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YIELDING DEPRESSOR PLATE FOR COMBINED TYPE WRITING AND ADDING MACHINES.
APPLICATION FILED JUNE 16, 1908.

992,342.

Patented May 16, 1911.

4 SHEETS-SHEET 1.

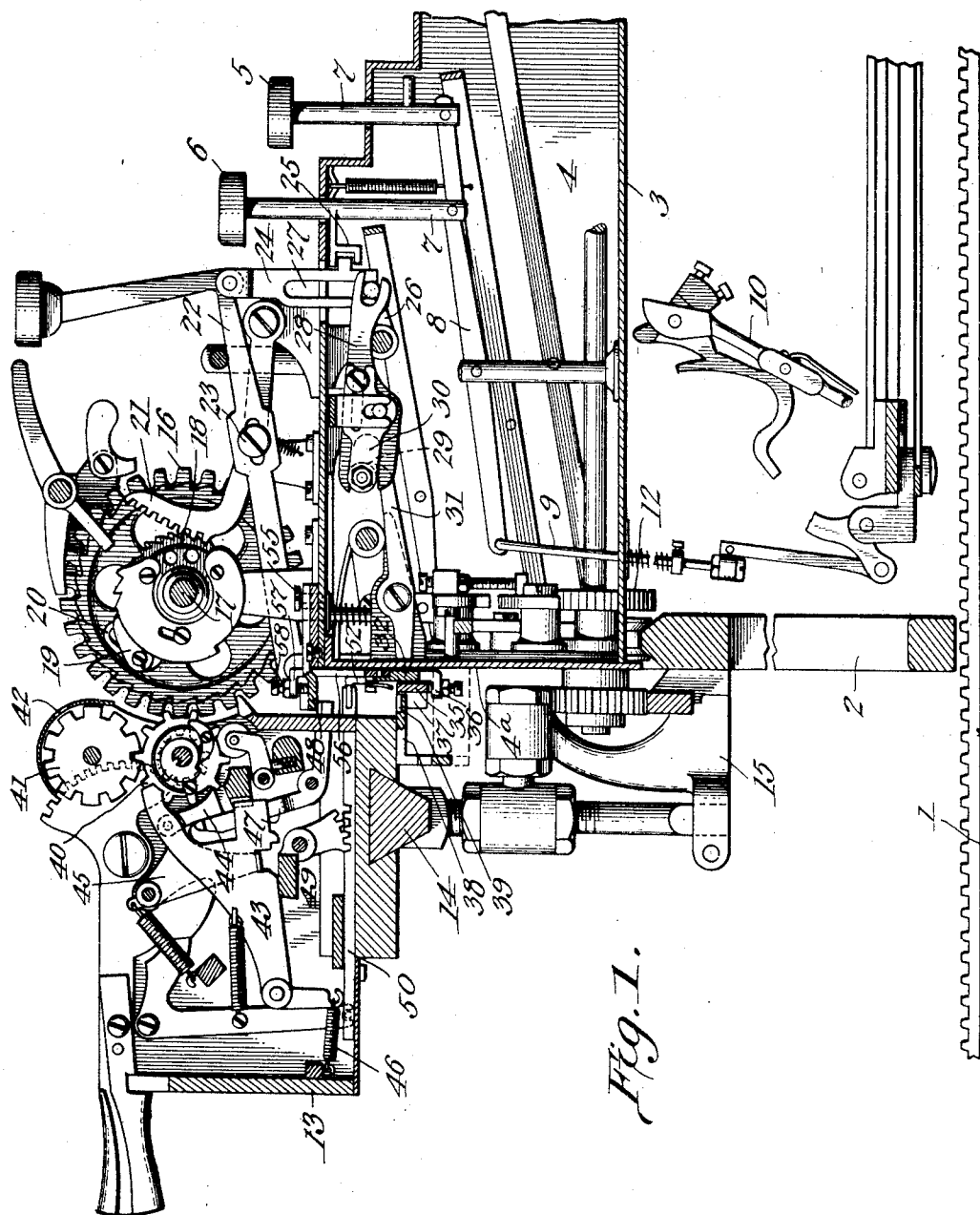


Fig. 1.

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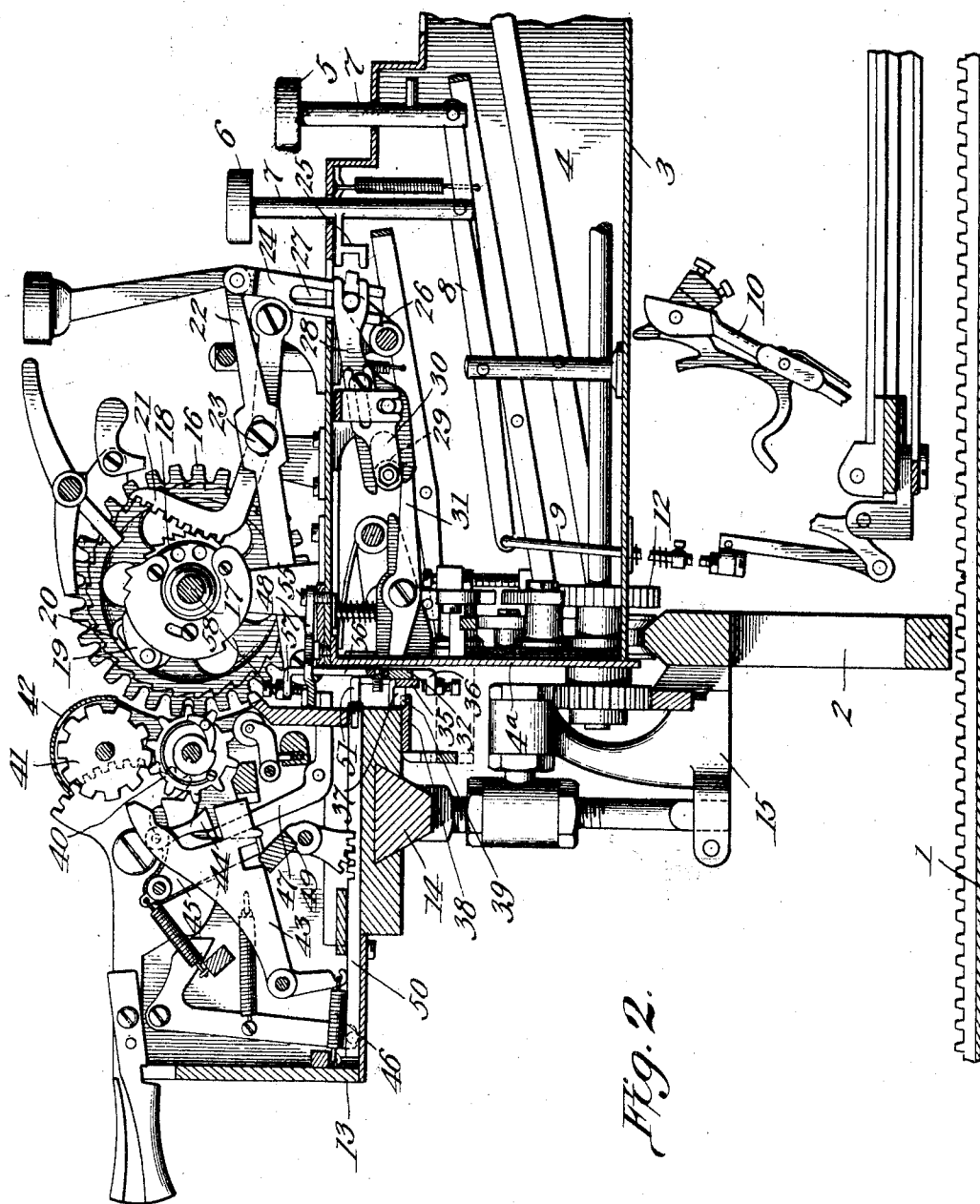
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 5.

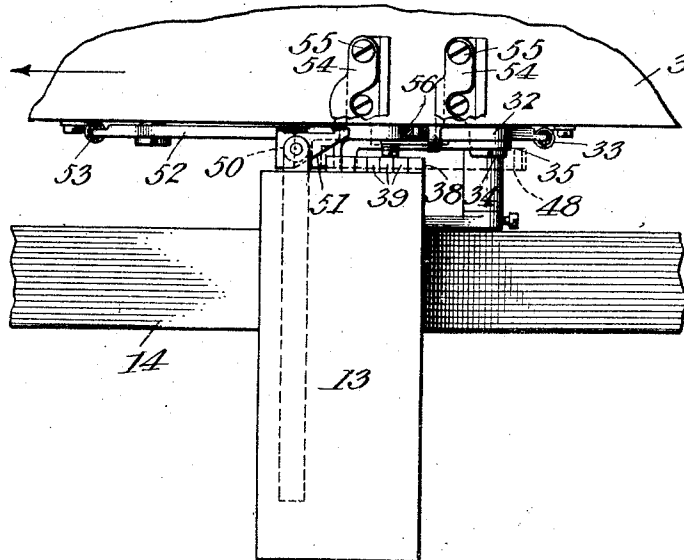


Fig. 6.

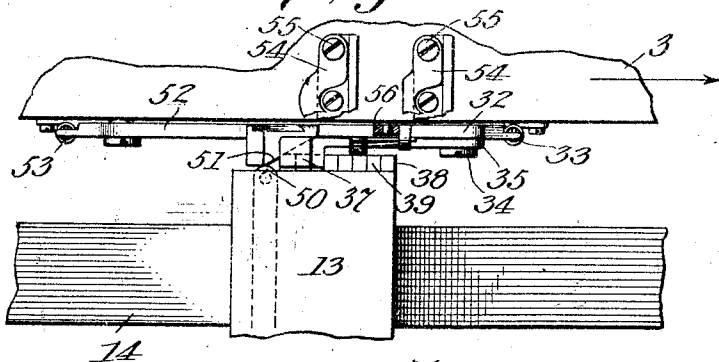
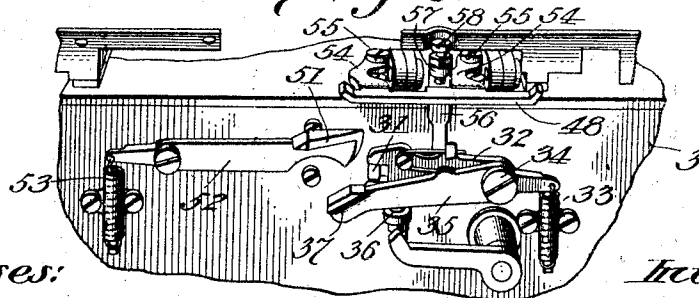


Fig. 7.



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UNITED STATES PATENT OFFICE.

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YIELDING DEPRESSOR-PLATE FOR COMBINED TYPE-WRITING AND ADDING MACHINES.

992,342.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed June 16, 1908. Serial No. 438,836.

To all whom it may concern:

Be it known that I, WILLIAM L. DENCH, a citizen of the United States of America, residing at Pelham, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Yielding Depressor-Plates for Combined Type-Writing and Adding Machines, of which the following is a specification.

This invention relates to combined type-writing and adding machines, but more particularly to means for simplifying the manipulation of and eliminating certain sources of possible error in what is known as the Elliott-Fisher billing and adding machine.

Before proceeding to a description of the invention it may be explained that the machine referred to includes a flat platen type-writer equipped with adding mechanism operated from the numeral keys. The keys are normally disconnected from the adding mechanism and the retractile movement of the carriage effects two important functions. In the first place, it resets the carrying mechanism of the adder and secondly, it establishes a coöperative relation between certain parts which act upon the forward movement of the carriage to automatically connect the keys and adding mechanism.

One source of error resides in the possibility of beginning the operation of the machine before the carriage has been sufficiently retracted to properly position the key connecting mechanism. Another possibility of error has heretofore resided in a relation of the parts which has made it possible under some conditions to retract the carriage sufficiently to cause the proper connection of the keys with the adding mechanism without effecting a sufficient retraction of said carriage to properly reset the carrying mechanism of the adding devices.

In my co-pending application, No. 438,835 filed June 16, 1908 I have disclosed a means whereby the carriage is dogged against forward movement until the key connecting mechanism is properly set, and my present invention resides in the combination with such means of certain other devices which insure both the proper connection of the keys and the proper resetting of the carrying devices prior to the recording and adding of each successive number.

In the accompanying drawings—Figure 1 is a sectional view of an Elliott-Fisher bill-

ing and adding machine equipped with my invention but having portions of the structure broken away, the positions of the parts being those assumed during the recording and adding operation. Fig. 2 is a similar view showing the parts in the positions they assume during the retraction of the carriage preparatory to the recording and adding of the next number. Fig. 3 is a rear elevation of a portion of the machine showing the positions assumed by certain of the parts during the forward advance of the carriage, as in Fig. 1. Fig. 4 is a view similar to Fig. 3 showing the parts in the positions they assume during the retraction of the carriage as in Fig. 2. Fig. 5 is a plan view of the mechanism with the parts in the positions shown in Fig. 3. Fig. 6 is a similar view of the mechanism with the parts in the positions shown in Fig. 4, and Fig. 7 is a detail perspective view of those parts mounted on the carriage with which my invention is concerned.

Each part, wherever shown, is indicated by the same reference character.

The billing machine.—The machine to which my invention is shown applied is the Elliott-Fisher billing machine of commerce. This machine includes a flat platen 1 over which a machine frame 2 is mounted to travel longitudinally to space the lines of writing. Mounted to travel on the frame 2 transversely of the platen, to letter space the writing, is a carriage 3, the upper portion of which is in the form of a casing 4 surmounted by letter and numeral keys 5 and 6, the stems 7 of which are connected to key levers 8 fulcrumed in the casing and connected by draw-wires 9 to downwardly swinging type bars 10. The carriage is moved to the right by carriage propelling mechanism including spring drums, not shown, and tapes 11, a portion of one of the latter being shown in Fig. 2. The letter spacing movement of the carriage is controlled by key-operated escapement mechanism, indicated generally at 12 in Fig. 1. As usual in this class of machines, the characters are printed one at a time by the depression of the keys, and the carriage advances step-by-step under the control of the escapement as the keys rise.

The computing mechanism.—This mechanism includes a computing device or register 13 adjustable longitudinally of a guide bar

14 carried by brackets 15 secured to the frame 2. The adjustment of the register 13 enables the same to be located in position for use with reference to a column located at any desired point on the work sheet, which latter is supported in a flat spread-out condition on the platen 1.

The computing device or register usually embraces a series of denominational members or digit carriers disposed at the front of the register and equipped with suitable carrying mechanism whereby, when the value accumulated upon any member reaches the limit of that particular order or denomination, the value so accumulated will be automatically transferred to the wheel of next higher order. The primary element of the actuating mechanism for the denominational members of the register is a master wheel 16 mounted on the carriage 3 of the typewriter and movable therewith into engagement with successive denominational members of the register. The master wheel or actuator 16 is rotated a different distance by each numeral key 6 for the purpose of moving the engaged member a distance proportionate to the value of the particular numeral key from which the actuator is operated. Thus when any numeral key is depressed, the digit of corresponding value will be printed on the work sheet in a given denominational position, and the registering member of corresponding denomination will be given a movement corresponding in value to that of the printed digit, so that the value of such digit will be added to the amount already accumulated in the register.

The master wheel 16 is fixed to a comparatively long actuator shaft 17 suitably supported above the carriage casing 4 and each numeral key 6 is arranged to be operatively connected with the shaft by one of a series of operating connections identical in construction and operation, except as to a graduated variation of the movement transmitted to the shaft from the several keys. One of these operating connections is shown in Fig. 1. It includes a ratchet wheel 18 fixed to the shaft 17 and designed to be engaged by a driving pawl 19 carried at one end of a driving arm or lever 20 mounted to swing loosely on the shaft 17. The opposite end of the lever 20 is geared to the rear end of a lever 21 fulcrumed at its front end on the carriage and arranged in crossing relation with a lever 22 fulcrumed at its rear end and having loose pivotal connection with the lever 21 at the point of intersection of said levers, as indicated at 23.

From the front end of each lever 22 depends a link 24 connected to the adjacent numeral key stem 7 by a separable connection 25 located within the casing 4. In printing outside of a column or adding field, the actuator or wheel 16 is out of coincidence

with the register 13, and therefore the latter is not operated when a digit is printed. If the connection between the links 24 and the numeral keys 6 were maintained, however, the keys when printing digits outside of an adding field would be burdened by the operating mechanism of the register, which mechanism would necessarily be operated upon each depression of a key. This unnecessary burdening of the numeral keys when printing outside of a column is undesirable. It is for this reason that the links 24 are arranged to be swung out of engagement with the numeral keys so as to render the latter entirely independent of the register or its operating connections.

For a more complete disclosure of the register operating mechanism, attention is directed to Patent No. 829,971, issued to Laganke and Smith September 4, 1906.

The means for automatically connecting the keys with the register operating mechanism when the printing point of the typewriter is presented to the adding field.—The shifting of the links 24 to effect the connection and disconnection of the keys and adding mechanism is accomplished by means of a yoke 26 which engages in the slots 27 in the several links. This yoke normally occupies the position shown in Fig. 2, but at a given point in the advance of the carriage, to-wit when the printing point of the typewriter moves into the adding field or column, the yoke is automatically operated to throw the links forward to the position shown in Fig. 1, thus effecting an operative connection between said links and the numeral keys 6. The means whereby this automatic connection of the keys is effected is fully disclosed in Patent No. 863,232 to John A. Smith, and a general description thereof will therefore suffice.

Suitably mounted in the casing 4 of the typewriter is a yoke operating lever 28, see Figs. 1 and 2, normally occupying the position shown in Fig. 2, and having its rear end bifurcated for the reception of an abutment in the form of a roller 29 carried by the abutment plate 30, which may be shifted longitudinally of the lever by setting mechanism which need not be described. In one position of the roller 29, to-wit that position shown in both Figs. 1 and 2, it overlies the front end of what is called an intermediate lever 31 suitably fulcrumed in the casing 4 and having its rear end extended through the back wall 4* of the casing and engaged by the bifurcated end of an arm 32 pivotally mounted on the rear side of the wall 4* and normally held in its elevated position by a spring 33.

Mounted to swing from the fulcrum 34 of the lever 32 is what is termed the key connecting arm 35 resting upon an abutment 36 at the lower edge of the arm 32, 130

the purpose being to allow the arm 35 to swing freely in an upward direction, but to depress the arm 32 when forced downward. At its front or left hand end, viewed from the rear of the typewriter, the arm 35 is provided with a laterally disposed cam 37 adapted to coact with what is termed the key connecting plate 38 of the register. The plate 38 is merely a ledge extending across the front of the register at its bottom, as shown in Figs. 1 and 3, and acts, upon the advance of the carriage, to depress the key connecting arm 35 to the position shown in Figs. 1, 3 and 5. That is to say, as the carriage advances in the direction of letter spacing, the cam 37 of the arm 35 will engage the end of the plate 38 and being inclined, and adapted to yield, said arm will be depressed sufficiently to allow the cam 37 on the end of the arm to ride under the plate. When the arm 35 is thus depressed it in turn depresses the arm 32 which depresses the rear end of the lever 31, causing the front end of said lever to be elevated. This movement of the lever 31 will cause it to engage the roller abutment 29 and thus swing the yoke operating lever 28 for the purpose of throwing the several links 24 into engagement with the numeral key stems. Thus when the key connecting arm 35 and the plate 38 bear the relation indicated in Fig. 3, the carriage will be advancing in the direction of letter spacing with the keys connected to the adding mechanism, as shown in Fig. 1, and with the printing point of the typewriter located within the adding field. When the master means 16 has moved beyond the register and the printing point has advanced beyond the adding field, the cam 37 will have passed beyond the end of the plate 38 and will be sufficiently elevated by the spring 33 to effect the disconnection of the keys and the restoration of the key connecting arm 35 to normal position. If now, the carriage is retracted, the cam 37 will ride back over the plate 38, as shown in Figs. 3, 4 and 6, since, as has been explained, the arm 35 may yield upwardly independently of the arm 32.

The letter space lock.—It will be seen that during the retraction of the carriage the cam 37 of the key connecting arm 35 will ride back over the plate 38 and that during this manipulation of the machine the keys are disconnected and can only be reconnected by retracting the carriage sufficiently to cause the cam 37 to drop down from the end of the plate and in position to be depressed by said plate upon the forward advance of the carriage. If, however, the operator retracts the carriage to a new writing position without retracting it sufficiently to cause the cam 37 to clear the plate 38, he may proceed with the writing of a

number in the column to be computed while the keys remain disconnected because during this premature forward movement of the carriage the key connecting arm will be resting upon the upper side of the plate 38. To render this impossible, I provide the upper side of the plate 38 with ratchet teeth 39 arranged to dog the cam 37, and hence the carriage, against forward or letter space movement in the event of insufficient retraction of the carriage to cause the cam 37 to drop into proper position for the automatic connection of the keys and adding mechanism. By reference to Fig. 3, for instance, wherein the parts are shown in the positions they assume during the retraction of the carriage, it will be seen that the lower edge of the cam engages the teeth on the plate 38 thus constituting the plate and arm 35 a pawl and ratchet mechanism which acts during a predetermined portion of the retractile movement of the carriage to prevent a forward or letter space movement of the carriage until the retractile movement of the latter has been completed sufficiently to insure the proper operation of the automatic key connecting mechanism. It will also be observed that as soon as the proper retractile movement of the carriage has been insured, the locking mechanism becomes ineffective and permits the forward advance of the carriage, which is necessary for the proper operation of the machine. This provision for effecting a letter space lock of the carriage is fully disclosed in my co-pending application heretofore identified.

The yielding depressor plate for the vibrators and the resetting means for the carrying devices.—It will be recalled that one of the enumerated sources of error has resided in the possibility of retracting the carriage sufficiently to position the parts for the automatic connection of the keys before the resetting mechanism for the carrying devices was operated, thus allowing the printing of a number and the operation of a number wheel of the register with the carrying mechanism in unset condition. This obviously resulted in error because the values accumulated upon the wheels would not be carried to the wheels of next higher order and in fact certain of the number wheels would be inoperative because locked by an unset or previously operated carrying device. Heretofore, however, it has been considered impossible to so arrange the resetting mechanism that the carrying devices would be reset at a sufficiently early stage in the retraction to avoid the difficulty mentioned, but by a re-arrangement of parts which it is now in order to describe, I am enabled to insure the resetting of the carrying mechanism by the retractile movement of the carriage before the key connecting mechanism

is positioned for proper operation. In order that this re-arrangement may be clearly understood, it is first necessary to explain briefly the construction of the registering mechanism employed in this class of machines, but for a more complete description than is necessary for the purposes of this disclosure, attention is directed to the co-pending application for Letters Patent of Charles F. Laganke and John A. Smith, No. 308,279 filed March 27, 1906.

Within the casing of the register 13 is mounted a series of denominational members 40 in the form of toothed wheels operated by the master wheel 16 and serving in turn to rotate a series of registering wheels 41 which display the digits before a sight opening 42 in the register casing. Associated with the wheels 40 are carrying levers 43 having swinging carrying dogs 44 which extend over the teeth of the wheels 40, as shown in Fig. 1. The carrying levers 43 are normally held elevated by selectors 45, as shown in Fig. 2, and when released are thrown down from the position shown in Fig. 2 to that shown in Fig. 1 by carrying motors or springs 46. The selectors 45 are thrown back by lugs on the wheels 40 in a manner which will be clearly understood by those skilled in the art.

To insure the engagement of the carrying dogs 44 with the wheels, a series of dog vibrators 47 are mounted in the casing and have their front ends extended beyond the same to facilitate their engagement by what is known as a vibrator depressing plate 48. Ordinarily this plate is rigidly mounted on the carriage 3 of the typewriter and as the carriage advances to the right to present the master wheel 16 to successive number wheels 40, the plate 48 depresses the front ends of the vibrators 47 successively and causes them to throw the carrying dogs 44 into engagement with the wheels 40. The depressor plate is of sufficient length to hold each operated vibrator in its advanced position as the master wheel continues its movement across the register so that any carrying device to the left of the wheel being operated will be in proper position to carry or transfer a value to the proper wheel. The two positions of a given vibrator will be noted by comparing these elements in Figs. 1 and 2.

It is obvious that since certain or all of the carrying devices may be operated during a traverse of the register by the master means, or, in other words, during the printing and adding of a given number, it is necessary to restore these carrying devices to normal or set position before the value of the next number is thrown into the register. For this purpose it is usual to employ a reset rocker 49 geared to a rocker operating slide 50 and rocked by the inward or rear-

ward movement of said slide from the position shown in Fig. 1 to that shown in Fig. 2 to effect the elevation or resetting of the levers 43 and selectors 45. The slide 50 is extended beyond the front of the register and is operated upon the retraction of the carriage by what is known as a carrying reset cam 51 formed at one end of a swinging arm 52 pivoted upon the rear wall of the carriage casing and retained in normal position by a spring 53. The cam 50 is so constructed that it rides under the projecting end of the slide 50 during the forward or letter space movement of the carriage, as indicated in Fig. 3, and therefore in no way affects the resetting mechanism. When the carriage is retracted, on the contrary, the reset cam 51 engages the front end of the slide 50 and urges the same rearwardly, as shown in Fig. 6, thus effecting the resetting of the carrying mechanism in the manner described.

The elements which have been described under the last heading are all old, but, as heretofore stated, the depressor plate 48 has been rigidly mounted. This rigid mounting of the depressor plate has made it necessary to so locate the depressor plate 48 and the reset cam 51 relative to each other that the cam would not come into action until after the depressor plate had been removed from engagement with the vibrators 47. The necessity for this relation arose from the fact that as long as the depressor plate 48 remained in engagement with the vibrators 47 it held the latter in their operative positions and therefore held the carrying dogs 44 in engagement with the wheels 40. Therefore, if, with the parts in these positions, the slide 50 should be operated to reset the carrying mechanism, the frictional engagement of the dogs 44 with the wheels would obstruct the resetting operation and if sufficient force were applied to overcome this obstruction the upward movement of the dogs would tend to carry the wheels 40 backward, thus producing an erroneous registration of the value previously accumulated in the register. This necessity for mounting the cam 51 a sufficient distance from the depressor plate to insure the complete removal of the plate from the vibrators before the cam came into action was responsible for the possible failure to reset the carrying mechanism by the time the key connecting mechanism was properly positioned.

It is the primary object of the present invention therefore to devise an arrangement whereby the depressor plate will be effective to perform its normal function of operating the dog vibrators 47 during the advance of the carriage without necessitating a sufficient retraction of the carriage to remove the depressor plate from the vibrators be-

fore the cam 51 can act to reset the carrying mechanism. In other words, the present invention is directed to a re-arrangement of the carrying reset cam 51, the depressor plate 48, and the key connecting arm 35, whereby the proper resetting of the carrying mechanism will necessarily be completed by the time the key connecting arm 35 has reached the end of the plate 38 and drops into position to accomplish the automatic connection of the keys with the adding mechanism. To accomplish this end it is simply necessary to so mount the depressor plate 48 that it will be held rigidly while advancing across the vibrators 47 and will be allowed to yield upwardly while in engagement with the vibrators during the retraction of the carriage, this yielding of the depressor plate permitting the carrying reset cam to be moved farther to the right (viewed from the back of the carriage) so that it may act to reset the carrying mechanism before the depressor plate has moved beyond the vibrators, since the upward yielding of the plate will prevent the latter from obstructing such movement of the vibrators as is occasioned by the resetting operation. To effect these ends the depressor plate 48 instead of being rigidly mounted on the carriage 3, is provided with forwardly extending arms 54 retained at their front ends by screws 55 secured to the top of the carriage casing. The screws 55, however, are not screwed down tight, but on the contrary, allow limited vertical play of the arms, the openings in which are of sufficient size to allow somewhat greater play of the depressor plate proper. This vertical yielding or play of the plate 48 will be understood by a comparison of Figs. 3 and 4. In Fig. 3 the plate occupies its depressed position, since it is shown in the act of depressing the vibrators 47, while in Fig. 4 the plate 48 is shown elevated so as not to interfere with the elevation of the front ends of the vibrators which is incidental to the resetting of the carrying mechanism. It should be understood, however, that the particular manner of mounting the plate 48 to secure the necessary vertical play is immaterial, as the same may obviously be hinged or arranged to have a vertical sliding motion.

In order to hold the plate 48 rigidly in its depressed position, during its forward or operative movement, the arm 32 of the key connecting mechanism is provided with a draw rod 56 pivotally connected at its lower end to the arm 52 and provided above the plate 48 with an angular end or lug 57 through which is passed an abutment screw 58 disposed directly over the plate 48. Normally, that is to say, when the keys are disconnected, the abutment screw 58 will be elevated above the plate 48 sufficiently to

allow the latter to rise freely, see Fig. 4. When, however, the advance of the carriage to the right causes the arm 35 of the key connecting mechanism to be depressed by the plate 38 to in turn depress the arm 32, the latter will draw down the draw rod 56 and thus cause the abutment screw 58 to hold the depressor plate 48 in its depressed position. Therefore, as the plate 48 moves across the front ends of the vibrators 47, it will operate the latter in the usual manner to insure the proper engagement of the carrying dogs 44 with the wheels 40. As soon, however, as the cam 37 moves beyond the plate 38 the arms 35 and 32 will be elevated by the spring 33 and the abutment screw will be elevated to permit the upward yielding of the plate 48. If now, the carriage is retracted, the cam 37 will ride over the plate 38 and while the depressor plate 48 is still located over the vibrators, the reset cam 51 will act, as shown in Figs. 2, 3 and 6, to reset the carrying mechanism.

It will be observed that in my present arrangement the cam 51 is so positioned relative to the plate 48 and the arm 35 that it will act to set the carrying mechanism while the plate 48 is arranged over the vibrators (the vertical yielding of the plate permitting the resetting operation at this time) and before the arm 35 has dropped into position to effect the automatic connection of the keys. Thus the enumerated possibilities of error are completely eliminated, first, because by reason of the letter space lock, to wit the ratchet connection between the arm 35 and the plate 38, the carriage cannot move to the right after its partial retraction across the register until it is sufficiently retracted to insure the automatic connection of the keys, and second, because the relative positions of the resetting cam 51 and the key connecting arm 35, (made possible by the yielding of the depressor plate during retraction) insures the resetting of the carrying mechanism by the time the key connecting mechanism is properly positioned and before the letter space lock becomes ineffective. In this connection attention may be directed to the fact that the letter space lock not only prevents the forward advance of the carriage until the key connecting mechanism has been properly positioned, but also prevents the advance of the carriage before the carrying mechanism has been properly reset. In certain aspects of the invention, however, it is complete without the inclusion of the letter space lock, since even with this feature eliminated and the plate 38 made smooth on its upper side, distinct advantages accrue from the yielding mounting of the depressor plate and the re-positioning of the reset cam 51 to cause the latter to act with certainty before the key con-

necting mechanism is restored to normal position, since this relation of the parts, regardless of the presence or absence of the letter space lock, renders it impossible to cause the connection of the keys while the carrying mechanism still remains in unset condition.

It is thought that from the foregoing, the construction, operation and advantages of my invention will be clearly apparent, but I wish to be understood as reserving the right to effect such changes, modifications or variations of the illustrated structure as may come fairly within the scope of the protection prayed.

What I claim is:—

1. In an adding machine, the combination with a register including a series of denominational members, carrying dogs and dog positioning devices, of a member movable back and forth and arranged to operate said devices successively during its movement in one direction only.

2. In an adding machine, the combination with a register including denominational members, carrying dogs, and dog vibrators, of a reciprocatory operating member for the vibrators, said members being yieldable during its movement in one direction and rigid during its movement in the opposite direction.

3. In an adding machine, the combination with a register including a series of denominational members, carrying dogs therefor, and positioning devices for said dogs, of a reciprocatory member cooperating with said devices, said member being yieldable during its retraction to avoid the obstruction of the positioning devices, and means for retaining the member during its movement in one direction in position to operate said devices.

4. In an adding machine, the combination with a register including a series of denominational members, carrying dogs therefor, and positioning devices for the dogs, of a traveling member arranged to operate the positioning devices, and controlling means for the member, said controlling means retaining the member in operative position during its travel in one direction and permitting the member to yield during its travel in the opposite direction.

5. In an adding machine, the combination with a register including denominational members, carrying dogs, and dog positioning devices, of a depressor plate for said devices, and controlling means for the depressor plate, said controlling means including a cam and a cooperating member.

6. In an adding machine, the combination with a register, including a series of denominational members, carrying dogs, and dog positioning devices, of an operating member for said devices movable into and out of op-

erative position, a stop cooperating with said member to retain the same in operative position, and means for moving the stop.

7. In an adding machine, the combination with a register including denominational members, carrying dogs therefor, and dog positioning devices, of an operating member for said devices, and controlling means for said member, said controlling means including a stop coacting with the member, an arm for moving the stop, and a cam arranged to operate the arm.

8. In an adding machine, the combination with a register including denominational members, carrying dogs, and positioning devices for the dogs, of a carriage, and a member movable with the carriage to operate said devices and yieldable during the retraction of the carriage.

9. In an adding machine, the combination with a register including a series of denominational members, carrying dogs, and dog positioning devices, of a member movable with the carriage to operate said devices and also having movement relative to the carriage to position the member in operative or inoperative position, and means controlling the movement of the member relative to the carriage and operated by the travel of said carriage.

10. In an adding machine, the combination with a register including denominational members, carrying dogs, and dog positioning devices, of a traveling carriage, a member movable with the carriage to operate said devices, a movable stop for said member, and means for automatically positioning the stop.

11. In an adding machine, the combination with a register including a series of denominational members, carrying dogs therefor, and dog vibrators, of a traveling carriage, and means for operating the vibrators upon the movement of the carriage in one direction, said means being ineffective to obstruct the movement of the vibrators during the movement of the carriage in the opposite direction.

12. In an adding machine, the combination with a register including a series of denominational members, carrying dogs, and dog vibrators, of a vibrator depressor plate movable with the carriage and yieldable relative to the carriage during the retraction thereof.

13. In an adding machine, the combination with a register including a series of denominational members, carrying dogs, and dog vibrators, of a traveling carriage, a vibrator depressor plate movable with the carriage and also movable to operative and inoperative position, and automatic controlling means for the depressor plate.

14. In an adding machine, the combination with a register including a series of

denominational members, carrying dogs, and dog vibrators, of a traveling carriage, a vibrator depressor plate movable with the carriage and yieldable under the impulse of the vibrators, and means preventing the yielding of the depressor plate during a predetermined movement of the carriage.

15. In an adding machine, the combination with a register including a plurality of denominational members, carrying dogs, and dog vibrators, of a traveling carriage, a depressor plate arranged to operate the vibrators during the movement of the carriage and movable to operative and inoperative positions, and means controlling the position of the depressor plate and operated automatically by the movement of the carriage.

16. In an adding machine, the combination with a register including a series of denominational members, carrying dogs therefor, and dog vibrators, of a depressor plate arranged to operate the vibrators during the movement of the carriage, and means controlling the depressor plate, said means including a cam and a cooperative member brought into engagement by the movement of the carriage.

17. In an adding machine, the combination with a register including a series of denominational members, carrying dogs, and dog vibrators, of a vibrator depressor plate mounted on the carriage and yieldable relative thereto, a stop coacting with the plate to prevent the yielding thereof and movable to permit said plate to yield, and automatic means for moving the stop.

18. In an adding machine, the combination with a register including a series of denominational members, carrying dogs, and dog vibrators, of a vibrator depressor plate mounted on the carriage and yieldable relative thereto, a stop coacting with the plate to prevent the yielding thereof and movable to permit said plate to yield, and means controlled by the movement of the carriage for positioning the stop.

19. In an adding machine, the combination with a register including a series of denominational members, carrying dogs, and dog vibrators, of a vibrator depressor plate mounted on the carriage and yieldable relative thereto, a stop coacting with the plate to prevent the yielding thereof and movable to permit said plate to yield, and stop positioning means including a cam and a coacting member brought into operative relation by the movement of the carriage.

20. In an adding machine, the combination with a series of denominational members, carrying mechanism therefor including carrying dogs and dog positioning devices, and resetting means for the carrying mechanism, of a traveling carriage, means operated by the movement of the carriage to actuate

the resetting means, and a member operated by the movement of the carriage in one direction only to actuate the dog positioning devices.

21. In an adding mechanism, the combination with a series of denominational members, carrying mechanism therefor including carrying dogs and dog vibrators and resetting means for the carrying mechanism, of a traveling carriage, means operated by the retraction of the carriage to actuate the resetting means, and means operated by the forward movement of the carriage to actuate the dog vibrators, said last named means being ineffective to obstruct the movement of the vibrators incidental to the resetting of the carrying mechanism during the retraction of the carriage.

22. In an adding mechanism, the combination with a series of denominational members, carrying mechanism therefor including carrying dogs and dog vibrators, and resetting means for the carrying mechanism, of a traveling carriage, a resetting cam coacting with the resetting means during the retraction of the carriage, and a vibrator depressor plate arranged to operate the vibrators during the forward movement of the carriage and yieldable to avoid the obstruction of said vibrators during the retraction of the carriage.

23. In an adding machine, the combination with a series of denominational members, of carrying mechanism therefor including carrying dogs and dog positioning members, of operating mechanism for the denominational members, keys normally disconnected from the operating mechanism, automatic key connecting mechanism, and means for operating the dog positioning devices, said means being controlled by the key connecting mechanism.

24. In an adding machine, the combination with a series of denominational members, carrying mechanism therefor including carrying dogs, and dog vibrators, of operating mechanism for the denominational members, keys normally disconnected from the operating mechanism, automatic key connecting mechanism, a yieldable vibrator depressor plate, and means operated by the key connecting mechanism and controlling the position of the plate.

25. In an adding machine, the combination with a series of denominational members, carrying mechanism therefor including carrying dogs and dog vibrators, of a traveling carriage, a vibrator depressor plate movable with the carriage and yieldable in a different direction, operating mechanism for the denominational members, keys normally disconnected from the operating mechanism, a stop movable to prevent the yielding of the vibrator depressor plate and means operated by the movement of the carriage to auto-

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matically connect the keys and position the stop.

26. In an adding machine, the combination with a series of denominational members, carrying mechanism therefor including carrying dogs and dog vibrators, and a traveling carriage, of a vibrator depressor plate movable with the carriage and yieldable in a different direction, a stop arranged in position to prevent the yielding of the plate, operating mechanism for the denominational members, keys normally disconnected from the operating mechanism, automatic key connecting mechanism including an arm and a coacting cam, and means connected to one of said last named elements for positioning the stop.

27. In an adding machine, the combination with a register including denominational members, carrying mechanism therefor, and resetting means for the carrying mechanism, of a reciprocatory carriage arranged to automatically operate the resetting means during the movement of the carriage in one direction, and means for dogging the carriage against movement in the opposite direction until the resetting means has been operated.

28. In an adding machine, the combination with a register including denominational members, carrying mechanism, and resetting means for the carrying mechanism, of means operated by the movement of the carriage in one direction to actuate the resetting means, and a pawl and ratchet mechanism for dogging the carriage against movement in the opposite direction until the operation of the resetting means is completed.

29. In an adding machine, the combination with a register including denominational members, carrying mechanism, and resetting means for the carrying mechanism, of operating means for the register, keys normally disconnected from the operating means, automatic key connecting mechanism, a reciprocatory carriage operative upon the retraction thereof to properly position the automatic key connecting mechanism and to actuate the resetting means, and means for dogging the carriage against movement in

the opposite direction until the resetting means has been properly operated and the key connecting means properly positioned.

30. In an adding machine, the combination with a register including denominational members, carrying mechanism, and resetting means for the carrying mechanism, of operating means for the register, keys normally disconnected from the operating means, automatic key connecting mechanism, a reciprocatory carriage operative upon the retraction thereof to properly position the automatic key connecting mechanism and to actuate the resetting means, and pawl and ratchet mechanism for dogging the carriage against movement in the opposite direction until the resetting means has been properly operated and the key connecting means properly positioned.

31. In an adding machine, the combination with a series of denominational members and carrying means, of actuating means for the members, said members and actuating means having relative movement in two directions, and means operative during such relative movement in one direction to insure coöperative engagement between the denominational members and carrying means and opposing no material resistance to the disengagement of the members and the carrying means during relative movement of the members and actuating means in another direction.

32. In an adding machine, the combination with a register including denominational members, carrying devices and positioning means for the carrying devices, of actuating means, said register and actuating means having relative forward and retractile movement, and means coacting with the positioning means during such forward movement only, to insure a coöperative relation between the denominational members and carrying devices.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM L. DENCH.

Witnesses:

L. MAIER,

MAX C. BEARD.