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C. ULMER.
CHANGE MAKING MACHINE.
APPLICATION FILED MAR. 24, 1911.

Patented Mar. 19, 1912.

5 SHEETS—SHEET 1.

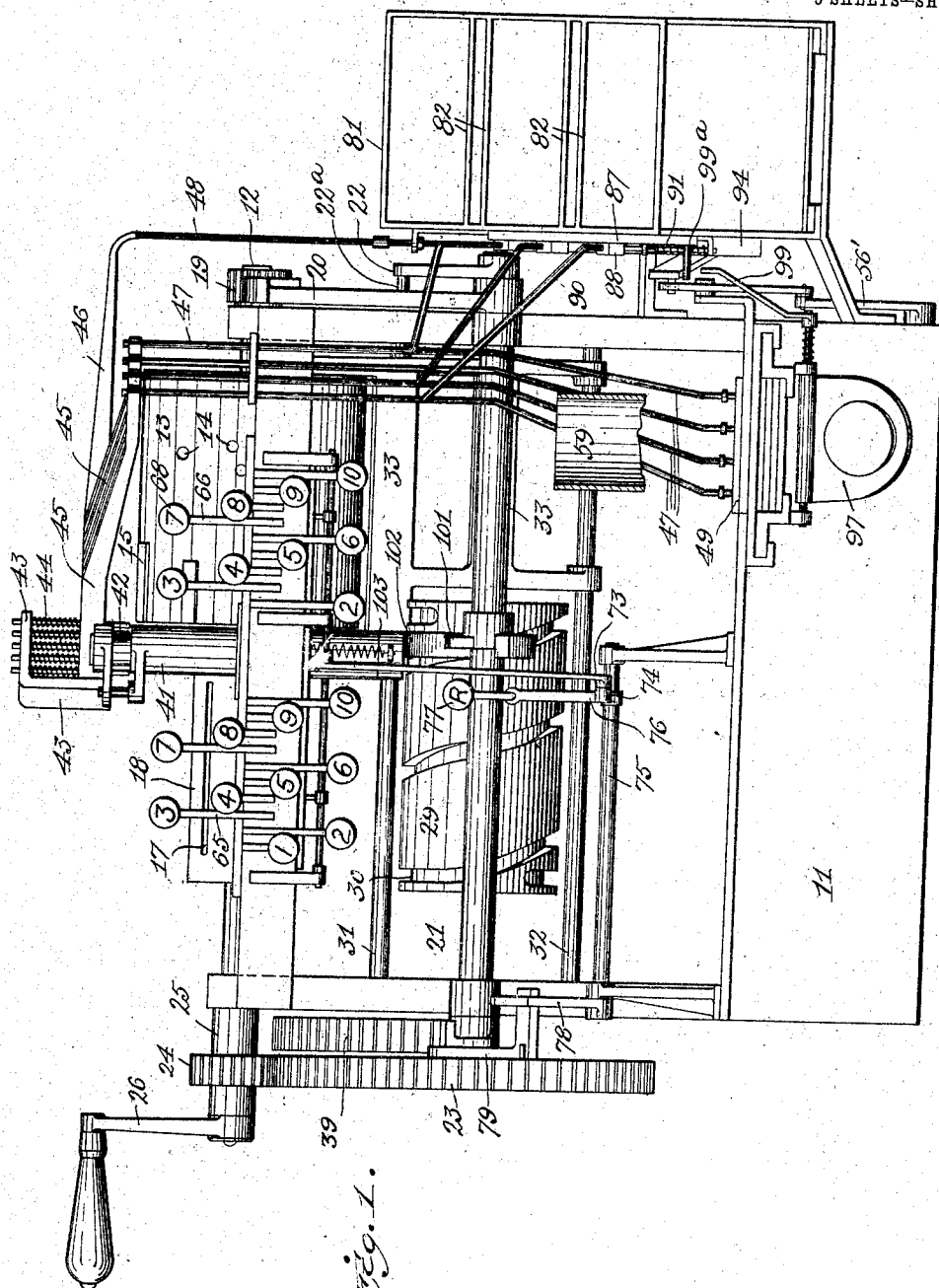


Fig. 1.

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Elizabeth J. J. J.
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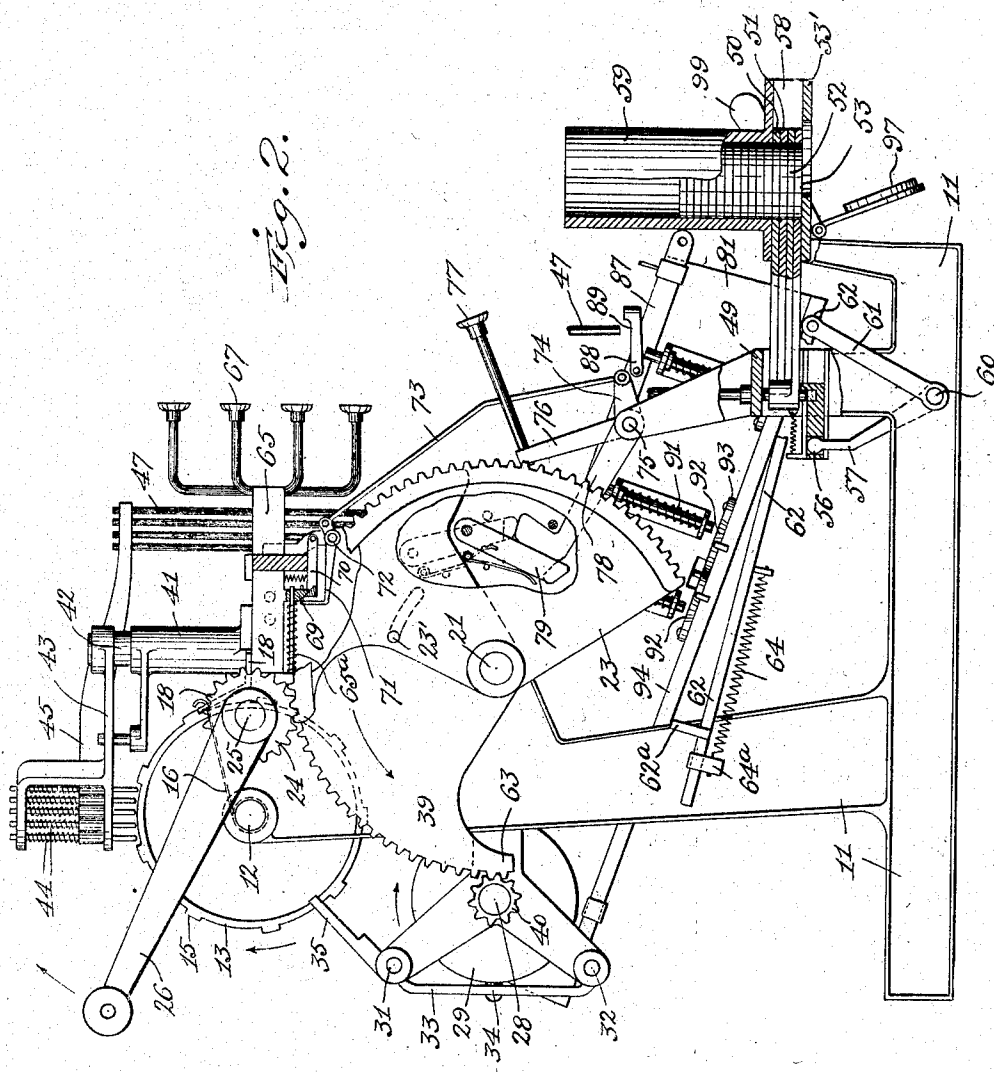
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5 SHEETS—SHEET 2.



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5 SHEETS—SHEET 3.

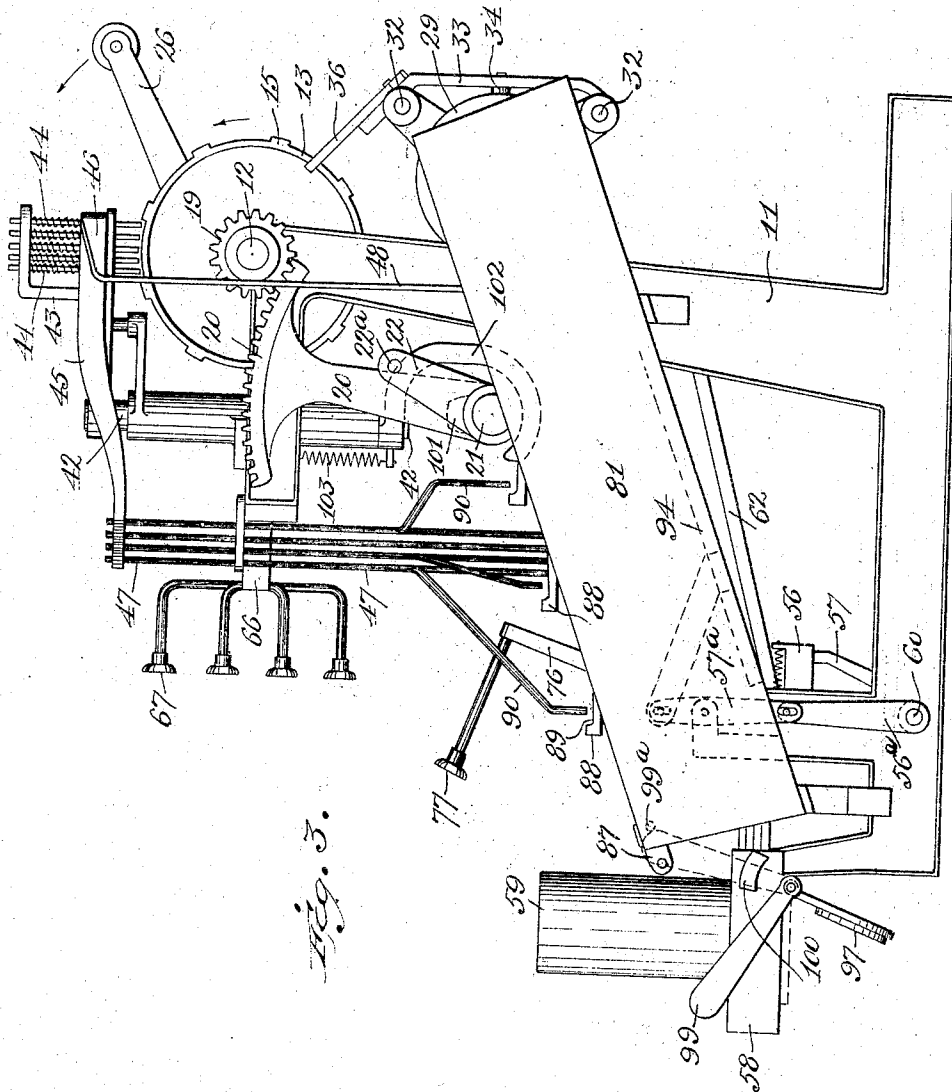


Fig. 3.

Witnesses;
Elizabeth Griffith
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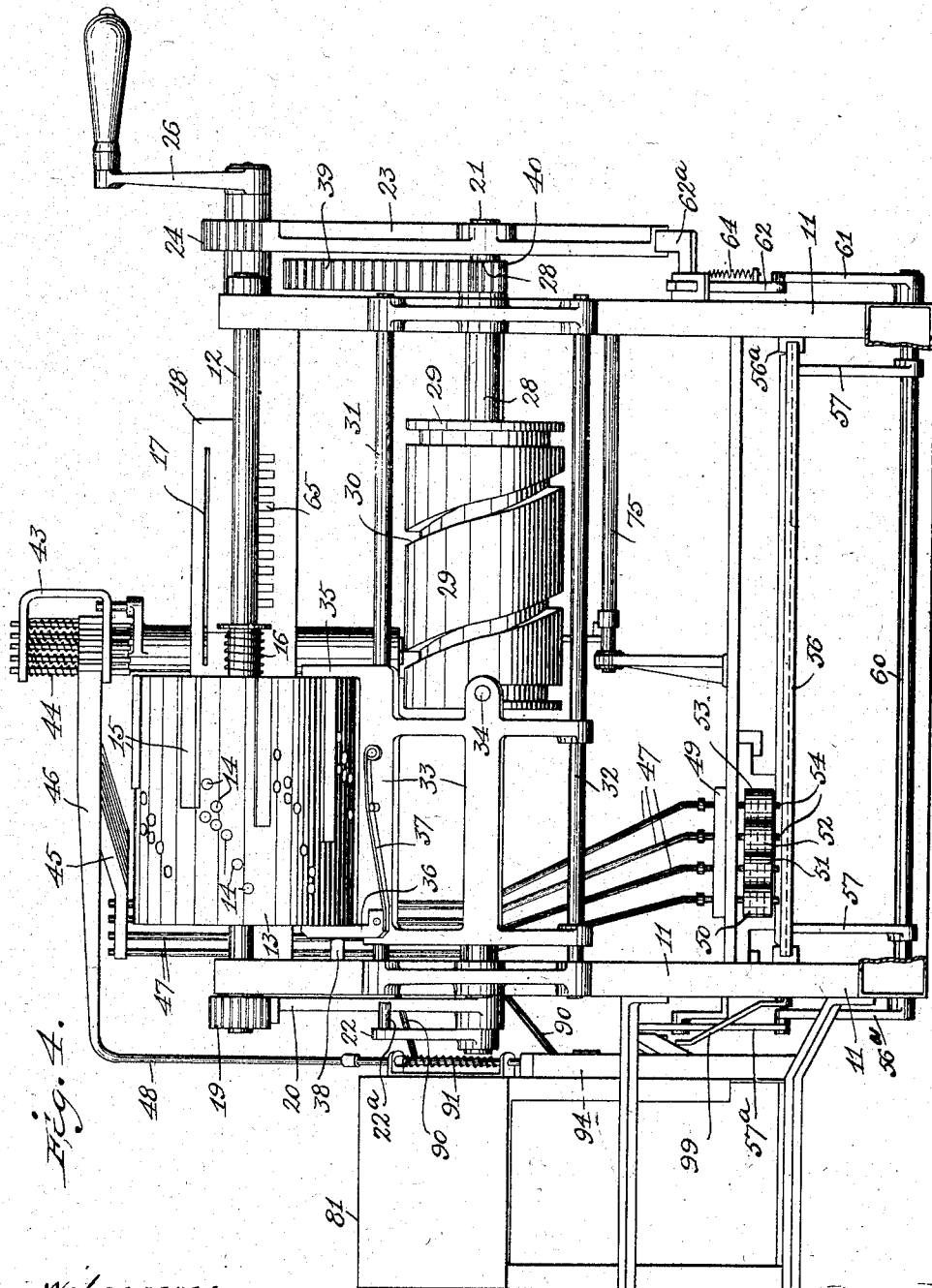
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5 SHEETS-SHEET 4.



Witnesses:
Elizabeth Griffith
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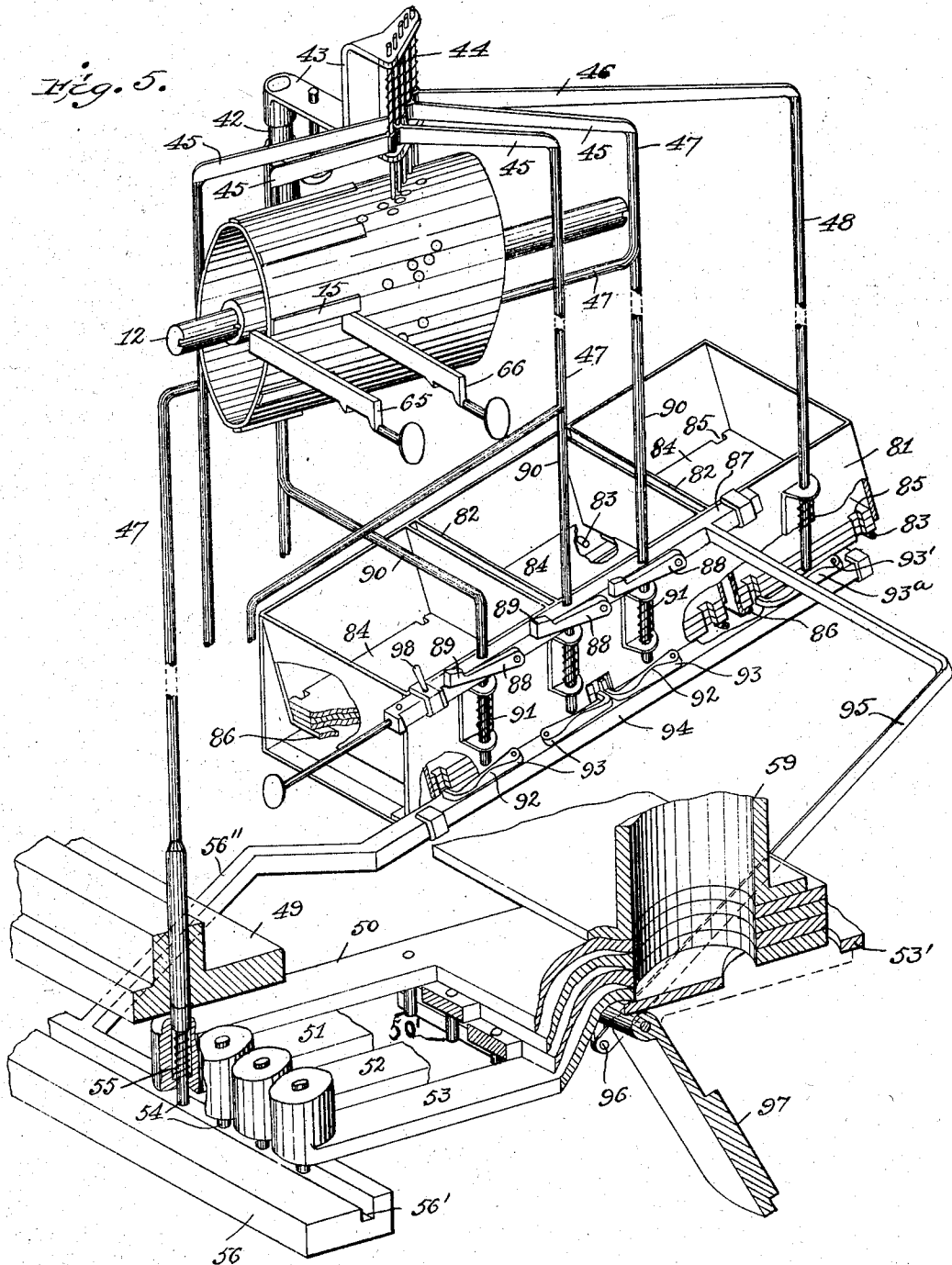
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

CHARLES ULMER, OF LISBON, NORTH DAKOTA.

CHANGE-MAKING MACHINE.

1,020,466.

Specification of Letters Patent. Patented Mar. 19, 1912.

Application filed March 24, 1911. Serial No. 616,622.

To all whom it may concern:

Be it known that I, CHARLES ULMER, a citizen of the United States, residing at Lisbon, in the county of Ransom and State of North Dakota, have invented certain new and useful Improvements in Change-Making Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates primarily to change making or money handling machines designed to simplify and make more accurate cash transactions between a customer and merchant, although certain features of the invention are capable of use in many machines where computations are to be effected mechanically under the control of keys or finger pieces corresponding to the factors entering into the computations.

The objects of the invention are to simplify the mechanism for making the computations and at the same time increase both the accuracy and the capacity of the machine.

The invention consists primarily in a machine embodying a control device or selector having motions in two intersecting planes, the motion in one plane being controlled and determined by a set of keys corresponding to one set of factors, and the motion in the other plane being controlled and determined by a set of keys corresponding to another set of factors; any of which may be used in the computation, there being means whereby the position of the selector will determine the result, such, for instance, as the discharge or indication of the proper change to be given where the purchase price is one factor and the amount deposited the other factor in the computation.

More specifically, the invention may be said to consist in a machine embodying a selector having a rotary movement about its axis and a bodily movement longitudinally of its axis, the two movements being controlled and determined by different sets of keys, whereby the selector may be positioned with any portion of its surface in proper relation to the cooperating mechanism through which the desired result is effected.

The invention further consists in certain novel details of construction and combinations and arrangements of parts all as will

be now described and pointed out particularly in the appended claims.

Referring to the accompanying drawings,—Figure 1 is a front elevation of a machine embodying the present improvement; Fig. 2 is an elevation looking at the left hand end; Fig. 3 is a similar view looking at the right hand end; Fig. 4 is a rear elevation; and Fig. 5 is a modified diagrammatic view showing the operative relation between certain of the essential parts of the machine, but with no attempt to preserve the relative location of the parts, as shown in the other views of the machine.

Like letters of reference throughout the several figures indicate the same parts.

In the machine adopted for illustration of the present invention, provision is made for transactions in amounts of uniform increment, as for instance, one to ten dollars, but it will be understood that the principles involved in the construction of the machine and the mechanism illustrated may be adapted for handling fractional amounts, although the number of control keys would have to be correspondingly increased, and in some instances additional selectors with provision whereby they might be controlled from the keys, as for instance, a selector might be provided for handling dollars, as in the machine illustrated, and another selector provided for handling fractional currency, the principles of operation and construction of selectors, however, being similar to that illustrated in the accompanying drawings.

The machine embodies in its general construction the frame 11 having suitable bearings therein for horizontal and vertical shafts to be presently described, and while it may be provided with a cover or casing for the working parts of the machine, such cover or casing has been omitted from the drawings, thus leaving the mechanical parts exposed to view.

Journalled in two parallel upwardly extending portions of the main frame, is a horizontal shaft 12, upon which shaft there is mounted a selector cylinder 13, the connection between the cylinder and shaft being such that they rotate in unison, but the cylinder is free to slide longitudinally of the shaft, the connection, if desired, being in the form of an ordinary spline or key working in a groove or channel in the shaft. The selector cylinder is provided on its sur-

face with a plurality of perforations or apertures which are so arranged that when brought into proper relation to cooperating parts they will control such parts in performing the functions for which the machine is designed. Mechanism for accomplishing this end is not new in the art, although there are elements of novelty in the mechanism which will be hereinafter described.

The selector itself, in the present instance, is of novel construction and is so controlled in its rotary and longitudinal movements that a large proportion of its area may be utilized and the capacity for making varied computations greatly increased. One set of keys, for instance, will control the angular positioning of the selector, while another set of keys will control its position longitudinally of its axis and by having said sets of keys correspond to the factors entering into the computation, it will be readily understood that the selector may be positioned by the operation of the keys to bring any portion of its surface to the desired position, and by having the apertures properly arranged, the desired result will be effected. For convenience in positioning the selector angularly about its axis it is provided with a series of bars or ribs 15 of progressively varying length and extending parallel with the axis. For cooperation with these bars or ribs there is provided a series of keys 66 preferably corresponding in number to the number of ribs on the selector, and any one of which when pressed inwardly is adapted to arrest the rotation of the selector with the appropriate rib resting on the actuated key. The position with the selector arrested by a key is well illustrated in Fig. 5, where it will be seen that the front rib 15 of the selector is resting on the inner end of the key bar 66. The longitudinal movement of the selector is also determined by a set of keys 65, said keys being arranged in proper order to arrest the longitudinal movement of the cylinder at different points, thus as shown in said Fig. 5, the movement of the selector cylinder 13 toward the left has been arrested by the contact of the edge of the cylinder with the key bar 65, and it will be understood that the other keys 65 and 66 would correspondingly determine the position of the cylinder when actuated and suitable pressure applied to the cylinder tending to move it in the directions indicated.

Various mechanisms may be provided for operating the selector and for effecting the direct control of the selector by the sets of keys so that its angular and longitudinal position may be accurately determined for positioning the apertures or parts on the surface of the selector, which determine the result to be effected. In the simple form of machine illustrated the forward rotation

of the selector about its axis is effected by a spring 16 which is secured to the cylinder at one end, coiled about the shaft 12 and at the other end held in a slot 17 in a plate 18 carried by the main frame. The spring 16 exerts a constant tendency to rotate the selector toward the front of the machine, as shown by the arrows in Figs. 2 and 3, while the retention of the outer end of the spring in the slot 17 leaves the cylinder free to slide longitudinally of its shaft. To hold the cylinder in its proper normal position and to return the same to that normal position after having been actuated, the shaft 12 is provided at one end with a pinion 19 meshing with a gear segment 20 journaled on a shaft 21. The shaft 21 is provided with an arm 22 having a pin 22^a cooperating with the segment 20 to return or hold the same until the shaft 21 is actuated. The shaft 21 at its opposite end is provided with a gear segment 23 with which meshes a pinion 24 rotated by a crank handle 26. The rotation of the crank handle in the direction indicated by the arrows in Figs. 2 and 3 will therefore cause the pin 22^a to move away from in front of the segment 20 and said segment 20 will be left free to advance in accordance with the rotary movement of the selector under the influence of the spring 16 to a point where such rotary movement is arrested by the actuated key of the series 66. The shaft 21 is however free to continue its forward movement of rotation and serves to actuate other parts of the mechanism, as will be presently described.

The mechanism for moving the selector longitudinally of its axis will be readily understood from an inspection of Fig. 4, wherein it will be seen that a carriage 33 is mounted to slide longitudinally on guide bars or ways 32 on the main frame. Said carriage has arms 35 and 36 embracing the selector, the arms 36 however being pivoted on the carriage and held in operative position for moving the selector by a spring 37, the arrangement being such that if the carriage is moved toward the right in Fig. 4 and the selector is arrested by one of the key bars 65, the arm 36 will yield, permitting the carriage to continue its movement, while the selector remains at rest. For moving the carriage it is provided with a stud or antifriction roller projection 34 working in a groove 30 in a cam cylinder 29 mounted on a shaft 28. The groove 30 in the cylinder 29 is at the ends made substantially circular or in a plane perpendicular to the axis of the cylinder, whereby the cam cylinder 29 will make a partial or almost complete rotation, if necessary, before the movement of the carriage is inaugurated, and during such time the selector may be positioned angularly without interference or retardation by the mechanism for moving

it longitudinally. The shaft 28 on which the cam cylinder 29 is mounted is provided at one end, see Fig. 2, with a pinion 40, meshing in a gear segment 39, journaled on the shaft 21, and actuated preferably from the segment 23 by means of a pin and slot connection 23', as shown in said Fig. 2.

From the foregoing description, the operation of setting the selector will be readily understood, for instance, one of the keys of each of the groups 66 and 65 are operated and the crank handle turned in the direction indicated by the arrow with the result that during the initial movement of the crank handle the selector is permitted to turn under the influence of its spring until arrested by the appropriate rib 15 coming in contact with the actuated key of the group 66. After the completion of this operation the rotation of the cam cylinder 29 causes the cam portion of its groove 30 to move the carriage 33 together with the selector longitudinally of the shaft 12, until the selector is arrested by engagement with the inwardly projected end of the actuated key of the group 65. Inasmuch as in the longitudinal movement of the selector the rib 15 would move out of engagement with the actuated key of the group 66, provision is made for retaining the selector in its proper angular position by causing one of the ribs to immediately move into engagement with a longitudinal guideway when the longitudinal movement of the selector is inaugurated. This longitudinally extending guideway is conveniently the upper edge of the plate 18, which, as shown in Fig. 2, lies in position to pass under any one of the ribs which may be in position at the time the longitudinal movement is inaugurated. The guide thus formed by the edge of the plate 18 will prevent any further forward rotation of the selector under the influence of its spring, and while it might be arranged to permit the selector to return to normal position the return movement of the selector takes place only after it has assumed its normal longitudinal position on the shaft and is out of engagement with the aforesaid guide formed by the plate 18.

The keys 65 and 66 are preferably formed by bars mounted to slide in suitable guides on the main frame and at their outer ends are provided with finger pieces 67. They are usually spring pressed in an outward direction as by springs 65^a, Fig. 2, and they are held inwardly in their operative position by spring pressed latches 70 which will cooperate with projections 69 on the keys whenever the latter are pushed inwardly. For releasing the keys and permitting them to return to normal position a trip 71 overlying the latches 70 is provided. Said trip is pivoted at 72 on the main frame and has a link connection 73 extending down

to an arm 74 on a bell crank lever pivoted at 75 and provided with a second arm 76 having a finger piece or key 77. Inward pressure on the finger piece or key 77, it is obvious will depress the inner end of the trip 71 so as to release the catches 70, thus providing for the release of any key which may have been incorrectly operated or for the manual release of the keys before the selector is returned to its normal position. For automatically releasing the keys during the return of the selector to its normal position a third arm 78 is provided on the shaft carrying arms 74 and 76, which arm 78 projects into position to cooperate with a pawl 79 pivoted on the gear segment 23 (Figs. 1 and 2), the relation of the parts being as shown by the dotted and full lines in Fig. 2, whereby as the segment returns toward its normal position, the end of the pawl 79 engaging the arm 78, depresses the latter and then, owing to the change in the angular relationship of the parts, slips off of the end of the arm 78 and the parts assume the position shown in full lines with the keys released, and the catches 70 again move into position to retain a key when actuated.

The mechanism controlled by the selector and through which the results aimed at are attained, consists generally of a series of spring pressed pins mounted in a carriage or carrier adapted to be advanced at the proper time for cooperating with the selector, the apertures in the selector permitting the pins to enter which are to control the actuation of the mechanism, while, if no apertures are in position for the pins to enter, the mechanism will not be operated. By the use of comparatively few pins it becomes possible to control the operation of mechanism for discharging coins of varying amounts, and if desired there is an alternative arrangement to control the discharge of paper money of equal value.

As shown in the accompanying drawings the series of spring pressed pins 44 are mounted to slide vertically in a vertically movable carriage or carrier 43. The carriage or carrier 43 is mounted on the upper end of a shaft 42 adapted to slide in a bearing 41 in the main frame, said shaft at its lower end being provided with a yoke 102 which passes around beneath the shaft 21 in position to be engaged and depressed by a cam 101 on said shaft. The cam 101 comes into operation to depress the carrier 43 and pins 44 after the selector has been positioned. The return movement of the carrier, pins and parts connected therewith may be effected by a spring, such, for instance, as indicated at 103 in Figs. 1 and 3.

To each of the spring pressed pins 44 there is connected an actuating arm for the control of the coin discharging mechanism.

The arms 45 on the first four pins 44 control the discharge of change up to an amount equal to four dollars, while the arm 46 on the fifth pin of the series controls the discharge of change equal in value to five dollars, the capacity of the machine illustrated being therefore to return change equal in amount to nine dollars, although, as will be readily understood, the capacity of the machine may be increased and made to embrace fractional currency, as heretofore indicated.

The mechanism for discharging silver coins up to four dollars, consists essentially of a coin stack 59 in which the silver dollars are piled and having at the bottom four superposed dischargers each adapted to discharge a single coin, and, when all are actuated, to discharge four coins. The discharging slides are indicated in the drawings by the numbers 50, 51, 52 and 53, each provided at its outer end with a lock pin 54 normally held elevated and with its upper end seated in a fixed locking bar 49 by a spring 55 (see Fig. 5), but adapted to be depressed to enter a groove 56' in a reciprocatory driver or bar 56. Obviously when depressed, the upper ends of the pins move out of the locking bar 49 and into the driver 56, and the reciprocation of the latter will actuate the ejectors or any one of them, whose pin is in engagement with the bar to discharge one or more coins as the case may be. The control of the pins 54 is effected from the arms 45, before referred to, through the medium of the rods 46, the lower ends of which extend down into the locking bar 49 in position to cooperate with and depress the pins 54, whereby the pins 54 will be moved out of engagement with the locking bar, and into engagement with the reciprocatory driver 56. During the reciprocation of the bar 56, the upper ends of the pins 54 will slide on the under surface of the locking bar 49, as will be readily understood from an inspection of Figs. 1, 2 and 5.

The coin ejector slides 50, 51, 52 and 53 are preferably arranged so that the upper slides will operate or insure the operation of all of the ejectors below it, thus the upper ejectors are provided with pins 50' which extend down to engage the lower ejectors as shown in Fig. 5, whereby the actuation of the ejectors 50, 51 and 52 alone becomes impossible without the actuation of the ejector 53, although ejector 53 may be actuated alone to discharge a single coin, and 52 and 53 may be actuated to discharge two coins, etc.

The bar 56 slides in ways 56^a in the main frame, see Fig. 4, and is reciprocated by arms 57 on a shaft 60. The shaft 60 at one end carries a crank arm 61 which at its extremity is joined to a sliding shaft 62 extending back alongside of the main frame

and having a projection 62^a adapted to be struck by the end 63 of the gear segment 39, just as the latter is completing its forward movement and after it has positioned the selector longitudinally of the shaft. By pushing the rod or frame 62 forwardly, the bar 56 is actuated to advance any coin ejector which at that time may be in engagement therewith through the medium of its pin 54. The return movement of the bar 56 is effected by the spring 64 which at one end may be connected with the bearing 64^a in which the end of the rod, shaft or frame 62 takes its bearing, as shown in Fig. 2.

As before stated, the ejectors 50 to 53 are competent to eject coins up to the value of four dollars, and in order to permit of the giving of change in amounts equal in value to nine dollars, provision is made whereby when the proper pin of the series 44 is operated a five dollar bill will be discharged. To accomplish this there is arranged along one side of the machine a receptacle 81 which is divided by partitions 82 into compartments adapted for the reception of paper currency, the currency of the proper denominations being folded and placed between superposed plates 84 in the compartments of the receptacles. One of the compartments is adapted for the holding of five dollar bills which are folded and placed between the plates 84, and these plates, together with bills which may be located between adjacent plates are discharged in succession through the medium of the arm 46 connected with the last pin 44 and the rod 48 carried by the arm 46 which extends down into position to cooperate with and actuate pawl 93'. The pawl 93' has an inclined face 93^a with which the end of the rod 48 engages, whereby the pawl will be moved inwardly so as to enter and engage with a notch in the lowermost plate 84. The plates are supported at one edge on ledges 86 and at the outer edge by short pins 83. The edges of the plates are notched at 85, the notches being in such position that upon any plate being drawn forwardly it will bring the notches therein into position to register with the pins 83 and at the same time the other edge of the plate will be moved off of the ledge 86 with the result that the plate is free to drop, and of course will permit the currency supported thereby to drop or be ejected from the machine.

The pawl 93' is mounted on a reciprocatory carrier 94, preferably receiving its motion from the reciprocatory bar 56. As shown in the diagrammatic view, Fig. 5, the carrier 94 is connected directly with the bar 56 by a connection 56'', but in the machine as preferably constructed and as shown in the other views, the shaft 60 carries at one end a crank arm 56^a which is connected through a link 57^a with the carrier 94 where-

by when the shaft 60 and reciprocatory bar 56 are moved, the carrier will be correspondingly moved, and, if at that time the pawl 93' has been moved into engagement with the bottom plate 84 in the receptacle, as by the depression of the pin 44 and arm 46, said bottom plate will be moved in a direction to effect its release from the receptacle and the discharge of both the plate and the currency held thereby.

In some instances it is desirable to provide for the payment of change either in coin or in paper currency, and this may be accomplished by providing a series of currency compartments in the receptacle 81, such currency compartments being adapted to contain bills, which will be discharged by the operation of the selector controlled pins which as heretofore described will effect the discharge of coins of like value, it being understood of course that provision is made for checking the discharge of coins when it is desired to make change in paper currency.

For operating the currency holding and discharging mechanism, the bills of proper denomination are folded between plates 84, such as before described, and the carrier 94 is provided with pawls 93, corresponding to the pawl 93' before described. Each of the pawls 93 is provided with an inclined face 92, and with each there is adapted to cooperate a spring pressed pin 91 mounted in bearings on the side of the receptacle 81 and adapted when depressed to move the pawls into engagement with the plates. Above the spring pressed pins 91 there is arranged a series of dogs 88, one dog for each pin and all of the dogs are mounted on a carrier 87 movable longitudinally of the receptacle and adapted when in one position to bring the dogs into proper position for depressing the pins 91 whenever the branches 90 of the rods 47 are depressed. Conveniently, the dogs 88 are provided with heads 89 which are moved beneath the arms 90 by the longitudinal movement of the dog carrier 87, said dogs thus acting as interponents between the arms 90 and the pins 91. The dog carrier 87 may be moved by hand, and held in position by a locking pin 98, Fig. 5, and its movement may simultaneously close a door 97 for the discharge opening in the bottom plate 53' of the coin stack 59, such simultaneous closure of the door 97 being effected through suitable connections indicated at 95, 96, in Fig. 5.

In the preferred construction, the door 97 for closing the coin discharge opening and preventing the ejection of coins is controlled by a handle 99, Figs. 1 and 3 which when swung from the position shown in full lines to that shown in dotted lines in Fig. 3, will close the coin discharge and by engagement with the pin 99^a on the dog carrier 87 will move the latter into position for the dogs to operate in the manner heretofore described.

The handle 99 will be retained in its position for preventing the discharge of coins and holding the parts ready for the discharge of paper currency by a catch 100 on the end of the portion 58 of the main frame.

To avoid the necessity of providing a large number of compartments in the currency receptacle, it is found convenient to arrange one compartment, say the intermediate compartment, as shown in Fig. 5, for the reception of two dollar bills supported by each plate 84. Two of the pawls 93 cooperate with the plates in the intermediate compartment, one of said pawls being adapted to discharge or cooperate with the two bottom plates, and the other with a single bottom plate. The pawl cooperating with the two bottom plates is actuated by an arm of the rod 47 which controls the discharge of four coins and will effect the discharge of four dollars in currency of four dollars in coin as the case may be. The pawl controlling the bottom plate of the two dollar bill compartment is itself controlled by the arm 90 of the rod 47 which cooperates with the coin ejector 52, and consequently when actuated will discharge two dollars, as will be readily understood. With this arrangement one, two, three or four dollars in either bills or coin may be discharged at the option of the person using the machine.

The operation of the machine may be briefly described as follows. A key 65 representing the value of a purchase is pressed inwardly until latched and held in its operated position. A key 66, representing the amount received from the customer and which of course is more than the value of the purchase is also pressed in until caught and held in its operated position. The handle 26 is now rotated in the direction indicated by the arrow in Figs. 2 and 3 whereby the shaft 21 is rotated through the medium of the pinion 24 and segment 23. The arm 22 moves away from the segment 20 or allows the segment 20 to advance as the selector is rotated under the influence of its impelling spring until the selector is arrested by the operated key 66. The continued rotation of the shaft 21, together with the segment 39 meshing with the pinion 40 on the shaft 28, causes the cam cylinder to rotate and advance the carriage 33 and selector longitudinally of the shaft 12 or until such movement of the selector is arrested by the operated key of the group 65. The selector is now positioned with the proper apertures in position for controlling the mechanism for ejecting the proper amount of change. The continued rotation of the shaft 21 brings the cam arm 101 into engagement with the yoke 102, whereby the yoke, shaft to which it is secured and pin carrier 43 will be depressed. The proper

pins finding apertures to receive them in the selector, will continue to move downwardly with the pin carrier 43, while the movement of the other pins will be arrested. Those pins 44 which continue to move downwardly carry with them the arms 45 or 46, together with the rods 48 and the arms 90 on the rods 47. The actuated rods 47 will, through the pins 54, cause the engagement of the proper coin ejector slides 50 with the reciprocatory bar 56, and the latter will be moved by the engagement of the end of segment 39 with the projection 62^a in the proper direction and the proper distance to discharge the coins from the holder 59. In case it is not desired to discharge coins, the door 97 will have been previously closed and by so doing the handle 99 will have moved the dog carrier into position for the dogs 88 to form interponents between the arms 90 and the pins 91, whereby paper currency will be discharged instead of coin. As soon as the discharge of either the paper currency or coin is effected, the parts are returned to their normal positions by a reverse rotation of the handle 26 and during such reverse rotation the pawl 79 will cooperate with the arm 78 to release the operated keys and restore them to their normal position. As the carriage 33 returns to its normal position shown in Fig. 4, the spring pressed arm 36 will be invariably returned to its normal position by striking a projection or shoulder 38 on the frame, but it will be understood that this spring pressed arm 36 is but one of many forms of loose connection which may be interposed between the carriage and the selector whereby the carriage may be permitted to make a full stroke while the selector is arrested at an intermediate point.

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

1. In a machine of the character set forth, the combination with a selector having a cylindrical surface and movable both angularly and axially, of two corresponding separate sets of keys each set comprising a plurality of independent keys with means whereby the keys of one set determine the angular movement, and the keys of the other set determine the axial movement of the selector.

2. In a machine of the character set forth, the combination with a selector having a cylindrical surface and movable both angularly and axially, of deposit and purchase key controlled means, one for determining the angular and the other for determining the axial movement of the selector.

3. In a machine of the character set forth, the combination with a cylindrical selector movable both angularly and axially, of two corresponding separate sets of keys each set

comprising a plurality of independent keys with means whereby the keys of one set determine the extent of angular movement and the keys of the other set determine the extent of axial movement of the selector.

4. In a machine of the character set forth, the combination with a cylindrical selector movable both angularly and axially, an operating handle and connections intermediate the handle and selector whereby the movements of the selector are effected, of two corresponding sets of keys each set comprising a plurality of independent keys, with means whereby the keys of one set determine the extent of angular movement and the keys of the other set determine the extent of axial movement of the selector.

5. In a machine of the character set forth, the combination with a cylindrical selector movable both angularly and axially, money discharging mechanism controlled by the selector and an operating handle for effecting the movements of the selector and money discharging mechanism, of two sets of keys with means whereby the keys of one set determine the extent of angular movement and the keys of the other set determine the extent of axial movement of the selector.

6. In a change computing machine, a cylindrical selector movable both angularly and axially, money discharging mechanism, pins controlling the actuation of the money discharging mechanism and adapted to cooperate with the selector in determining the amount of money discharged, and two series of keys, one series for determining the extent of axial movement of the selector and the other series for determining the extent of angular movement of the selector.

7. In a change making machine, the combination with a selector movable both angularly and axially, and two series of keys for determining one the axial and the other the angular movement of the selector, of a series of pins cooperating with the selector, a movable frame in which said pins are mounted, a money discharging mechanism, and connections whereby the money discharging mechanism is controlled by the movement of the pins with relation to the selector.

8. In a change making machine, the combination with a selector movable both angularly and axially, a shaft on which said selector is mounted, an operating handle, and connections intermediate said operating handle whereby the rotation of the shaft is regulated and the selector moved longitudinally on the shaft, of two sets of keys, one set determining the extent of longitudinal movement of the selector and the other set determining the extent of rotary movement of the selector, money discharging mechanism, and connections controlled by the selector for determining the amount of money discharged.

9. In a change computing machine, the combination with money discharging mechanism and a series of pins controlling the same, of a cylindrical selector with which said pins cooperate, a rotary shaft on which said selector is mounted to move axially, an operating handle, segments moved by said handle and controlling respectively the rotary and longitudinal movements of the selector, and two sets of keys, one set for determining the extent of rotary movement and the other set determining the extent of longitudinal movement of the selector.

10. In a machine of the character set forth, the combination with a cylindrical selector movable both angularly and axially, and two sets of keys, one set for determining the extent of angular movement and the other set for determining the extent of axial movement, of an operating handle and two segments moved by said operating handle, one for effecting the axial movement and the other for effecting the angular movement of the selector.

11. In a machine of the character set forth, the combination with a cylindrical selector movable both angularly and axially, two sets of keys, one for determining the extent of angular movement and the other for determining the extent of axial movement of the selector, of an operating handle, two segments moved by said handle, one for regulating the angular movement of the selector, and a cam operated by the other segment for effecting the axial movement of the selector.

12. In a change computing machine, the combination with the money discharging mechanism, pins for controlling the money discharging mechanism, and a cylindrical selector movable angularly and axially for determining which pins shall be operated, of a shaft on which said selector is mounted, an operating handle, two segments moved by said handle, and intermediate connections between one of said segments and the selector shaft, and between the other of said segments and the selector itself, whereby the segments effect the angular and axial movements of the selector, and keys for determining the extent of such movements.

13. In a change making machine, the combination with the selector, keys for determining the position of the selector, and means for moving the selector into the position determined by the keys, of mechanism controlled by the selector for effecting the discharge of money, embodying a reciprocatory driver, slide and lock for the slide movable out of locking position and into engagement with said driver to connect the driver and slide for movement in unison with each other.

14. In a change computing machine, the combination with a coin holder, slides mov-

able in paths intersecting the coin holder for discharging coins therefrom, spring pressed pins mounted in said slides, a fixed part with which said pins cooperate to lock the slides against movement, and a movable driver with which the pins cooperate for actuating the slides, of a key set selector mechanism for determining which of the pins shall be released from their locking position and moved into engagement with the driver.

15. In a change making machine, the combination with the coin holder, slides for ejecting coins from said holder, locking pins carried by said slides, a fixed locking member with which said pins cooperate to hold the slides against movement, and a driver with which the pins cooperate when released from the fixed locking member, of a key set selector mechanism embodying longitudinally movable locking pin releasing members, and an operating handle for effecting the movement of the releasing members and driver for discharging the coins from the holder.

16. In a change making machine, the combination with the coin holder, slides for ejecting coins therefrom, spring pressed pins carried by said slides, a fixed locking member with which said pins are normally engaged to hold the slides against movement, and a driver for actuating the slides when the pins are released, of a selector movable both angularly and axially, keys for determining the position both angularly and axially of said selector, and pins controlled by the selector with connections intermediate said selector controlled pins and the locking pins, whereby the locking pins are released when the selector controlled pins are actuated.

17. In a change making machine, the combination with the cylindrical selector, a shaft on which said selector is mounted to move longitudinally, a spring for rotating the shaft and selector, a cam for moving the selector longitudinally on the shaft, and an operating handle for controlling said movement, of two sets of keys, one for determining the extent of rotary movement and the other for determining the extent of longitudinal movement of the selector, and coin ejecting mechanism controlled by the selector.

18. In a change making machine, the combination with the cylindrical selector, shaft on which the selector is mounted to slide longitudinally, spring for rotating the selector, cam for moving the selector longitudinally, and operating handle for controlling such movements of the selector, and returning the same to normal position, of a guide with which the selector cooperates in its longitudinal movement for locking the same against rotary movement, two sets of

keys, one for determining the extent of rotary movement of the selector and the other for determining the extent of longitudinal movement, and coin ejecting mechanism controlled by the selector.

19. In a change making machine, the combination with the cylindrical selector, shaft on which the selector is mounted to move longitudinally, spring for rotating the shaft and selector, cam for moving the selector longitudinally, operating handle, gearing interposed between said operating handle and shaft and between said operating handle and cam, and keys for determining the extent of rotary and longitudinal movements of the selector, of coin ejecting mechanism controlled by the selector.

20. In a change making machine, the combination with the cylindrical selector, shaft on which said selector is mounted to move longitudinally, and keys for determining the extent of longitudinal and rotary movement of the selector, of an operating handle, a series of pins cooperating with the selector, a frame in which said pins are mounted adapted to be moved by the operating handle, coin ejecting mechanism, and connections intermediate said pins and coin ejecting mechanism.

21. In a change making machine, the combination with a selector movable in two intersecting planes, and two sets of keys, one set for determining the extent of movement of the selector in each plane, of a set of pins for cooperating with the selector, a movable frame in which said pins are mounted, and operating shaft with connections intermediate said shaft and frame for depressing the frame, a coin ejecting mechanism, and connections intermediate said coin ejecting mechanism and pins, whereby the selector determines which of the coin ejecting mechanisms shall be effective to discharge coin.

22. In a change making machine, the combination with a selector movable in two intersecting planes and two sets of keys for determining the extent of movement of the selector in said planes respectively, a vertically movable frame, spring pressed pins mounted in said frame and cooperating with the selector, an operating shaft, a cam on the operating shaft for depressing the pin carrying frame, coin ejecting mechanism, and connections intermediate said coin ejecting mechanism and pins, substantially as set forth.

23. In a change making machine, the combination with separate holders for coins and paper currency, and key set control mechanism for determining the amount to be discharged from each, of a door for closing the coin discharge opening when the delivery of paper currency is desired.

24. In a change making machine, the combination with separate coin and paper currency holders, and key set control mechanism for determining the amount to be discharged, of a door for closing the coin discharge opening when the delivery of paper currency is desired, and mechanism connected with said door for moving the paper currency discharging mechanism into operative position when the door is closed.

25. In a change making machine, the combination with separate holders for coins and paper currency, mechanism for discharging coins and paper currency, and means whereby the paper currency discharging mechanism may be rendered inactive, of a door for closing the coin discharge opening and dogs controlled by said door for rendering the paper currency discharge mechanism active when the door is closed.

26. In a change making machine, the combination with key set selecting mechanism, embodying pin and discharging mechanism controlled by said pins, of separate holders for coins and paper currency, a door for closing the discharge for coins and interponent mechanism interposed between the pins of the selecting mechanism and the paper currency discharging mechanism, controlled by the position of the said door, whereby when the door is opened the paper currency discharging mechanism is rendered inactive and when the door is closed, said mechanism is rendered active for the discharge of currency.

27. In a machine of the character set forth, the combination with a selector having a cylindrical surface movable both angularly and axially, of means for controlling the extent of movement in both directions embodying a plurality of keys for determining the axial movement and a plurality of keys for determining the angular movement, whereby the selector may be set to a different position by the operation of each combination of keys of the two sets.

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Witnesses:

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