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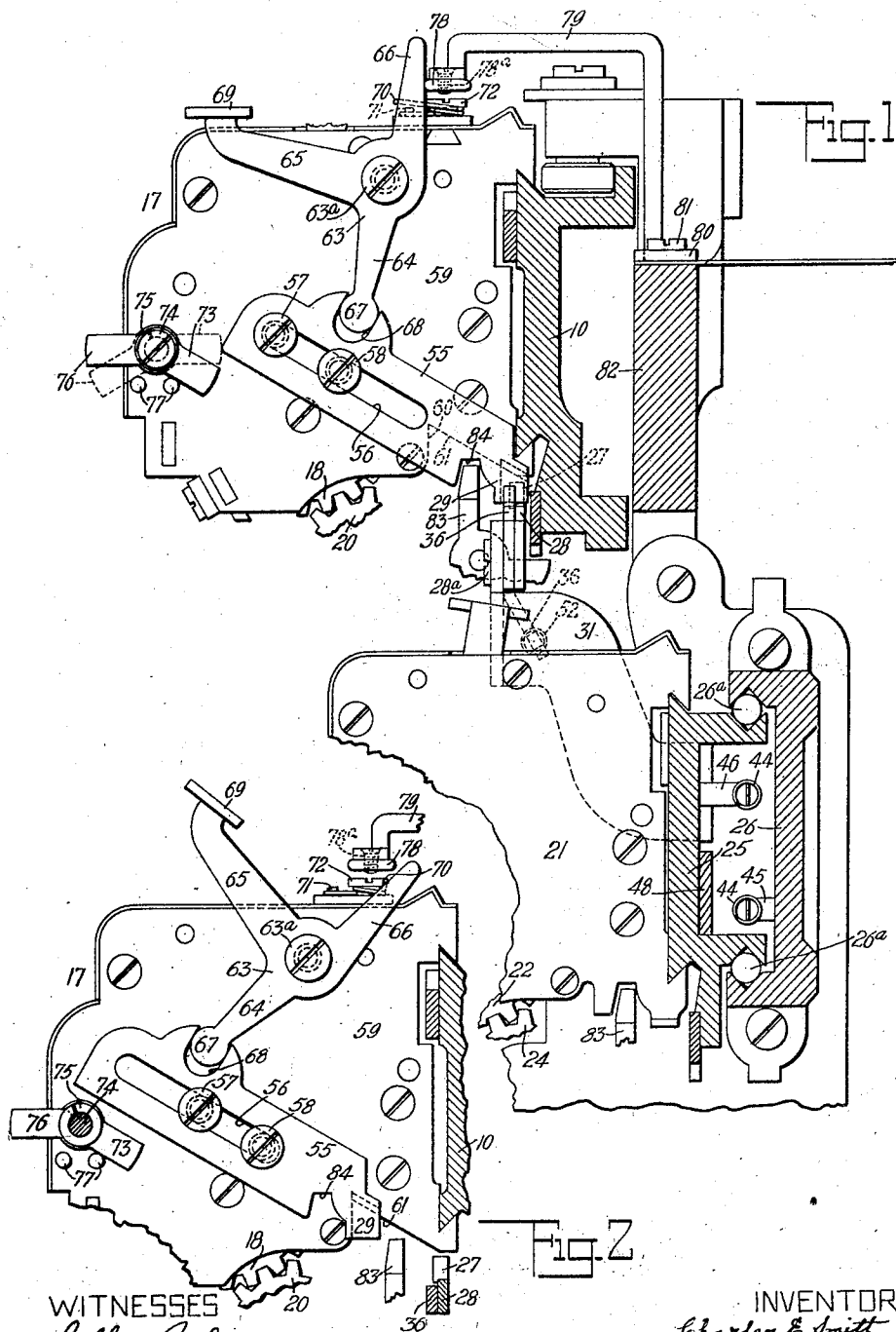
1,566,286

C. E. SMITH

CALCULATING MACHINE.

Filed Nov. 16, 1923

3 Sheets-Sheet 1



WITNESSES

William Nelson
E. M. Wells

INVENTOR

Charles E. Smith
By *Jacob Falbel*
HIS ATTORNEY

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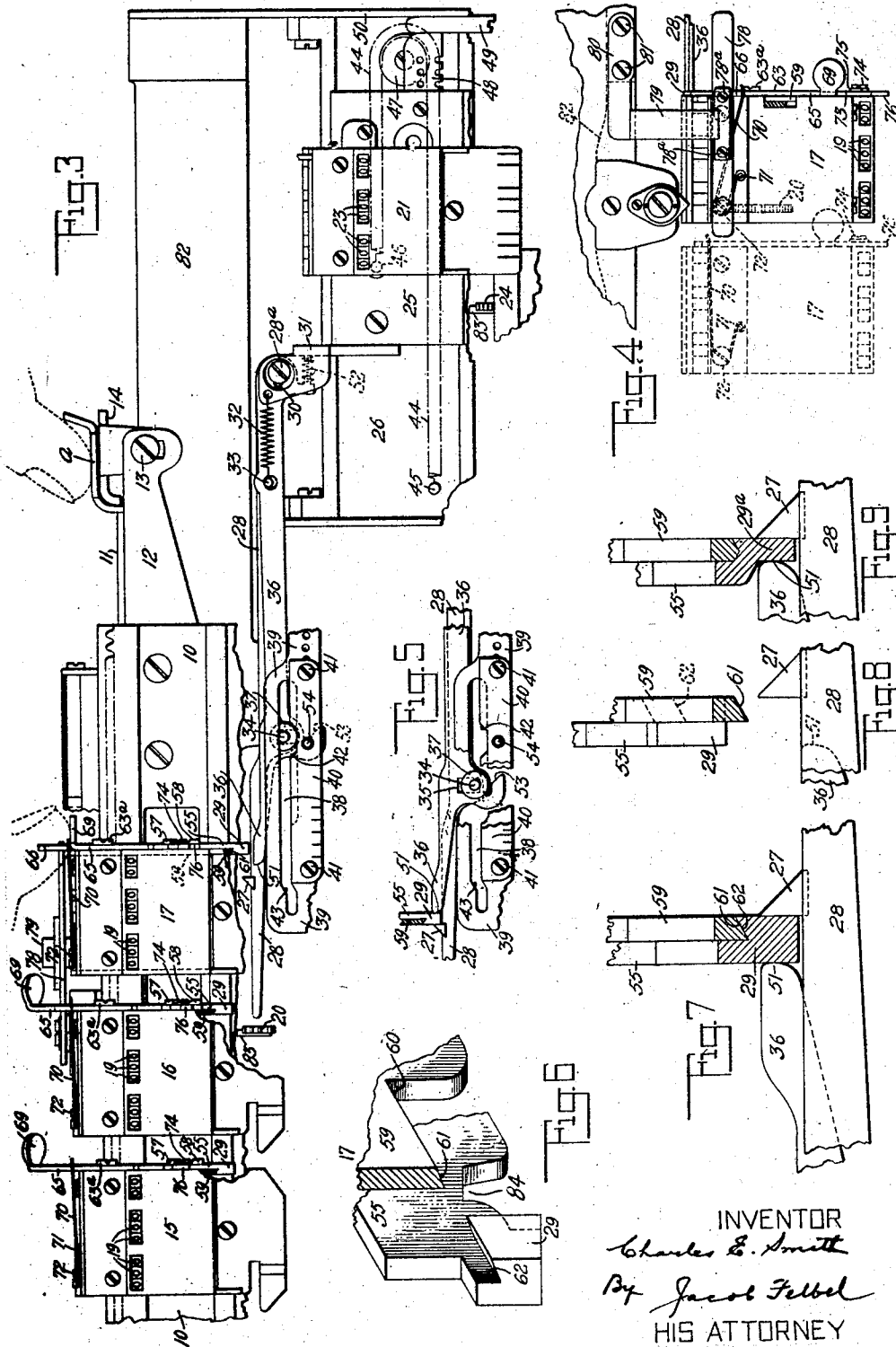
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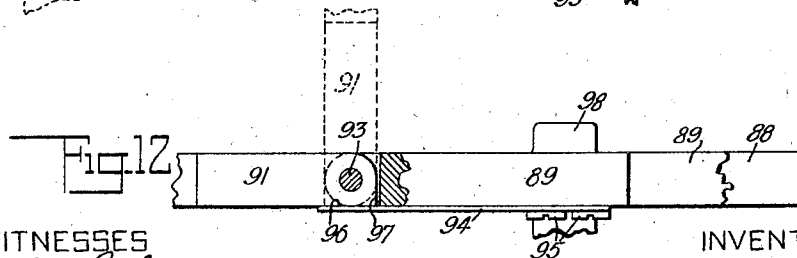
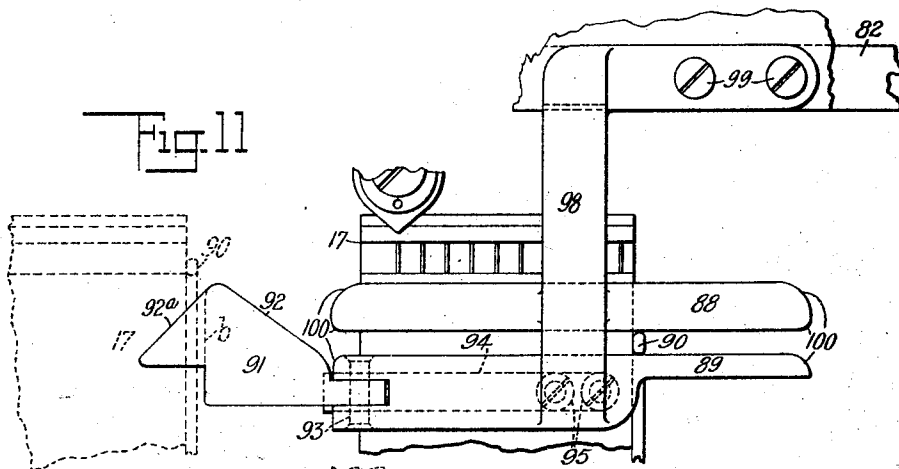
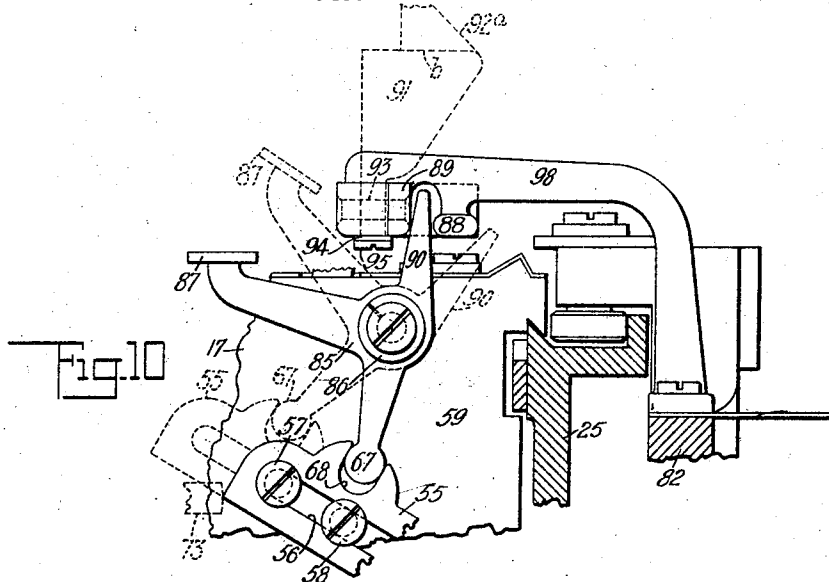
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UNITED STATES PATENT OFFICE.

CHARLES E. SMITH, OF BROOKLYN, NEW YORK, ASSIGNOR TO REMINGTON ACCOUNTING MACHINE CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CALCULATING MACHINE.

Application filed November 16, 1923. Serial No. 675,058.

To all whom it may concern:

Be it known that I, CHARLES E. SMITH, a citizen of the United States, and resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Calculating Machines, of which the following is a specification.

My invention relates to calculating machines and more particularly to the control of the pick-up mechanism.

The main object of the invention, generally stated, is to provide means for preventing unnecessary traveling movements of a cross truck or jumping totalizer without rendering it ineffective to move at proper intervals in the operation of the machine, thereby reducing the wear, strain and noise incidental to such unnecessary movements, and decreasing liability of injury to the machine.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices set forth in the following description and particularly pointed out in the appended claims.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the different views,

Figure 1 is an enlarged detail fragmentary side elevation, with parts in section, of a portion of a Remington accounting machine showing my invention embodied therein; the pick-up lug on one of the vertical totalizers being shown in operative position.

Figure 2 is a like view of a portion of the same, showing the pick-up lug in ineffective position.

Figure 3 is a detail fragmentary front elevation in the main of the parts represented in Fig. 1, but showing the parts on a smaller scale.

Figure 4 is a fragmentary detail top plan view of one of the vertical totalizers and some of the associated parts.

Figure 5 is a fragmentary detail front elevation of the pick-up mechanism in action.

Figure 6 is an enlarged detail fragmentary perspective view of one of the pick-up

lugs as seen from the rear and a part of the vertical totalizer frame by which it is carried.

Figures 7 and 8 are enlarged sectional details as seen from the rear of one of the pick-up lugs and some of the associated parts; Fig. 7 showing the lug in the operative position and Fig. 8 in the inoperative position.

Figure 9 is a view that corresponds to Fig. 7 but shows a modified form of pick-up lug.

Figure 10 is an enlarged detail fragmentary side view with parts in section showing a still further modification of the construction.

Figure 11 is a detail fragmentary top plan view of the same.

Figure 12 is a detail fragmentary front elevation of the controlling bars and some of the associated parts shown in Figs. 10 and 11.

I have shown my invention, in the present instance, embodied in a Remington accounting machine of the character disclosed in the patent to John C. Wahl, No. 1,270,471, dated June 25, 1918, but have shown only so much of said machine as is necessary to arrive at an understanding of my invention in its embodiment therein. It should be understood, however, that the invention is not restricted to its inclusion in such a machine, but may be employed wherever found available in different makes of calculating machines.

The Remington accounting machine referred to above includes a Remington typewriting machine, the paper carriage of which has connected thereto a main calculator carriage or truck on which a series of so-called vertical totalizers is mounted. A cross or jumping totalizer is carried by an auxiliary carriage or cross truck. Automatically operating means are employed for intermittently picking up and releasing the cross truck, thus alternately moving the latter forward and allowing it to return to normal position during the travel of the typewriter and main carriage or truck across the machine in one direction. These forward and back movements of the cross truck are sometimes unnecessary, as for example when the operator desires to skip

computing columns without writing therein. Let it be assumed for instance that the operator desired to bring the third vertical totalizer to the adding zone for computing
 5 in this column without operating the preceding vertical totalizers. Ordinarily the travel of the main carriage would result in picking up the cross carriage as each vertical totalizer approaches the computing
 10 zone, and releasing it for return movement when the computing zone is passed, thus causing a series of forward and backward jumping movements of the cross carriage with the wear, strain, noise and increased
 15 liability of injury incidental to such unnecessary movements. By my present invention I overcome these difficulties by picking up the cross truck only when a desired or selected one, or, say, the third of
 20 the vertical totalizers, reaches the pick-up beam or approaches the computing zone, so that for each column skipped without computing therein there is no forward and back movement of the cross truck.

25 The Remington typewriting machine to which the calculating mechanism is applied as an attachment includes the usual letter keys and numeral keys. Each of these is connected to a type bar and controls the escapement mechanism which enables a step-
 30 by-step letter feed movement of the typewriter carriage to be effected. Each of the numeral keys in addition controls devices of the actuator of the calculating machine, as
 35 fully shown and described in said hereinbefore mentioned Wahl patent.

The combined typewriting and calculating mechanism as thus far described is like that shown and described in the above mentioned
 40 Wahl patent, and it will be unnecessary for the purpose of my invention to illustrate or describe such mechanism in detail except in so far as concerns parts thereof which are necessary to an understanding of the present
 45 invention. Therefore, the illustration has been materially simplified by omitting many parts of the machine disclosed in said Wahl patent.

The main truck for the calculating mechanism comprises a bar 10 mounted and connected to the typewriter carriage 11 in the usual manner to travel therewith. Thus, said
 50 bar 10 carries bracket arms 12 connected by screws 13 to arms 14 which are fixed to and project forwardly from the carriage 11. So-called vertical totalizers 15, 16 and 17 are detachably and adjustably mounted on the
 55 truck bar 10. Any desired number of these totalizers may be employed, three being shown in the present instance. Each totalizer carries registering mechanism including a series of gear wheels 18 and a series of
 60 number wheels 19. As a totalizer passes step-by-step through the computing zone the wheels 18 thereof are brought successively

into mesh with a master wheel 20 controlled from the numeral keys. The extent the master wheel 20 and meshing gear wheel 18 rotate at each actuation of a numeral key depends on the particular numeral key depressed.
 70

In addition to the vertical totalizers referred to, the machine is provided with a cross or jumping totalizer 21 which accumulates the sum registered on the series of vertical totalizers. This totalizer 21 is like the
 75 vertical totalizers and includes gear wheels 22 and a series of number wheels 23. The wheels 22 are brought successively into mesh with a master wheel 24, turned by the actuator at each depression of a numeral key the same extent that the master wheel 20 is
 80 turned. The cross totalizer is carried by a cross truck comprising a bar 25 somewhat similar in transverse section to the bar 10 and on which the cross totalizer is detachably mounted. This bar is supported to move
 85 longitudinally on bearing balls 26^a movable in grooves in a fixed supporting bar 26 secured to the frame. The trucks or carriages 10 and 25 are sometimes called "decimal carriages" because they determine by their positions at the time the decimal order in which the calculation, due to an operation of a numeral key, will occur.
 90 95

In the hereinbefore mentioned Wahl patent, automatically operating connecting means between each vertical totalizer and the cross truck or carriage are provided for intermittently picking up the cross carriage
 100 and releasing it for alternate forward and back movements during a single travel of the main truck or carriage in one direction. In said patented construction the right-hand side plate of each of the vertical totalizers
 105 is formed with a fixed engaging projection which is adapted to coact with an upwardly extending hook-like projection or tooth 27 on a so-called pick-up beam 28. In accordance with the present embodiment of my invention I make the engaging lug or member
 110 29 on each vertical totalizer shiftable thereon into and out of effective position, as will hereinafter appear. For the present, however, it may be supposed that each member is maintained in effective position in order that the operation of the pick-up mechanism as it operates in said patented construction may be understood. After having first described more in detail the features of the pick-up
 120 mechanism and the ordinary operation thereof as disclosed in said Wahl patent, I will thereafter describe the modified operation under control of the mechanism as I have changed it. A laterally projecting headed screw stud 28^a, fixed to the beam 28, is received in a short horizontally disposed bearing slot 30 in a bracket arm 31 secured to the cross truck bar 25. This construction enables the beam 28 to receive a pivotal
 125 130

movement on the bracket. It also affords a limited relative sliding movement between the beam and bracket against the action of a contractile buffer spring 32, connected at one end to a pin 33 carried by the beam 28 and at its other end to the bracket arm 31. It will be observed that the force of the spring is directed in a line above the stud 28^a, and therefore tends to turn the beam around the center of said stud and elevate the inner hook-carrying end of the beam, and also tends to maintain the stud seated at the right-hand end of the slot 30. This last mentioned function of the spring is to provide a cushion between each connected vertical totalizer and the cross truck as the latter is picked up by the former, especially in the rapid movement of the carriage under the action of the usual tabulator keys or when the carriage is moved by hand after depressing one of the ordinary carriage release keys *a*.

A forwardly projecting pin 34 extends from the pick-up beam 28 and projects through an enlarged opening 35 in a pick-up guard or locking beam 36, to be hereinafter more fully described. This pin 34 is provided with a guide flange 37 which coacts with the guard 36 at the front side thereof. The pin 34 after passing through the opening 35 in the pick-up guard, extends into a slot 38 in a fixed plate 39. A part of the lower wall of the slot 38 is formed by the upper edge of an auxiliary plate 40 adapted to be adjusted along the plate 39 and secured in place thereon by screws 41. The upper edge of the plate 40 has a depression 42 therein which, when the parts are in the normal position represented in Fig. 3, is beneath the pin 34. This permits the pin 34 to move down into the depression as the engaging lugs 29 on the vertical totalizers move successively over the beveled face of the tooth or hook 27 and depress the pick-up beam in the backward travel of the main carriage 10. The slot 38 throughout all other parts thereof is of a width which corresponds substantially to the diameter of the pin 34, and the walls of the slot therefore restrain the pin against free up and down movement. The left-hand portion of the slot 38 is formed with a cam 43 with which the pin 34 coacts as the pick-up beam is carried along with the main carriage by a lug 29 on a vertical totalizer. The effect of engaging the cam 43 is to move the pin 34 and the hook carrying end of the beam down, thus disengaging the hook 27 from the totalizer and enabling the cross truck 25 and the beam to be returned to the right independently of the main truck or carriage. A spring 44 is effective to bring about this independent return movement of the cross truck and the parts connected therewith. Said spring is connected at one end to a pin 45 on the stationary bar 26 and at the other end to a pin 46 on the truck bar 25; the intermediate looped portion of the spring passing around a pulley 47 on the supporting bar 26. The cross truck when released as described will be moved rapidly to the right by the spring 44 until arrested by the bar 48 adjustably secured to the cross truck striking a member 49 and forcing it against the fixed supporting frame 50.

The pick-up guard 36 hereinbefore referred to is provided to automatically coast at its free end 51 with the right-hand face of the pick-up lug 29 on a vertical totalizer when the hook or tooth 27 engages the opposite side of said projection, and thus form an interlock that prevents a relative movement between the main truck and cross-truck in either direction of the travel.

A more complete detail description of the construction and operation of the pick-up guard is deemed unnecessary, except to point out that it is automatically actuated and operates in conjunction with the pick-up beam to insure the proper positioning of the cross truck in a decimal position corresponding to that of a vertical totalizer when the latter is in the computing zone. This may be better understood when it is pointed out that the pick-up guard 36 is pivoted on the stud 28^a and is moved to its elevated engaging position by a spring 52. When the cross truck returns, and the pick-up beam moves back to normal position, a cam 53 (see Figs. 1 and 5) on the guard 36 engages a pin 54 which is in the path of the cam and is carried by the fixed plate 39. This engagement of the cam with the pin causes the guard member 36 to be lowered at its free end out of the path of the lugs 29. When, however, the pick-up beam is engaged by a lug 29 and moved to the left, the cam member 53 is moved away from the fixed pin 54, as shown in Fig. 5. This enables the guard to be elevated by its spring 52, and the end 51 to be positioned to the right of the lug 29 engaged by the hook 27. However, when the hook 27 is cammed down out of engagement with the projection 29, as hereinbefore described, the pin 34 carries the guard 36 down with it.

The construction thus far described, except as specifically indicated, is the same as that disclosed in the Wahl patent referred to above.

It will be understood that ordinarily in the operation of the machine, as a vertical totalizer, say 17, approaches the computing zone to bring a wheel 22 thereof into mesh with the master wheel 20, the hook 27 of the pick-up beam 28 will be engaged by the lug 29 of said totalizer 17, causing the cross-truck and totalizer 21 to travel in unison with the main truck or carriage. As said totalizer 17 passes out of the computing

zone and beyond the master wheel 20 the pin 34 reaches the cam 43 and releases the pick-up beam, thereby enabling the cross-truck and totalizer 21 to be returned to the right by the spring 44. This intermittent forward and back movement of the cross truck and totalizer takes place as each vertical totalizer passes through the computing zone, even when no actuation of the vertical totalizer is effected. This, therefore, results in unnecessary forward and back movements of the cross-truck and totalizer, with consequent unnecessary wear, liability of injury thereto, and the production of a clattering noise, especially under the rapid movements of the main carriage by hand or under control of the tabulator. Let it be assumed, for example, that the main carriage is in the extreme right-hand position, and the operator desires to operate only the last or third totalizer 17. It has hereinbefore been explained that this may be effected by depressing either of the carriage release keys *a* and moving the carriage down to the proper position by hand, as is usually the case. Or as is sometimes the case, the result may be effected by operating the tabulator to bring the third totalizer 17 into proper position to be actuated. In the said Remington accounting machine this would result in the specific example assumed, in four unnecessary forward and backward movements of the cross truck to bring the totalizer 17 into proper position without actuating any of the preceding vertical totalizers. It should be remembered however, that as many as, say, thirty vertical totalizers are sometimes employed on long carriage Remington accounting machines, and that to bring the last totalizer to proper position as supposed above would result in some fifty-eight unnecessary rapid forward and back jumping movements of the cross truck at each such selection of the last vertical totalizer for use. But by my present invention these unnecessary jumping movements of the cross truck are eliminated, thus saving a great amount of unnecessary wear on the parts, liability of injury thereto and the elimination of the clattering noise due to such jumping of the truck.

In accordance with my present invention I overcome these difficulties by picking up the cross truck only when the selected or desired vertical totalizer in which a number is to be registered is just about to enter the computing zone; those vertical totalizers in which no registration is to be effected passing through the computing zone without picking up the cross truck and while the latter remains at rest in its normal position. Thus, for example, if there should be thirty vertical totalizers employed and a registration is to be effected only in the last or right-hand totalizer, then the first twenty-nine

totalizers pass through the computing zone without picking up the cross truck and the last totalizer will pick up the cross truck and feed it with the main carriage in the usual manner, and release it for return movement to normal position after the registration is effected and the last vertical totalizer passes out of the computing zone. It results therefore that there has been but one forward and back movement of the cross truck although thirty vertical totalizers have passed through the computing zone.

I accomplish these results by the particular embodiment of my invention disclosed in the present instance as follows:

It has been hereinbefore explained that the usual fixed pick-up lug or projection on the right-hand side plate of each vertical totalizer frame is cut away and replaced in the present construction by the pick-up lug, member or device 29 movable on its totalizer into effective position shown in Fig. 1, or out of effective position as shown in Fig. 2. I preferably form this member 29 as a part of a plate, slide or carrier 55 slotted at 56 to receive the shouldered portions of two headed screws 57 and 58, said screws being threaded into the right-hand side plate 59 of the associated vertical totalizer to support and guide the plate 55. The screw 57 also limits the movement of the slide to effective or operative position, shown in Fig. 1. This side plate of the totalizer is preferably cut away at 60 and is provided at the upper wall of said cut-out with an inclined inwardly beveled wall 61; the inclination of this wall 61 corresponding to the inclined movement of the slide 55. The upper edge of the lug 29 is under-cut at 62 to match and receive the beveled edge 61 of the totalizer side plate. The construction therefore provides for a sliding adjustment of the lug 29 on the plate 59 but resists outward lateral movement of the lug 29 away from the side plate of the totalizer frame on which the adjustable lug is mounted. It will be seen, moreover, that the inner side face of the lug 29 is coincident with the plane of the inner face of the side plate 59 of its totalizer frame, as shown in Fig. 7, so as not to extend into the frame. The inner face of the lug 29 therefore bears the same relation to its totalizer frame as the usual fixed lug which has been cut away. As shown in Figs. 3 and 7, the outer face of the lug 29 is in the plane of the outer side of its carrier or slide 55 so that the lug is about twice the thickness of the fixed lug usually employed, and there is less danger of the lug being broken off than heretofore. With such a construction it is necessary to cut away a small portion of the free end of the usual locking beam 36 so that it may properly contactively engage the right-hand

face of the lug 29 as shown in Fig. 7. If it is not deemed advisable to make this change in the usual locking beam, then the lug may be modified as indicated in Fig.

9. In this form of the construction the pick-up lug 29^a is of a thickness corresponding to the side plate 59 of the totalizer frame on which it is mounted, and of the thickness of the usual lug which ordinarily forms part of said side plate. Therefore, the locking beam 36 in this construction need not be modified but may be of the usual length and construction.

I have hereinbefore indicated that each lug 29 (or 29^a) is mounted on its slide or carrier for movement from the ineffective position shown in Fig. 2, where it is out of co-operative relation with the projection 27 on the pick-up beam, to the effective position, shown in Fig. 1. In this last mentioned position the pick-up lug is in co-operative relation with the hook or member 27 and picks up the pick-up beam and cross truck and causes them to travel with the main carriage, as has been described.

The means for controlling these movements of the pick-up lugs into and out of effective position will now be described.

In the present instance I have provided on each vertical totalizer hand controlled means co-acting with its slide 55. As these means for all vertical totalizers are alike the description of one will apply to the others. A lever 63 provided with three arms 64, 65 and 66 respectively, is pivotally mounted on a headed shouldered pivot screw 63^a threaded into a tapped opening in the right-hand side plate 59 of the totalizer frame. The lower rounded end 67 of the lever arm 64 is received in a cut-out or slot 68 in the slide 55, whereas the lever arm 65 carries a key 69. The third arm 66 extends up beyond the totalizer, and in this form of the construction a spring 70 bears rearwardly against said arm and tends to turn the lever on its pivot from the Fig. 1 to the Fig. 2 position. One end of the spring is anchored on a pin 71 (see Fig. 4) on the totalizer frame, whereas the right-hand free end portion of the spring bears rearwardly against the arm 66 as explained. Intermediate its ends the spring is coiled around the stem of a shouldered screw 72 and under the head thereof.

On the side plate 59 of each vertical totalizer is a latch, catch, detent or retaining device 73 which may be of any suitable construction but in the present instance is shown in the nature of a lever pivoted on a shoulder pivot screw 74 received at its threaded end in a tapped opening in the plate 59. Any suitable means may be employed to hold the detent in either extreme position. In the present instance a split friction washer 75 is mounted on the pivot

screw between the head thereof and the body of the device 73. A finger piece 76 extends forward of the associated totalizer for easy manipulation by the operator, and stops 77 limit the movement of the latch from the dotted line effective position, to the full line releasing position, shown in Fig. 1, or vice versa. When a slide 55 has been projected to operative position, shown in this figure by the depression of its key 69, and the latch 73 is moved to the dotted line position, then the associated pick-up lug 29 will be held indefinitely in its active position against the force of its spring 70 and the pick-up lug will operate as it does ordinarily; always picking up the pick-up beam and cross truck as this particular totalizer is about to enter the computing zone, as will be understood by referring to the totalizer 17 in Fig. 3. If all of the lugs be thus locked in effective position each totalizer will pick up the beam 28 and the cross truck as it is about to enter the computing zone, releasing the cross truck in the ordinary manner as the vertical totalizer passes out of said zone; in this respect operating as the Remington accounting machine does ordinarily. On the other hand, if all of the latches 73 are in the releasing position then all of the lugs 29 will be normally maintained by their springs 70 in the Fig. 2 or ineffective positions and each may be projected to effective position when desired.

Referring particularly to Figs. 1 to 4, inclusive, it will be seen that I have provided a fixed controlling member or bar 78 detachably secured by screws 78^a to and supported by an inverted U-shaped bracket 79, the rear depending arm of which terminates in a foot piece 80 secured by screws 81 to the main frame bar 82 of the calculator attachment. As shown in Fig. 4, the bar 78 extends longitudinally from a point to the left of a vertical fore and aft plane that includes the master wheel 20, to a point at a considerable distance to the right of such plane. The position of this bar is such that the arm 66 on each vertical totalizer, as it travels with the main carriage, passes along either the forward or rear edges of said bar, depending on the condition of the associated lug 29 or whether the associated key 69 is in the elevated position or is maintained depressed. Each arm 66 if in an intermediate position cannot pass the bar 78, but on the other hand each arm 66 is maintained in one of such extreme positions before it reaches the bar 78. If, for example, the operator should desire to have all of the vertical totalizers except, say, the last one 17 pass through the computing zone without picking up the cross truck then all of said totalizers except the last will have their pick-up lugs withdrawn to ineffective position as shown in Fig. 3, whereas the

lug 29 of the last totalizer will either be held down by a finger of the operator as shown or be latched down by its latch 73. Therefore, the arms 66 of the totalizers preceding the totalizer 17 will pass behind the bar 78 in passing through the computing zone, and the arm 66 of the totalizer 17 will pass along in front of the bar in passing through said zone. From an inspection of Figs. 3 and 4, it will be understood that the arm 66 of each totalizer is either in front or in the rear of the bar 78 before the pick-up hook 27 is reached and the totalizer is about to enter the computing zone, and cannot be shifted from such position until the active totalizer has passed through said zone. This is an important factor from several points of view. For example, in this particular construction it would be necessary in the absence of the bar 78 for the operator to maintain the key 69 of the totalizer, in which a registration is to be effected (assuming its lug 29 is not latched down), depressed with a finger while the active totalizer is being moved step-by-step through the computing zone by an actuation of the numeral keys with the other hand. However, the use of the bar 78 renders this unnecessary. Thus, the key 69 of the selected totalizer being held depressed, the bar 78 is effective to hold the lug 29 in its operative position even before said lug reaches the pick-up hook 27 (see Fig. 3), and thereafter maintains the lug effective until such totalizer passes out of the computing zone, or to the dotted line position shown in Fig. 4, even though the finger key 69 be released. This is due to the fact that at this time the companion arm 66 will ride along the front edge of the bar 78, as indicated in Fig. 1. When the totalizer in question reaches the dotted line position shown in Fig. 4, the arm 66 will be automatically forced by the spring 70 rearwardly of the bar to the Fig. 2 position, where it will pass in the rear of the bar 78 on the return movement of the carriage, and the companion lug 29 will be withdrawn to and held in ineffective position shown in Fig. 2.

From the foregoing it will be seen that once the cross truck is picked up to travel with any given vertical totalizer, the companion lug 29 cannot be withdrawn until that totalizer passes through the computing zone. Due to this fact both hands of the operator are free to manipulate the printing keys even though the lug 29 of the totalizer be not locked down by its latch 73.

Another important function of the bar 78 is to prevent an interference between a lug 29 in its shifting movements and the usual master dog 83, as will hereinafter appear. From an inspection of Fig. 3 it will be seen that the master dog carried by the actuator frame is located substantially in

the fore and aft vertical plane which includes the master wheel 20, and also is located in the rear of said wheel. This master dog is not cleared by a totalizer until the latter reaches the third sub-units position. From an inspection of Fig. 1, it will be seen that when a lug 29 is in the effective position, a slot 84 in the companion slide 55 registers with the master dog, the dog passing through said slot without interference from the master dog in the traveling movement of the totalizer. In the ordinary construction the master dog is in a slot or cutout corresponding to the slot 84 but located in the fixed side plate 59. In such construction the master dog is located in such slot when the totalizer reaches the second sub-units position and prevents an operation of the master dog, thus locking the entire machine against operation. This same effect is produced in the present instance by the notch 84 in each slide 55 when the latter is in the effective position. When a lug 29 is in the ineffective position shown in Fig. 2 the path of movement of the slide with its totalizer is clear of the master dog and there are no means to coact with the master dog to lock it at this time. However, at this time the totalizer is not to be registered in and there is no necessity for a locking of the master dog.

From the foregoing it will be seen that there is only one time when a lug 29 or its slide 55 could collide in passing through the computing zone with the master dog 83 and that is when the slide is intermediate the positions shown in Figs. 1 and 2, or is being moved from one of such positions to the other. However, the bar or controlling member 78 precludes such movement of the slide at this time, and therefore compels the positioning of the slide in either the Fig. 1 or Fig. 2 position and insures against each slide 55 or its lug 29 colliding with the master dog. From an inspection of the dotted line position of the totalizer in Fig. 4, it will be understood that the lug 29 thereon cannot be moved either from the effective to the ineffective position or vice versa until such lug has passed to the left beyond the master dog. Nor can the totalizer pass to the right from the dotted line position in Fig. 4 without first having its lug 29 positioned in either one of the two extreme positions shown in Figs. 1 and 2. Any injury to the machine from collision with the master dog is therefore prevented.

One example of the operation of the machine as thus far described, is as follows:—

Assume that the main carriage is in its extreme right-hand position and that all of the lugs 29 (or 29^a) are in the retracted or ineffective position; assume further that the operator desires to skip all columns except the last without writing therein; that

is to say, he desires to have all of the totalizers except the last one 17 pass through the computing zone without registering therein. The operator merely depresses the key 69 of the totalizer 17 and then depresses the carriage release key *a*, allowing the carriage to run its length while controlled by the hands of the operator until the totalizer 17 has been positioned to receive its registration. Or, if desired, the positioning of the totalizer may be obtained by the use of the tabulator, and while the lug 29 on the totalizer 17 is held projected by hand, as described. If the machine is to be used repeatedly with the same character of blanks, then the lug 29 on the totalizer 17 may be locked down with its latch 73, and the carriage positioned as hereinbefore described. When the totalizer 17 has been positioned as described, both hands of the operator are free to manipulate the numeral keys to register in the totalizer 17, and as said totalizer reaches the sub-units position under the action of the numeral keys, the cross truck will be automatically released by the cam 43 and the cross truck will return to normal position. During the forward travel of the carriage to position the totalizer 17 as described the cross truck remained at rest in its normal position while the preceding vertical totalizers were passing through the computing zone by reason of the fact that all of their pick-up lugs 29 were ineffective to coact with the pick-up hook 27. When, however, the lug 29 on the totalizer 17 reached the hook 27 the pick-up beam and cross truck were moved forward with the main carriage and were not released for return movement until after the registration was effected in the totalizer 17 as above described. Therefore, there are no unnecessary back and forth traveling movements of the cross truck, nor destructive hammering resulting from the unused vertical totalizers passing through the computing zone. In the example described, there would be only a single back and forth movement of the truck no matter how many vertical totalizers are mounted on the main truck. Of course, the operation may be widely varied. Any desired number of vertical totalizers may be selectively used to pick-up the cross totalizer or truck. If work of the character described is not to be done, then the lugs 29 for all of the vertical totalizers may be latched down in operative position when the machine will operate in all respects like the Remington accounting machine of ordinary construction.

In the modified form of construction shown in Figs. 10, 11 and 12 I have provided pick-up lugs constructed and each under control of a lever 85 similar to the lever 63 of the previously described construction. However, in the present construction the

spring 70 may be eliminated and a split friction washer 86 or other suitable means employed to frictionally hold each lever in either of the two extreme positions to which it may be shifted and thus hold the pick-up lug controlled thereby in either the operative or inoperative position. This construction is such, therefore, that when a key 87 is depressed from the dotted to the full line position in Fig. 10 its lever 86 and the parts controlled thereby will remain shifted in the full line position until returned to the dotted line position, as hereinafter more fully explained.

The controlling member or bar 88 in this modified form of construction is somewhat similar to and performs the same function as the bar 78 in the previously described construction so far as preventing at times a shifting of the key actuated controlling member is concerned. However, in this modified form of construction the controlling member has a second parallel controlling bar 89 between which and the bar 88 the upright arm 90 on the controlling lever 85 is adapted to pass, as shown. At the left-hand end of the bar 89 is mounted a cam member 91 having an inclined cam face 92. For purposes which will hereinafter appear, I prefer to mount this cam member so that it may be shifted from the full line operative position shown in Figs. 10 and 12 to the inoperative dotted line position shown in said figures. It will be understood that the positions of the cam member (when operative) and the left-hand end of the bar 88 are such that an arm 90 when disposed in the full line position will collide with the cam face 92 when the associated vertical totalizer, say 17, reaches the third sub-units position. From this point on, the arm 90 is cammed rearwardly as the totalizer travels to the left until the effective part of said arm clears the cam face 92, at which time the active portion of the arm 90 is in the dotted line position shown in Figs. 10 and 11 where its path of movement with the totalizer is in the rear of the bar 88.

By this construction an operator may depress a selected key 87 and immediately release it; the pick-up lug 29 (or 29^a) controlled thereby remaining in its effective position and leaving both hands of the operator free to manipulate the machine. After the associated totalizer passes through the computing zone, the lever 85 thereon and the pick-up lug controlled thereby will be automatically returned to the dotted line Fig. 10 position ready to be again selected for use when desired.

It will be understood that when the cam member 91 is in effective position this precludes the locking of any of the latches 73 because such a latch in effective position would cause the parts to be broken or in-

jured when an associated arm 90 reaches the cam member 91. However, there is no necessity of using the latches 73 in this construction since the lugs 29 are held in effective position by the associated friction washers 86, or some such equivalent means. However, should it be found desirable to use the latches 73 in this construction, I have provided means whereby this may be done without any liability of injurious results following from locking of one or more of the slides 55 down with the aid of such latches. Thus, I may pivot the cam member 91 to its support 89, as indicated at 93, so that the cam member 91 may be shifted on its pivot from the effective full line position shown in Figs. 10 and 12, to the ineffective dotted line position shown in said figures, or vice versa. In the dotted line position the cam member 91 is carried to ineffective position out of the path of the arms 90 as they travel with the main carriage, and even if they should be locked in this position by the use of latches 73 no injurious results can follow. In this instance each arm 90 will travel back and forth between the bars or controlling members 88 and 89 as the main carriage moves back and forth without affecting or being affected by said controlling bars, or the cam member 91 supported thereby.

Suitable means are provided for retaining the cam member 91 against accidental displacement from either of the extreme positions to which it may be shifted. In the present instance such means comprise a flat detent spring 94 secured by screws 95 to the bottom of the bar 89. The free end portion of this spring bears on either of the two flat faces 96 or 97 on the member 91, depending on the position to which said member may be turned on its pivot 93. The spring thus retains the member in either the full or dotted line positions shown in Figs. 10 and 12.

As in the previously described construction the controlling device (88 and 89 as well) is mounted on or forms part of a bracket 98 secured by screws 99 to the bar 82.

Should the operator fail for any reason to bring about movement of the lever 86 to either of its extreme positions, or if it should be accidentally slightly displaced from such position, no injurious results can follow. This is due to the fact that one of the cams 100 at the right, coacting with each arm 90, will complete the movement of the associated lever and assure its proper positioning, and a corresponding proper positioning of the companion lug 29 (or 29^a) before the latter reaches the pick-up hook 27 in the forward travel of the main carriage. In the return movement of each vertical totalizer from the left of the computing zone the cams 100 at the left will likewise afford

an assurance of the complete movement of each lever 86 to either extreme position before its arm 90 passes through the computing zone to the right thereof.

An operator through inadvertence might depress a key 87 when the vertical totalizer which carries said key is to the left of the cam member 91 and the latter is in the effective position. Any difficulty arising from this situation may be avoided by constructing the cam member 91 in either of two ways. The said member may, if desired, be provided with an oppositely disposed cam face 92^a in which event the return movement of the main truck would bring the forwardly moved arm 90 into contact with said cam face 92^a and return the lever 85 and the parts controlled thereby to the ineffective dotted line position shown in Fig. 10, where the arm 90 could pass in the rear of the bar 88 and the member 91 would constitute no obstruction to the return movement to the right. The fact that the arm 90 of the erroneously depressed key collides with the cam face 92^a in these circumstances is sufficient to notify the operator that the erroneously depressed key should be reset. The use of the cam face 92^a might be found particularly desirable when the main carriage is power returned.

If desired, however, the cam member 91 may be cut away on the line *b* to present a flat face on the member along said line, especially if the main carriage is hand returned in the usual manner. In such a construction the inadvertently set key would bring its arm 90 against this flat face of the cam member and prevent further return movement of the carriage to the right. This would notify the operator of the erroneous setting of the key and the cam member 91 may be lifted to permit the arrested arm 90 to pass with its totalizer to the right of said member. The member 91 may then be again lowered to effective position and the operator proceed with the work. With either of the constructions described an improper setting of a key 87 when located to the left of the cam member 91 will be taken care of as explained.

Even in a construction like that disclosed in Figs. 1 to 9, where the levers 63 and lugs 29 are returned to normal position by the spring 70, the cam member 91 might be employed either as a substitute for or in conjunction with the springs 70 to give positive assurance of the return of said levers after each passes through the computing zone with its totalizer.

It will be understood from the foregoing description that my invention may be readily embodied in a Remington accounting machine without material modification of said machine except the addition of a few

simple parts and that I have provided simple and effective means for accomplishing the results pointed out.

My invention contemplates broadly the provision of key-operated means whereby the pick-mechanism may be repeatedly used selectively at will to operate as any given vertical totalizer is about to enter the computing zone or not, as may be desired, and if actuated will automatically return with its key to normal position after having performed its function, ready for another operation if desired. Expressed from another point of view, I believe that I am the first to provide pick-up mechanism which may be controlled at will and automatically returned with its key to normal position so that it may be employed repeatedly under key control to pick up the cross totalizer and move it from its normal position in unison with the main truck or allow the cross totalizer to remain in its normal position unaffected by the travel of the main truck. I am aware that under these broad aspects of the invention many changes may be made without departing from my invention as it is defined in the accompanying claims. The foregoing statement of what my invention contemplates from a broad aspect is intended to define such a construction as that specified in contradistinction to one in which parts may be set-up by the aid of keys or otherwise to operate indefinitely in accordance with said setting, and the keys and parts set thereby are not automatically returned after each setting thereof ready for another key controlled setting. This aspect of my invention I believe to be broadly new notwithstanding that by my construction I may, if desired, also set up the machine to operate indefinitely as in prior machines.

What I claim as new and desire to secure by Letters Patent is:—

1. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers which travel therewith, a cross totalizer, and pick-up mechanism for automatically causing said cross totalizer to intermittently travel in unison with and return independently of said main carriage, said pick-up mechanism including selecting keys each normally maintained in one position and automatically returned to said position after the companion vertical totalizer passes through the computing zone, and means controlled by each of said keys for connecting the cross totalizer with a given one of said vertical totalizers or for preventing such connection from being effected depending on the position of the companion key.

2. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers which travel therewith, a cross totalizer, and pick-up mechanism for auto-

matically causing said cross totalizer to intermittently travel in unison with and return independently of said main carriage, said pick-up mechanism including key controlled selecting means by which the cross totalizer may be connected to any desired vertical totalizer to be moved thereby as the selected vertical totalizer is about to enter the computing zone, means for holding said selecting means in effective position while the companion vertical totalizer is passing through the computing zone, the actuated selecting means being automatically returned to render said means ineffective when the selected vertical totalizer passes through the computing zone.

3. In a calculating machine, the combination with vertical totalizers and a cross-totalizer, of pick-up mechanism including a device associated with each vertical totalizer and shiftable to two positions to render the pick-up mechanism operative or inoperative, and means to prevent said device from being shifted during the computation of a number.

4. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers which travel therewith, a cross totalizer, and pick-up mechanism for automatically establishing a direct connection therethrough between each vertical totalizer and the cross totalizer so that the two may travel in unison and which when disconnected enables the cross totalizer to return independently of the vertical totalizer with which it was connected, said pick-up mechanism including a pick-up lug on each vertical totalizer, means adapted to directly engage therewith to cause the cross totalizer to travel in unison therewith, and hand controlled means to determine with which vertical totalizer the cross totalizer shall be connected.

5. In a calculating machine, the combination with vertical totalizers and a cross-totalizer, of pick-up mechanism for the cross-totalizer comprising a pick-up device associated with each vertical totalizer and movable by hand to operative position, means for holding said device in operative position during a single computation, and means for automatically restoring said device to inoperative position after computation.

6. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers that travel therewith, a cross totalizer, pick-up mechanism for causing the cross totalizer to be connected with any of said vertical totalizers to travel in unison therewith and permit the cross totalizer to return independently thereof, said pick-up mechanism comprising a pick-up lug on each vertical totalizer and a pick-up beam adapted to directly engage each lug to be moved thereby and cause the cross totalizers

to travel in unison therewith, and selective means for selectively causing the pick-up mechanism to become effective only when a selected vertical totalizer approaches the computing zone, said selective mechanism comprising an automatically returned key carried by each of said vertical totalizers.

7. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers that travel therewith, a cross totalizer, pick-up mechanism for causing the cross totalizer to be connected with any of said vertical totalizers to travel in unison therewith and permit the cross totalizer to return independently thereof, said pick-up mechanism including pick-up engaging members one carried by each of said vertical totalizers, and selective means for rendering any one of the members effective to engage and carry with it a co-operative engaging member of said pick-up mechanism.

8. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers that travel therewith, a cross totalizer, and pick-up mechanism for causing the cross totalizer to be connected with any of said vertical totalizers to travel in unison therewith and permit the cross totalizer to return independently thereof, said pick-up mechanism including pick-up engagement members carried by said vertical totalizers and movable thereon into and out of effective pick-up position.

9. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers that travel therewith, a cross totalizer, pick-up mechanism for causing the cross totalizer to be connected with any of said vertical totalizers to travel in unison therewith and permit the cross totalizer to return independently thereof, said pick-up mechanism including pick-up engaging members carried by said vertical totalizers and movable thereon into and out of effective position, and means for maintaining each effective one of said members in its effective position while the corresponding vertical totalizer is passing through the computing zone and for automatically returning it to ineffective position after said corresponding vertical totalizer has passed through the computing zone.

10. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers movable therewith, a cross totalizer, automatically operating pick-up mechanism for causing the cross totalizer to travel in unison with and return independently of said main carriage, hand controlled means operable at will for rendering said pick-up mechanism effective to cause the cross totalizer to move in unison with the main carriage as each vertical totalizer passes through the computing zone or only to move in unison with the main

carriage as any selected one of the vertical totalizers travels through the computing zone, and automatically operating means co-acting with said hand controlled means to prevent a displacement thereof from its set position during a portion only of the travel of the main carriage.

11. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers movable therewith, a cross totalizer, automatically operating pick-up mechanism for causing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism including pick-up members one for each vertical totalizer and movable into and out of effective position, automatically operating means for moving said members to ineffective position, and keys for moving said members to effective position.

12. In a calculating machine, the combination of a main carriage, a plurality of vertical totalizers movable therewith, a cross totalizer, automatically operating pick-up mechanism for causing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism including pick-up members one for each vertical totalizer and movable into and out of effective position, springs for moving said members to ineffective position, keys for moving said members to effective position, and automatically operating means for preventing each of said members from returning to normal position under the force of its spring when the corresponding vertical totalizer is passing through the computing zone.

13. In a calculating machine, the combination of a main carriage, a cross totalizer, pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, key controlled selective means for selectively determining at what points in the travel of the main carriage the pick-up mechanism shall be effective to pick up and move the cross totalizer and at what points it shall be ineffective, and means for returning said selective means including an actuated key thereof to normal position after the corresponding vertical totalizer has passed through the computing zone.

14. In a calculating machine, the combination of a main carriage; a vertical totalizer; a cross totalizer; pick-up mechanism for causing the cross totalizer to be connected with the vertical totalizer to travel in unison therewith and permit the cross totalizer to return independently of said vertical totalizer, said pick-up mechanism comprising a pick-up engaging lug on the vertical totalizer and a pick-up beam; a special key; and means controlled thereby for effecting a relative displacement be-

tween said lug and beam to control the effectiveness and ineffectiveness of the former to engage and carry the latter with it.

15. In a calculating machine, the combination of a main carriage; a vertical totalizer; a cross totalizer; pick-up mechanism for causing the cross totalizer to be connected to and travel in unison with and permit it to return independently of said vertical totalizer, said pick-up mechanism comprising a pick-up or engaging lug on the vertical totalizer and a pick-up beam on the frame of the machine; and means whereby said pick-up lug may be shifted into and out of co-operative engaging relation with said pick-up beam.

16. In a calculating machine, the combination of a main carriage; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism comprising a pick-up lug on the carriage and a pick-up beam on the frame of the machine; means which enable said pick-up lug to be shifted into and out of co-operative relation with said pick-up beam; means which automatically shifts said lug to one of said positions; and a key for shifting said lug to the other of said positions.

17. In a calculating machine, the combination of a main carriage; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism comprising a pick-up lug on the carriage and a pick-up beam on the frame of the machine; means which enable said pick-up lug to be shifted into and out of co-operating relation with said pick-up beam; a spring which shifts said lug to one of said positions; and detaining means which holds said lug in the other of said positions and against the force of said spring.

18. In a calculating machine, the combination of a main carriage; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism comprising a pick-up engaging lug and a pick-up beam; automatically operating means for effecting a relative displacement between said lug and beam out of co-operative relation and for thus maintaining them while the cross truck remains at rest in its normal position, thereby rendering the lug ineffective to pick-up the cross totalizer and move it from normal position, and an automatically returned key whose operating movement shifts said means to render the pick-up lug effective on said beam.

19. In a calculating machine, the combination of a main carriage; vertical total-

izers carried thereby; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism including selective means for determining whether said pick-up mechanism shall be effective or ineffective to move the cross totalizer in unison with the main carriage as each vertical totalizer passes through the computing zone; and automatically operating means for returning to normal position such of said selective means as are set to cause the pick-up mechanism to be effective.

20. In a calculating machine, the combination of a main carriage; vertical totalizers; a cross totalizer; and pick-up mechanism for causing said cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism including a series of devices one for each vertical totalizer and which may be selectively set to determine whether the cross totalizer shall move in unison with the main carriage as each vertical totalizer passes through the computing zone or shall be allowed to remain at rest in its normal position; and automatically operating means for returning to ineffective position such of said devices as are set to render the pick-up mechanism effective.

21. In a calculating machine, the combination of a main carriage, vertical totalizers, a cross totalizer, pick-up mechanism for causing said cross totalizer to travel in unison with and permit it to return independently of each of said vertical totalizers, said pick-up mechanism comprising a pick-up engaging lug on each vertical totalizer adapted to connect with the cross totalizer to move the latter, and selective means for rendering said cross totalizer quiescent in its normal position during the passage of any desired number of said vertical totalizers through the computing zone.

22. In a calculating machine, the combination of a main carriage; vertical totalizers; a cross totalizer; and pick-up mechanism for causing said cross totalizer to travel in unison with and permit it to return independently of each of said vertical totalizers, and having selective means for rendering said cross totalizer quiescent during the passage of any desired number of said vertical totalizers through the computing zone, said pick-up mechanism including a pick-up beam and pick-up engaging lugs one of the latter on each vertical totalizer employed, and means whereby a relative shifting movement between said engaging lugs and beam into and out of co-operative engaging relation may be effected.

23. In a calculating machine, the combination of a main carriage; vertical total-

izers; a cross totalizer; pick-up mechanism for causing said cross totalizer to travel in unison with and permit it to return independently of said main carriage and having selective means for rendering said cross totalizer quiescent during the passage of any desired number of said vertical totalizers through the computing zone, said pick-up mechanism comprising a pick-up beam and pick-up lugs one of the latter for each vertical totalizer employed, and means whereby a shifting movement of said lugs into and out of co-operative relation with the beam may be effected; and automatically operating means for rendering each effective lug ineffective on the pick-up beam after the corresponding vertical totalizer passes through the computing zone.

24. In a calculating machine, the combination of a main carriage; vertical totalizers; a cross totalizer; pick-up mechanism for causing said cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism comprising a series of devices one for each vertical totalizer and which may be selectively set to determine whether the cross totalizer shall move in unison with the main carriage as each vertical totalizer passes through the computing zone or shall be allowed to remain at rest in its normal position; and means for preventing each of said selective devices from being moved from the position in which it is set while its vertical totalizer is passing through the computing zone.

25. In a calculating machine, the combination of a main carriage; vertical totalizers carried thereby; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism including a pick-up lug carried by each vertical totalizer; means whereby each of said lugs may be shifted into and out of effective position, a separate key for shifting each of said lugs into effective position, automatically operating means for holding the lugs in effective position, and automatically operating means for returning each lug to ineffective position after the companion vertical totalizer passes through the computing zone.

26. In a calculating machine, the combination of a main carriage; vertical totalizers carried thereby; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism including a pick-up lug carried by each vertical totalizer; means whereby each of said lugs may be shifted into and out of effective position, a separate key for shifting each of said lugs into effective position, automatically operating

means for holding the lugs in effective position, automatically operating means for returning each lug to ineffective position after the companion vertical totalizer passes through the computing zone, and means whereby each of said lugs may be retained indefinitely in its effective position.

27. In a calculating machine, the combination of a main carriage; a master dog; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism including a pick-up lug shiftable into and out of effective position; and which during its shifting movement passes a point where ordinarily it might be brought into conflict with said master dog during the travel of the carriage; and means for preventing the pick-up lug from colliding with the master dog.

28. In a calculating machine, the combination of a main carriage; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism including a pick-up lug shiftable into and out of effective position; a master dog with which said lug would collide if the latter were maintained in an intermediate position but which clears the master dog if the lug be set in either the effective or ineffective position; and controlling means for compelling a setting of said lug in either the effective or ineffective position before it reaches the master dog.

29. In a calculating machine, the combination of a main carriage; a cross totalizer; pick-up mechanism for causing the cross totalizer to travel in unison with and permit it to return independently of said main carriage, said pick-up mechanism including a pick-up lug shiftable into and out of effective position; a master dog with which said lug would collide if the latter were maintained in an intermediate position but which clears the master dog if the lug be set in either the effective or ineffective position; and controlling means for compelling a setting of said lug in either the effective or ineffective position before it reaches the master dog and for preventing a shifting of said lug after it comes under control of said controlling means and until after the master dog has been passed.

30. In a calculating machine, the combination of a main carriage, a vertical totalizer carried thereby, a cross totalizer, and pick-up mechanism for automatically causing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism comprising a carrier mounted on a side of the frame of the vertical totalizer and carrying a pick-up lug

movable with the carrier into and out of effective position.

31. In a calculating machine, the combination of a main carriage, a vertical totalizer carried thereby, a cross totalizer, and pick-up mechanism for automatically causing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism comprising a carrier mounted on a side of the frame of the vertical totalizer and carrying a pick-up lug movable with the carrier into and out of effective position and having an inner contact face the plane of which is coincident with the plane of the inner side of the totalizer frame on which the carrier is mounted.

32. In a calculating machine, the combination of a main carriage; a vertical totalizer carried thereby; a cross totalizer; and pick-up mechanism for automatically causing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism comprising a carrier mounted on a side of the frame of the vertical totalizer and carrying a pick-up lug movable with the carrier into and out of effective position, said carrier also having a locking notch therein; and a master dog adapted to be received in said locking notch.

33. In a calculating machine, the combination of a main carriage, a vertical totalizer carried thereby, a cross totalizer, and pick-up mechanism for automatically causing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism comprising a carrier mounted on a side of the frame of the vertical totalizer and carrying a pick-up lug movable with the carrier into and out of effective position, a lever which controls said carrier, and a key carried by said lever.

34. In a calculating machine, the combination of a main carriage, a vertical totalizer carried thereby, a cross totalizer, and pick-up mechanism for automatically causing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism comprising a carrier mounted on a side of the frame of the vertical totalizer and carrying a pick-up lug movable with the carrier into and out of effective position, a lever which controls said carrier, and automatically operating controlling means coacting with said lever to shift it.

35. In a calculating machine, the combination of a main carriage, a vertical totalizer carried thereby, a cross totalizer, and pick-up mechanism for automatically caus-

ing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism comprising a slide mounted on a side of the frame of the vertical totalizer and carrying a pick-up lug movable with the slide into and out of effective position, a lever which controls said slide, a key carried by said lever to move it in one direction, and automatically operating means for moving the lever in the opposite direction.

36. In a calculating machine, the combination of a main carriage, a vertical totalizer carried thereby, a cross totalizer, and pick-up mechanism for automatically causing the cross totalizer to travel in unison with and return independently of said main carriage, said pick-up mechanism comprising a slide mounted on a side of the frame of the vertical totalizer and carrying a pick-up lug movable with the slide into and out of effective position, a lever which controls said slide, a key carried by said lever to move it in one direction, automatically operating means for moving the lever in the opposite direction, and detaining means for locking the slide so as to maintain the pick-up lug indefinitely in its effective position.

37. In a calculating machine, the combination of a main carriage, a vertical totalizer carried thereby and having a portion of one of the side plates of its frame cut out, a cross totalizer, and pick-up mechanism for alternately causing the cross totalizer to travel in unison with and return independently of the main carriage, said pick-up mechanism comprising a pick-up lug mounted on the vertical totalizer to move in the cut-out in the frame thereof into and out of effective position.

38. In a calculating machine, the combination of a main carriage, a vertical totalizer carried thereby and having a portion of one of the side plates of its frame cut out, a cross totalizer, and pick-up mechanism for alternately causing the cross totalizer to travel in unison with and return independently of the main carriage, said pick-up mechanism comprising a pick-up lug mounted on the vertical totalizer to move in the cut-out in the frame thereof into and out of effective position, and means for setting and maintaining said lug in either its effective or ineffective position, as may be desired.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 14th day of November, A. D. 1923.

CHARLES E. SMITH.