. 1,336,840, dated April 13, 1920.

In the accompanying drawings:

Fig. 1 is a side view, principally in elevation but partly in section, showing the improved non-add and total key movements, some features of the machine not pertaining to the invention being omitted entirely or partly broken away;

Fig. 2 is a detail end view of the accumulator;

Fig. 3 is a detail side elevation showing the total key and mechanism which may be employed for locking the same against movement;

Fig. 4 is a detail plan view of the parts shown in Fig. 3;

Fig. 5 is a detail sectional view taken on the line 5—5 of Fig. 3;

Fig. 6 is a perspective view showing a key which may be used in connection with the locking mechanism illustrated in Figs. 3, 4 and 5; and

Fig. 7 is a section on line 7—7 of Fig. 1.

In so far as the present improvements are concerned the accumulator, generally designated 10, the movable racks, as 11, and the item and total printing mechanism, generally designated 12, are or may be identical with the corresponding parts of the machine illustrated in Patent No. 1,336,840 already mentioned. Likewise, the present machine also includes an oscillating control shaft 13, which turns in one direction during the outward movement of the racks, as 11, and in

the reverse direction during the return movement of the racks.

In the item printing and accumulating operations of the machine the register wheels, as 14, of the accumulator are supported out of the path of the racks, as 11, during their outward movement, but are lowered into position for engagement with the racks during inward movement of the same, while in total taking and printing the said register wheels, as 14, are lowered at the beginning of the operation for engagement with the racks during their outward movement. In printing a non-add item the accumulator 10 is idle, its register wheels, as 14, being supported out of the path of the racks, as 11, during the entire operation. The said special operations of the machine, viz:—total taking and printing and non-add item printing, are controlled as usual by the depression of total and non-add keys 15, 16, respectively. When a sub-total is to be printed the total key 15 is released at the end of the forward stroke of the handle (not shown).

Raising and lowering the accumulator 10 is permitted by mounting the spindle, as 17, upon which the register wheels 14 are journaled, in a frame 18. This frame is supported at its opposite ends in bell-crank levers, one of which is shown at 19. Bell-crank lever 19 is pivoted to a fixed support at 20, and the movements of the spindle 17 are confined to a vertical plane by the extension of the ends of the spindle through vertical slots, as 21, in a fixed part of the frame. A spring 22 reacts between one arm of the bell-crank lever 19 and a fixed support to normally support the accumulator in elevated position.

Movement is transmitted to the accumulator 10 from an oscillating plate 23, journaled on a fixed stud 24. As shown, a link 25 connects the plate 23 with one arm of the bell-crank lever 19. A light spring 26, reacting between the link 25 and the plate 23, and connected to the plate at a greater distance from the stud 24 than the link 25, acts in opposition to the spring 22. Furthermore, link 25 is preferably so positioned that when the accumulator has been depressed by a forward swinging movement of the plate 23, link 25 is so nearly aligned with stud 24 that spring 22 is ineffective to

restore the accumulator to elevated position.

The swinging of the plate 23 is accomplished by the coaction of a pair of links 27 and 28 with two wrist pins 29 and 30, carried by a flanged disk 31, mounted upon the adjacent end of the control shaft 13. In the form shown, the two links 27 and 28 have a common pivotal connection with the plate 23 at 32. A spring 33 connects the links 27 and 28 intermediate their ends, and both links have sliding engagement with a bracket plate 34, formed on the stem of the total key 15, the said bracket plate 34 normally supporting the link 27 and limiting the upward movement of the link 28 by the spring 33. The link 28 also extends in the path of a stud 35 mounted on the stem of the non-add key 16. On depression of the total key 15 both links 27 and 28 are lowered, link 28 being directly depressed by the bracket plate 34, and the lowering of bracket plate 34 permitting the depression of link 27 by the spring 33. Upon depression of the non-add key 16, link 28 is depressed by the engagement therewith of stud 35.

In the normal operation of the machine, viz:—in item printing and accumulating, wrist pin 30 is idle. In these operations link 28 is depressed and passed by wrist pin 29 near the end of the forward oscillation of the control shaft 13. However, since link 28 is elevated by spring 33 immediately after wrist pin 29 has passed beyond the end of the link, this link receives a direct thrust from wrist pin 29 at the beginning of the return movement of the control shaft. The said direct thrust upon the end of link 28 serves to advance both links 27 and 28, thus depressing the accumulator 10, while near the end of the return movement of the control shaft 13, both links are returned and the accumulator elevated by the engagement of wrist pin 29 with a forwardly facing shoulder 36 on link 27.

During the interval between the engagement of wrist pin 29 with the end of link 28, and the engagement of this wrist pin with the forwardly facing shoulder 36 on link 27, the accumulator 10 is held in depressed position by spring 26, the stronger spring 22 being ineffective to raise the same because of the said direct alignment of link 25 with stud 24. The register wheels, as 14, of the accumulator are accordingly held in the path of the racks, as 11, during the return or inward movement of the racks.

The part, as 37, of link 27 having the forwardly facing shoulder 36, takes the form of a depending finger. Preferably this finger has a rearwardly facing beveled end 38, for cam engagement with the wrist pin 30, to raise the link. However, this raising of link 27 by wrist pin 30 is merely

for the purpose of permitting the wrist pin 30 to come to rest beneath the finger 37, the parts being so proportioned that wrist pin 30 never passes beyond the finger.

In taking a total or sub-total, link 28 is idle, the said depression of this link by the total key 15 serving to move the link entirely out of the path of wrist pin 29. Furthermore, in taking a total there is no operative engagement with either of the wrist pins 29 or 30 with any part of the finger 37 on link 27. On the contrary, movement of the accumulator 10 for total taking is accomplished by the engagement of wrist pins 29 and 30 with oppositely facing shoulders 39 and 40, respectively, on link 27. As shown, these shoulders are too short to extend into the path of the wrist pins 29 and 30 except when the link 27 is lowered by the depression of the total key 15. In order that the accumulator 10 may be lowered during the outward movement of the racks, as 11, shoulder 39 is located in front of the finger 37 for engagement with wrist pin 29 at the beginning of the forward oscillation of the control shaft 13, while shoulder 40 is located in rear of finger 37 for engagement with wrist pin 30 at the beginning of the return movement of the control shaft. The rear end of link 27 is accordingly beveled, as at 41, for cam engagement with wrist pin 30 to raise the link 27 and permit the wrist pin to move to a position in front of shoulder 40, as this wrist pin approaches the end of its forward movement.

In case the total key 15 is released at the end of the forward movement of the handle (not shown) for taking a sub-total, the accumulator remains in lowered position until the end of the return stroke of the control shaft 13, when it is raised by contact of wrist pin 29 with forwardly facing shoulder 36, as in the item printing and accumulating operations of the machine.

When total taking is to be prevented, except by authorized persons, locking mechanism, preferably controlled by a removable key, as 42 (Fig. 6), may be provided for holding the total key 15 against movement. As shown, an escutcheon plate 43, having a key hole, is mounted on the key board 44 immediately adjacent the total key 15, while a flat swinging bolt 45, having a socket 46 conforming in shape with the end of the key 42, is pivotally supported under the key board 44 in line with the escutcheon plate 43. Preferably the bolt 45 has its pivotal support independent of the keyboard 44, as upon a fixed bracket or shelf 47. In the simple form of lock illustrated, the bolt 45 swings in its own plane and coacts with a notch 48 formed in the adjacent edge of the total key 15, the movements of the bolt in both directions being limited by the location

of the parts adjacent a wall plate, as 49, of the machine frame.

The locking device for holding the total key against movement will usually be employed in conjunction with a device for concealing the accumulator as shown and claimed in my concurrently filed application for patent on listing machine, Serial No. 590,383. As in my said concurrently filed application the expression "removable key" has been used to avoid confusion with other parts of the machine, and is not intended to limit the claims to the particular form of locking device shown, it being recognized that the use of a combination lock for the same purpose would represent only the substitution of a known equivalent.

I claim as my invention—

1. In a calculating machine, the combination with a movable accumulator, an oscillating plate controlling the movements of the accumulator and an oscillating control shaft, of a crank pin moving with the control shaft, and a pair of links having a common pivotal connection with the said oscillating plate, said two links being formed at their free ends for operative engagement with the crank pin during different parts of its movement in the same direction.

2. In a calculating machine, the combination with a movable accumulator, an oscillating plate controlling the movements of the accumulator and an oscillating control shaft, of a crank pin moving with the control shaft, a pair of links having a common pivotal connection with the said oscillating plate, said two links being formed at their free ends for operative engagement with the crank pin during different parts of its movement in the same direction, and a non-add key operable to shift the link first engaged by the crank pin out of the path of said pin.

3. In a calculating machine, the combination with a movable accumulator, and an oscillating control shaft, of means operable to move the accumulator at the beginning of the return movement of the control shaft during the normal operation of the machine.

4. In a calculating machine, the combination with a movable accumulator, an oscillating plate controlling the movements of the accumulator and an oscillating control shaft, of a pair of spaced crank pins moving with the control shaft, a pair of links having a common pivotal connection with the said oscillating plate, one of the links being formed at its free end for abutting engagement with one of the crank pins at the beginning of the return movement of the control shaft, a total key for shifting the other link, oppositely facing spaced shoulders formed on the last-mentioned link to be engaged in alternation by the said two crank pins only when the said last-mentioned link has been shifted by the total key, and another

shoulder formed on the said last-mentioned link to be normally engaged by the same crank pin engaging the first separately mentioned link near the end of the return movement of the control shaft.

5. In a calculating machine, the combination with a movable accumulator, an oscillating plate controlling the movements of the accumulator and an oscillating control shaft, of a pair of spaced crank pins moving with the control shaft, a pair of links having a common pivotal connection with the said oscillating plate, one of the links being formed at its free end for abutting engagement with one of the crank pins at the beginning of the return movement of the control shaft, a non-add key for shifting said link out of the path of said crank pin, a total key for shifting the other link, oppositely facing spaced shoulders formed on the last-mentioned link to be engaged in alternation by the said two crank pins only when the said last-mentioned link has been shifted by the total key, and another shoulder formed on the said last-mentioned link to be normally engaged by the same crank pin engaging the first separately mentioned link near the end of the return movement of the control shaft.

6. In a calculating machine, the combination with a movable accumulator, an oscillating plate controlling the movements of the accumulator and an oscillating control shaft, of a pair of spaced crank pins moving with the control shaft, a pair of links having a common pivotal connection with the said oscillating plate, one of the links being formed at its free end for abutting engagement with one of the crank pins at the beginning of the return movement of the control shaft, a total key for shifting both of the links, the shifting of the said link having its free end formed for abutting engagement with one of the crank pins serving to move said link out of the path of said pin, oppositely facing spaced shoulders formed on the other link to be engaged by different ones of the said two crank pins at the beginning of the forward and return movements of the control shaft only when the said last-mentioned link has been shifted by the total key, and another shoulder formed on the said last-mentioned link to be normally engaged by the same crank pin engaging the first separately mentioned link near the end of the return movement of the control shaft.

7. In a calculating machine, the combination with a movable accumulator, an oscillating control shaft, a pair of crank pins moving with the control shaft, and a pair of shiftable links operatively connected with the accumulator and cooperating with the said two crank pins in the different positions of the links to move the accumulator during

different parts of the movement of the control shaft of a total key for shifting both of the links.

8. In a calculating machine, the combination with the reciprocating racks and movable accumulator, of oscillating actuating devices operable to move the accumulator both into and out of the path of the racks during movement of the said actuating devices in one direction.

9. In a calculating machine, the combination with the reciprocating racks and movable accumulator, of oscillating actuating devices having an initial forward and following return movement at each operation, and connection between the said actuating devices and the accumulator operable to move the accumulator both into and out of the path of the racks during the said return movement of the actuating devices.

10. In a calculating machine, the combination with the reciprocating racks, movable accumulator and total key, of oscillating actuating devices controlled by the total key operable to move the accumulator both into and out of the path of the racks during movement of the said actuating devices in one direction in one position of the total key, and to effect the said two movements of the accumulator during movement of the actuating devices in opposite directions in a different position of the total key.

11. In a calculating machine, the combination with the reciprocating racks, movable accumulator and total key, of oscillating actuating devices having an initial forward and a following return movement at each operation, and connection between the said actuating devices and the accumulator controlled by the total key normally operable to move the accumulator into the path of the racks at the beginning of the said return movement of the actuating devices and operable upon depression of the total key to move the accumulator into the path of the racks at the beginning of the said forward movement of the actuating devices.

12. In a calculating machine, the combination with the reciprocating racks, movable accumulator and total key, of oscillating actuating devices having an initial forward and a following return movement at each operation, and connection between the said actuating devices and the accumulator controlled by the total key normally operable to move the accumulator both into and out of the path of the racks during the said return movement of the actuating devices, and operable upon depression of the total key to move the accumulator into the path of the racks at the beginning of the said forward movement of the actuating devices.

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