

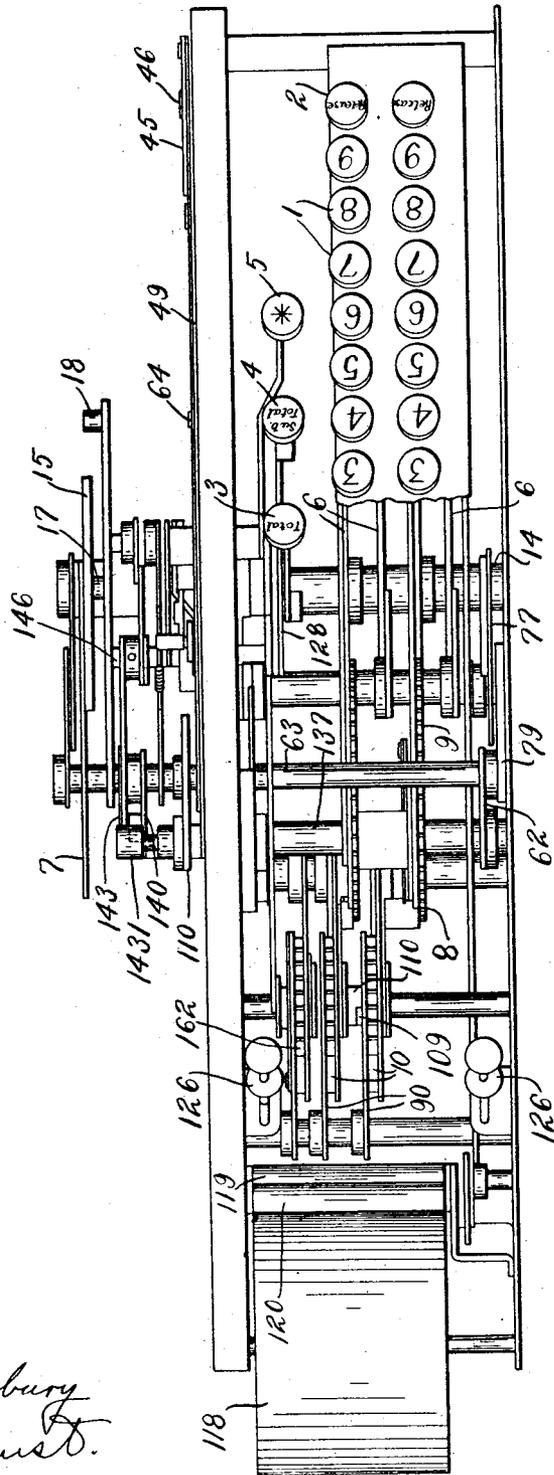
1,045,258.

E. S. CHURCH.  
ADDING MACHINE.  
APPLICATION FILED MAY 5, 1911.

Patented Nov. 26, 1912.

10 SHEETS—SHEET 1.

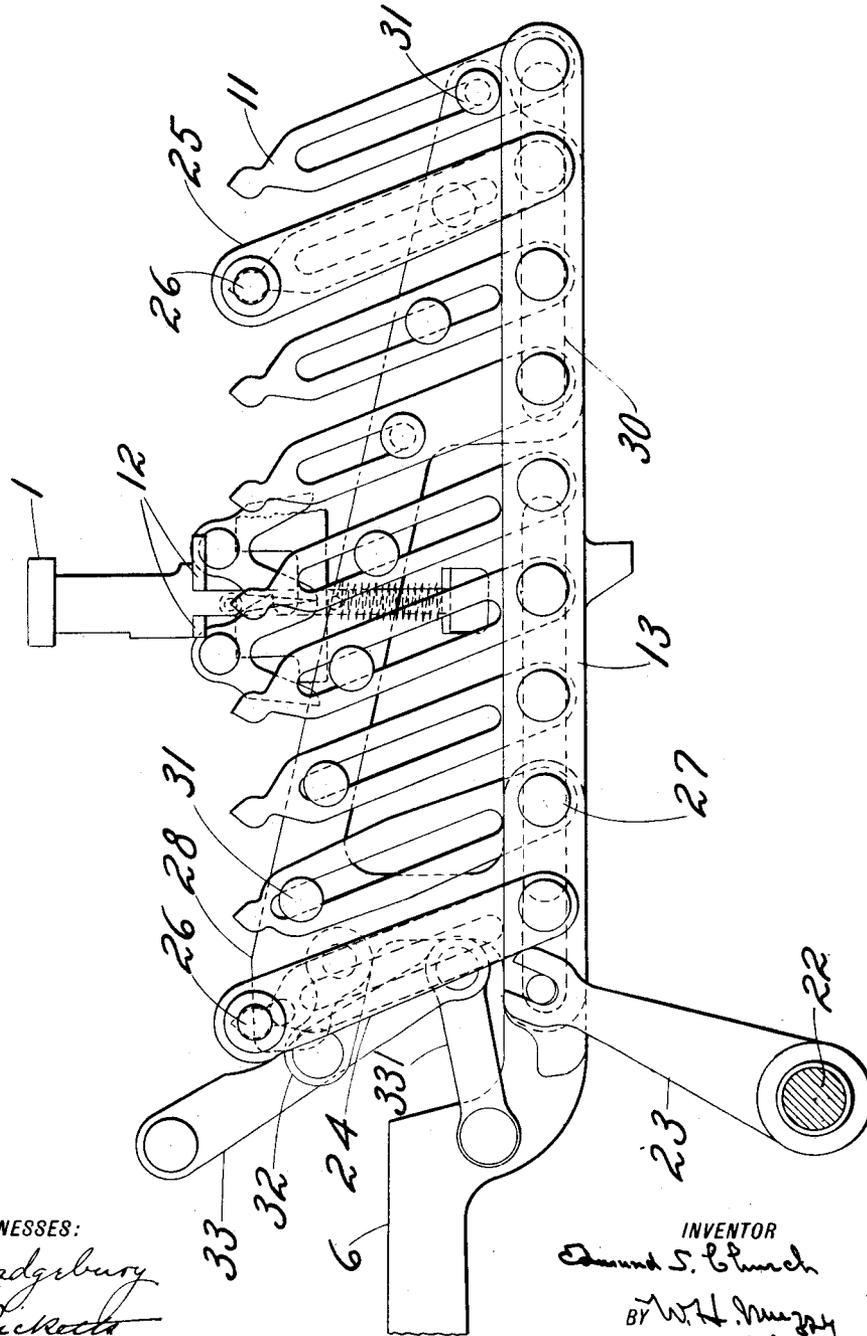
FIG. 1.



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FIG. 2.



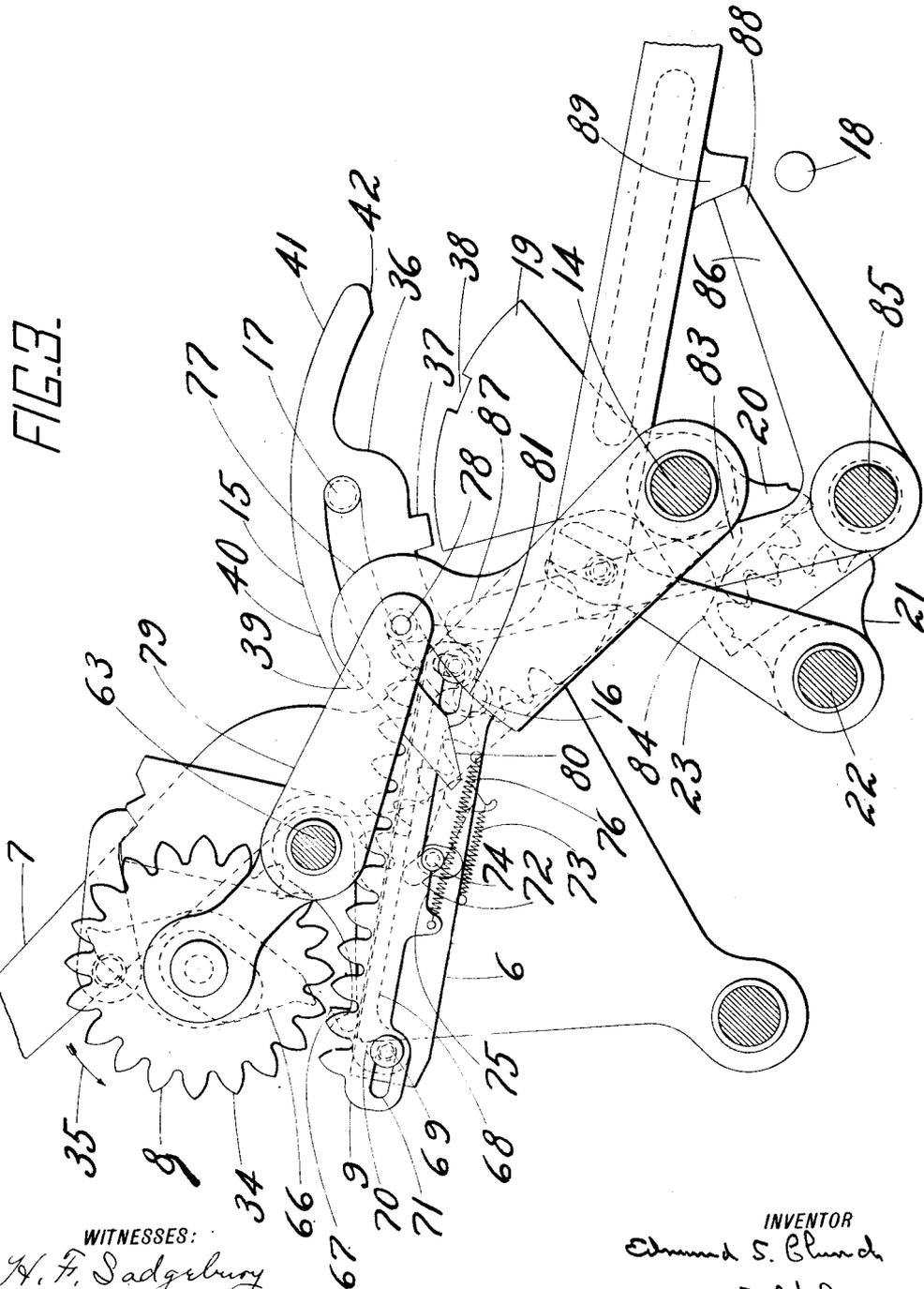
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10 SHEETS—SHEET 3.



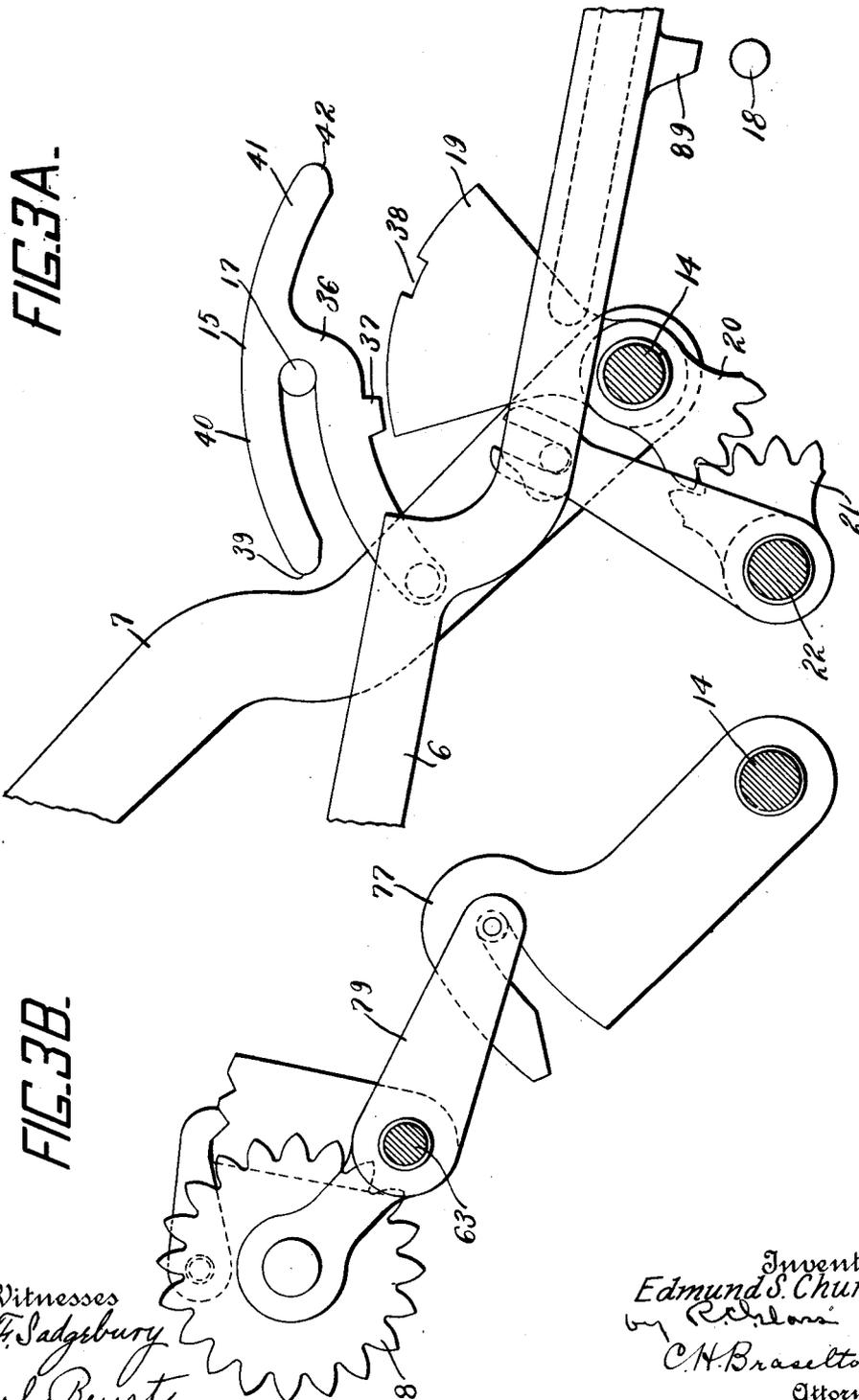
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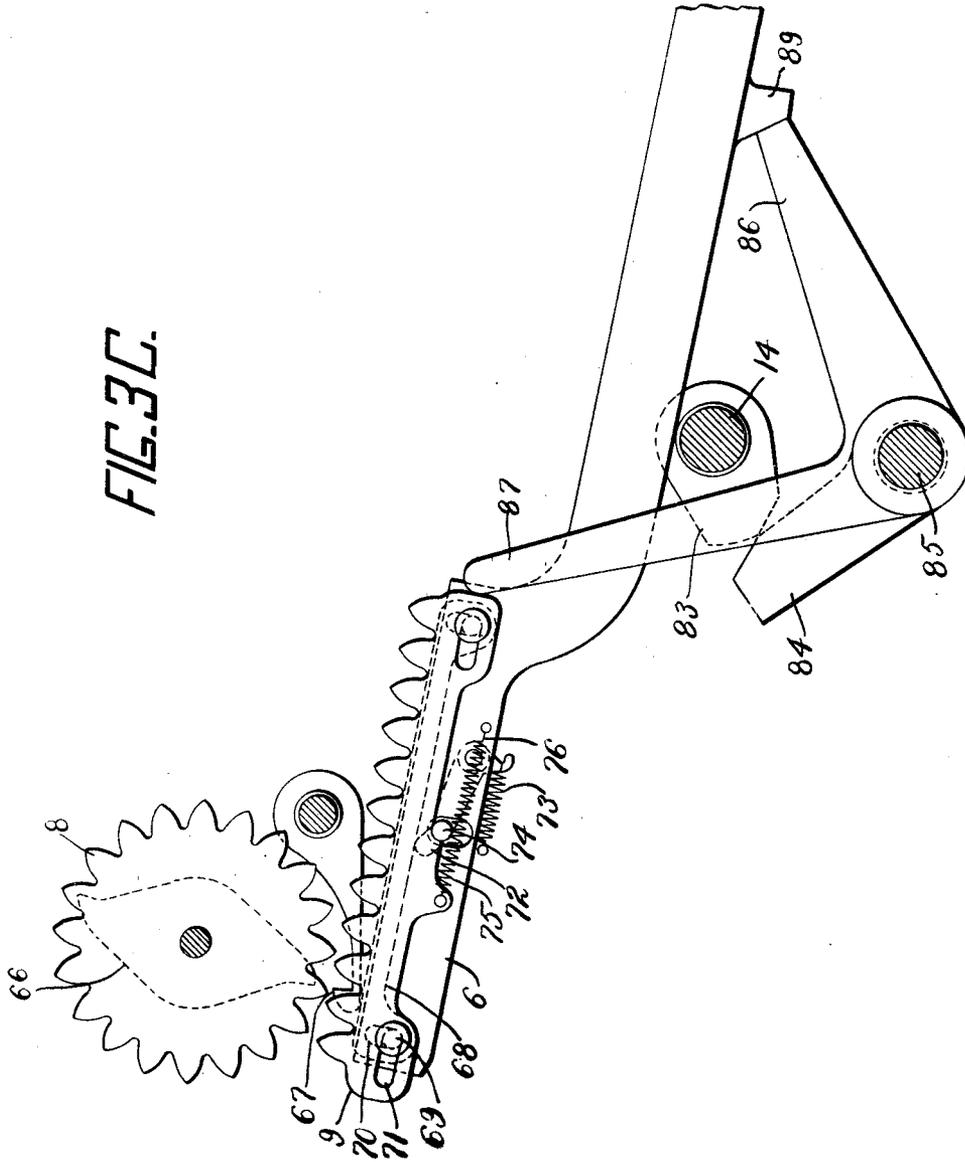
Patented Nov. 26, 1912.  
10 SHEETS—SHEET 4.



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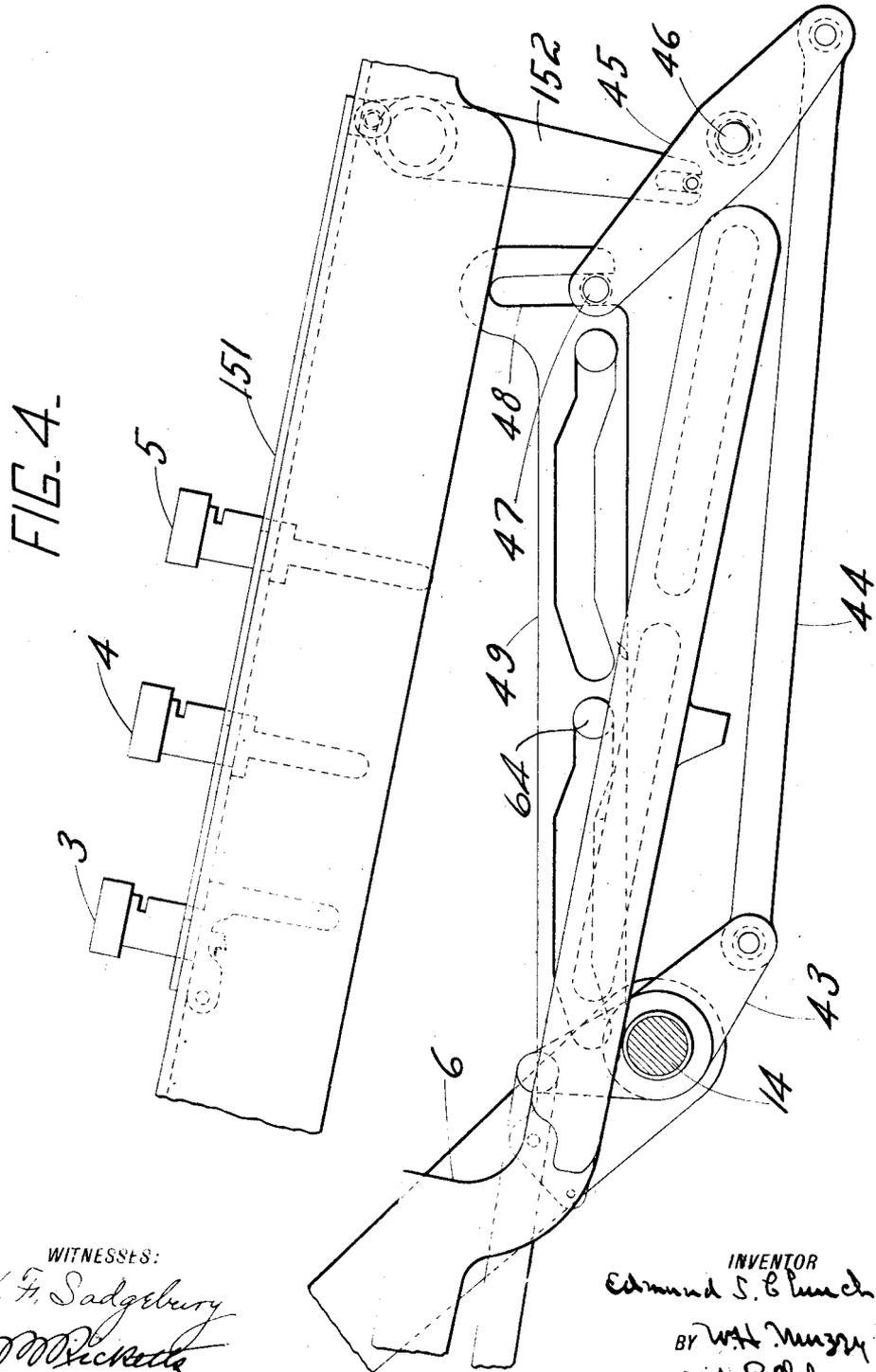
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FIG. 3C.



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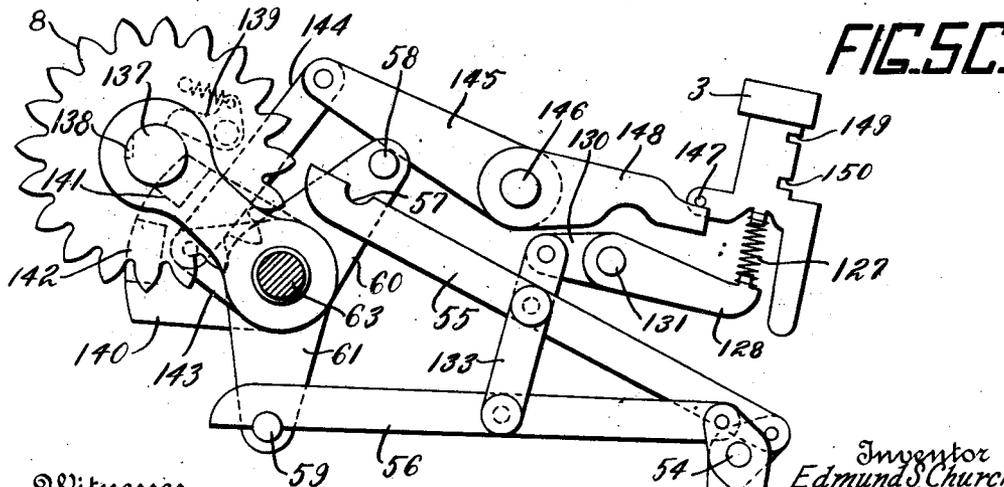
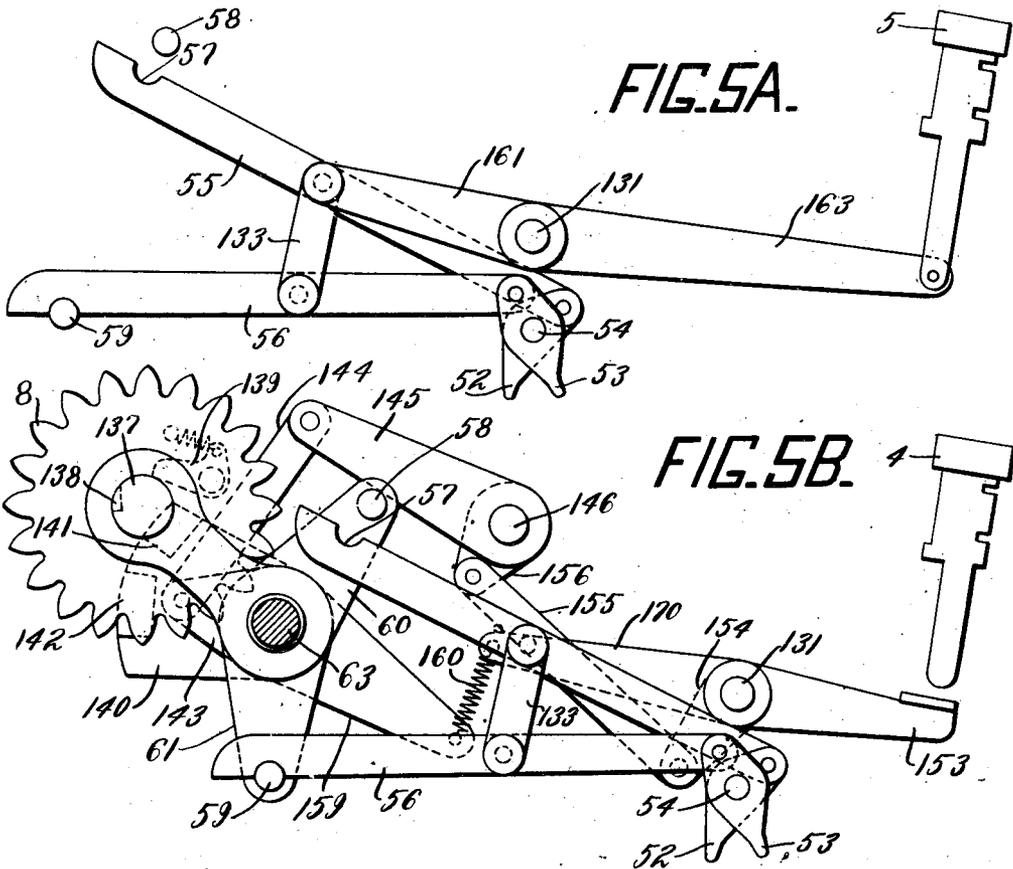
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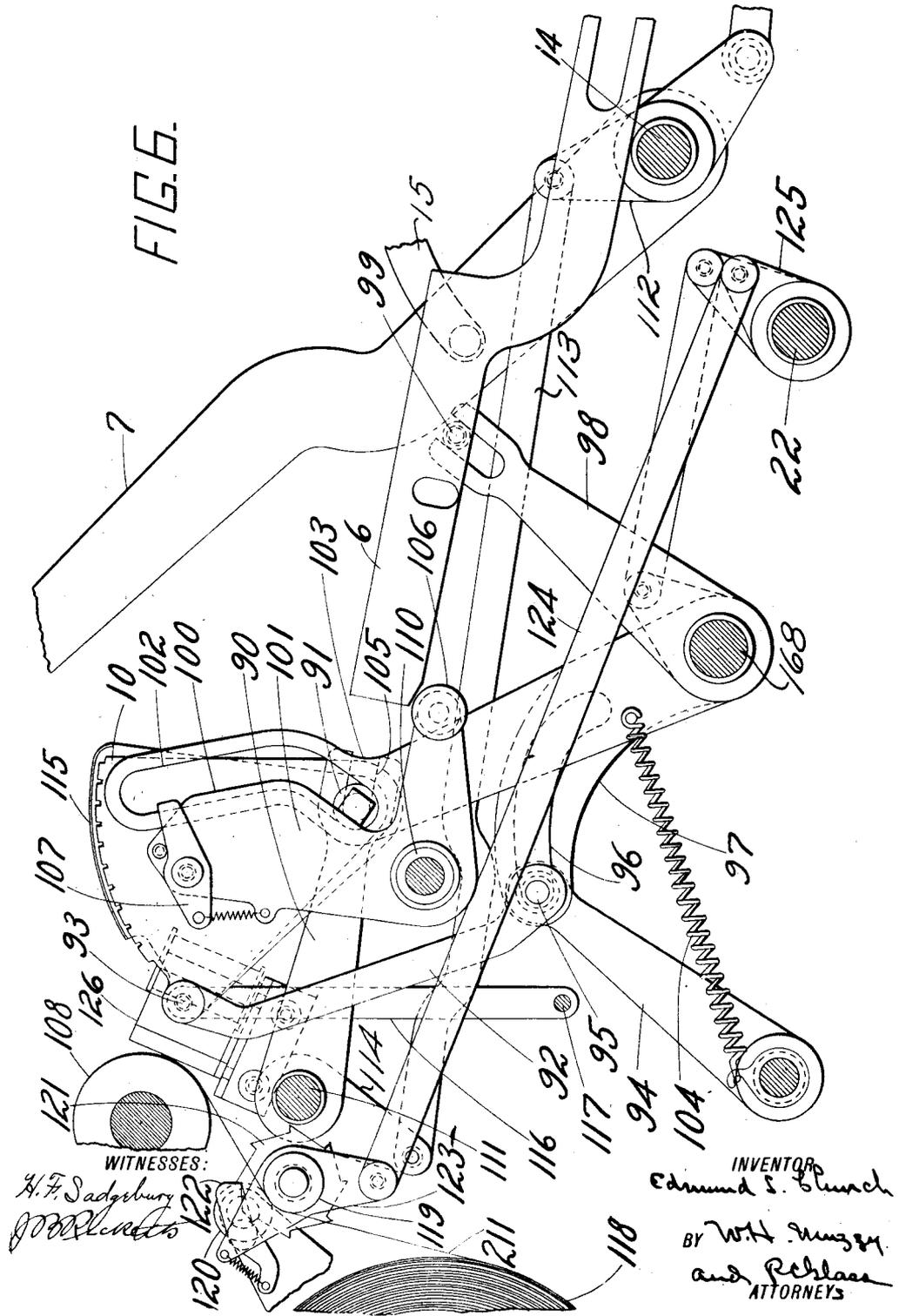
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E. S. CHURCH.  
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Patented Nov. 26, 1912.  
10 SHEETS—SHEET 9.



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ADDING MACHINE.

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10 SHEETS—SHEET 10.

1,045,258.

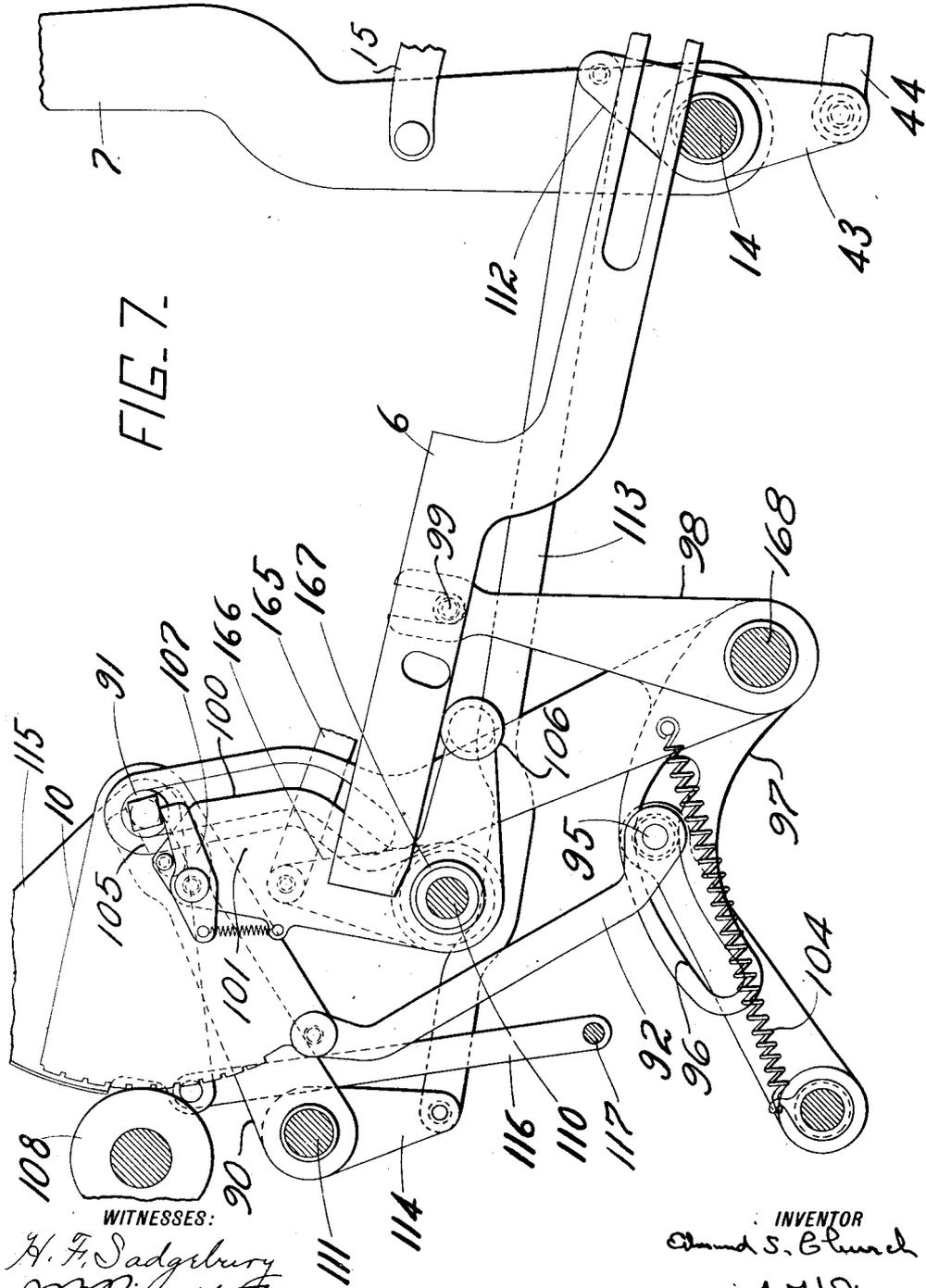


FIG. 7.

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# UNITED STATES PATENT OFFICE.

EDMUND S. CHURCH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

## ADDING-MACHINE.

1,045,258.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed May 5, 1911. Serial No. 625,170.

*To all whom it may concern:*

Be it known that I, EDMUND S. CHURCH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Adding-Machines, of which I declare the following to be a full, clear, and exact description.

This invention relates to adding machines and its prime object is to provide an adding machine with a printing device so arranged that impressions are visible immediately after being effected.

The above object brings to mind visible printing typewriters but the present invention is somewhat different in that visible printing as accomplished in typewriters is not readily applicable to adding machines because of the difference of work performed. Adding machines usually having a plurality of denominational type carriers suitable for operation by differential mechanism whereas typewriters as a rule are provided with individual carriers for each type.

To obtain visible printing by means of type carriers having a plurality of type thereon is, therefore, an aim of this invention.

Other objects of this invention are to combine the visible printing mechanism with the keyboard and differential mechanism construction described in a pending application of E. S. Church, filed June 16, 1909, Serial No. 502,541, and also to provide suitable mechanism in combination whereby total printing and resetting may be accomplished by operations of the machine.

The totalizer of this machine may be made inoperative while the printing mechanism is left operative as is usual in adding machines, but the means here employed is believed to be novel with the present case.

With these and incidental objects in view the invention consists in certain novel features of construction and combinations of parts the essential elements of which are set forth in appended claims and the preferred form of embodiment of which is hereinafter described with reference to the drawings which accompany and form part of the specification.

Of said drawings Figure 1 is a top plan view of an adding machine constructed according to the invention. Fig. 2 is a fragmentary view in side elevation illustrating

how differential rotating of totalizer pinions and differential setting of type carriers is attained. Fig. 3 is a right side elevation of the totalizer and its actuating racks and the mechanism by which the operating handle is connected to certain drive shafts. Figs. 3<sup>A</sup>, 3<sup>B</sup> and 3<sup>C</sup> are detail views of the mechanisms shown in Fig. 3. Fig. 4 is a detail in right side elevation illustrating certain special keys and how power is applied to a totalizer meshing device. Fig. 5 is a detail in right side elevation of the totalizer meshing device and the special keys which control the meshing device. Figs. 5<sup>A</sup>, 5<sup>B</sup> and 5<sup>C</sup> are detail views of the mechanisms shown in Fig. 5. Fig. 6 is a right side elevation of the printing mechanism in its normal position. Fig. 7 is a right side elevation of the printing mechanism showing the same in its moved position at the time an impression is taken.

The results attained by this machine with the exception of visible printing, are similar to those of other adding machines but the construction and operation of the machine are different. For this reason the invention will be described by following out the different modes of operation with reference to the specific construction shown in the drawings. Adding and detail printing will be described, then total printing, and finally resetting, but first the relative location of some of the main elements in the machine will be pointed out.

In the drawings—1 denotes banks of value keys; 2 release keys for the value keys; 3 a totalizing and resetting key; 4 a subtotalizing key; 5 an eliminating key for causing the totalizer to become inoperative while not effecting the printing mechanism; 6 rack carriers which carry racks serving for differentially actuating totalizer elements; 7 an operating handle by which power is applied to the machine; 8 the totalizer; 9 totalizer actuating racks; 10 type carriers; and 11 levers which serve to connect the rack carriers 6 with the driving mechanism and to determine the extent of movement of the carriers. The rack carriers 6 beside transmitting differential movement to the totalizer elements transmit differential movement to the type carriers 10.

For the purpose of avoiding duplication only two banks of keys and connected mechanism are shown in the accompanying draw-

ings but, of course, in practice the machine will be provided with several more banks of keys.

*Adding operation.*—In an adding operation all that is performed by the machine is rotation of the totalizer pinions in a forward direction, setting of type carriers according to the value of depressed keys, printing, and if necessary the operation of carrying devices.

It was stated that the keyboard and differential mechanism are not new in the present invention but for the sake of convenience they are here briefly described.

The value keys are arranged in numerical order from rear to front of the machine and each key is depressed into engagement with one end of a corresponding lever 11 for the purpose of fulcruming the lever at such end.

Each key has a pair of flanges 12 between which the end of its corresponding lever 11 enters when the key is depressed. (See Fig. 2). The levers 11 are all pivoted at their lower ends to a reciprocating link 13 driven an invariable extent at each operation of the machine by operating handle 7. (Figs. 3 and 7.) The handle 7 is loosely pivoted upon a shaft 14 but carries a clutch member 15 by which it is connected to shaft 14 during certain parts of its stroke. Clutch member 15 is pivoted to handle 7 by a pin 16 and is guided in its movement by stationary pins 17 and 18. It coacts with a clutch member 19 secured to shaft 14. The object of this relative movement between handle 7 and shaft 14 is to allow time for meshing and unmeshing the totalizer with its actuating racks 9 before and after the forward and return movement of the racks, which are driven by shaft 14 through the following connection. Shaft 14 is provided with a segment gear 20 (Fig. 3) meshing with a segment gear 21 fixed to a shaft 22. Shaft 22 also carries fixed thereto a plurality of forked arms 23. The number of these arms corresponds with the number of denominations represented in the keyboard. Each arm 23 is connected at its upper end to one of the links 13 which are carried by arms 24 and 25 hung from pins 26 of the machine frame. (See Fig. 2.) By the above connection the reciprocation of links 13 is accomplished. The lower ends of levers 11 are pivoted to links 13 by pins 27 and the levers 11 are also pivotally connected to a slide 28 which is guided in its movement by two of the pins 27 extending through slots 30 in the slides. In each bank the pivotal connections 31 between levers 11 and slides 28 are located at graduated distances from upper ends of the levers 11. Upon the rocking of arms 23, assuming that no key is depressed, the levers 11 rock different distances around their pivots 31 without causing movement of slide 28, but if a key is depressed the le-

ver 11 for such key will be compelled to rock around its pivotal connection with the key and accordingly cause movement of slide 28 corresponding to the distance of its pivot 31 from its pivotal connection with the depressed key. Looking from left to right (Figs. 1 and 2) the levers 11 coact with the "1" key at the left to the "9" key at the right.

Each slide 28 is connected to a rack carrier 6 by links 32, arms 33, and links 331 and, therefore, compels the rack carriers 6 to reciprocate according to the reciprocation of slides 28. In adding operations totalizer pinions 34 are rotated in the direction indicated by arrow 35 (Fig. 3) upon the return movement of slides 6. Accordingly the totalizer is meshed with racks 9 at the moment racks 9 come to rest in their moved positions at which time clutch member 15 is free from clutch member 19 for the purpose of preventing movement of carrier 6 at the time of meshing the totalizer.

The operating handle 7 is shown in its normal position in Fig. 3 and is operated by drawing the same forwardly until edge 36 of clutch member 15 strikes the stop 18 and is then returned to its normal position. Upon the forward movement of operating handle 7 pin 17 holds the clutch member 15 clear of clutch member 19 until a lug 37 formed on the clutch member 15 arrives opposite a notch 38 in member 19 at which time end 39 of an extension 40 of member 15 passes the pin 17 permitting member 15 to drop downwardly by its own weight or under spring action. Shaft 14 is then rocked forwardly with the handle 7 until the handle 7 nears its extreme forward position when an extension 41 of the member 15 at its beveled end 42 strikes pin 18. The engagement with pin 18 causes the member 15 to be rocked to disengage its lug 37 from the notch 38 formed in member 19 and it is held out of engagement during the further forward movement of handle 7 and during the return of the handle until the lug 37 again arrives opposite notch 38. This permits the rack carrier 6 to remain at rest during a sufficient length of time for meshing or unmeshing the totalizer before the rack carriers are returned to their home positions.

The movement of handle 7 while the racks are at rest is employed for meshing the totalizer as follows: Shaft 14 carries an arm 43 (Fig. 4) connected by a link 44 to a lever 45, pivoted to the machine frame by pivot 46. The lever 45 is provided at its upper end with a pin 47 extending through a slot 48 in a pitman 49 for the purpose of reciprocating the pitman. Pitman 49 carries a pair of pawls 50 and 51 (Fig. 5) which are broad enough to engage levers 52 and 53 and disengage either one or the other or both of the levers, both upon the forward and return

movement of pitman 49. Levers 52 and 53 are pivoted to the machine frame by a pin 54 and the lever 52 is pivotally connected at its upper end to a link 55 and the lever 53 to a link 56. These links are provided with notches 57 at their rear ends for the purpose of respectively engaging pins 58 and 59 on arms 60 and 61 of a totalizer carrying frame 62. The totalizer carrying frame is secured to a shaft 63 so that the totalizer may be rocked into and out of mesh by rocking shaft 63 independently of an actuation of links 55 and 56, as described farther on under the heading of "Total printing and resetting".

Upon the forward movement of operating handle 7 pitman 49 through the link and lever connection 44 and 45 is caused to move forwardly. It is guided in its movement by pins which extend from the machine frame, and after moving a slight distance in a forward direction pawl 50 engages lever 52 merely idly rocking the same with its link 55 a short distance, slots 65 through which the pins 64 extend causing the pitman to lower clear of lever 52 at about the time lever 52 reaches the position of lever 53. After the pawl 50 has passed by the levers 52 and 53, the rear ends of slots 65 cam the pitman to its former position. It may be seen from the way in which the pawls 50 and 51 are mounted that upon this camming movement of pitman 49, pawl 51 may rock downwardly when it engages levers 52 and 53. Soon after the beginning of the return movement of pitman 49 pawl 51 engages levers 52 and 53 rocking lever 53 so that its link 56 is drawn forwardly and this through pin 59 and arm 61 rocks the totalizer into mesh. This occurs before rack carriers 6 start to return to their home position. Its engagement with lever 52 causes the idle return of this lever and its link 55.

If one of the totalizer pinions passes from "9" to "zero" when actuated by racks 9 upon their return movement, one of a series of carrying cams 66, which is rigid with such pinion, engages a transfer tripping pawl 67 rocking the same downwardly into engagement with a plate 68 which is carried by pins 69 on the rack carrier 6 of next higher order. Pins 69 extend through vertical slots 70 in plates 68 and through horizontal slots 71 in their respective racks 9. Plate 68 is normally held in its upper position by a pawl 72 which is held in engagement with plate 68 by a spring 73. Pawl 72 carries a pin 74 which extends across the forward edge of a shoulder 75 of rack 9. When plate 68 is depressed pawl 72 is rocked downwardly so that its pin 74 is carried away from shoulder 75. Rack 9 then springs forwardly as urged by spring 76 and by this means rotates its respective totalizer pinion an extra unit as required in a carrying operation. After racks 9 have come to rest the

totalizer is rocked out of mesh by a slotted cam 77 carried by shaft 14. (Fig. 3.) This cam for the purpose of rocking the totalizer out of mesh engages a roller 78 on a forwardly extending arm 79 on the totalizer carrying shaft 63.

The totalizer is rocked out of mesh at the time the beveled edge 80 of cam 77 engages roller 78 and it will be seen by the length of slot 81 in the cam that the drive shaft 14 rotates still farther before coming to rest. Upon this final movement of the drive shaft such of the racks 9 as have been tripped for the purpose of carrying, are returned to their normal relation with carriers 6 by a cam 83 fixed to shaft 14 and which engages an arm 84 of a shaft 85 rocking this shaft. Shaft 85 carries bell crank levers 86 corresponding in number to the racks 9 and when shaft 85 is so rocked upper ends 87 of the bell crank levers engage the forward ends of racks 9 returning the same to normal position and thereby permitting pawls 72 to return to normal position and again latch racks 9 against relative movement with respect to the carriers 6. Forward ends 88 of the bell crank levers 86 at the time of restoring, rock into engagement with lugs 89 of the rack carriers 6 thereby preventing the rack carriers from being carried rearwardly by springs 76 when the racks 9 are engaged by the upper ends 87 of the bell crank levers.

The type carriers 10 are all pivoted to an arm 90 by pins 91 which are carried by the type carriers and in order differentially to set the type carriers 10 as desired they are rocked rearwardly and downwardly from their pivots 91 by links 92 which are pivoted at their upper ends to the type carriers by pins 93 and at their lower ends to arms 94 by pins 95. (Fig. 6.) The pins 95 extend through eccentric slots 96 in cams 97 which are loosely pivoted upon shaft 168 but rigid with arms 98 which are pivotally connected with rack carriers 6 by pins 99. This connection serves to cause the arms 98 to rock rearwardly according to the rearward movement of rack carriers 6 and through the cams 97 and links 92 to rock the type carriers 10 similar extents around their pivots 91. When the type carriers are at rest in their set positions impressions are taken by rocking arms 90 upwardly which movement causes pins 91 to ride upwardly along the forward edges 100 of bell crank levers 101 and along slots 102 of arms 103 which are loosely pivoted upon shaft 168. Springs 104 urge the arms 102 to rock rearwardly but are normally prevented from action by pins 91 which are normally in the rear ends of slots 105 in arms 90. The initial movements of rack carriers 6 cause the corresponding bell crank levers 101 to rock forwardly through engagement with rolls 106 on these levers. The forward rocking of

bell crank levers 101 forces pins 91 toward the forward ends of slots 105 in the arms 90 and then upon the upward rocking of arms 90 when the pins pass pawls 107, which are carried by bell crank levers 101, the pins 91 spring rearwardly in the slots 105 under the action of springs 104 and through arms 103. This transverse movement of pins 91 causes the type carriers 10 to be forced into engagement with a platen 108 thereby to effect an impression. If any one of rack carriers 6 remains in its zero position upon the operation of the machine its corresponding bell crank lever 101 will normally remain in its normal position and will, therefore, permit the respective pawl 107 to remain in its normal position preventing transverse movement of its pin 91 and for this reason such type carrier will not be projected against the platen when pin 91 arrives above the pawl 107. Means are, however, provided for effecting cipher printing when keys are not depressed in the banks for the respective segments, which accomplish the desired printing provided a key of higher order than these segments is depressed. This means merely consists of overlapping lugs 109 (Fig. 1) of hubs 110 for bell crank levers 101. This arrangement permits independent movement of bell crank levers of lower order if the ones of higher order are permitted to remain in normal position but if a bell crank lever 101 of higher order is rocked by its respective rack carrier 6, it compels through these lugs the bell crank levers of lower order to be similarly rocked. The arms 90 are all carried by a shaft 111 which is rocked for the purpose of actuating the arms by shaft 14 through an arm 112 on shaft 14, link 113, and an arm 114 on shaft 111.

The type carriers 10 are invisible as they are provided with a shield 115 which is carried by arms 90 and therefore moves with the type carriers when the same are projected against platen 108. (Fig. 6.) At the point where the type carriers are pivoted to links 92 the shield 115 is pivoted to links 116 but these links are not movable in a longitudinal direction as are links 92, being pivoted to the frame of the machine by fixed pins 117. The links 116, of course, are not prevented from rocking upon their pivots 117 as such rocking movement is necessary when arms 90 are rocked upwardly. The links 92 of the type carriers also rock rearwardly from pivots 95 upon the rise of arms 90 and therefore only a very slight horizontal movement of the type carriers is required to effect an impression.

The strip of record paper 211 is fed from a supply roll 118 by a pair of feed rolls 119 and 120. The feed roll 119 is rigid with a ratchet 121 which is actuated to rotate one tooth space upon each operation of the ma-

chine by a pawl 122 which is carried by a lever 123 loosely mounted upon the shaft of roll 119. The lever 123 is connected at its lower end to the oscillating shaft 22 by means of a link 124 and an arm 125 on shaft 22.

An ink ribbon is fed between the type carriers and the platen but feeding mechanism for this ink ribbon is omitted from the drawings. Carrying spools 126 for the ink ribbon are shown in Figs. 1 and 6. It may be seen from Fig. 6 that the ink ribbon spools are carried at a suitable angle so that the ink ribbon will not prevent seeing impressions. At the time impressions are made the ink ribbon is first engaged by the type at its upper edge and then carried rearwardly into engagement with platen 108.

*Resetting and total printing.*—The total which is accumulated by totalizer 8 may be printed and the totalizer reset by operating the machine simply by depressing the key 3 and then operating handle 7 in the usual manner. (See Figs. 1 and 5.) The total key 3 and also the subtotal key 4 may be provided with mechanical connections for preventing depression of value keys when either one of these keys is in its depressed position, but as this is a usual arrangement in adding machines such connections are omitted from the drawings. Total printing and resetting in this machine is accomplished in the well known manner of reversely rotating the totalizer pinions to their zero position and employing their rotation at this time for setting up the type carriers. In the present machine the connections employed for resetting operations are as follows: The total key when depressed, through a spring 127, rocks an arm 128 fixed upon a shaft 129 and through this shaft, an arm 130 and a link 131 lifts link 55 into engagement with pin 58 and link 56 out of engagement with pin 59, the links 55 and 56 being connected together by a link 133. Accordingly the conditions for meshing and unmeshing the totalizer are now reversed from normal, therefore upon the initial forward movement of pitman 49 when pawl 50 engages lever 52 the totalizer is rocked into mesh and is, therefore, in mesh during the forward stroke of operating handle 7 and upon the initial return movement of pitman 49 when pawl 51 engages lever 52 the totalizer is rocked out of mesh. The engagement of pawl 51 with lever 53 at this time does not perform any function, the link 56 merely idly reciprocating. The resetting of the totalizer pinions is accomplished by rotating the totalizer shaft 137 at the time that the totalizer is in mesh with racks 9 and for this purpose shaft 137 is provided with a plurality of notches 138 for engaging pawls 139 on the totalizer pinions when the shaft 138 is rotated. The totalizer pinions are re-

versely rotated to their zero positions by the rotation of shaft 137 and as they are in mesh with racks 9 at this time, the racks will be compelled to move rearwardly extents which correspond with the extents of backward rotation of the totalizer pinions. The type carriers are set through the levers 98 and cams 97 in the usual manner and the impression is also effected as described under the heading, "Adding operation" and while the rack carriers 6 are at rest in their moved positions.

In order that notches 138 in the totalizer shaft shall not prevent forward rotation of the totalizer pinions upon adding operations, the shaft 137 is normally in such position that the notches are not in the same planes as pawls 139. When total key 3 is depressed the shaft is shifted in a longitudinal direction thus bringing all of the notches 138 into coacting relation with the pawls 139. This shifting is accomplished by a cam member 140 which is journaled upon shaft 63 and is provided with two oppositely inclined shoulders 141 and 142. The shoulders 141 and 142 coact with inclined surfaces of collars 1431 on shaft 137 when the member 140 is oscillated. (Fig. 1.) The shoulder 142 serves to shift the shaft 137 so that notches 138 are brought into the planes of pawls 139 and shoulder 141 serves to return the shaft to its normal position after the resetting is accomplished. The cam member 140 is connected by a sleeve to an arm 143 which arm is connected by a link 144 to an arm 145 on shaft 146. This shaft is rocked in the direction of arrow 157 upon the depression of the total key by engagement of a pin 147 on the key with an arm 148 on shaft 146 and is reversely rocked upon release of key 3 by spring 169.

Each of the keys 3, 4 and 5 are provided with notches 149 and 150. These are for the purpose of coacting with a detent 151 (Fig. 4) which is reciprocated by a lever connection 152 with lever 45. The lever 152 is rocked upon every operation and in ordinary operations of the machine the detent serves to lock out all of the special keys but upon special operations of the machine serves to lock in its depressed position the particular special key which is depressed and to lock the remaining keys against depression.

The subtotal key 4 controls the machine in the same manner as the total key 3 except that when it is depressed it permits the totalizer 8 to remain in mesh both while being reset and upon the return of racks 9, therefore when the totalizer is finally unmeshed its pinions are in the same state as before being temporarily reset. The resetting in this case merely serves to set the type carriers for the total printing.

When the subtotal key 4 is depressed it

engages an arm 153 fast upon shaft 131 and through an arm 154 on this shaft, a link 155 and an arm 156 fastened to shaft 146, rocks the shaft 146 in the direction indicated by arrow 157 the same extent which this shaft is rocked upon depression of the totalizer key. By this means the cam member 140 is lifted causing the shaft 137 to shift to resetting position. Shaft 131 also carries fast thereon an arm 158 between which and an arm 159 fast upon shaft 63 spring 160 is extended. The rocking of shaft 131 therefore tensions spring 160. When the totalizer frame is released from cam 77 (Fig. 3) the spring will rock the totalizer into mesh with racks 9. Link 55 is provided with a pin 170 extending across the upper edge of arm 158, therefore when key 4 is depressed the links 55 and 56 connected by link 133 are lifted from normal position but the leverage between shaft 131 and key 4 is such that the link 55 will not be carried into engagement with pin 58 but link 56 will be lifted out of engagement with pin 59. The totalizer rocking mechanism is, therefore, not employed when subtotal key 4 is depressed, spring 160 being relied upon to mesh the totalizer and cam 77 to rock the totalizer out of mesh at the required time, that is after racks 9 are returned to home positions. Depression of the eliminating key 5 also rocks the links 55 and 56 to neutral position thus making the totalizer meshing devices inoperative but the depression of this key does not cause the tensioning of spring 160, therefore the totalizer remains in its unmeshed position upon the operation of the machine and as long as this key remains in its depressed position amounts which are set up upon the keyboard will not be added to the totalizer but merely printed upon the record strip. Links 55 and 56 are in this instance rocked to neutral position by a connection between the links and key 5 consisting of arms 163 and 161 fastened to sleeve 171, arm 161 being also pinned to link 133. The key 5 controls the operation of a special type carrier 162 causing this type carrier to print a special character for the purpose of indicating that the amount printed to the left of this character is not added to the amount on the totalizer. The key 5 is connected to the controlling bell crank lever 101 for this type carrier by arm 163, arm 164 which is rigid with arm 163 upon sleeve 171, link 165 and arm 166 (Fig. 7). This latter arm is secured to the particular bell crank lever 101 by a sleeve 167. Because of this arrangement bell crank lever 101 is rocked to operative position upon the depression of key 5 and the impression will take place. Special type carrier 162 carries only one type at the "zero" point and is not movable around its pivot 91.

While the form of mechanism herein shown and described is admirably adapted

to fulfil the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein shown and described as it is susceptible of embodiment in various forms all coming within the scope of the claims which follow.

What is claimed is:

1. In an accounting machine, the combination with a type segment, dual means for positioning said type segment one having a constant movement at each operation of the machine and the other a differential movement according to the amount to be recorded, a platen, and means rendered effective by an operation of the differential means for effecting the movement of the type carriers against the platen.

2. In an accounting machine, the combination with a type segment having two movable pivots, means for giving one of said pivots a constant movement at each operation of the machine, means for giving the other of said pivots a differential movement only when recording a given number, a platen, and means rendered operable whenever said differential movement is effected to force the type segment against the platen at the end of the said constant movement.

3. In an accounting machine, the combination with a type carrying segment having two pivots, one pivot central with respect to the type, the other eccentric to the type, of means for differentially rocking the type carrier around the eccentric pivot into engagement with the platen.

4. In an accounting machine, a printing device for effecting visible impressions comprising type carrying segments pivoted at two points, in combination with a platen, and means for effecting different impressions by differentially rocking the segments from the two pivots.

5. In an accounting machine, a printing device comprising a plurality of type carrying segments each pivoted at two points, in combination with a platen, and means for differentially rocking the type carriers from

one or both pivotal points for the purpose of effecting impressions. 50

6. In an accounting machine, the combination with a main operating mechanism including a handle and a connecting pawl driven thereby, of a notched disk to which said pawl may be connected, a differential mechanism comprising rack bars, connections from said notched disk for driving said differential mechanism, a totalizer, connections for engaging and disengaging said totalizer and said rack bars, and devices actuated directly by said operating handle for driving said totalizer engaging connections. 55 60

7. In an accounting machine, the combination with a totalizer and actuating devices therefor, of a pivoted totalizer carrying frame including arms extending in opposite directions from the pivot, oppositely moving links positioned separately to engage said extending arms, a total key having connections to shift said links a full distance to disengage one and engage the other with said totalizer frame, a sub-total key having connections to shift said links a part distance thereby disengaging both links from said totalizer frame, and a spring tensioned by said sub-total key and connected to shift said totalizer frame. 65 70 75

8. In an accounting machine, the combination with a totalizer and actuating devices therefor, of a pivoted totalizer carrying frame including arms extending in opposite directions from the pivot, oppositely connected together and moving links positioned to engage separately said totalizer arms, means to move said links whereby to engage and disengage said totalizer and its actuating devices, and an eliminating key, with connections from said key for shifting said links to positions where neither link engages said extending arms. 80 85 90

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

EDMUND S. CHURCH.

Witnesses:

FRED GERLACH,  
FRANK W. BEMM.