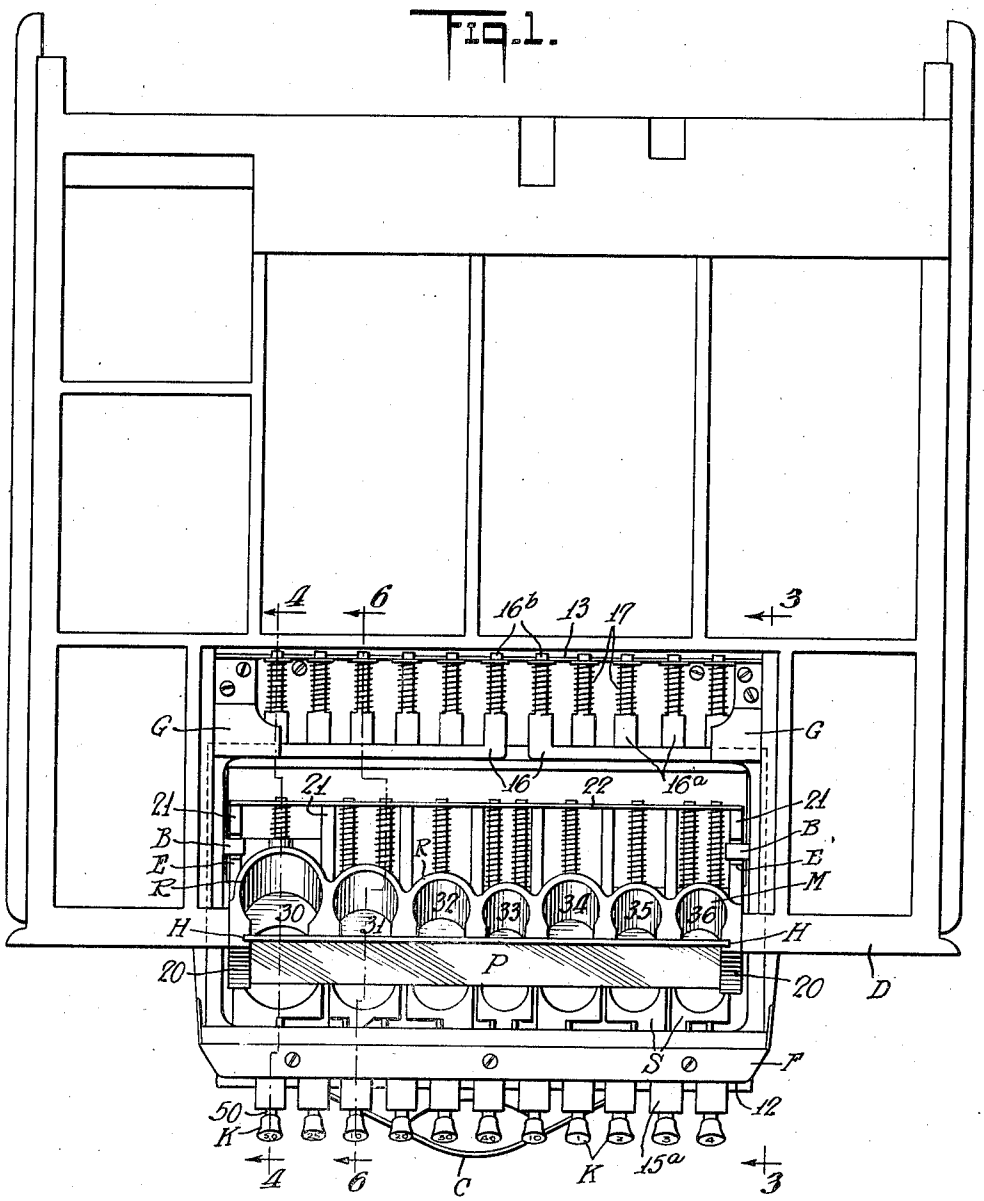
July 26, 1938. S. J. BACHARDY 2,125,058

CHANGE MAKING MACHINE

Filed March 18, 1932 5 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

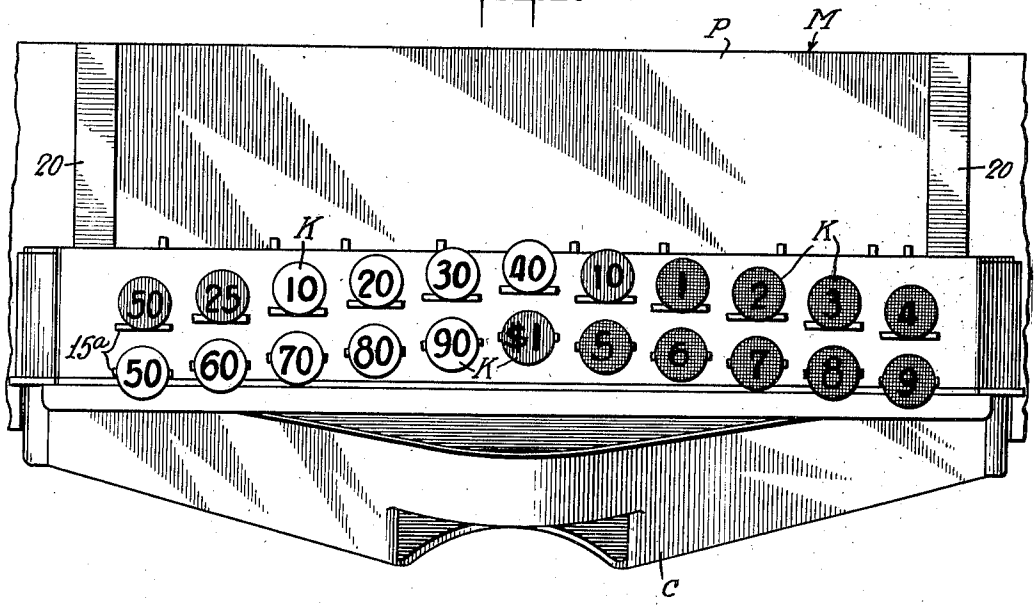
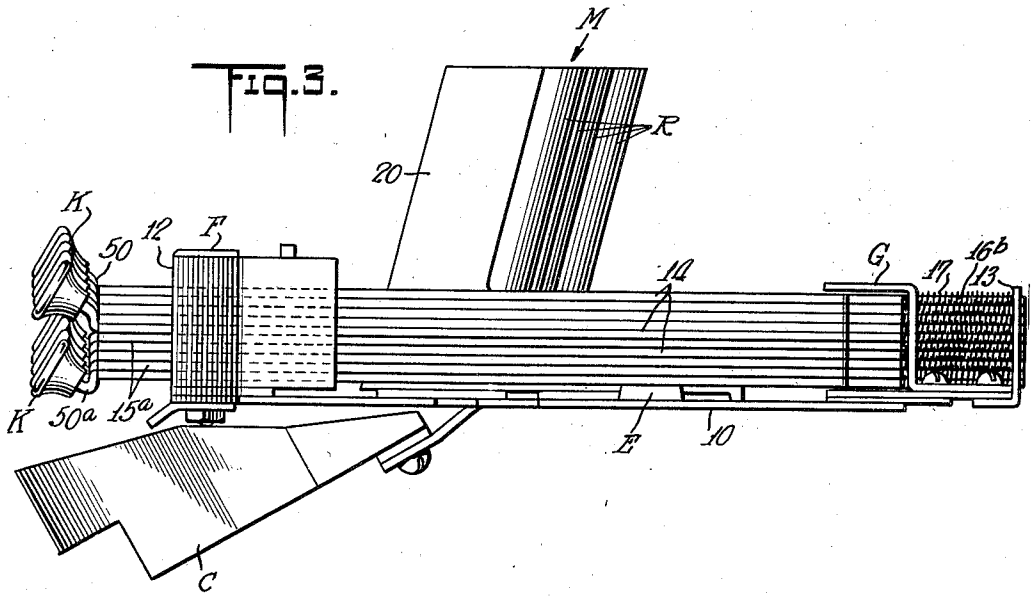


Fig. 3.



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CHANGE MAKING MACHINE

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Fig. 4.

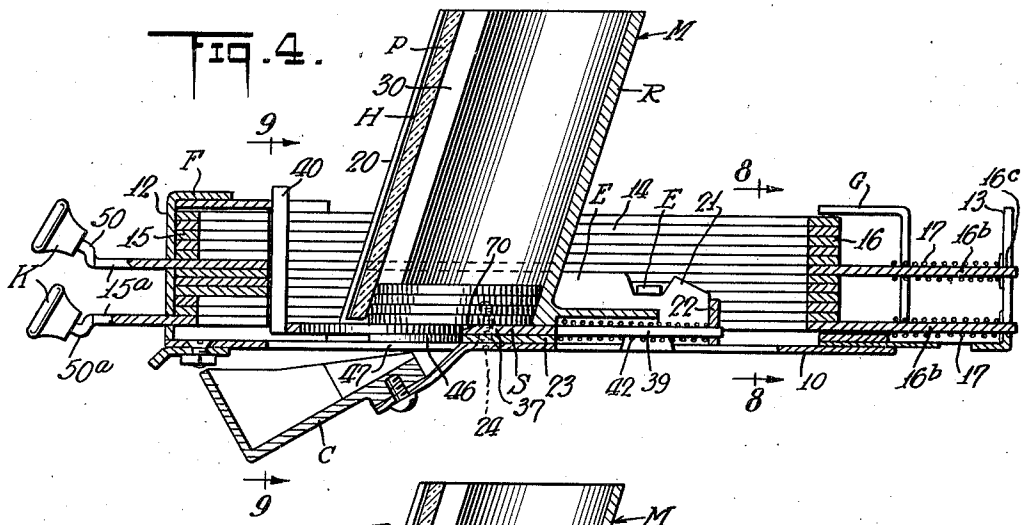


Fig. 5.

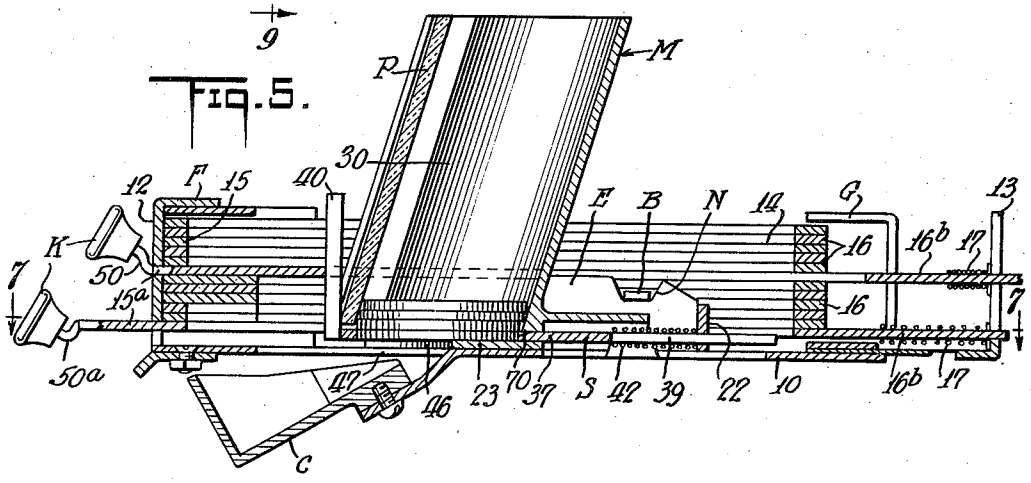
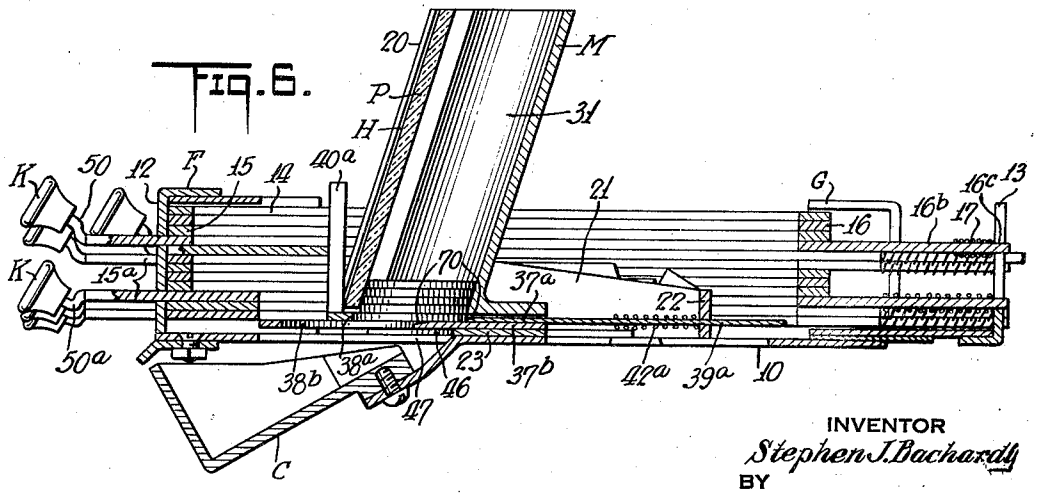


Fig. 6.



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CHANGE MAKING MACHINE

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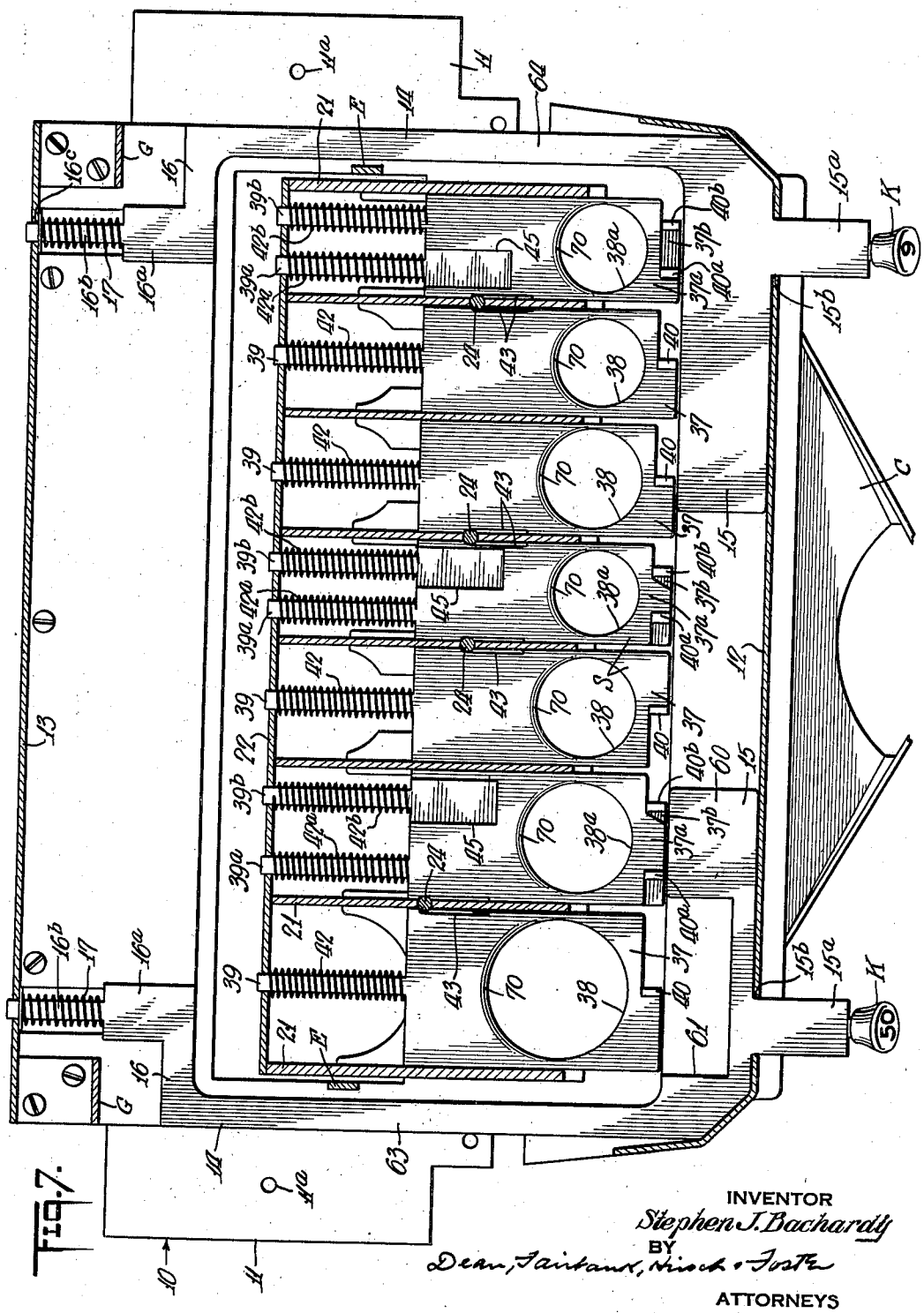


Fig. 7.

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CHANGE MAKING MACHINE

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Fig. 8.

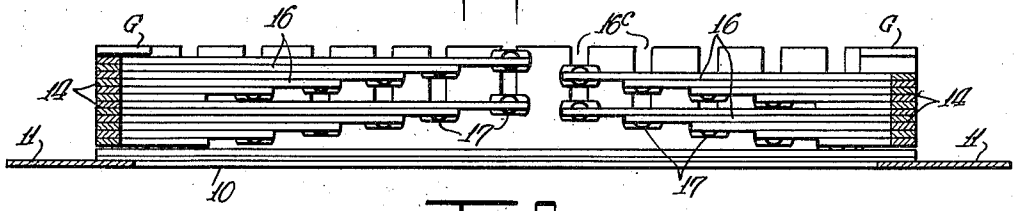


Fig. 9.

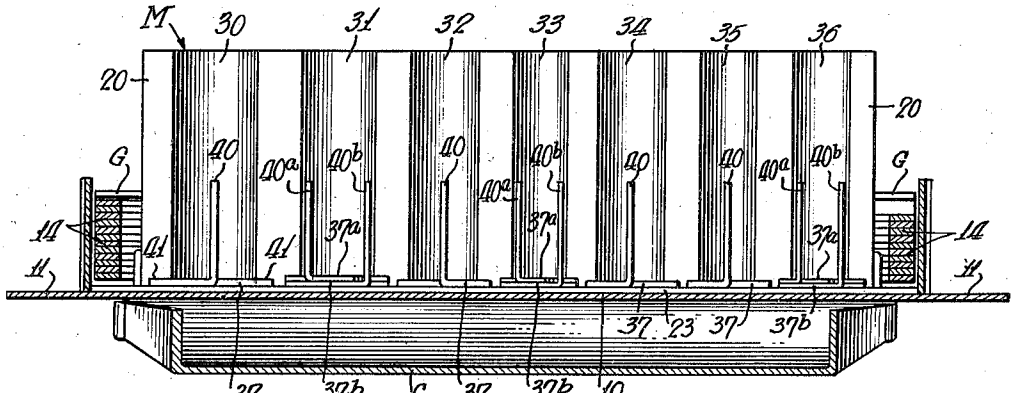


Fig. 10.

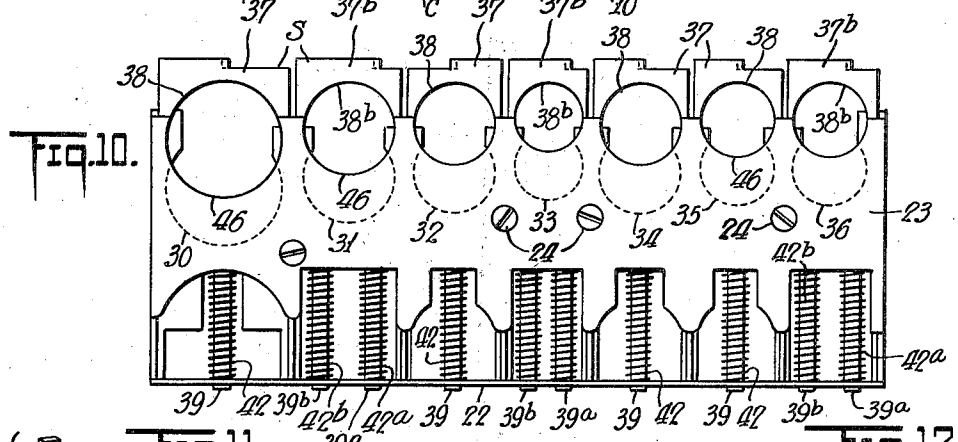


Fig. 11.

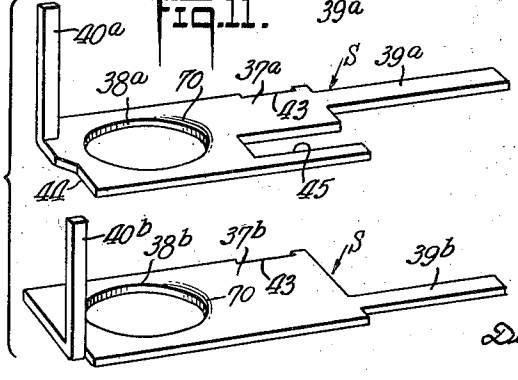
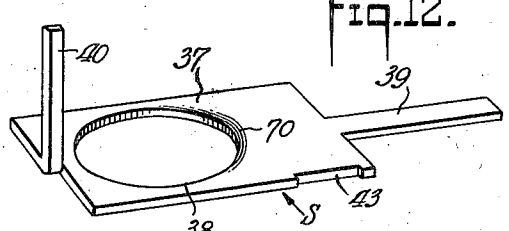


Fig. 12.



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UNITED STATES PATENT OFFICE

2,125,058

CHANGE MAKING MACHINE

Stephen J. Bachardy, Allentown, Pa., assignor to Monex Corporation, New York, N. Y., a corporation of Delaware

Application March 18, 1932, Serial No. 599,659

5 Claims. (Cl. 133—4)

My present invention is concerned with apparatus for discharging coins in selected numbers or change in selected amounts, and is especially adapted for embodiment in a change making apparatus of the key operated type.

An object of the invention is to provide a machine of this character involving a minimum number of moving parts, requiring but a light touch for operation, devoid of complex motion transmitting links or levers or wearing or hinging parts apt to cause looseness, noise or unreliability in operation, and a machine in which the energy required for operating any of the selector keys is substantially the same regardless of the number and/or denominations of the coins to be discharged.

Another object is to provide a machine of this character unlikely to get out of order even under severe conditions of use or abuse, of simple, rugged, practical and durable construction, all of the elements of which may be readily manufactured from inexpensive parts such as die castings, metal stampings and springs, and the parts of which may be rapidly and conveniently assembled.

Another object is to provide an apparatus characterized by compactness, by a minimum number of coin receptacles for the range of change selection available and affording choice in the denominations of the coins delivered in a change making manipulation as well as affording choice in the discharge of one or more coins from one and the same stack.

Another object is to provide a machine of this character which will eliminate the using of separate keys for each amount or even for each multiple of five and yet capable of delivering any amount of change from one cent to one dollar by the simultaneous or successive operation of not more than two separate keys.

Another object is to provide a change making apparatus having banks of decimal keys and unit keys of distinctively contrasting color or appearance and capable of single or dual actuation in accordance with whether the desired change required represents decimals or digits or a combination thereof.

Another object is to provide a machine of this character of such compact and diminutive size that it may be conveniently embodied in the drawers of even the smallest models of cash register.

Another object is to supplement the regular digit and decimal keys by certain further distinctively colored special purpose keys, certain of which may afford a visible field of separation between the banks of unit and decimal keys. Other advantages of the individual special purpose keys will appear from the specification.

In accordance with a preferred embodiment of the invention the depression of a key is not effective to discharge a coin so that if the operator realizes that he has pressed the wrong key or started to depress the wrong key he will be aware of his error before the change reaches the customer. The coins are ejected as an incident of key release rather than key depression with a consequent better opportunity for an operator to recognize an error before the coins have actually been delivered. The liability to err is further reduced by the fact that the coins are passed to discharge into the hand of the clerk rather than directly to the customer.

Preferably a plurality of coin stack holders are arranged side by side and the lowermost coin of each stack rests in untrapped position upon a coin trapping slide. The keys are arranged at the front of the machine for movement in a horizontal plane and are each fixed to a flat horizontally movable selector bar. The sets of bars may thus be stacked to occupy a minimum of space and are arranged to straddle the coin magazine. Each selector bar is suitably shaped to engage and actuate one or more of the slides as the bar is thrust rearwardly by pressure on the key. Springs normally tend to hold the keys in projected position with the selector bars inoperative and other springs normally tend to hold the trapping slides in a position where they serve as false bottoms for the coin stacks. As a key is pushed inwardly, however, the selector bar moves rearwardly carrying with it the coin trapping slides and moving them to a position where one or more of the lowermost coins of the selected stacks are trapped in the slides. As a key is released the key with its selector is returned to inactive position by the associated spring and the coin trapping slide returned by its spring to a position where it will again support the coin stack and where the entrapped coins are gravitationally discharged.

Preferably the key board and selector unit are assembled independently of the coin magazine and coin trapping slide unit and the two units may be assembled or disassembled with respect to each other without requiring the use of tools or the release of securing devices of any character. In order to economize in the total height of the stacked selector bars, the selector bars of the unit keys and those of the decimal keys are

separate and independent. Each set of bars is of general U-shape, one set straddling one side of the coin magazine and the other set straddling the opposite side. The frame structure may be extremely simple consisting merely of a base plate affording front and rear guides for forwardly and rearwardly extending guide projections on the legs of the selector bars. The magazine and slide assemblage may also be of simple construction; the magazine proper consisting of a die casting having a plate secured in spaced relationship to the bottom thereof with the coin trapping slides movable over the plate and having their movement limited by the devices which secure the plate to the casting.

The invention may be more fully understood by the following description in connection with the accompanying drawings wherein:—

Fig. 1 is a top plan view of a cash register drawer with my improved change-making mechanism mounted in the forward end thereof,

Fig. 2 is a front elevational view of the change-making machine,

Fig. 3 is a side elevational view thereof taken approximately on the line 3—3 of Fig. 1,

Fig. 4 is a transverse sectional view of the change-maker on the staggered line 4—4 of Fig. 1,

Fig. 5 is a view similar to Fig. 4, but showing one of the keys thrust inwardly to cause one of the coins to be entrapped by its correlated slide,

Fig. 6 is a transverse sectional view of the machine on the staggered line 6—6 of Fig. 1, this view showing a single coin being trapped at the bottom of one of the stacks which are provided with double slides for single or multiple coin ejection,

Fig. 7 is an enlarged sectional plan view of the machine taken approximately on the line 7—7 of Fig. 5,

Fig. 8 is a vertical sectional view on the line 8—8 of Fig. 4,

Fig. 9 is a vertical sectional view on the line 9—9 of Fig. 4,

Fig. 10 is a bottom plan view of the magazine and slide unit removed from the machine,

Fig. 11 is a disassembled perspective view of the double slides used under certain of the coin stacks, and

Fig. 12 is a perspective view of one of the single slides.

General assembly

The machine illustrated is adapted to be used in conjunction with the drawer D (Fig. 1) of a cash register. The drawer is cut away at its central forward portion to receive the machine. The latter is mounted upon a flat skeleton base plate 10 having lateral projections 11 underlying the drawer and secured thereto by securing devices (not shown) passed through openings 11*a* in said projections.

Vertically disposed front and rear guide plates 12 and 13 rise from the forward and rear edges of the base plate being attached thereto in any suitable manner. The plates 12 and 13 serve to support and guide the selector bars which are arranged in two sets. Each selector bar preferably comprises a horizontally disposed metal stamping of generally U-shape with its intermediate portion 14 lying adjacent or over one lateral edge of the base plate 10 and with its front leg 15 and its rear leg 16 straddling the coin magazine and associated mechanism, which will be later described. A forward extension 15*a* of the leg 15 projects through a corresponding guide opening 15*b* in the front plate 12, terminating in a bent tongue 50 which carries a key K and a rearward extension 16*a* of the leg 16 is provided with a reduced portion 16*b* extending through a corresponding opening 16*c* in the rear plate 13 whereby the selector bars are guided for fore and aft movement. Springs 17 encircling portions 16*b* and reacting against the rear guide plate 13 urge the selector bars and keys forwardly toward their normal inoperative position. Two sets of these bars are provided, for instance where there is a twenty-two key board, eleven bars are stacked at each side of the base, two sets of bars straddling opposite ends of the coin magazine.

The stacks of selector bars are further prevented from riding upwardly by flange F integral with the front guide plate 12 and overlying the stacks at the forward portion of the machine and also by bracket members G rising from the rear of the base plate and overlying the rear legs of the stacked selector bars. The flange F and the brackets G of course merely supplement the front and rear guide plates in preventing upward movement and also aid in preventing undue flexing of the selector bars which may be of relatively thin stock.

The coin magazine M comprises a casting affording a plurality of generally three-quarter circular receptacles R to receive the various stacks of coins. Coin trapping slide members S are movable back and forth under the receptacles R by actuation of the selector bars as will be more fully hereinafter described. The coins are delivered into a chute C at the lower forward end of the machine.

Preferably the coin magazine and its coin trapping slides are formed as a unit, a bottom plan view of which is shown in Fig. 10 and this unit is removably held in position on the base plate by a pair of bracket members B integral with the base plate and latching in notches in integral rearward extensions E at the ends of the coin magazine casting.

I shall now describe in detail the construction of the individual units which go to make up the machine and then explain the operation thereof.

Coin magazine and coin trapping slides

The open front sides of all of the various coin receptacles are covered by a transparent plate P slidably engaged in grooves H in forward extensions 20 at the ends of the magazine casting. Between each pair of coin receptacles the casting includes an integral rearwardly extending heel piece 21 the outermost of these heel pieces constituting the notched members or extensions E which are locked under the brackets B. A cross bar 22 is screwed or otherwise secured to the rear ends of the heel pieces 21 and a retainer plate 23 for the coin trapping slide members S is secured to the underface of the heel pieces 21 by screws 24.

With particular reference to Figs. 9 to 12 inclusive, it will be observed that the coin magazine is provided at the left with a receptacle 30 for half dollars. To the right of this receptacle is a stack holder 31 for quarters, after which follows the receptacle 32 for nickels, 33 for dimes, another nickel receptacle 34 and two penny receptacles 35 and 36.

Under the quarter receptacle 31, the dime receptacle 33 and the penny receptacle 36, there are a pair of super-imposed coin trapping slide mem-

bers, whereas, only one slide is provided under each of the other receptacles.

One of the single slides is illustrated in Fig. 12 and a pair of the double slides in Fig. 11. The single slide Fig. 12 comprises a plate 37 having a coin trapping opening 38 therein and formed with a rearwardly extending tail piece 39. At its front end, the slide carries or is integral with an upstanding finger 40 lying in the plane of the front legs of one stack of selector bars. Immediately beneath each coin receptacle the coin magazine is undercut, as at 41, these undercuts cooperating with the retainer plate 23 to define guideways in which the slides are movable. The tail piece 39 of each slide 37 slides in the cross bar 22.

Each slide member is normally spring urged forwardly by a coiled expansion spring 42 encircling the tail piece 39 and reacting against the cross bar 22. The forward spring impelled movement of each slide as well as the rearward selector bar impelled movement thereof is limited by the engagement of the ends of slots 43 in the edges of the selector bars with the shanks of the screws 24 which hold the base plate 23 in position.

Where double slides are used as under the dime magazine, the superimposed slide members 37*a* and 37*b* are provided with alined coin trapping apertures 38*a* and 38*b*. The upstanding fingers 40*a* and 40*b* which correspond with the finger 40 are disposed at opposite sides of the front edges of the two slide plates, finger 40*b* being accommodated in a notch 44 in the superposed slide plate 37*a*. Thus as the finger 40*b* is pushed rearwardly by one of the selector bars, both of the slide plates 37*a* and 37*b* will be actuated. If, however, the finger 40*a* of the plate 37*a* is pushed rearwardly this slide member will travel alone.

In order to prevent interference between the actuating spring 42*a* and 42*b* of the double slide members the tail pieces 39*a* and 39*b* are laterally displaced with respect to each other. Furthermore, slide 37*a* is provided with a notch 45 therein of greater width than the diameter of the spring which encircles the tail piece 39*b* of the companion slide, to the end that the slide 37*a* may be thrust rearwardly without engaging the spring 42*b*. This notch has no function when the two slides are simultaneously thrust rearwardly.

The retainer plate 23 is provided with a plurality of semi-circular notches 46 registering with the circular openings 38, 38*a*, etc. of the coin trapping slides when the slides are in their normal forward position. Thus the slides define false bottoms for the stacks of coins in the receptacles 30, 31, etc. and the base plate 23 defines a true bottom for these stacks of coins.

After the slides have been thrust rearwardly so that one or more coins from the stack have gravitationally descended into the coin trapping openings of the slides, the retainer plate 23 prevents the coins from dropping further until such time as the slides are released and spring forwardly to a position where their coin trapping openings register with corresponding openings 47 in the main base plate 10. At this time the entrapped coins drop into the chute C sliding gravitationally into the waiting hand of the operator at the chute discharge opening and the coin trapping slides are again in a position to serve as false bottoms for the remaining coins of the various coin stacks.

Keyboard and selectors

The arrangement of the selector bars is such as to present two rows of eleven key-carrying extensions 15*a* at the front of the machine. These rows are arranged one above the other and each row of extensions 15*a* is of an exceedingly obtuse angular contour, in the present instance, defining an angle of one hundred and sixty-five degrees as best shown in Fig. 2. The stacking of the selector bars in the manner previously described necessarily causes the members 15*a* to be disposed at different levels. This would not necessarily throw the two rows of keys into the angular conformation shown since if desired the key carrying tongues 50 of each extension 15*a* might be made of a different length to present two truly horizontal rows of keys. In order to avoid the additional manufacturing expense of making the key carrying part of each selector of a different length I prefer to use key carrying shanks of uniform length merely bending the shanks 50 of the upper row of keys slightly upwardly and the corresponding shank 50*a* of the lower row of keys slightly downwardly, whereby to space the two key rows a sufficient distance apart.

I also prefer to mount each key with its axis at an angle of about thirty degrees to the horizontal. This arrangement makes the key board visible to an operator standing above, and in front of the machine. The use of carrying key shanks of uniform nature also obviates any possibility of unequal leverages being applied upon the selectors when operating the keys thus practically eliminating the danger of breaking off a key shank 50 in the event that one of the selector bars was temporarily blocked against rearward movement by some foreign article which had found its way into the machine.

Fig. 7 illustrates two selector bar constructions, it being readily understood that to design the requisite selector bar for any key it is merely necessary that the bar be provided with portions 60 arranged in proper position to actuate the fingers of the desired slide members and with one or more notches 61 to clear the other fingers and prevent actuation thereof.

Of the two selector bars shown in plan, one bar 63 clears the decimal 50 key and includes portion 60 to actuate both fingers of the double quarter slides. The other bar 64 is attached to the units key 9 and arranged to engage the double slide member of one penny magazine, the single slide member of the other penny magazine and the slide member of one of the nickel magazines. It will be observed in this conection that the coin trapping slide of the magazine 35 is sufficiently thick to entrap two pennies, whereas the double slide arrangement of the other penny magazine permits the selective discharge of either one or two pennies.

In the absence of some means to prevent it, the presence of any coin in the machine, of slightly less than a normal thickness would tend to block operation as soon as a slide was shifted rearwardly. The thin coin and the one above it would both drop down with the upper coin projecting slightly into the trapping opening, thus blocking forward movement of the slide and jamming the machine. This is taken care of by providing an arcuate camming recess at the rear upper edge of each of the coin trapping openings. Thus where a slide is designed to discharge only one coin and that coin is thin and is followed by a second superimposed coin which partially enters the opening, the latter coin will be cammed out

of the opening as the slide moves forwardly due to the action of the camming portion 70 under the rear edge of the undesired coin.

Noting the key board in Fig. 2 it will be seen that in addition to regular white decimal keys and black digit keys I have shown four red "special purpose" keys, two of which serve to divide the decimal key bank from the digit key bank and two others of which are located at the left hand side of the key board at the end of the decimal key blank.

These special purpose keys are marked respectively .10, .25, .50 and 1.00. The dollar key is simply for convenience in making change for a dollar where a patron desires it. The dime key serves to make change for a dime, that is, deliver two nickels instead of the ten cent piece delivered by the regular ten cent key of the unit key bank. The fifty cent special purpose key delivers a fifty cent piece in contra-distinction to the two quarters delivered by the regular fifty cent decimal key. The twenty-five cent key when depressed delivers a single quarter and is of advantage principally because of the great number of times where the twenty-five cents in change is required and such change may be supplied by a single United States coin.

The right hand bank of selector bars looking at the machine from the front mounts all of the digit keys and the dime and dollar "special purpose" keys. The special dime and dollar keys, each being colored red, afford a prominent line of color demarcation between the units keys and the decimal keys. The other bank of eleven keys contains all of the decimal keys and the special purpose twenty-five cent and fifty cent keys.

The operation of the machine will be in large part obvious from the foregoing description but it may be briefly summarized as follows:—

Assume it is desired to discharge the sum of fifty-nine cents; the operator while holding one hand under the mouth of the chute C simply depresses the decimal key 50 and the unit key 9. By this depression the 50 cent key selector bar shifts both twenty-five cent slides rearwardly entrapping two quarters. The 9 cent key thrusting its selector bar rearwardly pushes back the other nickel slide and the double thickness "two penny" slide and both slides of other penny stack thereby entrapping a nickel and four pennies. By releasing the buttons the entrapped coins are carried forwardly by the expansion of springs 42 of their slide members 37, drop into the chute C and slide gravitationally through the outlet opening in the chute into the waiting hand of the operator. Simultaneously the selector bars are returned to normal position by their springs 17.

It is worthy of note that each key is directly rigidly connected to a single selective device, i. e., selector bar and that a thrust on the key is transmitted directly and as a straight rectilinear motion of the selector bar, there being no motion translating device, no hinges and no intermediate linkage or leverage of any kind. There is no danger of cocking, jamming or binding, but little operative effort is needed and that effort is substantially uniform for each of the keys. While the key board is small and compact, coins in any desired denominations in amounts up to a dollar and over may be selectively delivered by the actuation of at most two selector keys.

The speed of the machine is not retarded by the provision of long gravity chutes or by the necessity of the operator having to wait for one customer to remove his change before making change for another.

In use of the machine there is no danger of the coin magazine and slide unit becoming disassembled from the associated selector bar mechanism since with the slides held in their normal forwardly projecting position it is impossible to rock the members E out of engagement with their latches. In order to effect disengagement of the coin mechanism and slide unit from the rest of the machine all of the slides must be thrust rearwardly against the action of their springs in order to permit them to clear the front legs of the selector bars as the coin magazine unit is rocked out of its latched position. Similarly, when applying the coin magazine all of the slides must be pushed to their released position and the members E slid under their latches with the coin magazine canted.

While the apparatus has been shown as applied to a cash register drawer it will be apparent that it might be mounted on the edge of a table or in any other suitable location without any change in its operation and with but minor changes in its mounting arrangement.

It will thus be seen that there is herein described apparatus in which the several features of this invention are embodied, and which apparatus in its action attains the various objects of the invention and is well suited to meet the requirements of practical use.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a machine of the class described a coin magazine presenting a series of coin stack receptacles, coin trapping slides arranged under said receptacles and having coin receiving openings therein normally out of registration with the stack and in advanced position whereby said slides normally serve as supports for the stacks, a plurality of selector bars mounted for horizontal sliding movement and including means directly to engage the slides and force them into coin trapping position, a key bank comprising a plurality of keys, each mounted on one of said selector bars and serving as an actuating means therefor, springs acting on the selector bars to normally hold them out of engagement with the slides and means under the slides for supporting coins trapped therein while the slide is moving from its trapping to its discharging position.

2. In a machine of the class described, a coin magazine to retain a plurality of stacks of coins, a plurality of flat superimposed horizontal selector bars, means mounting the bars and guiding them for sliding movement, each bar being of general U-shape to straddle one end of the coin magazine, keys connected to the legs of the bars for actuating them, coin trapping slides arranged under the coin magazine and actuated by said selector bars to entrap a coin as the bars are forced rearwardly by their keys and means for moving the coin trapping slides to coin ejecting position upon the release of said keys.

3. In a machine of the class described, an elongated coin magazine including a plurality of laterally adjacent coin stack holders, a plurality of flat superimposed horizontal selector bars, means mounting the bars and guiding them for sliding movement, each bar being of general U-shape to straddle one end of the coin magazine, keys connected to the bars for actuating them, coin trapping slides arranged under the coin stacks of the magazine and actuatable by said selector bars into coin trapping position as the bars are forced rearwardly by their keys and means for moving the coin trapping slides to coin ejecting position upon the release of said keys, each slide including a finger extending upwardly therefrom at its forward end, the forward legs of the selector bars being suitably shaped to engage one or more predetermined fingers and thereby simultaneously operate the proper slides.

4. A change making machine including a frame structure, an elongated coil magazine mounted on said frame structure and providing receptacles for supporting a plurality of generally vertical coin stacks, two sets of selector bars each of generally U-shape each set straddling one end of the coin magazine, each set of bars comprising a plurality of flat superimposed members guided for sliding movement at the front and rear of the coin magazine, key supporting means projecting from the front legs of the selectors, coin trapping slide mechanism moved into position by the selectors for entrapping coins from one or more stacks of the magazine as a selector is actuated by its key, said slides being automatically returnable to coin discharging position when the actuating selector is released.

5. A change making machine including a frame structure, an elongated coin magazine mounted on said frame structure and providing receptacles for supporting a plurality of generally vertical coin stacks, two sets of selector bars each of generally U-shape each set straddling one end of the coin magazine, each set of bars comprising a plurality of flat superimposed members guided for sliding movement at the front and rear of the coin magazine, key supporting means projecting from the front legs of the selectors, coin trapping slide mechanism engaged and moved into position by the selectors for entrapping coins from one or more stacks of the magazine as a selector is actuated by its key, each of said slides having an upstanding operating arm and being automatically returnable to coin discharging position when the actuating selector is released, the coin trapping slide members for certain stacks including a plurality of individual superimposed slides operable singly or in unison by the cooperation of the upstanding arm of the lower slide member with the slide superimposed member to discharge one or more coins from the stack as the selectors are actuated.

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