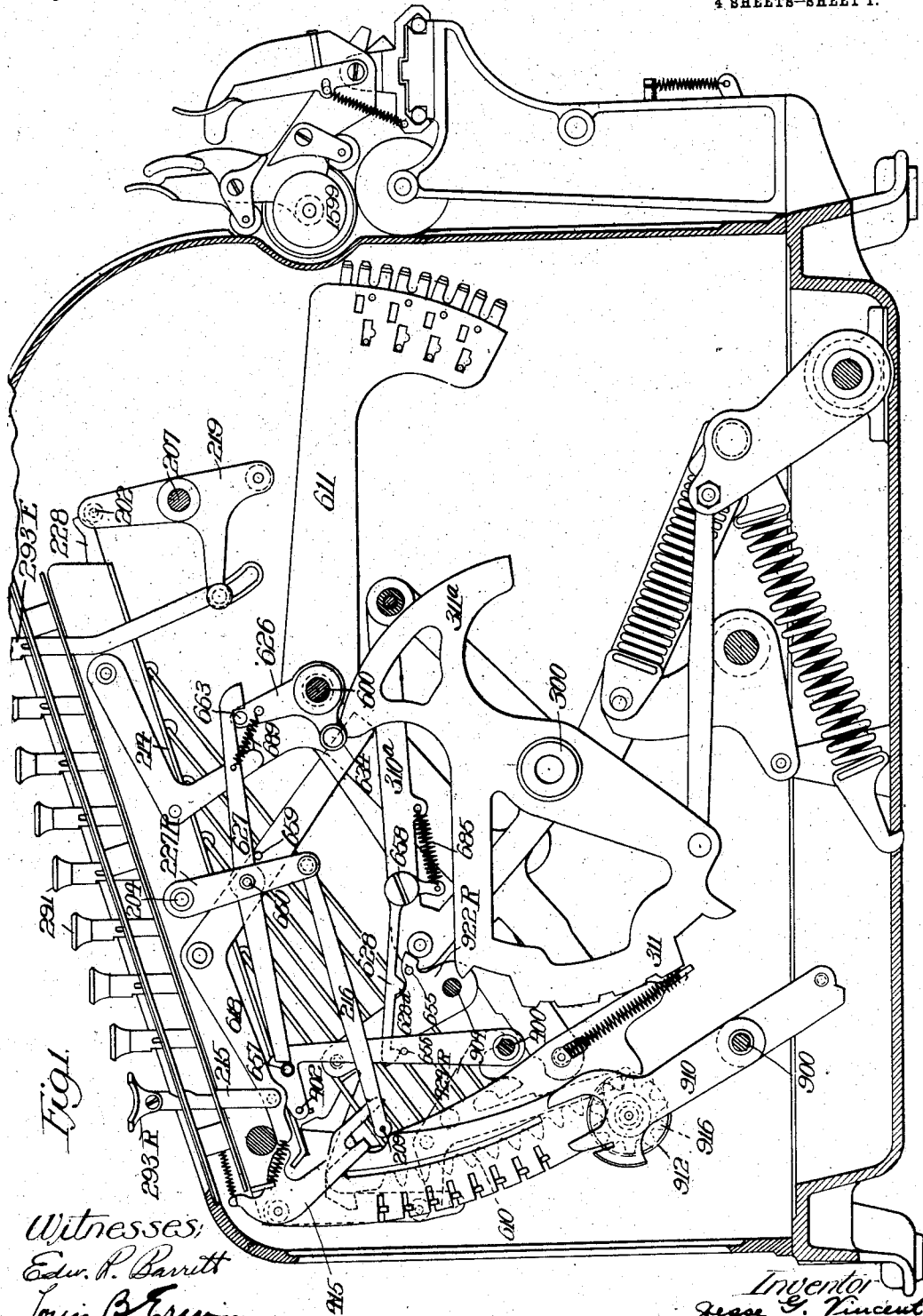


J. G. VINCENT.
 ADDING MACHINE.
 APPLICATION FILED MAY 27, 1905.

1,023,895.

Patented Apr. 23, 1912.
 4 SHEETS-SHEET 1.



Witnesses:
 Edw. R. Barrett
 Louis B. Egan

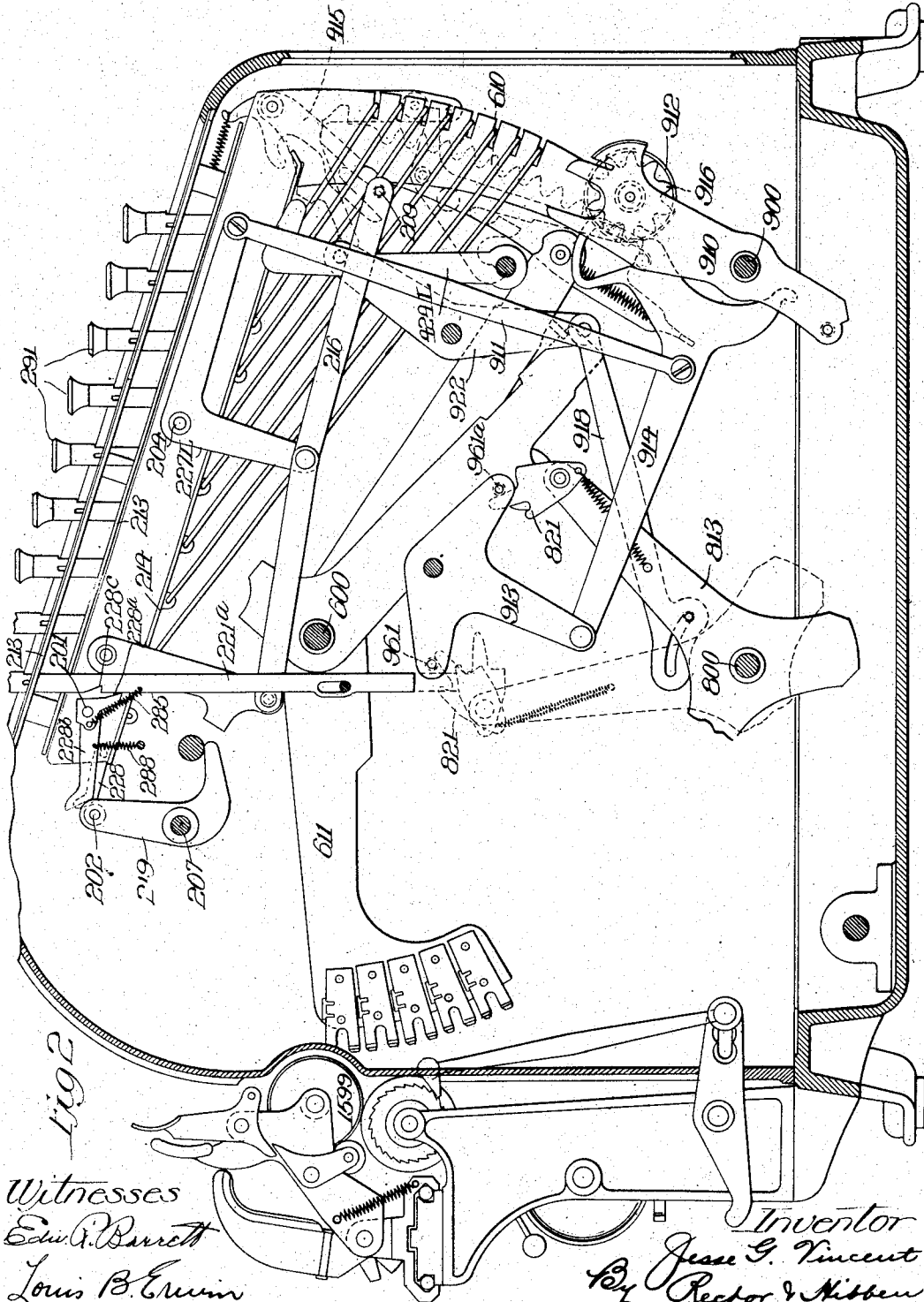
Inventor
 J. G. Vincent
 By Rector & Hibben
 Attys

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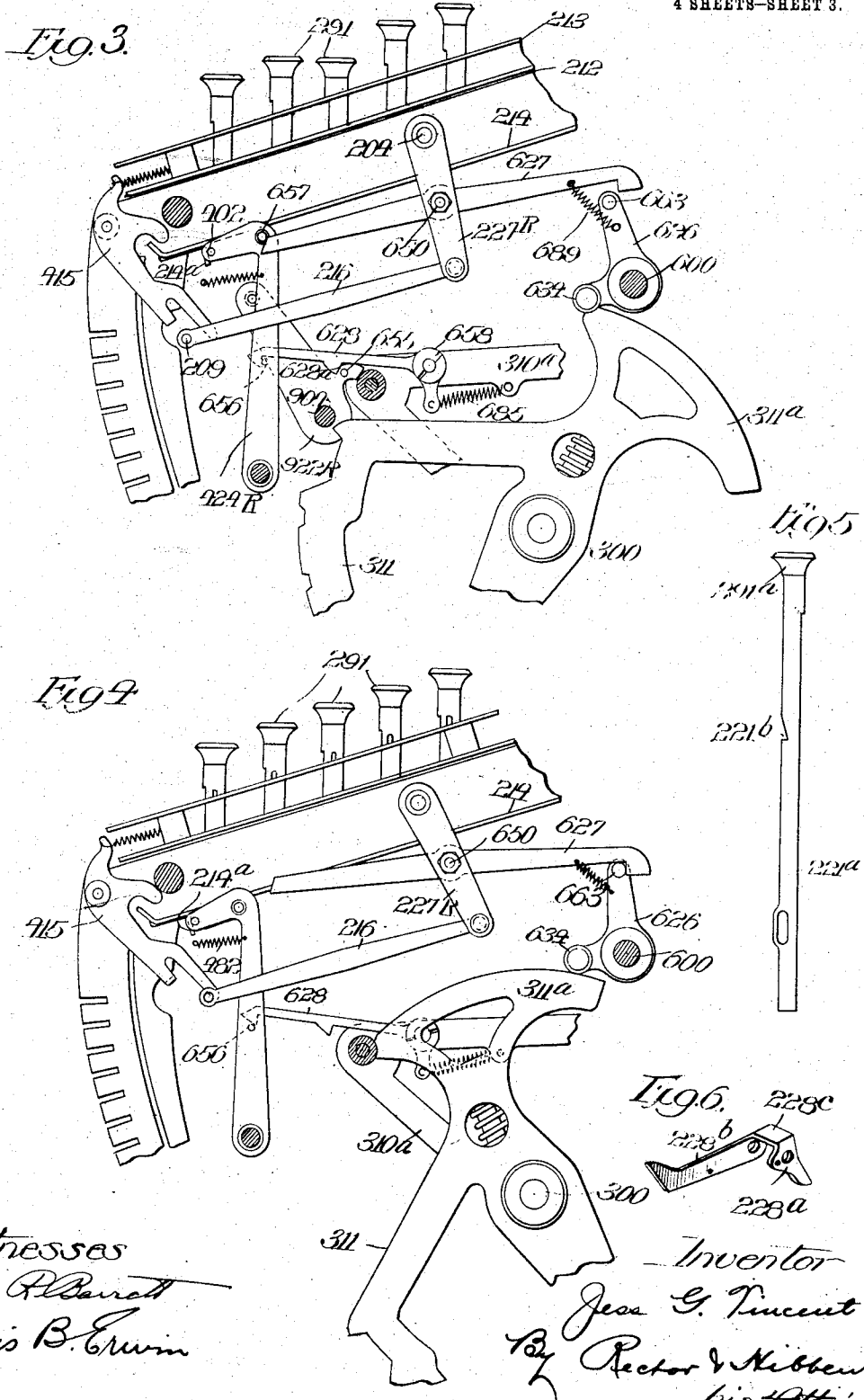
Inventor
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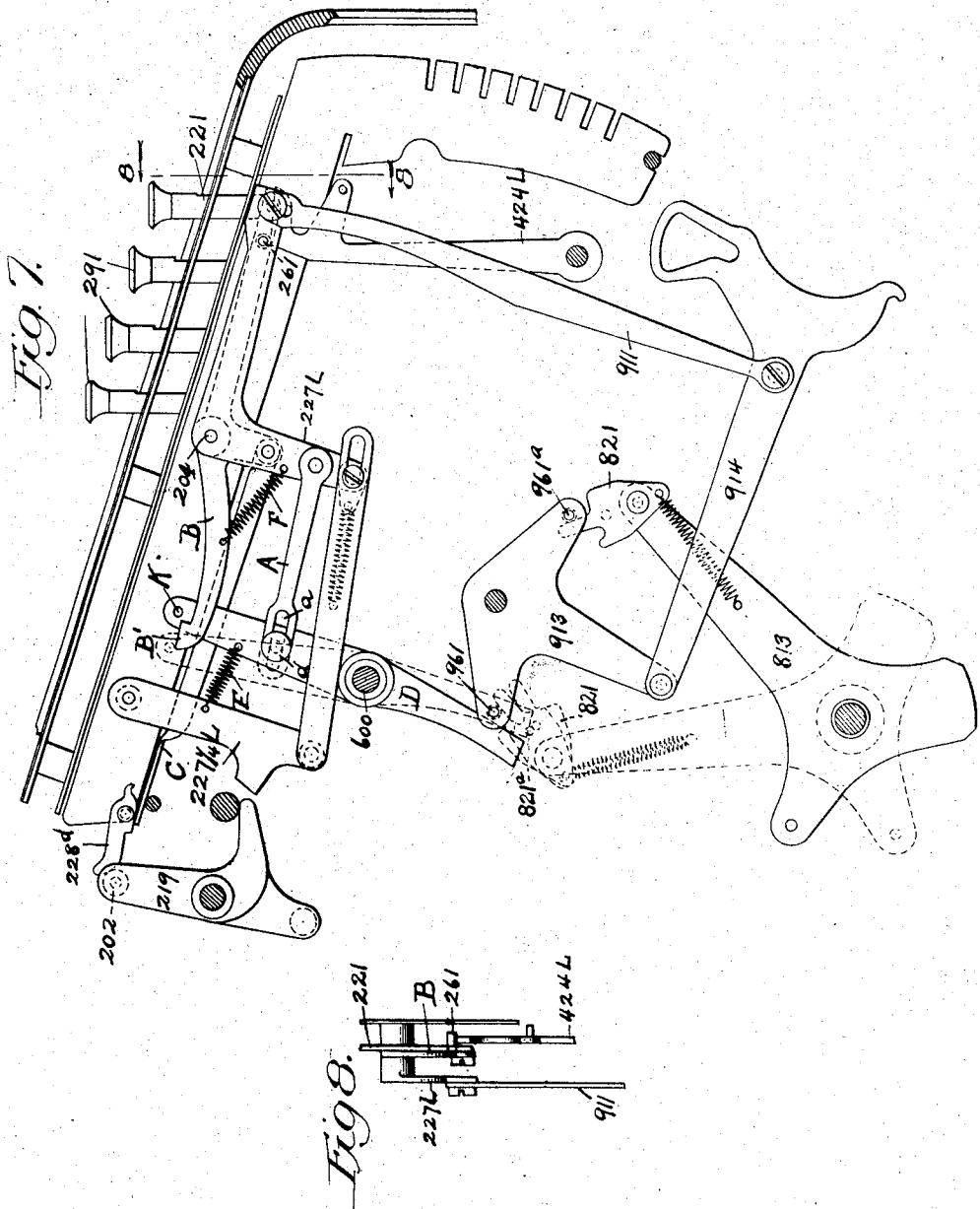
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4 SHEETS—SHEET 4.



Witnesses
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UNITED STATES PATENT OFFICE.

JESSE G. VINCENT, OF DETROIT, MICHIGAN, ASSIGNOR TO BURROUGHS ADDING MACHINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

ADDING-MACHINE.

1,023,895.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed May 27, 1905. Serial No. 262,585.

To all whom it may concern:

Be it known that I, JESSE G. VINCENT, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification.

My invention relates to adding machines and the like of that type or character capable of listing, printing and adding or accumulating individual items, such character of machine being exemplified by the well known Burroughs adding machine made in substantial accordance with Burroughs Patents Numbers 504,963 and 505,078, issued on September 12, 1893.

The object of my invention is to provide efficient and reliable means for automatically taking a total by a blank operation of the machine without the employment of the usual total key or button or any equivalent mechanism requiring manipulation or setting by the operator in the operation of taking a total (subtotal or grand total).

In the present instance, for the sake of a clear and definite description of my invention, I have illustrated and will hereinafter describe my invention as embodied in an adding machine of the Burroughs type, but it will be understood that my invention is not restricted in its application or scope to such particular machine, but that it may be employed in connection with machines of the same general character and used for the same general purposes.

In the drawings, Figure 1 is an elevation of some of the principal operating parts on the right-hand side of a Burroughs adding machine, the parts more particularly illustrated being the ones in connection with which my attachments or improvements cooperate for the purposes stated; Fig. 2 a view similar to Fig. 1 but of the left-hand side of the machine; Fig. 3 a detail view of my attachments and the parts of the regular Burroughs machine directly associated therewith, such view illustrating the relative position of the parts after a value key on the keyboard has been operated or depressed; Fig. 4 a similar detail view illustrating the relative position of parts when operated by a blank stroke or operation of the machine; Figs. 5 and 6 detail views of certain of the new parts, and Figs. 7 and 8

detail views of a modified form of mechanism for automatically taking the sub-total.

The same numerals and letters of reference are employed to represent corresponding parts in the several views.

The Burroughs adding machine being well-known, and illustrated and described in a number of patents and pending applications for patents, I shall here describe only those parts thereof which are associated with and concerned in the operation of the parts which I have added to the machine for the purpose of automatically taking a total in the manner hereinafter explained.

The Burroughs machine employs a series of adding wheels 912 mounted in the upper end of a rocking frame 910, Figs. 1 and 2, each provided upon its side with a pinion 916, said pinions being adapted to cooperate with racks 610 (shown in dotted lines) carried by the front ends of levers 611 hung upon the central shaft 600 of the machine and carrying at their rear ends the printing type 618 cooperating with the platen roller 1599.

The main operating shaft of the machine, to which power is applied, usually by means of a suitable handle, is the rock shaft 300 shown in Fig. 1; and the ordinary operation of the machine consists in depressing or setting the proper number or value keys 291 and then rocking said shaft forward and backward through its limit of movement. When one of the keys 291, in any given denominational row, is depressed or set, and the rock shaft 300 rocked forward, the rack 610 carried by the lever 611 corresponding to such row of keys will be released and permitted to drop downward a distance measured by the value of the operated key; and when the rock shaft is rocked backward to normal position the rack will be lifted to its normal position again and the operated key be released.

By engaging the pinions 916 of the adding wheels with the rack 610 during the movement of the latter in one direction, and holding them out of engagement therewith during their movement in the opposite direction, the values of the operated keys may be added upon said wheels. In the Burroughs machine the adding wheel pinions, while normally engaged with the racks,

Figs. 1 and 2, are disengaged therefrom at the beginning of each adding operation of the machine, and held out of engagement with them during the downward movement of the racks, and then reengaged with them prior to their upward or return movement and held in engagement with them during such movement. This is accomplished by the means shown in Fig. 2, where it will be seen that a three-armed lever 913 hung upon a stud 941 has pivoted to the lower end of its middle arm the rear end of a forwardly extending arm 914, which is supported near its forward end by a long link 911 hung at its upper end to the front end of the bell crank 227 fulcrumed upon framework in the machine at 204. At its front end the arm 914 is divided into two diverging arms, the upwardly extending one 914^a of which is provided with a notch engaging a stud 958 upon one of the side arms 910 of the rocking frame which carries the adding wheels. In the normal operation of the machine, for the purpose of printing and accumulating individual items or amounts, the arm 914 is swung bodily forward at the beginning of each operation of the machine, to disengage the adding wheel pinions from the racks, and is swung bodily backward, to reengage them therewith, at the beginning of the backward movement of the operating handle and rock shaft 300. This is accomplished by means of a wiper plate 821, pivoted upon the upper end of an arm 813 fast upon a rock shaft 800 which is so connected with the operating rock shaft 300, Fig. 1, that they move in reverse directions, the arm 813 being swung rearward at the forward movement of the operating handle and rock shaft 300, and forward again at their rearward movement. The wiper plate 821 cooperates with studs 961 and 961^a upon the three-armed plate 913 in such manner as to rock said plate in one direction at the beginning of the rearward movement of the arm 813 and forward movement of the operating handle, and in the other direction, back to normal position, at the beginning of the return forward movement of the arm 813 and rearward movement of the operating handle and rock shaft.

In taking a total on the Burroughs machine it is simply necessary to leave the adding wheel pinions in mesh with the racks while the latter are permitted to drop and turn the wheels backward to zero. This will set the type carried by the rear ends of the levers 611 to position to print the amount represented upon the adding wheels prior to the turning of them backward to zero. If it be desired to leave the adding wheels at zero, after taking the total, and to thus "clear" the machine, the adding wheel pinions are disengaged from the racks while in zero position, and the racks then re-

turned to normal position; but if it be desired to leave in the machine the amount which had been accumulated on the adding wheels, and take only a sub-total, the adding wheel pinions are left in mesh with the racks during the return movement of the latter and are consequently turned forward again to the respective positions which they before occupied.

To permit the adding wheel pinions to remain in mesh with the racks during the downward movement of the latter, for the purpose of taking a total, it is necessary to swing the front end of the arm 914 down and disengage the notch in its upper end from the stud 958 of the adding wheel frame, so that upon the forward movement of the arm 914 the adding wheel frame will not be swung forward as it normally is. In the Burroughs machine as heretofore generally constructed this depression of the front end of the arm 914 was accomplished by means of a "total key" secured to the front end of the bell crank 227, by depressing which key the arm 914 would be swung downward and disengaged from the stud 958 on the adding wheel frame. Such depression of the front end of the arm 914 brought the hooked lower end of its lower forward arm 914^b in position to engage a stud 958^a upon the lower end of the side arm 910 of the adding wheel frame at the backward or return movement of the arm 914, with the result that at the beginning of the return movement of the operating handle and connected parts the adding wheel frame would be rocked upon its pivotal support 900 and the pinions disengaged from the racks, thereby leaving the adding wheels at zero while the racks returned to normal position. When it was desired to take merely a sub-total, the total key was held depressed only during the forward movement of the operating handle, and then released, thereby permitting the front end of the arm 914 to rise to normal position and its subsequent rearward movement to have no effect upon the adding wheels, whose pinions therefore remained in mesh with the racks during the return upward movement of the latter.

Having now described the usual operation of taking totals and sub-totals upon the Burroughs machine, and the parts concerned in such operations, I will proceed to an explanation of the means which I have provided for automatically taking a total by a mere blank or extra stroke of the operating handle:

The rock shaft 204 to which the bell crank 227 is secured extends transversely through the machine and has secured to its opposite end (Fig. 1) a depending arm 227^a, corresponding to the depending arm 227^b of the bell-crank 227. Pivoted about midway of the

its length upon the arm 227^R is a lever 627 provided with a hooked rear end and a beveled or cam shaped forward end. The hooked rear end of the lever 627 is adapted to cooperate with a stud 663 upon the upper end of a bell-crank arm 626 loosely mounted on the shaft 600, a connecting spring 689 tending to engage the hook of the lever with said stud. The short forwardly projecting arm of the bell-crank 626 carries a roller 634, cooperating with a cam plate 311^a forming in the present instance an integral part and rearward extension of the short sector plate 311 of the Burroughs machine, fast upon the rock shaft 300. The plate 311^a has an abrupt shoulder at its upper forward end, against which the roller 634 normally rests, so that at each operation of the machine the bell crank 626 will be rocked and its upwardly projecting arm thrown rearward at the beginning of the movement of said plate, the remainder of the cam surface or edge of the plate being approximately concentric to the shaft 300 so as to simply hold the bell-crank 626 in its moved position during the further travel of the plate. If the hooked rear end of the lever 627 be in engagement with the stud 663 on the bell-crank 626 at the time the latter is thus swung rearward, the arm 227^R which carries the lever 627 will be swung rearward and thereby rock the shaft 204 and swing downward the forwardly projecting arm of the bell crank 227, Fig. 2, so as to prevent the adding wheel pinions from being disengaged from the racks by the forward movement of the arm 914, as heretofore described, and thus permit said pinions to remain in mesh with the racks during the descent of the latter, for the taking of a total. In the normal operation of the machine, for the purpose of accumulating and printing individual items or amounts, however, the hooked rear end of the lever 627 is maintained out of engagement with the stud 663, so that the rocking of the bell crank 626 has no effect upon said lever and the parts with which it is connected. This is accomplished by means of a stud 657 carried by a bail composed of two vertical side arms 424^R and 424^L, Figs. 1, 2, 3 and 4, fast at their lower ends upon a rock shaft 400 and having their forwardly extended upper ends connected by a cross rod 402. This rod 402 lies immediately in rear of the downwardly bent ends 214^a of the series of sliding plates 214 of the Burroughs machine, of which plates there is one for each row of keys 291, each plate being adapted to be forced rearwardly by the depression or setting of any key in its row. When any one or more of the keys 291 is depressed, therefore, the bail carrying the stud 657 is swung rearwardly, and said stud, engaging and riding over the beveled or cam-shaped forward end of the lever 627, rocks the latter to the position shown in Fig. 3 and disengages its hooked rear end from the stud 663 on the bell-crank 626. So long as any one or more of the keys 291 is depressed, therefore, the forward movement of the operating handle and rock shaft 300 will have no effect upon the parts concerned in the taking of a total and they will remain inert. Upon the first succeeding or blank stroke of the operating handle, however, the stud 663 upon the bell crank 626 would, but for the provision of the additional devices to be now described, engage the hooked rear end of the lever 627 and pull the latter rearward and rock the shaft 204 and depress the arm 914 and leave the adding wheel pinions in mesh with the racks for the taking of a total. It is considered desirable, however, to take a "spacing" stroke immediately before taking a total, in order to leave a slight blank space between the last item in a column and the total to be printed beneath it, and thus to separate and distinguish the total from such last item; and in the Burroughs machine as usually constructed it is further necessary to take such a spacing stroke for the purpose of fully restoring to normal position any of the racks 610 which may have been set for "transfers", and thus insure a proper accumulation or adding up of all the individual items. Inasmuch as I have illustrated my present invention as applied to a Burroughs machine of this character, I have provided the additional devices, to be now described, for preventing engagement of the hooked rear end of the lever 627 with the stud 663 upon the bell crank 626 until after such a spacing stroke has been taken, so that the parts are operated for the taking of a total only upon the succeeding stroke, to wit, the second stroke after the last stroke concerned in the printing and accumulation of an individual item. These devices consist of a latch for holding the bail carrying the stud 657 in its rearward position, as shown in Fig. 3, during the taking of such spacing stroke; and the devices cooperating with the latch to trip or disengage it after such stroke has been taken. This latch 628 is in the form of a bell crank pivoted at 658 to a fixed plate 310^a in the framework of the machine and having a spring 685 connected to its short depending arm and tending to swing its forward end downward. The front end of this latch arm 628 is provided with a hook adapted to cooperate with a stud 656 upon one of the side arms 424^R of the bail which carries the stud 657 which cooperates with the front end of the lever 627. When the machine is at rest and no keys depressed the nose of the hook of this latch rests upon the upper surface of the stud, as seen in Fig. 1. When any key is depressed and the bail carrying the stud 656

thereby swung rearward, the hooked end of the latch drops down over the stud 656, to hold the bail in its rearward position, and in such position the stud 657 carried by said bail maintains the lever 627 in the position shown in Fig. 3, with its hooked rear end disengaged from the stud 663 of the bell crank 626.

The latch arm 628 is provided on its under side, about midway of its length, with a beveled lug or projection 628^a adapted to cooperate with a stud 655 upon an upwardly and forwardly projecting arm 922^R fast upon a rock shaft 904 which extends transversely through the machine and has secured to its left hand end, Fig. 2, a lever 922^L whose upwardly and forwardly extending arm corresponds to the arm 922^R of Fig. 1, and to the lower end of whose depending arm is connected the forward end of a link 918, whose rear end has a slot-and-pin connection with the arm or lever 813 heretofore described. Near the end of the forward movement of the operating handle and the rock shaft, and rearward movement of the arm 813, the pin or stud upon the latter will engage the rear end of the slot in the link 918 and draw the latter slightly rearward, thereby rocking the shaft 904 and swinging the stud 655, Figs. 1 and 3, upward and forward against the beveled projection upon the latch arm 628, to lift the latter and disengage its hooked forward end from the stud 656 upon the swinging bail whose stud 657 cooperates with the lever 627. At the end of the forward movement of the operating handle and rock shaft 300, therefore, the latch 628 is disengaged from the stud 656, so that if not otherwise restrained the swinging bail would be pulled forward from the position shown in Fig. 3 by its spring 482, and the hooked rear end of the lever 627 permitted to reengage the stud 663 upon the bell crank 626. But under the conditions shown in Fig. 3, where one or more of the keys 291 is depressed, the swinging bail carrying the stud 657 is held rearward by the downwardly bent front ends of one or more of the sliding plates 204 engaging the cross rods 402 of said bail; and inasmuch as the depressed keys are not released in the Burroughs machine until the operating handle and connected parts have returned a considerable distance toward normal position, the latch 628 will be permitted to reengage the stud 656 (owing to the character of the slot and pin connection of the link 918 with the arm 913, Fig. 2,) before the depressed or set keys are released. The result will be that, while the latch 628 is lifted at each operation of the machine, its movement is an idle one so long as any of the keys 291 are depressed, since it reengages the stud 656 upon the bail before the latter is released by the de-

pressed keys. At the first blank or spacing stroke taken, however, the bail being then free from the restraint imposed by any depressed keys, and being held in rearward position solely by the latch 628, the lifting of the latter will release the bail and permit its spring 482 to pull it forward to normal position, and cause its stud 657 to release the lever 627 and permit the hooked rear end of the latter to engage the stud upon the bell crank 626; and upon the next or second blank stroke the parts will be swung to the position shown in Fig. 4, and the shaft 204 be rocked to swing down the forwardly projecting arm of the bell crank 227, and, through the medium of the depending link 911, to depress the front end of the arm 914 and disengage the notch in its arm 914^a from the stud 958, and thereby permit the adding wheel pinions to remain in mesh with the racks during the descent of the latter, for the taking of a total; and as the parts will be held in their moved position, with the arm 914 depressed, until the operating handle and rock shaft 300 have completed their forward stroke and returned nearly to normal position, owing to the travel of the roller 634 upon the concentric surface of the cam plate 311^a, Fig. 4, the adding wheel frame will be rocked forward at the beginning of the return movement of the operating handle and rock shaft, by the engagement of the lower hooked end of the arm 914^b with the stud 958^a, and the adding wheel pinions be thereby held out of engagement with the racks during the return of the latter to normal position, and the machine thereby "cleared."

The lower ends of the two arms 227^R and 227^L depending from the rock shaft 204 are connected by forwardly extending links 216 with a cross rod 209 cooperating with the latches 415 which normally hold the racks 610 in elevated position; so that whenever the arms 227^R and 227^L are swung rearward in the manner above explained, for the taking of a total, all of the latches 415 are likewise swung rearward and disengaged from the racks, and all of the latter permitted to drop until their respective adding wheels have turned backward to zero position. The latches 415 are individually operated, to release their respective racks, in the ordinary work of accumulating and printing individual items, by the upturned front ends of the sliding plates 214 which are operated by the depression of the keys as heretofore explained.

In the automatic taking of a total in the manner and by the means above described the machine is "cleared," that is to say, the adding wheels are left at zero owing to the fact that their pinions are disengaged from the racks 610 prior to the return upward movement of the latter; but for the purpose

of enabling a total to be taken without clearing the machine I provide means for preventing such disengagement of the adding wheel pinions from the racks, so that they may remain in engagement therewith during the return upward movement of the racks and be thereby turned forward again to the respective positions occupied by them before the taking of the total. Such means consist in the present instance of a vertically sliding key or rod 221^a, Fig. 2, whose lower end, when the rod is depressed, is adapted to stand in the path of the wiper plate 821 on the arm 813 when the latter is swung to the rearward position shown by the dotted lines in Fig. 2, and to depress said wiper plate to the position indicated by the lowermost dotted lines in said figure so that it will not engage the stud 961 on the three-armed lever 913 at the return forward movement of the arm 813. Consequently the lever 913 will not be rocked back to normal position at the return forward movement of the arm 813, and the arm 914 will not be drawn rearward while in depressed position, and its lower hooked arm 914^b will not engage the stud 958^a on the adding wheel frame and rock the latter to disengage the pinions from the racks.

For the purpose of detaining the key 221^a in depressed position during the operation of the machine, and obviating the necessity of holding it down by hand, I provide a pawl or detent 228^a pivoted at 201 and adapted to engage a notch 221^b in the rear side of the key 221^a when the latter is depressed, a spring 285 connecting the detent and key serving to hold the latter normally elevated. The detent is in the present instance constructed in detail as shown in Fig. 6, having a rearwardly extending arm 228^b connected with the pawl or detent proper by the cross portion 228^c, and both arms of the structure having a bearing upon the pivot 201. A spring 288 connected to the arm 228^b and to a fixed part of the machine serves to hold the said arm down and enforce engagement of the pawl or detent with the notch of the key when the latter is depressed, a function in which the spring 285 also takes part owing to its connection with the detent in rear of the latter's pivot. The inclined or beveled rear end of the arm 228^b stands in the path of the key-restoring rod or shaft 202, so that at the forward movement of the latter, near the end of each operation of the machine, the rear end of the arm 228^b will be thrown upward and the detent disengaged from the key 221^a, to release the latter and permit it to be lifted to normal position by the spring 285. The key 221^a is provided at its upper end with a finger button 291^a, Fig. 5, and constitutes what is commonly called a "sub-total" key, inasmuch as by its use a subtotal, *i. e.*, a

total without clearing the machine, may be taken.

The key-restoring rod 202 coöperates in the well-known way with the pawls 228, Figs. 1 and 2, to release the operated or set keys at the end of each operation of the machine, and the "error key" 293^a, Fig. 1, has a slot-and-pin connection at its lower end with the forwardly extending arm of one of the two bell cranks which are fast upon the rock shaft 207 and carry at their upper ends the cross rod 202, so that by depressing the error key at any time the subtotal key 221^a, as well as any operated or set number keys, may be released.

For the purpose of enabling the operator to take a series of spacing strokes at any time desired without operating the devices for taking a total I place a stud 659 upon the repeat key lever 618, Fig. 1, which stud underlies the hooked lever 627 and lifts the rear end of the latter out of engagement with the stud 623 on the bell crank 626 whenever the repeat key 293^a is depressed.

Under the construction and arrangement of parts which have been described a grand total, or total accompanied by a clearing of the machine, is automatically taken by a second spacing stroke of the operating handle without any preliminary operation or setting of a total key, and the latter is required only where a subtotal, or total unaccompanied by a clearing of the machine, is to be taken. The machine may, however, be readily arranged for the reverse operation, to wit, an automatic taking of a subtotal by the second spacing stroke of the operating handle, and the employment of a special key, to be preliminarily set or operated, for the taking of a grand total; and in Figs. 7 and 8 I have illustrated such an arrangement of parts. As there shown there is hung upon the shaft 600 a lever D whose lower end, when swung forward to the position indicated by the dotted lines, is adapted to interfere with the operation of the wiper plate 821 upon the arm 813 and prevent its coöperation with the stud 961 upon the three-armed lever 913 when the arm 813 and wiper plate 821 are swung forward from the position indicated by the dotted lines to that of the solid lines in Fig. 7—substantially as does the subtotal key 221^a of Fig. 2 when depressed, and with the same result, *i. e.*, to prevent the arm 914 being drawn rearward while in depressed position and thereby disengaging the adding wheel pinions from the racks. A spring E connected to the lever D above its fulcrum tends to swing its upper end rearward and its lower end forward, but it is normally restrained from movement by a link A pivoted at its forward end to the depending arm 227^a of the bell crank 227 and having a slot-and-pin connection *a d* at its rear

end with the lever D. Under this arrangement of parts, whenever the bell crank arm 227^a is swung rearward by the rocking of the rock shaft 204, as it is at a second spacing stroke of the operating handle by the means shown in Fig. 1 and heretofore described, the spring E will be permitted to pull the upper end of the lever D rearward and swing its lower end forward to the position indicated by the dotted lines, thereby preventing any cooperation of the wiper plate 821 with the stud 961 on the lever 913, with the result that at such second spacing stroke of the operating handle the adding wheel pinions will not be disengaged from the racks, and the latter at their return upward movement will restore the adding wheels to the position which they occupied prior to the taking of the total. In this manner a subtotal, or total unaccompanied by a clearing of the machine, will be automatically taken by a second spacing stroke of the operating handle.

For the purpose of taking a grand total or a total unaccompanied by a clearing of the machine, whenever desired, I provide means for holding the lever D in normal position during such operation and thereby preventing any interference with the normal operation of the wiper plate 821 with the three-armed lever 913. To this end I provide the upper end of the lever D with a stud K adapted to be engaged by the hooked rear end B' of a three armed lever B whose forwardly extending arm is connected to the lower end of a "total-key" 221. Upon depressing this key 221, and holding it depressed during the second spacing stroke of the operating handle, its hooked rear end will prevent movement of the lever D, notwithstanding the bell crank arm 227^a is swung rearward and the lever D freed from the normal restraint of the link A; with the result that the adding wheel pinions will be disengaged from the racks prior to the return upward movement of the latter; and consequently left at zero after the taking of the total.

For the purpose of holding the total key 221 depressed during the operation of the machine, and obviate the necessity of holding it down by hand, I pivot to the lower end of the middle depending arm of the three armed lever B (dotted lines Fig. 7) the forward end of a metal strip C which near its rear end is given a quarter turn as shown and adapted to cooperate with the shoulder of a pawl 228^a similar in construction and action to the regular key controlling pawls 228 of the Burroughs machine. When the strip C is slid rearwardly by depression of the total key 221 it will be engaged and held by the pawl 228^a, thus maintaining the total key in depressed position; and near the end of the operation of the

machine the key-releasing rod 202 will be swung forward and lift the rear ends of all the pawls 228 and the pawls 228^a, and thereby release all of the depressed keys, including the total key 221.

For the purpose of preventing the operation of the total key 221 until after one spacing stroke of the operating handle has been taken, and also for the purpose of preventing the depression of any number keys in the keyboard after the total key has been depressed, I provide a stud 261 upon the side of the lever B near its forward end (dotted lines Fig. 7 and full lines Fig. 8,) which stud is adapted, when the total key is depressed, to move downward immediately behind the upper end of one of the side arms 424^a of the swinging bail which carries the cross rod 402, Figs. 3 and 4. Inasmuch as this bail is swung rearwardly by the depression of any one of the number keys it follows that none of such keys can be depressed after the total key has been depressed and the stud 261 carried downward behind the arm 424^a of said bail. On the other hand, when any number key is depressed prior to the operation of the total key, the swinging rearward of the bail which carries the cross rod 402 will carry the upper end of the arm 424^a, Fig. 7, beneath the stud 261, and thereby prevent any operation of the total key until the operated number key has been released and the bail has been restored to its normal forward position; and inasmuch as the bail is not restored to such position until one blank or spacing stroke has been taken, as heretofore explained, it follows that the total key 221 can not be depressed until the machine is ready for a second blank or spacing stroke and the consequent taking of a total.

The total key may be released, at any time after depression and prior to movement of the operating handle, by depressing the error key 293^a, which latter, as shown in Fig. 1 and heretofore explained, will serve to swing forward the key releasing rod 202 and lift the rear end of all the pawl 228 and the pawl 228^a, and thereby release the total key 221 in the manner heretofore explained.

I claim:

1. In an adding machine, the combination, with the totalizing, printing, and key mechanisms thereof and actuating means, of operating connections with the totalizing mechanism, means for rendering said connections inoperative when an amount or item is set up on the key mechanism, and means for retaining such connections in inoperative position during subsequent itemizing.

2. In an adding machine, the combination, with the totalizing, printing, and key mechanisms thereof and actuating means,

of operating connections with the totalizing mechanism, means for rendering said connections inoperative when an amount or item is set up on the key mechanism, and a latch arranged to retain such connections in inoperative position during subsequent itemizing and adapted to be operated to release the connections upon operation of the actuating means without itemizing.

3. In an adding machine, the combination, with the totalizing, printing, and key mechanisms thereof and actuating means, of operating connections with the totalizing mechanism, means under the control of and actuated by the key mechanism for rendering said connections inoperative when an amount or item is set upon the key mechanism, and means for retaining such connections in inoperative position during subsequent itemizing.

4. In an adding machine, the combination, with the clearing and key mechanisms thereof and actuating means, of operating connections with the clearing mechanism, means for rendering said connections inoperative when an amount or item is set up on the key mechanism, and means for retaining the connections in inoperative position during subsequent itemizing.

5. In an adding machine, the combination, with the clearing and key mechanisms thereof and actuating means, of operating connections with the clearing mechanism, means for rendering said connections inoperative when an amount or item is set up on the key mechanism, and a latch arranged to retain such connections in inoperative position during subsequent itemizing and adapted to be operated to release the connections upon operation of the actuating means without itemizing.

6. In an adding machine, the combination, with the totalizing, printing, and key mechanisms thereof and actuating means, of operating connections with the totalizing mechanism, means for rendering said connections inoperative when an amount or item is set up on the key mechanism and retaining the same in such condition during subsequent itemizing, and manually operated mechanism for rendering said connections inoperative to permit spacing strokes of the actuating means to be taken without affecting the totalizing mechanism.

7. In an adding machine, the combination, with the totalizing, printing, and key mechanisms thereof and actuating means, of operating connections with the totalizing mechanism, means for rendering said connections inoperative when an amount or item is set up on the key mechanism and for retaining the same in such condition during subsequent itemizing, and key-controlled mechanism for rendering said connections inopera-

tive at the will of the operator to permit spacing strokes of the actuating means to be taken without affecting the totalizing mechanism.

8. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, means for interfering with said relationship when an item is set up on the machine, and means for retaining said lever in its inoperative position during subsequent itemizing.

9. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, means for interfering with said relationship when an item is set up on the machine, and a latch for retaining said lever in its inoperative position during subsequent itemizing.

10. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, means for interfering with said relationship when an item is set up on the machine, and means for retaining said lever in its inoperative position.

11. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, means for interfering with said relationship when an item is set up on the machine, and a latch for retaining said lever in its inoperative position.

12. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, means for interfering with said relationship when an item is set up on the machine, and a latch for retaining said lever in its inoperative position during the subsequent itemizing.

13. In an adding machine, the combination, with the totalizing and printing

mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said machine, a rock arm cooperating with said lever and arranged to shift the latter to an inoperative position when an item is set up on the machine, and means for retaining said lever in its inoperative position during subsequent itemizing.

14. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, a rock arm cooperating with said lever and arranged to shift the latter to an inoperative position when an item is set up on the machine, and means cooperating with said arm for retaining the latter in the position to which it has been rocked to shift said lever.

15. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, a rock arm cooperating with said lever and arranged to shift the latter to an inoperative position when an item is set up on the machine, and a latch arranged to engage and retain said arm in the position to which it has been rocked to shift said lever.

16. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, a rock arm cooperating with said lever and arranged to shift the latter to an inoperative position when an item is set up on the machine, said arm having a pin or stud, and a latch arranged to engage said stud when the arm is rocked to a position to shift said lever.

17. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, a rock arm cooperating with said lever and arranged to shift the latter to an inoperative position when an item is set up on the machine, and a latch tending with a yielding pressure to engage said arm

to retain it when rocked to a position to shift said lever.

18. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, a rock arm cooperating with said lever and arranged to shift the latter to an inoperative position when an item is set up on the machine, said arm having a pin or stud, and a spring pressed latch tending to engage said stud and thereby hold the arm when rocked to a position to shift said lever.

19. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, and a rock arm in whose path of movement said lever is interposed and which is adapted to shift the latter through separable engagement therewith to an inoperative position when an item is set up on the machine and thereby prevent an operation of the totalizing mechanism.

20. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, and a rock arm adapted to separably contact one end of said lever to rock the same to an inoperative position and thereby prevent an operation of the totalizing mechanism.

21. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, and a rock arm having a projection to separably contact one end of said lever to rock the same to an inoperative position and thereby prevent an operation of the totalizing mechanism.

22. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, and a rock arm having an anti-friction roller to separably contact one end of said lever to rock the same to an inoperative position.

tive position and thereby prevent an operation of the totalizing mechanism.

23. In an adding machine, the combination, with the totalizing and printing mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating member arranged to actuate said lever, the latter being normally in operative relationship with said member, one end of said lever having a cam face, and a rock arm having a projection arranged to contact said cam face and thereby rock the lever to an inoperative position when an item is set upon the machine.

24. In an adding machine, the combination, with the totalizing mechanism thereof, of an operating lever pivotally connected at a point intermediate its length to the totalizing mechanism for operating the latter, an operating member arranged to cooperate with one end of said lever to shift it, said lever being normally in operative relationship with said member, and a rock arm operated by the setting up of an item on the machine and arranged to cooperate with the other end of said lever and thereby rock the latter to an inoperative position.

25. In an adding machine, the combination, with the totalizing mechanism thereof, of an operating lever pivotally connected at a point intermediate its length to the totalizing mechanism for operating the latter, an operating member arranged to cooperate with one end of said lever to shift it, said lever being normally in operative relationship with said member, and having a cam face at its other end, and a rock arm operated by the setting up of an item on the machine and having a projection arranged to contact said cam face to rock the lever to an inoperative position.

26. In an adding machine, the combination, with the totalizing mechanism thereof, of an operating lever pivotally connected at a point intermediate its length to the totalizing mechanism for operating the latter, an operating member arranged to cooperate with one end of said lever to shift it, said lever being normally in operative relationship with said member, and having a cam face at its other end, and a rock arm operated by the setting up of an item on the machine and having a projection arranged to contact said cam face to rock the lever to an inoperative position.

27. In an adding machine, the combination, with the totalizing mechanism thereof, of an operating lever pivotally connected at a point intermediate its length to the totalizing mechanism for operating the latter, an operating member arranged to cooperate with one end of said lever to shift it, said lever being normally in operative relationship with said member, a rock arm operated by the setting up of an item on the

machine and adapted, when operated, to rock said lever, and means for retaining said arm in its operated position.

28. In an adding machine, the combination, with the totalizing mechanism thereof, of an operating lever pivotally connected at a point intermediate its length to the totalizing mechanism for operating the latter, an operating member arranged to cooperate with one end of said lever to shift it, said lever being normally in operative relationship with said member, a rock arm operated by the setting up of an item on the machine and adapted, when operated, to rock said lever, and a latch arranged to engage and thereby retain said arm in its operated position.

29. In an adding machine, the combination, with the totalizing and key mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating or driving member arranged to cooperate with and operate said lever, and a rock arm under the control of the key mechanism and arranged, when operated, to move the lever to an inoperative position with respect to said driving member.

30. In an adding machine, the combination, with the totalizing and key mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating or driving member arranged to cooperate with and operate said lever, and a spring pressed rock arm arranged to be rocked against its tension directly by the key mechanism when an item is set up on the machine and adapted to directly move the lever to an inoperative position with respect to said driving member.

31. In an adding machine, the combination, with the totalizing and key mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating or driving member arranged to cooperate with and operate said lever, a rock arm under the control of the key mechanism and arranged, when operated, to move the lever to an inoperative position with respect to said driving member, and means for retaining the arm in such operated position.

32. In an adding machine, the combination, with the totalizing mechanism thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating or driving member arranged to cooperate with and operate said lever, means for moving said lever to an inoperative position when the first item is set up on the machine, and means for retaining the lever in such inoperative position while the subsequent items are being inserted in the machine.

33. In an adding machine, the combination, with the totalizing and key mechanisms thereof, of an operating lever connected with the totalizing mechanism for operating the latter, an operating or driving member arranged to cooperate with and operate said lever, a rock arm 424^R having a stud 657 and arranged to be rocked when an item is set up on the machine to cause its stud to contact and rock the lever to an inoperative position, said arm having a second stud 656, and a latch 628 arranged to engage the latter stud to hold the arm in rocked position.
34. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^R connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine, and a driving device for actuating said lever to operate the totalizing mechanism and comprising a bell crank rocked when the machine is operated and adapted to actuate the lever.
35. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^R connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine, and a driving device for actuating said lever to operate the totalizing mechanism and comprising a bell crank having a stud to engage and shift the lever, said bell crank being rocked when the machine is operated.
36. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^R connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine, and a driving device for actuating said lever to operate the totalizing mechanism and comprising a bell crank arranged to cooperate with and shift said lever, and a cam operated when the machine is operated and adapted to cooperate with and rock the bell crank.
37. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^R connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine, and a driving device for actuating said lever to operate the totalizing mechanism and comprising a bell crank arranged to cooperate with and shift said lever, said bell crank having a projection, and

a cam rocked when the machine is operated and arranged to cooperate with the projection and thereby rock the bell crank.

38. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^R connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine, and a driving device for actuating said lever to operate the totalizing mechanism and comprising a bell crank arranged to cooperate with and shift said lever, said bell crank having a projection and also having a stud, said lever having a hook-shaped end with which said stud is adapted to cooperate, and a cam rocked when the machine is operated and arranged to contact the projection and thereby rock the bell crank.

39. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^R connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine and a driving device for actuating said lever to operate the totalizing mechanism, and comprising a bell crank arranged to cooperate with and shift said lever, a cam rocked when the machine is operated and arranged to contact and rock the bell crank, and means for holding the lever and bell crank in operative relationship with a yielding pressure.

40. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^R connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine, and a driving device for actuating said lever to operate the totalizing mechanism, and comprising a bell crank arranged to cooperate with and shift said lever, a cam rocked when the machine is operated and arranged to contact and rock the bell crank, and a spring tending to hold the lever and bell crank in operative relationship.

41. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^R connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine, and a driving device for actuating said lever to operate the totalizing mechanism, and means tending to hold the lever and driving device in operative relationship with a yielding pressure.

42. In an adding machine, the combination, with the totalizing mechanism thereof, of a swinging arm 227^a connected with the totalizing mechanism for operating the latter, an operating lever connected at a point intermediate its length to said arm, means for rocking said lever when an item is set up on the machine, and a driving device for actuating said lever to operate the totalizing mechanism and a spring tending to hold the lever and driving device in operative relationship with a yielding pressure.

43. In an adding machine, the combination, with the totalizing mechanism, of an operating lever connected with such mechanism for operating the latter, a driving member for actuating the lever when operatively connected therewith, means for shifting the lever to break said operative connection when an item is set up on the machine, means for retaining said lever in its shifted position, and means for releasing said retaining means.

44. In an adding machine, the combination, with the totalizing mechanism, of an operating lever connected with such mechanism for operating the latter, a driving member for actuating the lever when operatively connected therewith, an arm operated when an item is set up on the machine and arranged to shift the lever to break said operative connection, means for retaining said arm in its shifted position, and means for releasing said retaining means.

45. In an adding machine, the combination, with the totalizing mechanism, of an operating lever connected with such mechanism for operating the latter, a driving member for actuating the lever when operatively connected therewith, an arm operated when an item is set up on the machine and arranged to shift the lever to break said operative connection, a latch for retaining said arm in its shifted position, and means for releasing said latch.

46. In an adding machine, the combination, with the totalizing mechanism, of an operating lever connected with such mechanism for operating the latter, a driving member for actuating the lever when operatively connected therewith, an arm operated when an item is set up on the machine and arranged to shift the lever to break said operative connection, a latch for retaining said arm in its shifted position, and a movable stud or projection for releasing said latch.

47. In an adding machine, the combination, with the totalizing mechanism, of an operating lever connected with such mechanism for operating the latter, a driving member for actuating the lever when operatively connected therewith, an arm operated when an item is set up on the machine and arranged to shift the lever to break said

operative connection, a latch for retaining said arm in its shifted position, and a rocking arm and having a stud arranged to release the latch.

48. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and actuating means, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator co-operating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having operating connections to coöperate with the accumulating mechanism, and comprising also mechanism for holding the key in operated position.

49. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and actuating means, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator co-operating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having operating connections to coöperate with the accumulating mechanism, and comprising also mechanism for holding the key in its operated position until the operation of the machine has been completed.

50. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and actuating means, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator co-operating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, and a retaining device for coöperating with and retaining said key stem in operated position.

51. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and actuating means, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator co-operating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, a spring pressed detent normally tending to

engage and retain said key stem in operated position, and means for releasing said detent.

52. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and actuating means, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing of the machine but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, said stem having a notch on one edge, a detent arranged to engage said notch to retain the key stem in operated position, and means for releasing said detent.

53. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and actuating means, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, said stem having a notch on one edge, a spring pressed detent normally tending to engage and retain said key stem and adapted to enter its notch when the stem is operated, and means for releasing said detent.

54. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, and a detent adapted to engage and detain the key stem when operated and under the control of said key-restoring mechanism for disengaging the detent from the key stem.

55. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumu-

lating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, and a spring pressed detent normally tending to engage and detain the key stem when operated, said detent being under the control of the restoring mechanism for disengaging the detent from the key stem.

56. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, a pivoted detent which is arranged to engage and detain the key stem when operated, and an arm or pawl under the control of the key-restoring mechanism and arranged to cooperate with and release the detent when such latter mechanism is actuated.

57. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, a pivoted detent which is arranged to engage and detain the key stem when operated, means for holding the key stem in normal position with a yielding pressure, and an arm or pawl under the control of the key-restoring mechanism and arranged to cooperate with and release the detent when such latter mechanism is actuated.

58. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a

5 fere with the normal operation of the accumulating mechanism, a pivoted detent which is arranged to engage and detain the key stem when operated and a spring connecting between the detent and key stem.

10 59. In an adding machine, the combina-
tion, with the accumulating, totalizing and
printing mechanisms thereof and with the
key mechanism and the key-restoring
15 mechanism of the machine, of means auto-
matically actuated for operating the total-
izing mechanism, and means under the con-
trol of the operator coöperating with the
accumulating mechanism for preventing a
20 clearing thereof but permitting a sub-total to
be printed when such totalizing mechanism
is operated, such latter means comprising a
key having a stem arranged to interfere
with the normal operation of the accumulat-
ing mechanism, a pivoted detent which is
25 arranged to engage and detain the key stem
when operated, an arm or pawl under the
control of the key-restoring mechanism and
arranged to coöperate with and release the
detent when such latter mechanism is actu-
30 ated; and a spring connecting between said
detent and key stem.

60. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, a pivoted detent which is arranged to engage and detain the key stem when operated, and an arm or pawl under the control of the key-restoring mechanism and arranged to cooperate with and release the detent when such latter mechanism is actuated, said detent having a movement independent of the said arm or pawl.

55 61. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total
60 to be printed when such totalizing mechanism

and an arm or pawl under the control of the key-restoring mechanism and arranged to cooperate with and release the detent when such latter mechanism is actuated, said detent and pawl being pivoted on the same axis.

mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator coöperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, a pivoted detent which is arranged to engage and detain the key stem when operated, and an arm or pawl under the control of the key-restoring mechanism and arranged to coöperate with and release the detent when such latter mechanism is actuated, said detent having a projection arranged to be engaged by the pawl when the latter is actuated by the key-restoring mechanism.

63. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism, and means under the control of the operator coöperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, a pivoted detent which is arranged to engage and detain the key stem when operated, and an arm or pawl under the control of the key-restoring mechanism and arranged to coöperate with and release the detent when such latter mechanism is actuated, said detent having a projection arranged over and adapted to be engaged by the pawl to rock the detent when such pawl is actuated by the key-restoring mechanism.

64. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the total-

izing mechanism, and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, a pivoted detent which is arranged to engage and detain the key stem when operated, and an arm or pawl under the control of the key-restoring mechanism and arranged to cooperate with and release the detent when such latter mechanism is actuated, a spring cooperating with the detent to hold it against the key stem which is notched to receive the detent when the key stem is depressed, and an arm or pawl under the control of the key-restoring mechanism and arranged to cooperate with and release the detent when such latter mechanism is operated.

65. In an adding machine, the combination, with the accumulating, totalizing and printing mechanisms thereof and with the key mechanism and the key-restoring mechanism of the machine, of means automatically actuated for operating the totalizing mechanism; and means under the control of the operator cooperating with the accumulating mechanism for preventing a clearing thereof but permitting a sub-total to be printed when such totalizing mechanism is operated, such latter means comprising a key having a stem arranged to interfere with the normal operation of the accumulating mechanism, a pivoted detent which is arranged to engage and detain the key stem when operated, and an arm or pawl under the control of the key-restoring mechanism and arranged to cooperate with and release the detent when such latter mechanism is actuated, a spring cooperating with the detent to hold it in position to engage the key stem when operated, and a spring pressed arm or pawl under the control of the key-restoring mechanism and arranged to cooperate with and release the detent when such latter mechanism is operated.

66. In a machine of the character described, the combination with the accumulating mechanism and its controlling connections adjustable for either itemizing or

totalizing operations of said mechanism, of means operating to adjust said connections for a totalizing operation, with provisions for disabling said means by the act of preparing the machine for accumulating an item and also provisions for maintaining the disablement between item accumulating operations.

67. In a machine of the character described, the combination with setting up devices, accumulating mechanism and controlling connections for the latter adjustable to bring about either itemizing or totalizing operations of said mechanism; of means operating to adjust said connections for a totalizing operation, with provisions for disabling said means by the setting up devices and for maintaining the said means disabled between itemizing operations.

68. In a machine of the character described, the combination with the accumulating mechanism and its controlling connections adjustable for either itemizing or totalizing operations of said mechanism, actuating means, of means operating to adjust said connections for a totalizing operation, with provisions for disabling said means by the act of setting the accumulating mechanism and also provisions for maintaining the disablement between item accumulating operations; together with means for reënabling said means in an operation of the actuating means without a setting of the accumulating mechanism.

69. In a machine of the character described, the combination with setting up devices, accumulating mechanism, and controlling connections for the latter adjustable to bring about either itemizing or totalizing operations of said mechanism; and actuating means, of means operating to adjust said connections for a totalizing operation, with provisions for disabling said means by the setting up devices and for maintaining the said means disabled between itemizing operations; together with means for reënabling said means whenever the actuating means are operated independently of the setting-up devices.

JESSE G. VINCENT.

Witnesses:

ALVAN MACAULEY,
R. S. MIELERT.