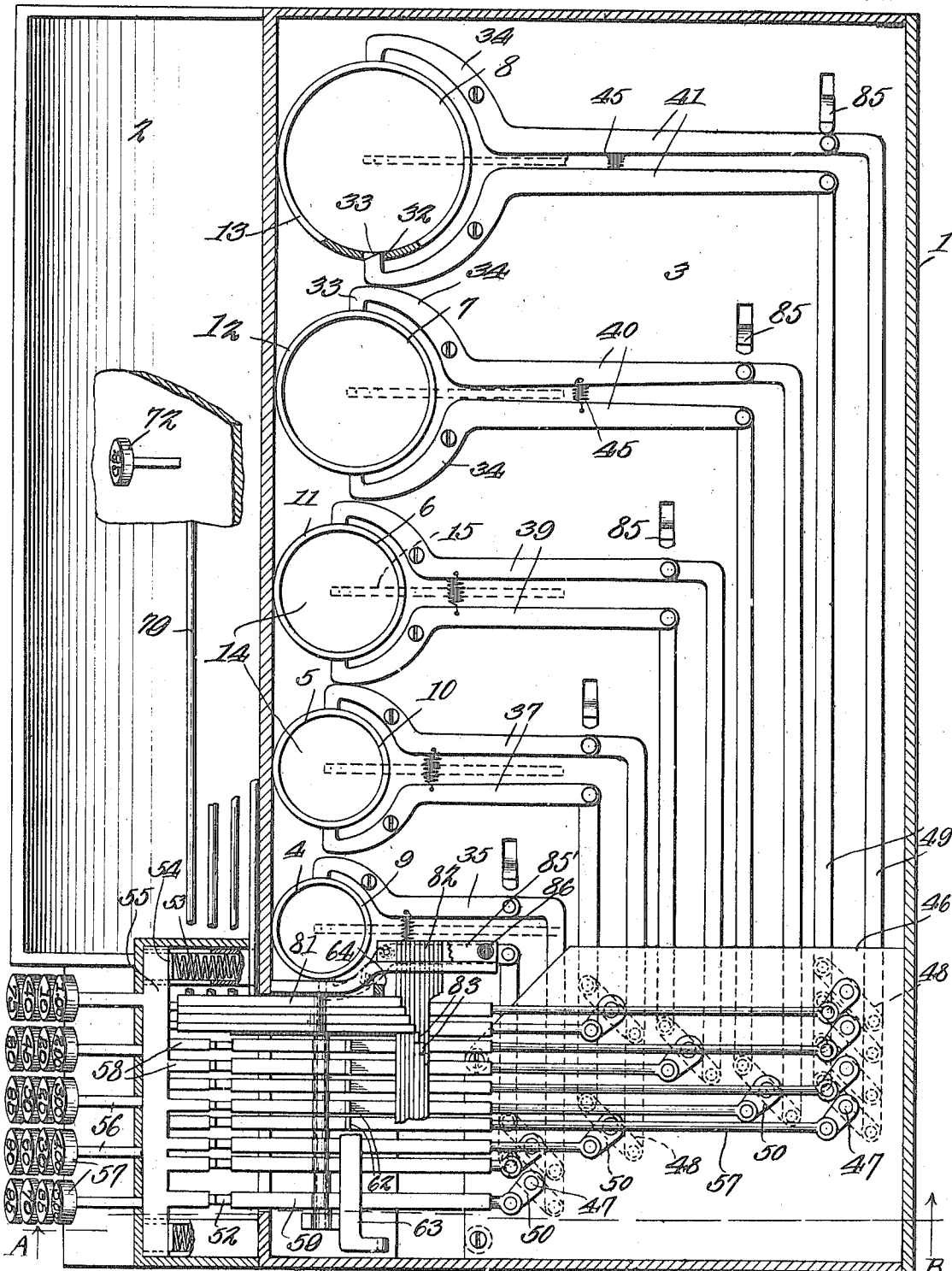


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CHANGE MAKING MACHINE.
APPLICATION FILED OCT. 25, 1915.

1,197,101.

Patented Sept. 5, 1916.
4 SHEETS—SHEET 1.



Witnesses

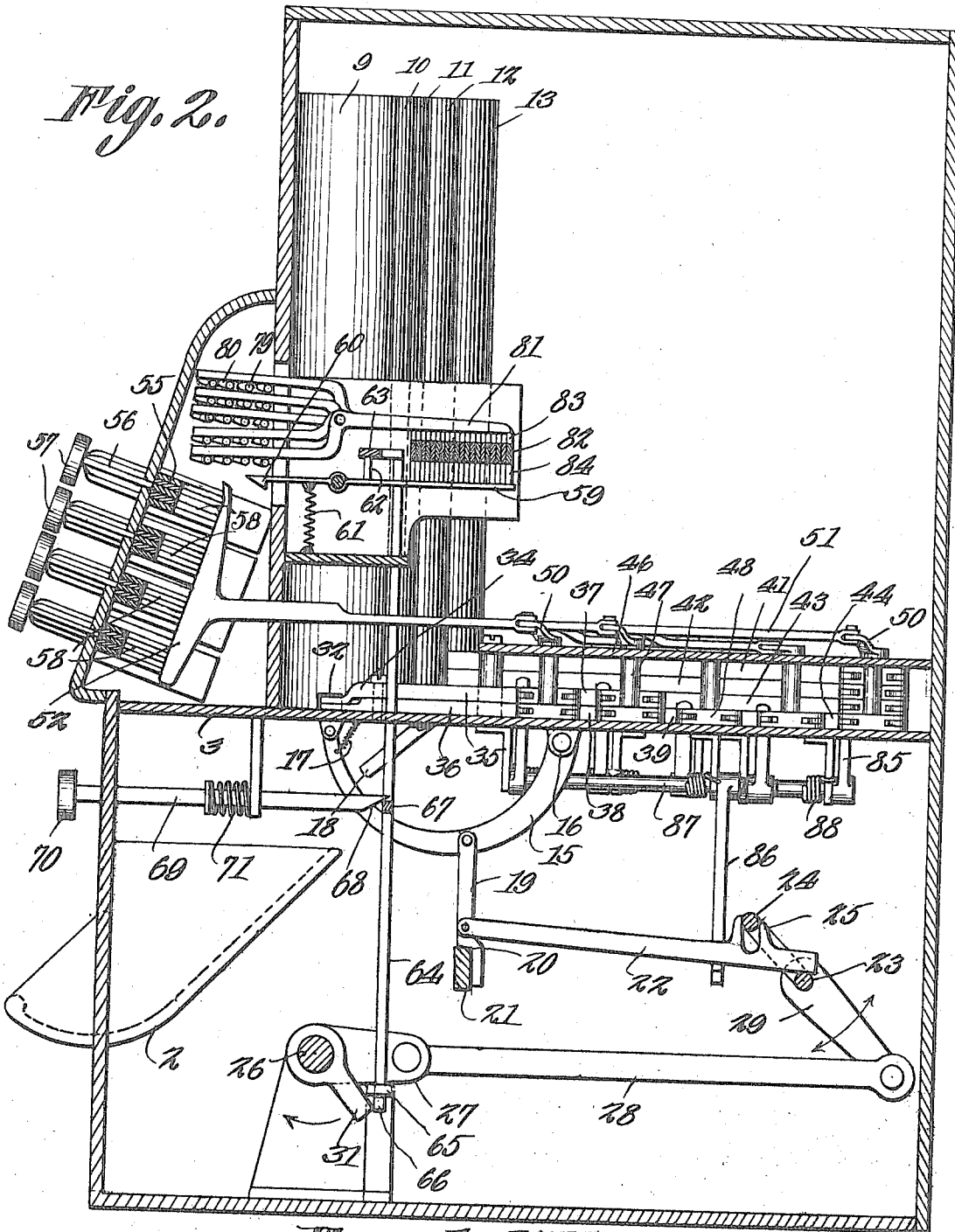
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Fig. 1. Attorneys

1,197,101.

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4 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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4 SHEETS—SHEET 3.



Witnesses

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Cashworth

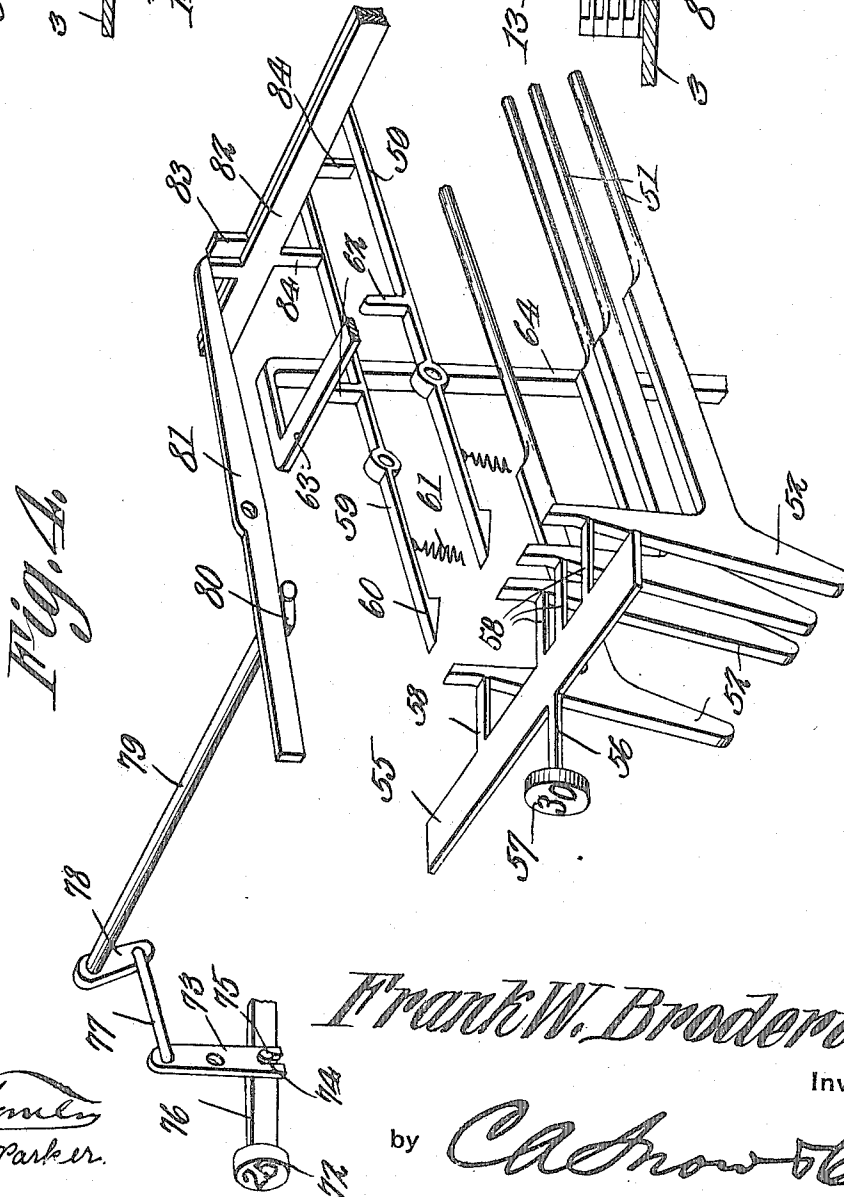
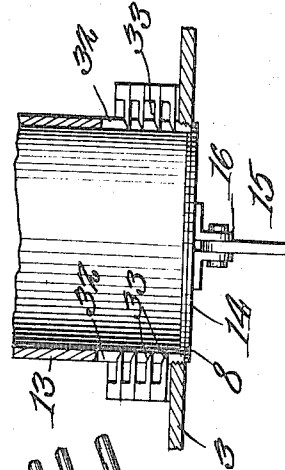
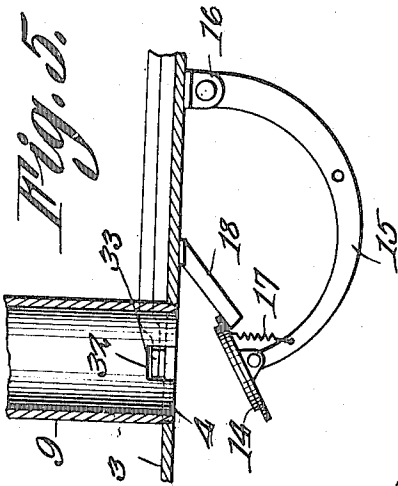
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4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK W. BRODERICK, OF ST. JOSEPH, MISSOURI.

CHANGE-MAKING MACHINE.

1,197,101.

Specification of Letters Patent.

Patented Sept. 5, 1916.

Application filed October 25, 1915. Serial No. 57,764.

To all whom it may concern:

Be it known that I, FRANK W. BRODERICK, a citizen of the United States, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented a new and useful Change-Making Machine, of which the following is a specification.

This invention relates to change making machines particularly designed for use in connection with cash registers although it is to be understood that the same may, if desired, be used by itself as a complete machine.

One of the objects of the invention is to provide mechanism of this character which, when combined with a cash register, will, after the depression of a key indicating the amount received and another key indicating the amount of the purchase, deliver coins aggregating the amount of change to be returned to the customer, it being unnecessary to perform any mental calculation or to handle any money other than that received from the customer.

A further object is to provide mechanism of this type which is simple and compact and which can be manipulated readily without requiring any special skill on the part of the operator.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a plan view of the mechanism embodying the present improvements, certain of the parts being broken away and other parts being shown in section. Fig. 2 is a section on line A—B Fig. 1. Fig. 3 is a rear elevation of the structure shown in Fig. 1, certain of the parts being broken away. Fig. 4 is a perspective view of a portion of the selective and release mechanisms. Fig. 5 is an enlarged section through the lower portion of one of the coin tubes and showing the position of the coin base or support when

lowered. Fig. 6 is an enlarged vertical transverse section through one of the coin tubes.

Referring to the figures by characters of reference 1 designates a portion of a casing which can be a part of the casing of a cash register or can be a separate casing in which the mechanism constituting the present invention is mounted. This casing is provided with a coin chute 2 opening through one face thereof and above this chute is located a table or partition 3 having a row of circular openings for the passage of coins of different sizes. The number of these openings will vary according to the number of denominations of coins to be delivered from the machine. Where the denominations range from five cents to one dollar, five holes will be provided as indicated at 4, 5, 6, 7 and 8. Removably mounted on the partition 3 and extending about the respective holes therein are coin tubes 9, 10, 11, 12 and 13 respectively. Where a greater number of holes are provided a greater number of coin tubes will be provided. In the present instance the respective coin tubes are adapted to hold nickels, dimes, quarters, half-dollars and dollars. Normally positioned within each of the holes in the partition 3 is a coin supporting disk 14 pivotally mounted upon one end of an arcuate arm 15 extending under the partition 3 and pivotally connected to a bracket 16 depending from the partition. A spring 17 may be employed for holding the disk 14 normally in a predetermined position relative to the arcuate arm 15. A tripping finger 18 is preferably extended downwardly from the partition 3 adjacent each of the openings therein and is so located that when arm 15 is swung downwardly, thus removing the disk 14 from the opening in the partition, said disk will strike against finger 18 and be tilted against the action of spring 17, as shown in Fig. 5, thus to insure the discharge of any coin which may be resting on the disk. When arm 15 is swung upwardly, the disk 14 will move away from the finger 18 and return to its normal position relative to arm 15 and ultimately become seated within the lower end of the coin tube thereabove.

Each of the arms 15 has a depending latch 19 pivotally connected to it, this latch having a shoulder 20 adjacent its lower end

which normally rests upon a supporting bar 21 extending transversely under all of the arcuate arms 15. When the latch 19 is thus located it locks the arm 15 against downward movement. Pivottally connected to each of the latches 19 is a draw bar 22 and all of these draw bars normally rest upon a shaft 23 mounted for rotation in the casing 1. This shaft is provided with loops or crank arms 24 each of which straddles one of the bars 22 and normally rests between the upper end portions of fingers 25 extending upwardly from the bar. In other words, when the latches 19 are in engagement with the transverse bar 21, and shaft 23 is in its normal position, all of the crank loops 24 on shaft 23 bear between the terminals of the upstanding fingers 25 so that rotation of the shaft 23 in one direction is prevented. However, rotation of said shaft in the opposite direction is permitted and, as long as the bars 22 are resting on shaft 23, this rotation of the shaft 23 will be independent of any movement of bars 22 for the reason that the crank loops 24 are free to swing upwardly away from the fingers 25. However, should one or more of the bars 22 be lifted off of the shaft 23, the fingers 25 would be likewise elevated so that swinging movement of crank loops 24 away from bar 21 would result in the actuation of the elevated bars 22 and the removal of their latches 19 from the transverse bar 21. The means utilized for lifting the draw bars 22 so that they will be coupled operatively to the crank loops 24, will be hereinafter more fully described.

The means employed for rotating shaft 23 back and forth may consist of an operating shaft 26 having a crank arm 27 connected by a link 28 to a crank arm 29 extending from shaft 23, the two crank arms being so proportioned that one complete rotation of crank arm 27 will result in the oscillation of the crank arm 29 through approximately 90 degrees. The operating shaft 26 may be actuated by a crank 30 located outside of the casing 1 where it can be conveniently grasped by the user of the mechanism. Tripping fingers 31 may be connected to the operating shaft so as to rotate therewith, these fingers being for the purpose hereinafter pointed out.

Formed in the bottom portion of each of the coin tubes at diametrically opposed points are apertures 32 designed to receive dividing knives 33 each of which is formed at one end of an arcuate arm 34. These arms 34 are disposed in pairs and are pivottally mounted close to the coin tubes, the arms extending partly around the outer sides of the coin tubes. Two pairs of superposed arms 34 are provided adjacent the coin tube 9 and are formed integral with upper and lower pairs of levers 35 and 36 respectively. The arms 34 adjacent the coin tube 10 are

likewise arranged in upper and lower pairs, the upper pairs forming parts of levers 37 while the lower pairs form parts of levers 38. A single pair of arcuate arms 34 is provided for the tube 11 and constitute portions of levers 39. A single pair of arms 34 is likewise provided for the coin tube 12 and form parts of levers 40. The coin tube 13 has four pairs of superposed arms 34, the upper arms forming parts of levers 41 while the next succeeding pairs of arms 34 thereunder constitute parts of levers 42, 43 and 44 respectively. A spring 45 connects the levers 41 so as to hold them normally drawn toward each other with the knives 33 withdrawn from the coin tubes. Similar springs connect the levers of the other pairs 42, 43 and 44 and likewise the levers of the pairs 37, 38, 35 and 36. Thus all of the knives 33 are normally retracted from the coin tubes.

Arranged above the partition 3 is a top plate 46 and journaled in this top plate and in the partition 3 are shafts 47 equal in number to the number of pairs of levers 35 to 44 respectively. Each of the shafts 47 has a cross arm 48 secured to it and each cross arm is connected, by rods 49, to one of the pairs of levers 35 to 44. Thus when one of the shafts 47 is rotated its cross arm 48 will thrust against one rod 49 and pull upon another rod thus causing the two levers to which the rods are attached, to move apart, thereby projecting the knives 33 controlled by said levers, through the openings 32 and into diametrically opposed portions of the coin tubes so that the knives will enter between certain coins in the tubes. As one of these shafts 47 and cross arms 48 is provided for each pair of levers and for each pair of knives 33, it will be apparent that any pair of knives 33 can be selected and actuated independently of the remaining knives.

Connected to the upper end of each of the shafts 47 is a crank arm 50 and secured to each crank arm 50 is a push rod 51 provided at its forward end with a head 52. Obviously the number of heads 52 is equal to the number of pairs of separating knives 33 and these heads 52 are preferably long and narrow so that they can be arranged close together and side by side.

As hereinbefore stated, the machine illustrated is adapted to hold stacks of dimes, nickels, quarters, half-dollars and dollars. The knives 33 adjacent the tube 9 are so positioned relative to each other that, when a stack of coins is arranged in the tube 9 and resting on the disk 14 in the bottom of the tube, the lower pair of knives 33 will be positioned to enter between the lowermost dime and the next adjoining dime while the uppermost pair of knives 33 will be positioned to wedge between the second and third dimes

from the bottom of the pack. The same arrangement is provided at the bottom portion of the nickel containing tube 10. When the lowermost knives 33 are thrust into the tube 10 they will separate the lowermost nickel from the rest of the stack whereas when the uppermost pair of knives 33 is thrust into said tube 10, they will separate the two lowest nickels from the rest of the stack. As only one pair of knives 33 is provided at the lower end of tube 11 and at the lower end of tube 12, it will be apparent that when either pair of knives is thrust inwardly, the lowermost coin will be divided from the rest of the stack. Four pairs of knives 33 are provided in the lower portion of tube 13. Thus when the lowermost pair is thrust inwardly, the lowest coin will be divided from the rest of the stack. When the second pair of knives from the bottom is thrust inwardly, two coins will be separated from the rest of the stack. When the third pair of knives from the bottom is thrust inwardly, three coins will be separated from the stack and when the uppermost pair of knives is thrust inwardly, four coins will be separated from the stack.

Yieldingly supported by springs 53 or in any other suitable manner are parallel bars 54 movably engaged by the end portions of selective bars 55 each of which has a stem 56 extending outwardly therefrom and provided with a key 57. Any desired number of these keys is employed. For example, where a machine is built for giving change up to five dollars, keys may be provided as shown in Fig. 1. Each of the selective bars 55 has selecting fingers 58 extending therefrom and adapted to bear against certain of the heads 52. For example, a key indicating thirty cents, is connected to a selective bar 55 having four fingers 58 extending therefrom. Two of these fingers bear against heads 52 adapted, when thrust inwardly, to operate levers 36 so as to swing the two pair of knives 33 into the coin tube 9, thus separating the two lowest dimes from the rest of the stack. The other two fingers on bar 55 designated by numeral 58 will press against two heads 52 which will simultaneously actuate the pairs of levers 37 and 38, thus to move both the upper and lower knives 33 into the nickel containing tube 10 so that the lower coin will be separated from the next lowest and both of the two lowest coins will be separated from the rest of the stack. As there are only the four fingers on the said selective bar 55 represented by numeral "30" only the four sets of knives or blades 33 will be operated when the key is pushed inwardly. In other words, by pushing inwardly on the key representing thirty cents, two dimes and two nickels will be separated from the rest of the stacks thereabove, the two coins being separated from

each other. This general arrangement is followed with reference to the other keys on the machine. For example, should the key designated by "\$1.00" be pushed inwardly, its selective bar, which contains nine fingers 58, will thrust inwardly on nine heads 52, thus forcing all of the four pairs of blades 33 into the stack of coins in tube 13, thrusting the blades 33 into the coins in tubes 11 and 12 so as to separate the lowermost coin in each tube from the remainder of the stack, thrusting both pairs of blades 33 into the dime tube so as to separate the two lowermost dimes from each other and from the stack, and thrusting the lowermost pair of the blades into the nickel tube to separate the lowermost nickel from the rest of the stack. The other keys are all so connected up that when any one of them is depressed there will be separated from the various stacks an amount of change equal to the sum indicated on the depressed key.

Arranged above each of the push bars 51 and in the path of each of the heads 52 is a latch lever 59 having a head 60 at one end adapted, when head 52 is pushed rearwardly, to engage it and hold it against return movement. Springs 61 may be employed for holding these latch levers in position to engage the heads 52. Fingers 62 extend upwardly from the respective latch levers at points back of the fulcrums thereof. Extending over all of the fingers 62 is a release bar 63 having arms 64 depending from the ends thereof and mounted, at their lower ends, in guides 65. Fingers 66 extend toward each other from the lower ends of the arms 64 and project into the paths of the trip fingers 31 secured to operating shaft 26. The arms 64 are connected at intermediate points by a cross bar 67. This cross bar is adapted to be engaged by the beveled end 68 of a stem 69 extending from a release key 70, a spring 71 being provided for holding said end 68 normally removed from the cross bar 67. It will be understood that whenever one or more of the heads 52 is thrust inwardly by means of a selective bar 55, the heads thus shifted will be automatically engaged and held by the heads 60 on levers 59. However, should a mistake have been made in actuating the wrong key 57, all of the heads 52 can be released simply by pushing inwardly on the release key 70. This will cause the beveled end 68 to ride on the bar 67, thus pushing the arm 64 downwardly and causing the release bar 63 to push on the finger 62, thus swinging the latch levers 59 out of their normal positions so as to release the heads 52.

Where the mechanism herein described is to be embodied in a cash register, the keys of the cash register ordinarily employed for registering the amount of a purchase can be employed in completing the operation for

which the present invention is designed. One of the sale recording keys of a cash register has been indicated at 72 and when this key is thrust inwardly it is adapted to actuate a lever 73 having a forked end 74 movably engaged by a stud 75 extending from the stem 76 of the key 72. One end of this lever 73 is connected by a link 77 to a crank arm 78 secured to one end of a rock shaft 79. Each of these rock shafts 79 has a lifting finger 80 adapted to actuate a lever 81. The number of these levers is equal to the number of keys 72 and each lever 81 is provided with an individual release bar 82 preferably provided with an upstanding finger 83 adapted to be engaged by lever 81. Each selective bar 82 has depending fingers 84 adapted to engage certain of the latch levers 59. The selective bars 82 are all closely arranged and are preferably yieldingly supported at their ends by bars 85 mounted on springs 86. Fingers 84 are so located that no matter what amount of money may be received and counted off by the actuation of the proper key 57, the depression of the key 72 indicating the amount of purchase will result in the release of those shifted heads 52 which, if left in engagement with latch levers 59, would result in giving incorrect change to the customer. For example, if a customer gives a clerk thirty cents in dimes after making a twenty-five cent purchase, the clerk first pushes inwardly on the key 57 designated by the numeral 30. This will result in forcing inwardly the heads 52 connected to the two sets of blades 33 in tubes 9 and 10 with the result that the four sets of blades will be thrust inwardly into said tubes so as to divide the two lowermost coins in each tube from each other and from the rest of the stack and when the heads 52 are thus thrust inwardly they will be engaged and held by the latches 59. The clerk then pushes inwardly on that key 72 on which numeral 25 appears, twenty-five cents being the amount of the purchase. This causes lever 73 to rock its shaft 59 with the result that the lever 81 belonging to said shaft will be shifted by finger 80 and pushed downwardly on its selective bar 82. As it is desired to release five cents in change, the fingers 84 on bar 82 will operate to disengage those levers 59 holding the heads 52 controlling the knives 33 in the dime holding tube 9 so that said heads 52 will be free to return to their normal positions while the levers 35 and 36 will also move back to their normal positions. Thus when the disk 14 under tube 10 is swung downwardly, only the coin under the lowermost pair of blades 33 will be released, this coin falling into the chute 2 from which it can be removed by the customer.

For the purpose of effecting the actuation

of the proper disks 14, a lever 85 is extended upwardly to one side of and in contact with one of the levers belonging to each of the coin tubes. For example, where five coin tubes are employed, five levers 85 are utilized. These levers are so positioned that when either lever 35 or lever 36 is actuated, the lever 85 provided therefor will be shifted laterally. When either levers 37 or 38 are actuated the lever 85 provided therefor will be shifted. The same is likewise true of the other levers 85 provided for levers 39 and 40 and for levers 41 to 44 inclusive. These levers are all arranged at the points where the rods 49 are connected to the blade carrying levers so that as all of the rods 49 have coextensive movement, the movement of the levers 85 will be coextensive. Each lever 85 is provided, at its lower end, with a normally inclined lifting finger 86 and each lifting finger extends under one of the draw bars 22. Thus assuming that the key 57 on which numeral 30 appears has been pushed inwardly, and the four pairs of levers 35, 36, 37 and 38 have been shifted out of their normal positions, it will be apparent that the two levers 85 cooperating with the levers 35 and 37 will be shifted to swing the lifting fingers 86 under those draw bars 22 belonging to the disks 14 under the tubes 9 and 10. As long as the levers of each pair are pushed apart by the depression of key 57, the lifting fingers 86 will support the push bars 82 in raised positions. When, however, the heads 52 belonging to the two sets of blades 33 in the dime tube are released by the depression of key 72, as hereinbefore pointed out, the two pairs of levers 35 and 36 will be restored to their normal positions, thus permitting the lever 85 cooperating therewith to swing to its normal position. Consequently the draw bar 22 which has been raised by said lever 85 will drop back to its normal position. However, the draw bar 22 which has been raised by the lever 85 under the control of levers 37 and 38, will be kept in elevated position and in engagement with the crank loops 24. Consequently when shaft 26 is rotated by means of the crank 30 two keys 57 and 70 being depressed, the shaft 23 will be rocked during the rotation of shaft 26 so that the one elevated bar 22 will remain in engagement with the crank loops 24 and be pulled longitudinally so as to remove the latch 19 from the transverse bar 21 and pull the arcuate arm 15 downwardly so that the coin resting on the disk 14 and below the lowermost pair of blades 33 in tube 10 will be discharged into the chute 2. As shaft 26 completes its rotation, the loops 24 will swing back and will return the bar 22 and the latch 19 to its initial position, the bar 22 being supported by fingers 86 and shaft 23 so that the shoulder 20 will be properly guided onto the bar 21

and the arm 15 swung upwardly to keep the disk 14 in the opening at the lower end of tube 10. During the completion of the rotation of shaft 26, the trip fingers 31 will strike the fingers 66 and pull downwardly on arm 64 so as to cause the release bar 63 to press on any elevated finger 62, thus releasing all of the heads 52 and allowing all of the blades 33 in the machine to return to their normal positions.

It is to be noted that each of the levers 85 is mounted on a pivot member 87 and has a spring 88 whereby the lever is held normally with its lifting finger 86 in inactive position. The various levers 85 are all disposed in alinement.

It is to be understood that the various coin tubes can be removably mounted so that it thus becomes possible to place them, with their contents, in a safe overnight. Furthermore, while the change making mechanism can be made complete in itself, it is designed to build it into an ordinary cash register so that the sales keys of the register can be utilized as means for separating the amount of purchase from the amount of selected coins, thus to insure the return of correct change to the customer.

What is claimed is:—

1. The combination with movable means for normally supporting a stack of coins, of opposed stack dividing members, key operated means for shifting said members to divide the lowermost coin from the stack and support the stack, and means for shifting the first named stack supporting means to release the coin below the dividing members.

2. The combination with movable means for normally supporting a stack of coins, and a latch for holding it in normal position, of opposed stack dividing members, key operated means for shifting said members to divide the lowermost coin from the stack and to temporarily support the stack, and means for successively unlatching and lowering the first mentioned stack supporting means to release the coin below the dividing members.

3. The combination with movable means for normally supporting a stack of coins, a swinging member pivotally engaged thereby, and a latch for holding said member and the supporting means in normal positions, of opposed stack dividing members, key operated means for shifting said members to divide the lowermost coin from the stack and support the stack, means for shifting the latch and lowering the swinging member to remove the first mentioned stack supporting means from its normal position, and means for tilting said stack supporting means relative to the swinging member during the descent thereof.

4. The combination with movable means

for normally supporting a stack of coins, of opposed stack dividing members, a key operated head, means operated by the movement of said head for simultaneously shifting the members into the stack to divide the lowermost coin from the stack and to support the stack momentarily, means for automatically engaging the head to lock said dividing members in position within the stack, an operating shaft, and separate means operated by the rotation of said shaft for successively swinging the first mentioned stack supporting means downwardly to release a coin and thence upwardly to its normal position and to release the head, and means for automatically returning the dividing members to position beyond the stack when the head is released.

5. The combination with movable means for normally supporting a stack of coins, of opposed stack dividing members, key operated means for shifting said members to divide the lowermost coin from the stack and to support the stack momentarily, means for automatically locking the dividing members in position within the stack, an operating shaft mounted for rotation, and separate means driven by said shaft during each rotation thereof, for successively swinging the first mentioned stack supporting means downwardly to release the coin below the dividing members, to then swing said supporting means back to its normal or stack supporting position, and to finally release the dividing members, and means for automatically withdrawing the dividing members from the stack when released.

6. The combination with movable means for normally supporting a stack of coins, of superposed pairs of opposed stack dividing members, separate key operated means for shifting either or both of said pairs of members into the stack to divide the lowermost coin or coins from the stack and support the stack, and means for shifting the first mentioned stack supporting means to release the coin or coins below the dividing members.

7. The combination with movable means for normally supporting a stack of coins, of superposed pairs of opposed stack dividing members, separate key operated means for shifting either or both of said pairs of members into the stack to divide the lowermost coin or coins from the stack and support the stack, key operated means for releasing the lower dividing members from the stack, and means for shifting the first mentioned stack supporting means to release the coins below the dividing members in engagement with the stack.

8. The combination with movable means for normally supporting a stack of coins, of superposed pairs of opposed stack dividing members, separate key operated means for shifting either or both of said pairs of mem-

bers into the stack to divide the lowermost coin or coins from the stack and support the stack, means for automatically locking said dividing members in the stack, key operated
 5 means for unlocking the lowermost dividing members, means for automatically removing the dividing members when unlocked, from the stack, and means for shifting the first mentioned stack supporting means to release
 10 the coins below the dividing members engaging the stack.

9. The combination with movable means for normally supporting a stack of coins, of superposed pairs of opposed stack dividing
 15 members, separate key operated means for shifting either or both of said pairs of members into the stack to divide the lowermost coin or coins from the stack and support the stack, means for automatically locking
 20 said dividing members in the stack, key operated means for unlocking the lowermost dividing members, means for automatically removing the dividing members when unlocked, from the stack, an operating shaft
 25 mounted for rotation, and means operated by said shaft during each rotation thereof, for shifting the first mentioned stack supporting means to release the coin below the dividing members in engagement with the
 30 stack, to return said stack supporting means to its initial position, and to release the dividing members in engagement with the stack.

10. The combination with movable means
 35 for normally supporting a stack of coins, of opposed stack dividing members, key operated means for shifting said members to divide one of the coins from the stack and support the stack, an operating shaft, and
 40 means operated by the dividing members

when moved into engagement with the stack, for coupling the operating shaft to the stack supporting means.

11. The combination with movable means for normally supporting a stack of coins, of
 45 opposed stack dividing members, key operated means for shifting said members to divide the lowermost coin from the stack and support the stack, a rock shaft, means for operating the same, means for fastening the
 50 movable stack supporting means in active position, and means operated by the movement of the stack dividing members to active position, for coupling said fastening means to the rock shaft. 55

12. The combination with movable means for normally supporting a stack of coins, and a latch for holding said means in normal position, of opposed stack dividing
 60 members, key operated means for shifting said members to divide a coin from the stack, a rock shaft, a crank member extending therefrom, a draw bar connected to the latch and normally supported by the rock shaft, and means operated by the dividing
 65 members when moved to active positions, for lifting the draw bar into engagement with the crank member thereby to couple the latch to the rock shaft, and means for oscillating the crank member to move the
 70 stack supporting means out of and back into active position.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses. 75

FRANK W. BRODERICK.

Witnesses:

HERBERT D. LAUSON,
 R. W. HOAGLAND.