April 20, 1954 R. E. DEY 2,675,959

DRAWER-CONTROLLED CASH REGISTER

Filed Feb. 9, 1952 4 Sheets-Sheet 1

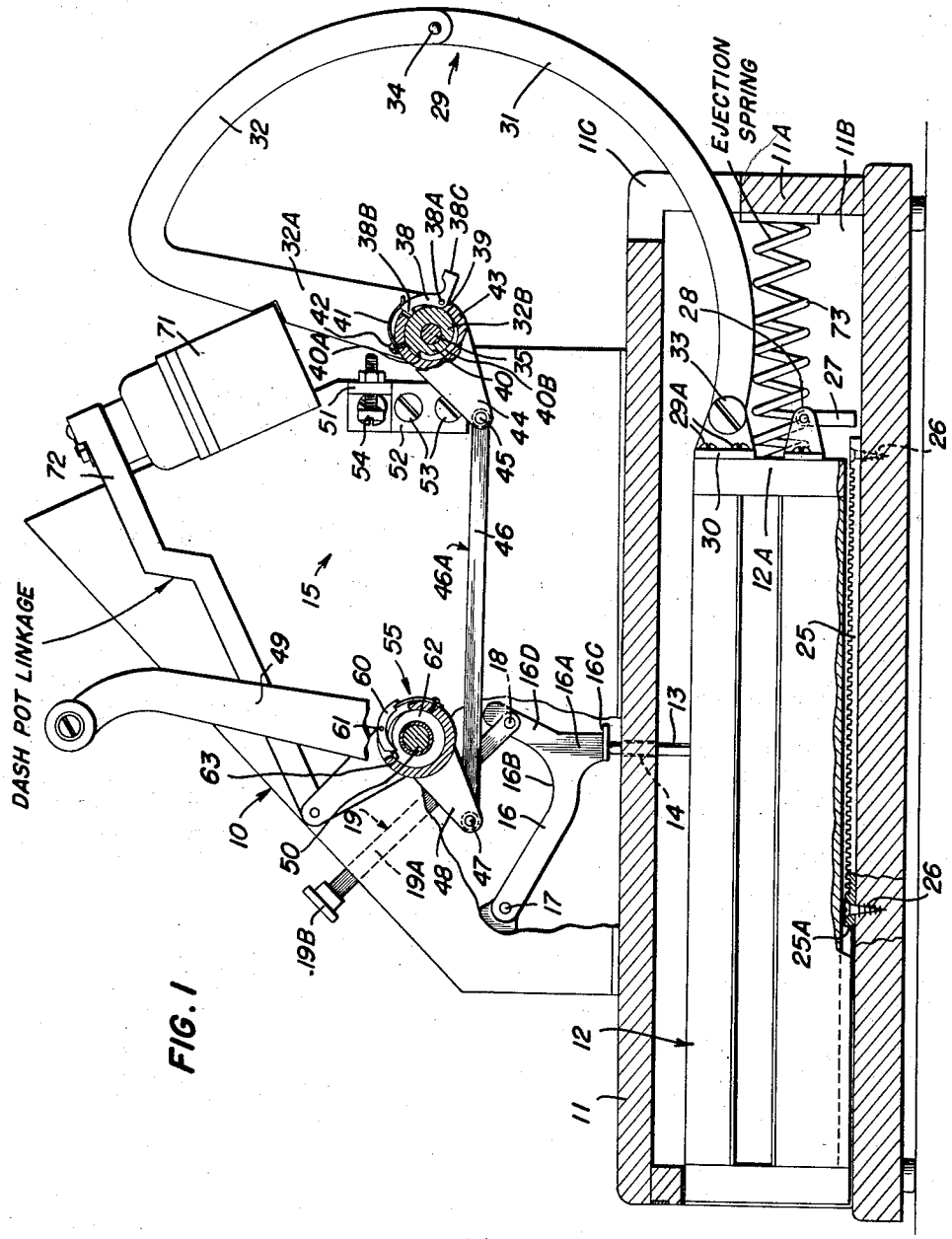


FIG. 1

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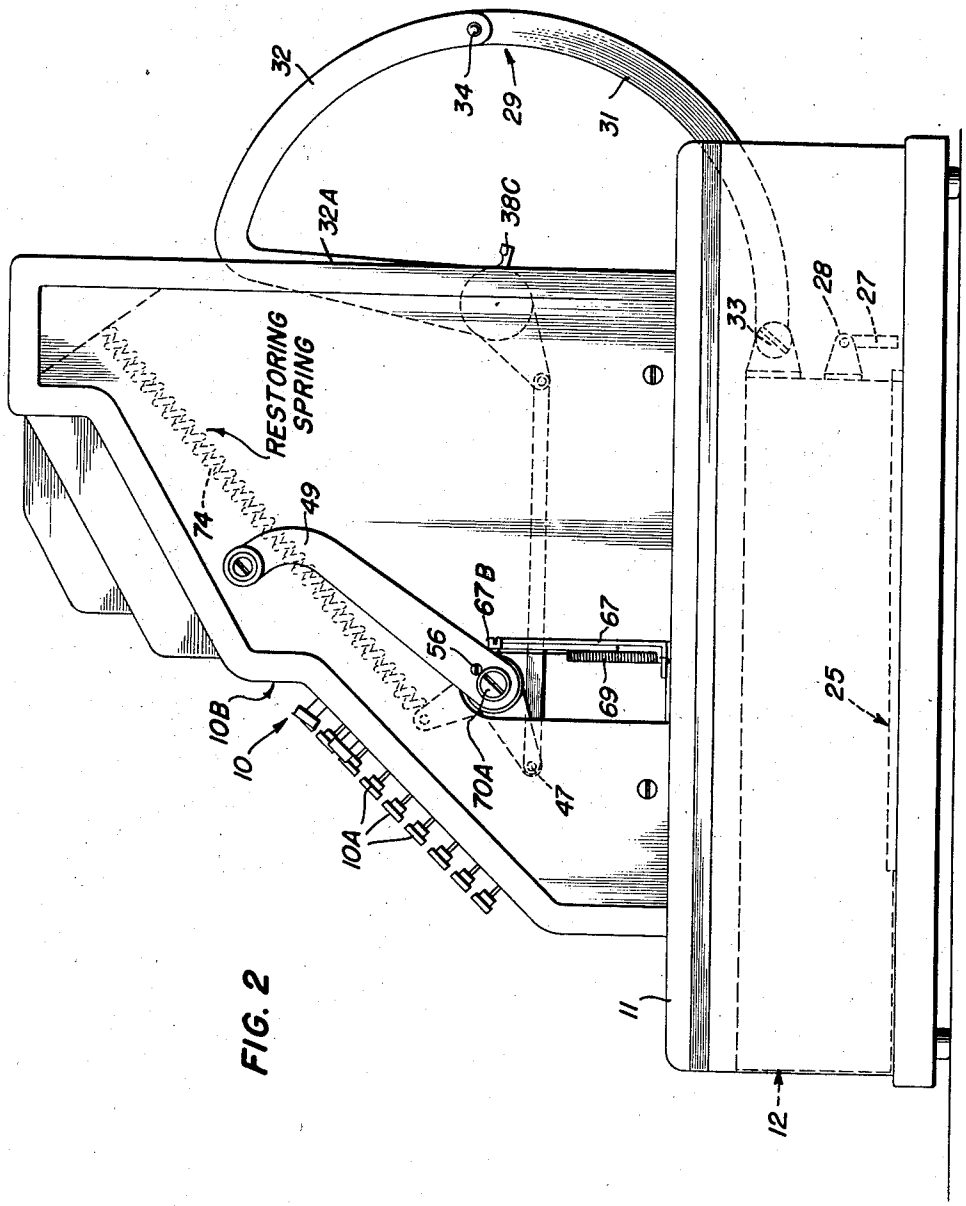


FIG. 2

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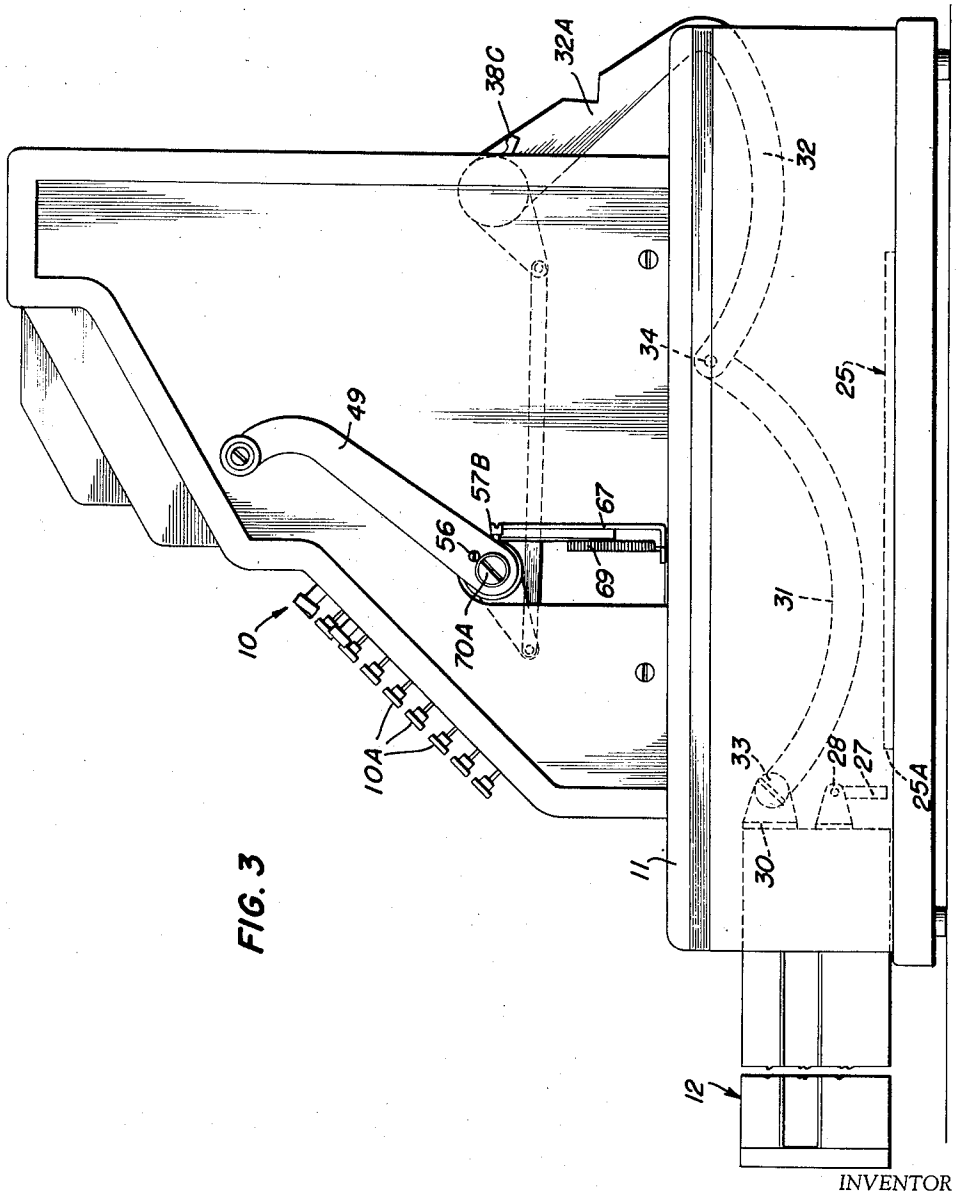


FIG. 3

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FIG. 4

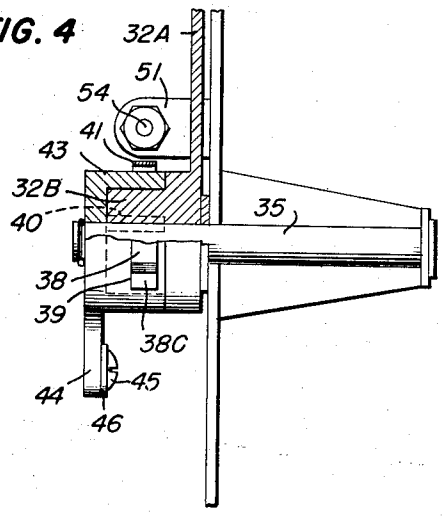


FIG. 5

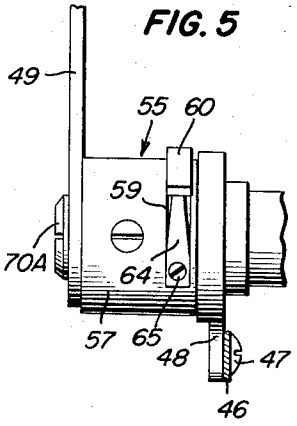


FIG. 6

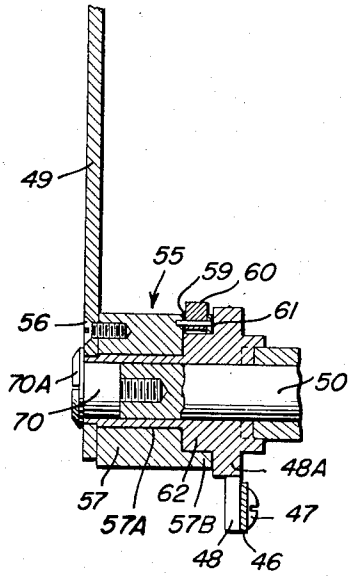
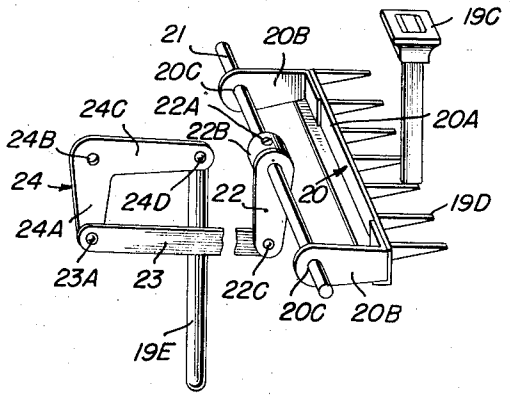


FIG. 7



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Patented Apr. 20, 1954

2,675,959

UNITED STATES PATENT OFFICE

2,675,959

DRAWER-CONTROLLED CASH REGISTER

Ralph E. Dey, Staunton, Va.

Application February 9, 1952, Serial No. 270,833

5 Claims. (Cl. 235—10)

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My invention relates generally to calculating machines and the like and particularly concerns a combination cash register having drawer control of the totalizing mechanism.

An object of my invention is to provide a mechanism of the general type described which is simple, direct and substantially fool-proof in operation, which is sturdy in operation and of long useful life, which effectively permits the drawer-operation of the machine without manipulating the control handle, and which control handle can in turn be operated without manipulation of the drawer-operated mechanism.

Another object is to produce a combination cash register having both number and department keys, wherein the results achieved are substantially equivalent to those of an electric machine, with complete operation of the machine taking place during and as an incident to the drawer closure stage; wherein the number of operations for complete entry of data is minimized, depression of any department key serving not only to set up that department concerning which data is to be recorded on the register tape, but as well, to open the cash drawer; wherein entries on the keyboard may either be corrected after preliminarily setting up the entry on the keyboard and thereupon opening the cash drawer, or may be initially set up following opening of the cash drawer; wherein the totalizing and entry mechanism of the register will be completely operated by the full stroke closure of the cash drawer; and wherein it is rendered impossible to open the cash drawer by any means without an indication of such opening appearing on the entry tape.

Yet another object is to provide a mechanism of the general type described wherein it is made mandatory that full stroke opening of the cash drawer occurs before the latter can be returned to its closed position; wherein the closure of the cash drawer is rendered simple and ready; wherein the requisite mechanism can be installed easily and at minimum cost both of equipment and of labor, on nearly all existing types of combination cash registers; wherein the rapidity or force with which the cash drawer is closed will not in any manner effect the calculating mechanism nor the accuracy of entries carried thereinto; and wherein amounts may be listed upon and entered into the machine while the cash drawer is opened by means of hand operated control handle, as well as by the drawer itself.

Other objects and advantages will in part be obvious and in part pointed out hereinafter during the course of the following description, taken in the light of the accompanying drawings.

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Accordingly, my invention may be seen to reside in the several parts, elements and features of construction, in the various mechanisms and linkages and in the combinations thereof, and in the relation of each of the same to one or more of the others, the scope of the application of all of which is more fully set forth in the claims at the end of this specification.

In the several views of the drawings, wherein I have disclosed that embodiment of my invention which I prefer at present,

Figure 1 is a side elevation, with upper case or canopy removed, of a combination cash register embodying my new invention parts being shown in skeleton outline for simplicity and ready understanding.

Figure 2 is a view in side elevation, generally similar to Figure 1, with the top case in position thereon;

Figure 3 is a side elevation, showing the control linkage in accordance with my invention, the associated parts of the cash register being shown in skeleton outline;

Figure 4 is a fragmentary front elevation, taken at right angles to Figure 3, and looking from the rear thereof, and disclosing the details of the one-way clutch mechanism which connects the rocker linkage with the straight-line linkage;

Similarly, Figure 5 is a fragmentary view, corresponding to Figure 4, but showing in rear elevation the details of the clutch mechanism at the base of the hand-operated actuating handle;

Figure 6 is a vertical section through the mechanism according to Figure 4, while finally,

Figure 7 is a fragmentary perspective view disclosing a modified arrangement of the department keys relative to the drawer-release mechanism.

Throughout the several views of the drawings, like reference characters denote like structural parts.

As conducive to a more thorough understanding of my invention, it may be noted that in the development of cash registers it has been a long-time objective to approach as closely as possible the ready and easy operation of the electrical cash register without, however, being subjected to the heavy initial investment required for such machines. Ordinarily, their high cost prohibits the use of electrical machines by the small merchant or other operator. Much study, therefore, has been directed to the production of a satisfactory drawer-operated cash register or gener-

ally similar calculating machine, wherein the drawer is released without actuating the totalizing mechanism of the machine, but which latter is operated at the time of, and as an incident to, the closure of the drawer.

However, for one reason or another all these many suggestions which have been presented from time to time have fallen short of their desired objective. Illustratively, in machines of the general type described and as heretofore known it has been impossible, so far as I have been able to ascertain, to set up entries on the calculating keys after the drawer has been opened. Similarly, it has been impossible to correct or change such entries, once they have been initially set up and the drawer opened. For once the drawer is opened, that entry then on the keyboard must be carried into the totalizer. It has been necessary, according to known practices, initially to set up the number to be carried over into the totalizer, before the cash drawer is opened. The opening of the cash drawer provides an initial half-stroke operation, in which the totalizer is conditioned to receive the entry from the keyboard and the keyboard is locked with the entry thereon; and this keyboard cannot thereafter be changed in any manner until after the entry thereon is carried into the totalizer. The entry into the totalizer is then completed upon closure of the drawer; and this constitutes the second half-stroke of the complete operation. Similarly it has been impossible in known machines to actuate the totalizer through manual control, as in addition, during drawer-open condition, without successive closures of the cash drawer.

A still further objection heretofore confronting the art is the difficulty in insuring correct entry into the totalizer upon forceful and vigorous drawer closure stroke. Heretofore in many such instances, forceful closure of the drawer has been accompanied by incorrect entry into the totalizing mechanism, in large measure resulting from objectionable backlash in the parts of the machine, as upon inertia or springlike action.

An important object of my invention, therefore, is to eliminate or appreciably reduce the many disadvantages and difficulties heretofore confronting the art, and at the same time to provide, in direct and simple manner and in substantially foolproof construction, a cash register and calculating machine of full stroke operation in which drawer-closure operates the totalizer mechanism; wherein entry need not be made prior to drawer opening, but which if made prior thereto, can be corrected readily after drawer opening and while the latter remains opened, or can be initially set up thereon with open drawer; wherein full stroke opening of the drawer is made mandatory before the keyboard setting can be carried over into the totalizer; wherein the drawer operation of the totalizer mechanism is carried out without movement of the hand-operated handle; wherein the operating handle can be operated without affecting or operating the drawer-control mechanism and can be operated at will during drawer-open position; and as well, wherein the drawer can be closed at any desired speed without in any manner affecting the correct carry-over of the keyboard setting into the totalizer.

And now, having reference more particularly to that embodiment of my invention disclosed in the several views of the drawings, it may be noted that on the ordinary combination cash register, indicated generally at **10**, and of the type such as shown in the patent to Sumner, 1,246,178 of November 13, 1917, I provide the usual keyboard, indicated generally at **10A** and a totalizer whose location is indicated at **10B**. I provide thereon the usual keys, including amongst others, the number keys and department keys. The keyboard is carried on the cabinet portion **11**, which contains the usual cash drawer, indicated generally at **12**. A retractable lock plunger **13** is carried loosely by and extends upwardly from the upper side of the cash drawer, emerging upwardly and outwardly therefrom, and is spring-pressed or otherwise suitably biased, by conventional means not shown, upwardly through a corresponding opening **14** provided in the bottom of the body portion **15** of the cash register **10**. This body portion **15**, including the keyboard, the totalizer mechanism, and the drive shaft, is likewise carried upon the cabinet **11**. To operate the plunger or pin **13** I provide a suitable lever **16**, conveniently of bell-crank configuration. Lever **16** is pivoted at one end **17** to the body portion **15**. An auxiliary arm **16A** projects outwardly and downwardly from lever **16** near the apex **16B** thereof and terminates in a striker plate **16C**. This plate **16C** bears against plunger **13**. On the second arm **16D** of bell-crank lever **16** I provide a suitable pivotal connection **18** to actuating key **19** for the release lever **16**. This release lever comprises a key stem **19A** and a key top **19B**.

Where desired, however, the modified construction of drawer-release mechanism according to Figure 7 may be employed. Here, any department key **19C**, only one of which is shown, may be depressed so that it abuts against a corresponding tooth **19D** of the yoke or comb like lever bar **20**. I provide arms **20B**, **20B** fast to the yoke portion **20A** of member **20** at opposite ends thereof. By their journaled openings **20C**, **20C**, these rocker arms **20B**, **20B** are made fast at opposite ends of a common shaft **21**. This shaft is mounted for rotation in suitable bearings, not shown. When key **19C** is depressed, it contacts adjacent tooth **19D**, and rotates bar **20A** and shaft **21** about the bearings of the latter. This rod **21** carries pivoted lever **22** which it rocks through a vertical angle, and passes bodily therethrough and is keyed to it in desired suitable manner as by collar **22A** and set screw **22B**, or by the usual splined joint, not shown. While lever **22** may be mounted on shaft **21** at any desired point along the length of the latter, this support point is usually at the middle of the shaft. At its bottom end lever **22** is connected in desired pivotal manner, as by connection **22C**, with link **23**, whereby to translate the arcuate motion of link **22** through a vertical angle into an arcuate swing through a nearly horizontal plane of the link **23**. This link **23** is pivotally connected at **23A** to one arm **24A** of bell-crank lever **24**, which latter is pivoted at its apex at **24B**, to the frame, not shown, of the adding machine, and which is carried by and forms part of the body portion **15**. Arm **24C** of bell-crank lever **24** is pivotally connected at **24D** to actuating rod **19E**, similar to the rod **19A** shown in Figure 1.

It will be seen that the assembly consisting of arm **19E**, bell-crank lever **24**, link **23** and link **22** and parts **20** and **21**, serve to translate the vertical reciprocating motion of the key **19C** through an arcuate path into linearly reciprocal motion of the actuating arm **19E**. From this it follows that depression of any of the department keys

19C will produce a reaction of the striker plate 16C against the pin 13, depressing the same out of the opening 14, so that the drawer 12 is free to open.

At this moment, and upon depression of pin 13, the drawer 12, constantly under the urge of a coiled ejecting spring 73 of conventional shape and construction, is thrust by such spring into its open position. Such spring is customarily positioned between the back end 12A of the drawer and the inner wall 11A of the drawer-opening 11B of the cabinet 11 as more particularly shown in Fig. 1.

I desire, for reasons hereinafter set forth, to provide that no reverse motion of the drawer 12 can take place, once the opening motion of the latter is set into progress by the ejecting spring, until the drawer reaches the full extent of its outward opening movement. This I call full stroke operation. I can accomplish this in any number of desired suitable manners. As shown, I employ a full stroke pawl and ratchet mechanism. To this end, I extend a toothed rack 25 along the length of the bottom surface of the opening 11B in the cabinet 11, preferably near one side thereof. If desired, rack 25 may comprise a toothed metal plate seated in desired suitable manner on the bottom of the floor of the cabinet, as by set screws 26, 26.

A reversing pawl 27 swings pivotally in desired suitable manner at 28 from the rear wall of the drawer 12 and by gravity, hangs pivotally downwardly into cooperating relation with rack 25. As the drawer 12 is ejected into its opened position, pawl 27 drags in trailing manner, at an angle to the vertical, along the top surface of the teeth of rack 25. If now, however, the motion of the drawer 12 be interrupted at any point intermediate its full stroke operation, the pawl 27 will drop between two adjacent teeth of the rack 25, thereby blocking the return or closing motion of the drawer. It is only when the drawer has been pulled into such forward position that the pawl 27 drops off the front edge 25A of the rack 25, that the position of the pawl can be reversed. It is at once apparent that upon attempt at this point to close the drawer 12, the pawl 27 will no longer impede such return motion, but will trail along and drag over the teeth of the rack without hindering the return stroke of the drawer.

Thus it will be seen that drawer 12 cannot be returned into its closed position from any point intermediate its full open stroke, but that once the drawer 12 is fully opened it can be returned to closed position without necessity for the exercise of force other than that requisite to overcome the summation of resistance of the outwardly-ejecting drawer spring and the drag of the totalizer mechanism as the same is being actuated, through rotation through its working cycle of the cash register drive shaft.

In accordance with the practice of my invention it is necessary that the inward movement of the cash drawer into its closed position bring about operation of the main drive shaft, to carry entries set up on the keyboard into the totalizer.

Contributing to this end, I provide a rocker-arm assembly, indicated generally at 29. As shown, the rocker-arm assembly, disposed at the back of the cash drawer, has double hinge construction, and extends through cabinet 11 through suitable slot 11C with bearing plate 30 abutting against and being attached to the back of the cash drawer in any suitable manner as by the screws 29A, 29A. Assembly 29 includes two curved arm portions 31 and 32 hinged together. Hinge members 33 and 34, respectively connect together in hinged manner the bearing plate 30 and arm 31 on the one hand, and the arms 31 and 32 on the other hand.

Curved member 32 is reverse-bent at its free end into a radial arm portion 32A, and to that end, I include a one-way clutch assembly in the assembly according to Figure 4, between the straight-line linkage and the rocker-arm assembly. This clutch comprises a pawl 38 (Figure 1) carried in desired convenient manne, as by pin 38A in sleeve 43, near the periphery thereof. This pawl extends through an arcuate recess 39 which extends for a limited angular distance about the sleeve 43.

For cooperation with the pawl 38 I provide, at a suitable angular point about the periphery of the hub portion 32B of arm 32A, an offset and laterally disposed depression 40, into which the tooth 38B (Figure 1) of the pawl 38 falls when the hub portion 32B is carried in clock-wise direction by arm 32A during the drawer-opening phase. Actually, the opening or depression 40 is not U-shaped, but has the right-hand wall 40A thereof as shown in Figure 1 disposed radially, that is, perpendicularly to the surface of the hub 32B. With the right-angular shoulder 40A as thus provided, therefore, when the drawer is opened, and the rocker arm mechanism 29 is rocked to the right in Figure 1, as when the drawer 12 is opened, the opening 40 comes beneath the pawl 38, so that the dog 38B thereof falls into the said opening. And, then, when any attempt is made to close the drawer, so that the rocker arm 29 is rocked counter-clockwise in Figure 1, the dog 38B abuts the abrupt shoulder 40A, and is carried along therewith, so that the pawl, and the sleeve 43 in which it is hingedly pinned, are carried in a counterclockwise direction, thus actuating the straight-line mechanism 46A. When, in drawer-open position, however, so that opening 40 lies beneath the pawl 38, and the latter, under the bias of spring 41, rests therein, the straight-line mechanism 46A is operated through handle 49, thus rocking the link 44, the sleeve 43 and the pawl 38 carried by the latter in a counter-clockwise direction, this pawl rides up the gentle shoulder 40B comprising the left-hand side of the opening 40, as seen in Figure 1. Thus the clutch thus described has the effect of permitting transmission of forces from the rocker arm mechanism 29 to the straight-line mechanism 46A, while effectively slipping all forces originating in mechanism 46A so that these latter are not transmitted to the rocker arm mechanism 29 and thence to the cash drawer 12. When near the end of the stroke of the rocker-arm mechanism in drawer-opening direction the clockwise rotation of the hub portion 32B brings its depression 40 into register with hitherto stationary tooth 38B of the pawl 38 this latter falls into the said depression 40. This locks together the rocker-arm assembly 29 and the straight-line linkage 46A, thereby conditioning this latter for totalizer-actuating motion, during the next or drawer-closure stroke of drawer 12. To insure proper operation of the pawl 38 I provide a biasing means of convenient construction, urging the pawl 38 into cooperation with the depression 40. As shown, this biasing means takes the form of leaf spring 41 mounted on and made fast at one end to sleeve 43 in any suitable manner as by set screw 42, and bears by its free end against the top surface of the free end of the pawl 38. It is to be

noted that both sleeve 43 and hub portion 32B are mounted freely on shaft 35 for rotation relative thereto.

Description will now be given of mechanism for releasing the connection, including pawl 38, between the straight-line linkage 46A and the rocker-arm assembly 29. The angular timing of the pawl assembly is such that tripping or release takes place thereof, separating linkage 46A and assembly 29, just as the latter reaches the end of its counterclockwise rotation as shown in Figure 1 into its full rest position and immediately following in time sequence that point in the rotation of the main drive shaft 50, under the driving impetus of the straight-line linkage, whereby it has caused the carry-over of the keyboard setting into the totalizer. Release of pawl 38 permits the main restoring spring 73 of the machine, to return to rest position, thereby clearing that particular transaction and setting up machine for next entry. The tripping mechanism which I employ comprises a bracket 52, conventionally of L-shape (Figure 1) having a laterally off-set arm 51, which extends into the path of the pawl 38. Bracket 52 is mounted in desired suitable manner on the side of the cash register frame, as by set screws 53, 53. An adjustable set screw 54 extends through arm 51 into adjustable proximity with the laterally offset and enlarged head 38C of the pawl 38. As the pawl 38 rocks in counterclockwise direction under the impetus of and along with rocker-arm assembly 29 to a point near the end of its stroke, it comes into contact with set screw 54 in the adjusted position of the latter. Further motion of the rocker-arm assembly in counterclockwise direction forces the head 38C of pawl 38 strongly against the end of the set screw 54. The reaction thrust of the latter rocks the pawl against the tension of spring 41 in clockwise direction about its pivot pin 38A, so that the pawl tooth 38B is forced outward from the recess 40 of the hub portion 32B, physically separating the straight-line linkage from the rocker-arm assembly. Adjustment of set screw 54 varies the angular position of sleeve 43 at which pawl release occurs. At this point, the drive shaft 50 having been rotated through the full extent of its work-conditioning stroke, the entry on the keyboard is carried into the totalizer under energy stored up in the drive shaft. The straight-line linkage 46A, now separate from the rocker-arm assembly, is carried by spring bias to be described back to its rest position to the extreme left in Figure 1.

Heretofore attention has been given largely to the rocker-arm mechanism 29. Attention will now be directed more specifically to the straight-line linkage 46A which interconnects the rocker-arm assembly 29 with the main drive shaft 50. This straight-line linkage 46A comprises link 44 made integral with sleeve 43. In turn, this latter is rotatably fast in desired suitable manner to stub shaft 35. At its free end link 44 is connected by suitable pivotal connection 45 to link 46. Link 46 extends in a generally horizontal direction towards the front of the machine, and through suitable means such as hinge connection 47 is connected at its free end to the bottom end of link 48. At its free, remote or upper end link 48 is connected, through a one-way clutch mechanism to be described, to the operating handle 49. Moreover, it is directly connected, in manner to be described, to the totalizer actuating or main drive shaft 50 for rotation therewith, whereby the driving impetus of the straight-line linkage is transmitted to the drive shaft 50, thereby operating the latter so that any entry on the keyboard is carried into the totalizer mechanism. Since this totalizer mechanism is of standard design, further description thereof is omitted.

Description has now been given of the rocker-arm assembly 29 and the relation of the cash drawer 12 thereto, and as well, the relation between the straight-line linkage 46A (which has also been described) and the rocker-arm assembly 29. During the course of that description reference has heretofore been made to the existence of a one-way clutch mechanism between the operating handle 49 and the straight-line linkage, which handle also effects the operation of the main drive shaft 50. Referring to the disclosure of Figure 5, it will be seen that this second one-way clutch, which I term the control handle clutch and which is indicated generally at 55, serves to by-pass the control handle 49 when the totalizer whose location is indicated generally at 10B is actuated by the straight-line linkage 46A from drawer control. This has the advantage that it avoids necessity for up and down movement of the handle 49 upon opening and closure of the drawer 12. On the other hand, this one-way clutch 55 permits the transmission of driving impetus from the handle 49 through its working stroke into the totalizer, during handle operation. The straight-line linkage 46A is operated as an incident to movement of the handle through its working stroke, but the first-one-way clutch, disclosed in Figure 4, effectively prevents carry-over of this stroke to the rocker-arm assembly 29. I make control arm 49 fast in any suitable manner, as by set screw 56 (Figure 6), to sleeve 57. Sleeve 57 is provided with central bore 57A whereby it fits snugly but freely about the cooperating and laterally projecting, shouldered end of link 48. The said shouldered end 48A of link 48 is removably fast to drive-shaft 50 in desired suitable and conventional manner, as by splined joint or the like. In the present embodiment a castellated construction is employed. Drive shaft 50 carries entirely through the machine to the far side of the latter, remote from handle 49, and powers the entire machine. It is apparent that sleeve 57, cooperating with shouldered end 48A of link 48, may be cast or otherwise formed integrally with handle 49, serving as a hub therefor. For simplicity, however, I form the two parts separately, securing them together by set screw 56.

On the shouldered end 48A of link 48 I provide a sleeve 62, comprising a hub portion. Sleeve 62 is offset from the adjacent end of arm 48 in the direction of sleeve 57. Sleeve 57 is correspondingly enlarged at its end 57B remote from the handle so as to fit snugly about sleeve 62, with freedom for rotation relative thereto, giving rise to a journal bearing. I provide means between sleeve 62 and sleeve 57 for locking them together during the working stroke of the operating handle 49, but which means will release these two elements and permit handle 49 to remain at rest during the work stroke of the straight-line linkage 46A under the impetus of the rocker-arm assembly 29. This I accomplish by providing an elongated recess 59 extending through sleeve 57 over a portion of its angular extent and serving to receive a pawl 60. Pawl 60 is pivoted within the recess 59 by any suitable hinge pin 61 received within and carried by

sleeve 57. Spring biasing means of conventional type and indicated generally at 64, here being shown as comprising an elongated leaf spring, is made fast to sleeve 57 in any suitable and conventional manner as by set screw 65. The free end of this leaf spring 64 projects into the open space of the recess 59 and engages under the rear, free end of pawl 60, swinging the latter about its hinge pin 61, so that the leading end of the pawl 60 is thrust downwardly onto and in engagement with the small step or shoulder 63 provided in the hub 62.

By this construction it is ensured that when sleeve 57 is rocked by handle 49 the spring-biased pawl 60 drops into step 63 so that it carries sleeve 62 along with it through the remainder of its working stroke, thereby rotating the main drive-shaft 50, to which shouldered end 48A, of which sleeve 62 is part, is made fast. Accordingly, such entry as has been set up on the keyboard is carried in conventional manner into the totalizer mechanism. More specifically, as the handle 49 is rocked in a counterclockwise direction (Figure 1) the spring-biased pawl 60 drops into the recess 63 of sleeve 62 so that the rotary action of the handle 49 is transmitted through sleeve 62 to the main drive-shaft 50, thereby carrying into the totalizer all the data which has theretofore been set up on the keyboard. At the same time, and in conventional manner, the keyboard is freed for re-setting.

I dispose the step 63 at such position along the angular extent of the hub 57 that when the straight-line linkage is drawer-actuated and the final link 48 thereof, connected to the hub 62, is rocked about sleeve 57 in counterclockwise direction and along with drive shaft 50, the step 63 is carried away from the working end of the pawl 60. In this instance the pawl rides freely over the sleeve 63, and none of the driving impetus of the straight-line linkage is imparted to the sleeve 57 and thence to the handle 49. The latter accordingly remains in a condition of rest.

Although sleeve 57 and handle 49 are mounted on sleeve 62 for rotation relative thereto, i. e. they are not fast thereon, their snug fit on the shaft occasions some frictional drag when straight-line linkage 46A is drawer-actuated. This drag imparts some tendency towards angular movement of the handle 49. Such angular movement is effectively resisted, however, by suitable spring biasing means, here shown as comprising coil-spring 69 mounted at one end to the bottom of bracket 67 and at its other end to the exterior surface of sleeve 62 by suitable lock-down means such as set screw 67B. Similarly, to secure the sleeve 57, shoulder 62 and drive-shaft 50 into a unitary package assembly, I provide a suitable lock-down set screw 70 which extends centrally through hollow sleeves 57 and 62 and threads into the hollow end of drive-shaft 50. Since set screw 70 adds to the finish appearance of the assembly I provide it with an enlarged head 70A of nice appearance.

A restoring spring 74 of conventional type (Fig. 2) forms part of the totalizer mechanism. Cocked by the drive shaft 50 during the working stroke of the latter, it provides a restoring moment for the shaft 50 and through pawl 60 returns the handle 49 in clockwise direction. Moreover, this restoring moment is superimposed on that of coil-spring 69. To provide a stop for limiting this restoring movement of the handle 49 I mount bracket 67 to the cabinet 11 by suitable means such as set screws. Arm 67 projects upwardly into the path of stop 67B which is threadedly mounted on and extends exteriorly from sleeve 57. While stop 67B may have any suitable form it is to be noted that when it comprises the threaded and headed set screw shown it serves the dual function of a lockdown screw for the coil spring 69.

Except for the improved construction described, and consisting largely of the rocker-arm assembly 29 and its association with the cash drawer 12, the straight-line linkage 46A and the clutches interposed between the rocker-arm assembly and the straight-line linkage on the one hand and between the straight-line linkage 46A and the operating handle 49 on the other hand, and except for the drawer-release mechanism, the construction and operation of my new combination cash register is substantially that of the conventional types presently available in the art.

When using my new machine or when employing any conventional machine to which my invention has been applied the operator will elect at will from time to time, either to set up data on the keyboard prior to opening the cash drawer, or to enter such data after the cash drawer is opened. If he sets up his data before he opens the cash drawer, he does this by setting up the figures on the number keys and by then depressing the appropriate department key or keys. This latter, through the mechanism disclosed in Figure 7, depresses the detent 13 whereby the drawer-ejecting spring forces the latter into its open position. The rack and pawl mechanism 25, 27 insures that the drawer is opened to its full extent before any movement thereof in a reverse direction can occur.

Should, however, the operator elect to wait until the drawer is opened before he sets up data on the keyboard, he opens the drawer simply by depressing the key 19B of Figure 1 or any department key according to the alternative embodiment of Figure 7, thereby opening the cash drawer. The operator can thereupon set up the rest of the data on the number keys at leisure, and while the cash drawer is opened.

Another and important feature of my invention is that when the drawer is open the operator can make any changes or corrections which he may desire as to the entry already set up on the keyboard, either as to department or amount. For opening the drawer does not lock this entry on the keyboard. Moreover, because the mechanism of the first clutch, between the straight-line linkage 46A and the rocker-arm assembly 29, slips the motion originating in the straight-line linkage, he can carry into the totalizer, during the drawer-open condition of the machine, such matters of addition or of additional entry which he may desire, simply through operation of the control handle 49. For upon each such operation of the control handle the clutch just referred to slips the force of the operating handle, transmitted through linkage 46A, without corresponding motion of the rocker-arm assembly 29. The foregoing operation is evident from the detailed disclosure hereinbefore given, having reference to the mechanism illustrated in Figures 1, 4 and 5.

Following carry-over into the totalizer of all required entries through the use of the control handle 49, and after the keyboard has been set for the final entry to be carried into the totalizer under the drawer-close impulse, drawer 12 can

be operated through its return stroke, into fully closed position. When this takes place the rocker-arm assembly 29 is carried in a counter-clockwise direction in Figure 1, carrying with it the straight-line linkage 46A, whereby the latter rotates the main drive shaft 50. The second clutch 55 slips the operating handle 49 during the drawer-closure stroke, whereby the latter remains stationary, compelled by the biasing spring 69 to rest against the stop 67.

As heretofore pointed out, my new machine permits listing all desired entries through handle operation during drawer-open position of the register. In this manner and with drawer open any number of entries may be set up on the keyboard and carried into the totalizer without closing the drawer. Moreover, should the keyboard setting be initially made prior to opening the drawer, this setting can be changed at will after the drawer has been opened. This is in sharp contrast with the known combination machines presently available which at their best have only half-stroke operation. By half-stroke I mean that the setting on the keyboard can not be corrected or changes made once the drawer has been opened, and this setting cannot be carried into the totalizing mechanism without closure of the drawer. For the first time there is made available a manual machine which can be operated at will either by drawer or handle without operation of the one affecting the other.

Moreover, so far as I know this is the first practical machine in which all data can be set up and carried into the totalizer with the drawer open, and any number of transactions carried into either the drawer or into the totalizer, or both, with a single opening of the drawer or while the drawer is open throughout the entry of all such transactions. Every opening of the drawer is indicated on the cash register tape by appropriate entry thereon. My new machine makes it possible to carry entries made on the keyboard into the totalizer, as in addition, through the use of the manual operating handle without the necessity of opening the cash drawer except in those instances when the cash drawer is key-locked.

My new construction is so simple that not only can it be readily incorporated in new equipment in simple and inexpensive manner but as well, it may be added with equal facility as part of existing machines. In this latter case the expense is small, and in both cases the machine is sturdy and fool-proof, displaying long, useful life, and involving but minimum change from known and available construction. It is ready and easy and simple in operation, requiring minimum effort on the part of the operator, and with no sacrifice to structural or functional uncertainty, complexity, fragility or high cost, it closely approaches the simple, nice and ready operation characteristic of the electric machine. The number of operations for complete entry of data is minimized, since depression of any department key in one embodiment of my invention serves not only to set up that department concerning which data is to be carried into the totalizer, but as well, to open the cash drawer. Full stroke opening of the cash drawer is made mandatory before carry-over into the totalizer of my new construction so that there is no possibility of hang-up of the mechanism in partly-open condition of the drawer.

Dash pot 71, of conventional design, and operably connected by link 72 with main drive shaft 50, insures that data is carried into the totalizer with even, uniform stroke, and this regardless of the rapidity or force with which the cash drawer is closed. In this manner provision is made that the different manners in which the several users of the machine close the cash drawer will have no effect on the entry of data into the totalizer.

All the foregoing, as well as many other highly practical advantages attend upon the practice and use of my new invention.

It is apparent from the foregoing that once the broad aspects of my invention are disclosed many embodiments falling within the scope thereof will readily suggest themselves to those skilled in the art. Accordingly, I intend the foregoing disclosure to be considered as illustrative, and not as a limitation.

I claim:

1. A cash register comprising a keyboard, a totalizer, a drive shaft for causing a keyboard setting to be transferred into said totalizer, a cash drawer slidingly mounted in said register, a linkage interconnecting said cash drawer with said drive shaft, a one-way clutch in said linkage so that upon the closing movement of said cash drawer said drive shaft is operated to cause the transfer of the keyboard setting into said totalizer while during the opening movement of said cash drawer said one-way clutch allows said drive shaft to be inoperative, a manually operable handle for operating said drive shaft independently of said drawer operation to cause the transfer of a keyboard setting into said totalizer, and a second one-way clutch interconnecting said handle and said drive shaft so that upon a closing movement of said cash drawer actuating said drive shaft said handle remains in initial position.

2. A cash register comprising a keyboard, a totalizer, a drive shaft for causing a keyboard setting to be transferred into said totalizer, a cash drawer slidingly mounted in said register, a one-way clutch, a first linkage interconnecting said one-way clutch with said drive shaft, a second linkage interconnecting said one-way clutch with said cash drawer, so that upon the closing movement of said cash drawer said drive shaft is operated to cause the transfer of the keyboard setting into said totalizer while during the opening movement of said cash drawer said one-way clutch allows said drive shaft to be inoperative, a manually operable handle for operating said drive shaft independently of said drawer operation to cause the transfer of a keyboard setting into said totalizer, and a second one-way clutch interconnecting said handle and said drive shaft so that upon a closing movement of said cash drawer actuating said drive shaft said handle remains in initial position and upon a manual operation of said handle said cash drawer and said second linkage remain undisturbed.

3. A cash register comprising a keyboard, a totalizer, a drive shaft for causing a keyboard setting to be transferred into said totalizer, a cash drawer slidingly mounted in said register, a linkage interconnecting said cash drawer with said drive shaft, a one-way clutch in said linkage so that upon the closing movement of said cash drawer said drive shaft is operated to cause the transfer of the keyboard setting into said totalizer while during the opening movement of said cash drawer said one-way clutch allows said drive shaft to be inoperative, a manually operable

handle for operating said drive shaft independently of said drawer operation to cause the transfer of a keyboard setting into said totalizer, a second one-way clutch interconnecting said handle and said drive shaft so that upon a closing movement of said cash drawer actuating said drive shaft said handle remains in initial position and means cooperating with said drive shaft to secure uniform rotation thereof throughout its working stroke regardless of the speed of closing said drawer.

4. A cash register comprising a keyboard, a totalizer, a drive shaft for causing a keyboard setting to be transferred into said totalizer, a cash drawer slidingly mounted in said register, a linkage connected at one end to said drive shaft, a handle releasably connected to said drive shaft and to said linkage for manual operation of said drive shaft, a rocker arm mechanism connected at one end to said cash drawer, clutch means interconnecting the free ends of said linkage and said rocker arm mechanism, said clutch means comprising a sleeve mounted on the free end of said linkage having an elongated recess therein, a shoulder at the free end of said rocker arm mechanism, said shoulder having an indented step therein, a spring pressed pawl mounted on said sleeve extending into said recess and engaging in said step in the fully open position of said drawer, said step rotating said sleeve through said pawl and operating said linkage during the drawer-closure stroke of said rocker arm mechanism to an extent sufficient to fully operate said drive shaft during the closing movement of said drawer but slipping said rocker arm mechanism in the open position of said drawer upon operation of said handle and an adjustable stop on said register cooperating with said pawl to trip said clutch and disengage said linkage and rocker arm mechanism near the end of the working stroke of said linkage and rocker arm mechanism.

5. A cash register comprising a keyboard, a totalizer, a drive shaft for causing a keyboard setting to be transferred into said totalizer, a cash drawer slidingly mounted in said register, a rocker arm mechanism connected at one end to said cash drawer, a linkage connected to said drive shaft, means interconnecting said rocker arm mechanism and said linkage so that upon the closing movement of said cash drawer said drive shaft is operated to cause the transfer of a keyboard setting into said totalizer while during the opening movement of said cash drawer said means allows said drive shaft to be inoperative, a manually operable handle for operating said drive shaft independently of said drawer operation to cause the transfer of a keyboard setting into said totalizer, a clutch interconnecting said handle and said linkage, said clutch comprising at one end thereof a shoulder frictionally fast on said drive shaft having a shaft portion, said shoulder having a step thereon, a peripherally and transversely recessed hub of enlarged diameter on said handle engaging about said shaft portion of said shoulder and a pawl mounted on said hub for swinging in said recess and into contact with said step whereby said handle engages said shaft-connected mechanism and hence said drive shaft only during the working stroke of said handle.

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