

(No Model.)

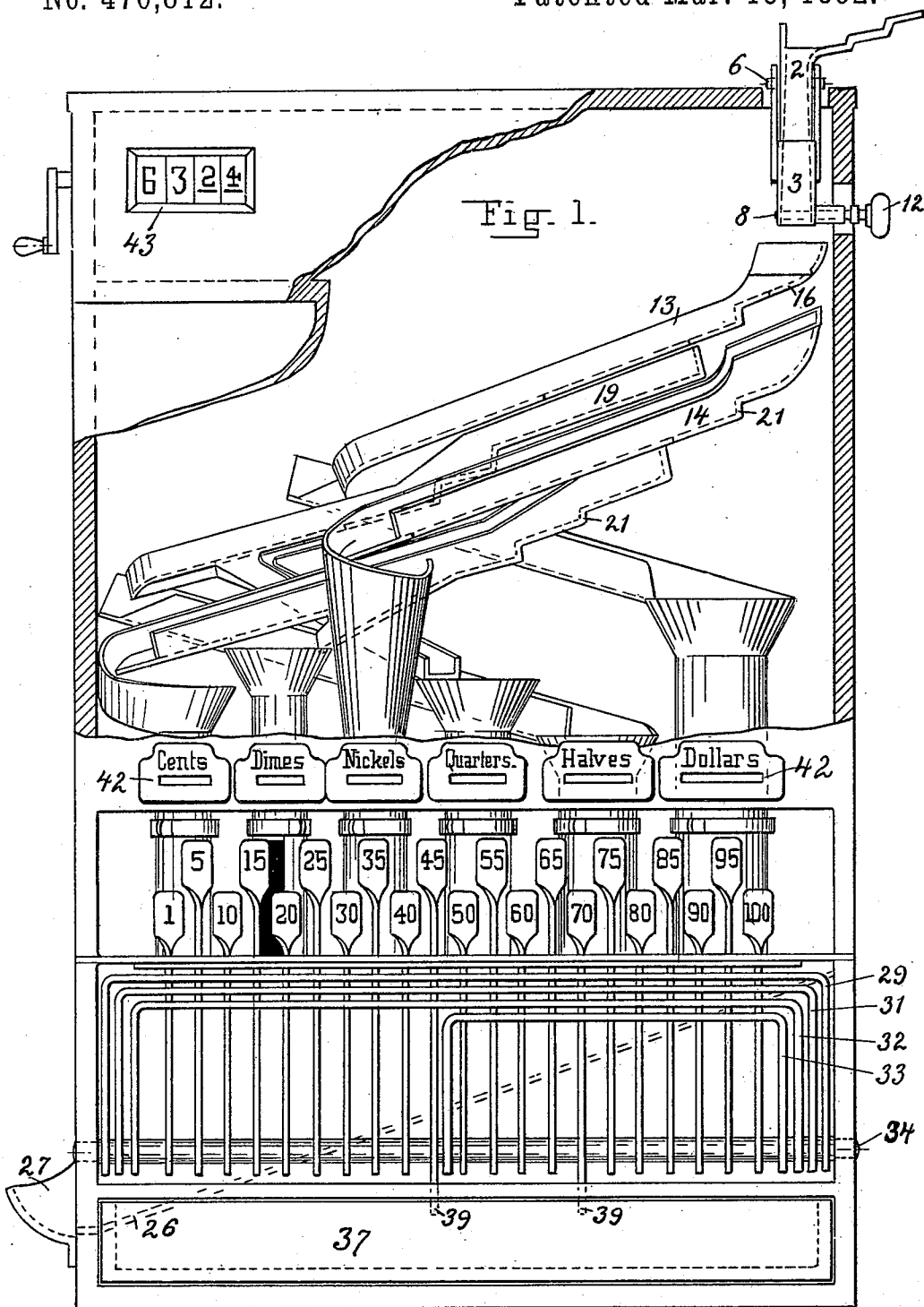
3 Sheets—Sheet 1.

T. J. McARTHUR.

COIN ASSORTING AND CHANGE DELIVERING MACHINE.

No. 470,812.

Patented Mar. 15, 1892.



Witnesses:

G. W. Balch
Galuska B. Balch

Inventor,

Thomas J. McArthur,
by Thomas Ewing, Jr.
his attorney.

(No Model.)

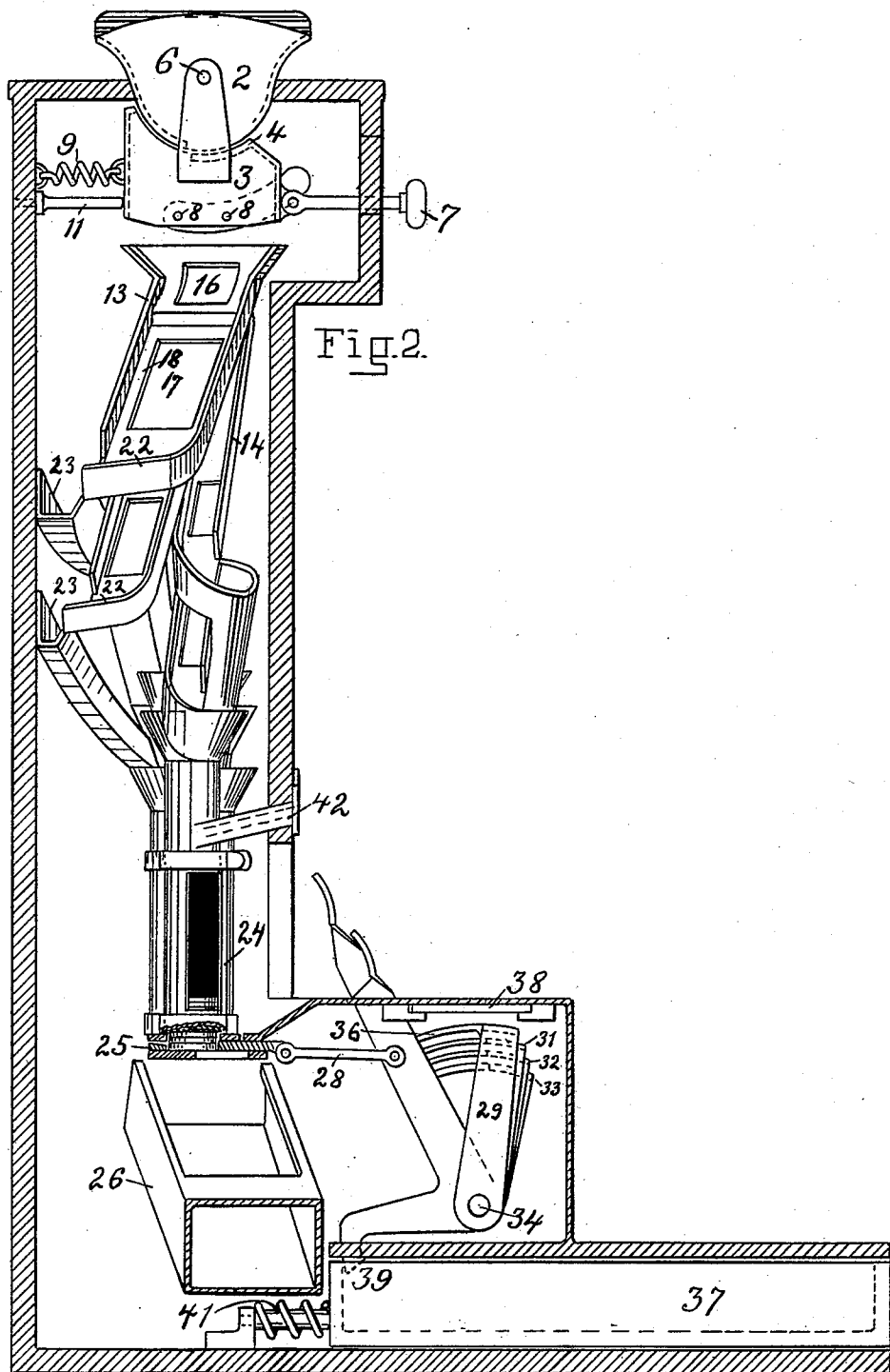
3 Sheets—Sheet 2.

T. J. McARTHUR.

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Witnesses:

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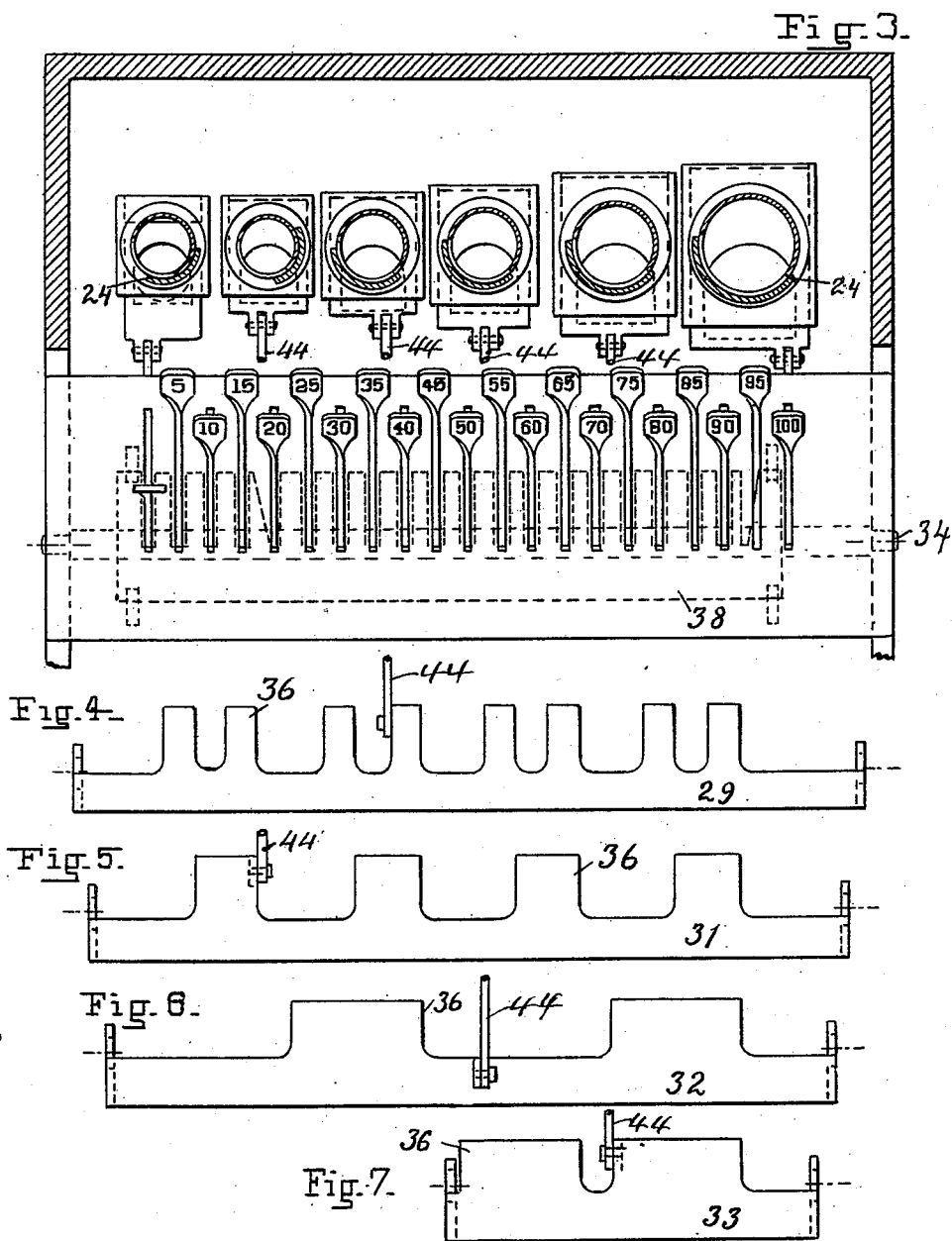
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UNITED STATES PATENT OFFICE.

THOMAS J. MCARTHUR, OF NEW YORK, N. Y., ASSIGNOR TO LAURA SHAVE,
OF SAME PLACE.

COIN-ASSORTING AND CHANGE-DELIVERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 470,812, dated March 15, 1892.

Application filed June 11, 1891. Serial No. 395,891. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. MCARTHUR, a citizen of the United States of America, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Coin-Assorting and Change-Delivering Machines, of which the following is a specification.

My invention consists in a coin-assorting and change-delivering machine in which the coins are partially separated in a feeding-hopper, are thence delivered into inclined channels or chutes, where final separation is accomplished, are discharged from these chutes into suitable receptacles, and are thence paid out separately or in desired combinations; and it further consists in many improvements in the details of the different elements of the machine, all pointed out in the claims.

Referring to the drawings which form a part of this specification, Figure 1 is a front view of the whole machine, partly in elevation, the front of the casing being removed. Fig. 2 is a side view in elevation. Fig. 3 is a top view of the change-delivering mechanism. Figs. 4, 5, 6, and 7 are details.

The hopper into which the coins are thrown is made in two parts 2 and 3. An incline in which there are abrupt changes of level (shown in the drawings as steps) leads to the mouth of the oblong box which forms the receptacle of the upper part of the hopper. The small and large coins are somewhat assorted by traveling over these steps. The box is of less width than the diameter of the smallest coin to be introduced and increases in width slightly from the top downward to the bottom of part 3, as indicated in the dotted lines in Fig. 1. The coins will therefore lie side by side with their horizontal diameter along the length of the box, and any bunch that can enter the top side by side will drop to the bottom. At the bottom of part 2 they are supported upon the removable plate 4, shown as a projection at an upper corner of the lower part of the hopper. This lower part swings upon an axis 6, and the adjacent or contacting edges of the upper and lower parts are arcs of circles centered upon this axis, so that the lower part can swing freely under the upper part when the knob 7 is

pulled without changing the distance between the edges. When the knob is pulled, the plate 4 is carried aside and the coins drop from the upper into the oblong box which forms the lower part of the hopper. Here the first separation of the coins takes place. The bottom of the lower part is open except for two pins 8, which project through one side wall and abut against or penetrate the other edge walls that the smaller coins—viz., the cents, nickles, and dimes—drop through and the larger coins—viz., the quarters, half-dollars, and dollars—are held back. The arms by which the lower box is suspended are of considerable length—say two inches—so that the box when it swings back on release of knob 6 under the force of the spring 9 will strike the stud 11 with sufficient force to throw the bunch of coins from one end of the box to the other and disengage and shake down any of the smaller coins that may be caught in the bunch. The rods are then withdrawn by pulling the knob 12, and the larger coins are thus discharged.

From the hopper all the coins fall into and pass along the chutes. Of these there are two mains 13 and 14, each having three branches, there being six sizes of coins divided into groups of three to be disposed of. At the upper end of the mains and under the mouth of the hopper the main for the larger coins is immediately over that for the smaller coins and has a hole 16 through its bottom large enough to permit the smaller coins to fall into the lower main, as shown in Figs. 1 and 2, the larger coins being stopped in the upper main. The chutes (shown in detail in Fig. 2) have flat bottoms, and each is of slightly greater width than the diameter of the largest of the group of coins discharged into it. Near the upper end of each main chute is an oblong hole (see 17) slightly wider and considerably longer than the medium coin of the group, which travels along the chute placed symmetrically along the middle line of the chute, so as to leave a narrow runner 18 along each side, which forms a part of the floor of the chute. At this point the two smaller coins must drop into the branch chute 19, which leads off from the main immediately below

this oblong hole, while the largest coin slides on the runner and is discharged into its proper receptacle; but if no provision is made against it the smaller coins will frequently ride upon larger ones down to and over the holes through which they should drop. To avoid this, the slope of the channel is abruptly changed at one or more points, or steps are introduced in the bottom of the chute some distance in front of each of the drop-holes. The steps are preferable, and are shown at 21. At these points a smaller coin riding upon a larger one will be thrown off and will drop through the hole into its appropriate chute. Each branch is a counterpart of the main, and there is a step at the entrance to the drop-hole. These steps need not be high, as in the main branches, as quite a slight change in elevation is sufficient to throw one coin off of another of nearly the same size. It is obvious that the coins may slide on their side along the whole length of these chutes from the mouth to the point at which they fall into the receptacles; and in order to save space the hopper can be placed in the middle of the box, and the two main chutes, with their branches, curve around toward opposite ends of the box and distribute the coins to the receptacles placed nearest these ends.

I have preferred to show in the drawings a special arrangement of the branches for delivery of the dollars and the half-dollars. The dollars after having been separated from the half-dollars and quarters and the half-dollars after having been separated from the quarters are turned by a curved plate 22 at right angles and dropped into a narrow and deep chute 23, in which the coin runs on its rim until it drops into its appropriate receptacle. It will be apparent that the upper end of the second chute must be below the mouth of the first chute and must start from below it in a direction substantially at right angles to the direction of motion of the coin as it emerges from the first chute. The advantage of thus tilting the coin on its rim after separation from all smaller coins is that the slant of this second part of the chute need not be so great as would be necessary if the coin slid on its flat face along it, and the course of the chutes is reversed without danger of the coins coming to a standstill.

The receptacles are cylinders large enough to permit the coins to fall flat in them. Each has a sliding face or half-sleeve 24 of slightly larger radius than the cylinder and held in place by a ring at either extremity which encircles the cylinder, which, being turned through one hundred and eighty degrees, leaves the whole front of the cylinder open and enables the operator to remove the coins. This may be omitted, if desired. A sight hole or strip is cut longitudinally in each face, through which the coins in the cylinder can be seen and along which a counting-scale is marked off.

The hopper, chutes, and cylinder together

form a complete assorting device, which may be connected with a change-delivering device, or not, as desired. If the cylinders be made removable and with removable bottoms, a bunch of mixed coins can be arranged in piles of like coins. This would be a very useful thing to churches and all institutions that have to handle great quantities of mixed coins; but I have here shown the assorting device combined with a change-delivering device, which I shall proceed to describe. The change-delivering device consists of the cylinders, in combination with pushing-bars or pushers to eject the coins from the cylinders into a suitable delivering-channel, the pushers being operated separately or in desired combinations, representing different amounts of change, by means of keys, which control suitable selecting-bars. The cylinders are open at the bottom and are supported at a height slightly greater than the thickness of one of the coins to be held therein above a plate 25, which sustains the pile of coins. This plate a little more than half covers the bottom of the cylinder, being cut away on its front edge to form a semi-circle, so that when one of the coins is pushed forward it will readily tilt over the edge and fall into the delivery-channel 26, which is placed below the whole line of cylinders and at the mouth of which is a receiving-saucer. The front edge of the pushers is the arc of a circle of radius equal to that of the cylinder under which it plays and is thinner than even a well-worn coin of the denomination held in the cylinder. These pushers are operated by keys placed in the front of the machine and marked to represent different sums, from one cent to one dollar. The keys which operate the one-cent and one-dollar numbers are shown connected directly with them by links, (see 28,) though they may be arranged to operate them indirectly through selecting-bars similar to those described below if it is desired to accomplish the delivering of cents and dollars along with other devised sums; but to show this would unnecessarily expand the specification. The pushers which discharge five, ten, twenty-five, and fifty cent pieces are respectively connected by means of wires, the ends of which (marked 44) are shown on Sheet 3, with the selecting-bars 29, 31, 32, and 33. All of these bars and all of the keys turn freely upon a common shaft 34 and are held in normal position by springs. The bars, as will be seen, are mounted on this shaft by arms, which are shown longest on bar 29 and shortest on 33, so that they lie one above another. Each bar has a number of teeth 36, which project forward toward the shaft of the keys, so that when a key is pulled forward the bar will be turned on its axis and draw forward its corresponding pusher. These teeth are curved downward, as shown in Fig. 2, so that when any bar is pushed backward while the bar next above it is stationary the two will not touch and block the machine. The location of these

teeth determines the coin or combination of coins which will be delivered by pulling any key. On the different bars there are teeth opposite the following keys. The teeth shown in Figs. 5, 6, and 7 lie opposite those keys (shown in Fig. 4) with which they are intended to engage, there being no lateral displacement of the bars relative to the keys in these figures: on the five-cent bar 29, opposite keys 5, 15, 30, 40, 55, 65, 80, and 90; on the ten-cent bar 31, opposite keys 10, 15, 35, 40, 60, 65, 85, and 90; on the twenty-five-cent bar 32, opposite keys 25, 30, 35, 40, 75, 80, 85, and 90, and on the fifty-cent bar 33, opposite keys 50, 75, 80, 85, and 90. By this means any combination, counting by fives, from five to ninety-five cents, both inclusive, which does not require two coins of the same amount can be delivered into the channel 26 by operating the appropriate key once. Thus by pulling key 15 the five and ten cent pushers will be operated, by pulling key 40 the five, ten, and twenty-five cent pushers will be operated, by pulling key 90 the five, ten, twenty-five, and fifty cent pushers will be operated, and soon. As we cannot get two coins of the same denomination, the machine will not deliver at one operation twenty cents, which requires two tens or more than two of smaller denominations; forty-five cents, which requires a quarter and two tens; seventy, which requires fifty and two ten, and ninety-five, which requires a quarter, fifty cents, and two tens. The four keys corresponding to these sums—viz., 20, 45, 70, and 95—are dummies, and are utilized as follows: Keys 95 and 20 operate a secret locking and unlocking device from the whole bank of keys, and the keys 45 and 70 together form a secret combination for opening the bill-drawer 37.

The locking and unlocking of the bank of keys are accomplished as follows: As will be seen by reference to Figs. 1, 2, and 3, each key moves forward in a narrow slot in a plate which forms a covering for the selecting-arms. Beneath this plate is another 38, free to slide the width of a slot sideways, and is itself slotted exactly like the first, except opposite keys 95 and 20, where one side of the slot is inclined. As shown in Fig. 3, it is the left side opposite key 20 and the right side opposite key 95. When key 95 is thrown forward, the lower plate will be thrown to the right and close all the slots, and when key 20 is thrown forward it will be moved back to the left to normal position and open all the slots.

The bill-drawer 25 is opened by the simultaneous operation of keys 45 and 70, each operating an independent hook 39, either one of the two hooks operated by the keys holding the drawer closed against the force of a spring 41, which pushes it open when both hooks are lifted at the same time. This is also secret, as the lower parts of the keys are under cover and therefore invisible from the outside of the box. A bell may be attached,

which shall be rung when the drawer opens.

In order that separate coins may be inserted into their appropriate cylinders without passing them through the hopper and chutes, a slide 42, large enough to admit the proper coins, extends from the top of the cylinder out beyond the front wall of the box which incloses the cylinders.

I have also indicated at 43 a registering device, which can be of any well-known design, to print in duplicate the amount of each purchase, one impression being on a card to be delivered to the purchaser and the other on a continuous strip wound on a spool within the case. The device is thus a complete counting-house machine, by which coins are assorted, bills and coins safely kept, change delivered, and a purchasers' and sellers' record made.

The operation of the machine is as follows: The mixed coins are dumped into the upper part of the hopper and are there held by the false bottom until the lower part of the hopper is swung back. The smaller coins then drop through the lower part into the lower of the main tubes. The larger coins drop into the upper main chute on removal of the pins which form the bottom of the lower part of the hopper. The coins are separated by traveling along the chutes and are delivered into their appropriate receptacles, whence they are paid out singly or in desired combinations by operating the change-delivering keys. When keys 45 and 70 are operated together, the bill-drawer is opened. When key 95 is operated the whole bank of keys is locked, and when key 20 is operated they are unlocked.

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

1. In a coin-assorting machine, a partial separator and a final separator to which the coins are delivered in groups by the partial separator, in combination with receptacles, substantially as described.

2. In a coin-assorting machine, a partial separator and assorting-chutes, in combination with receptacles, substantially as described.

3. In a coin-assorting machine, a partial separator consisting of a vibrating hopper partially closed by a removable bottom, in combination with assorting-chutes and receptacles, substantially as described.

4. In a coin-assorting machine, a partial separator consisting of a hopper swinging around its support, partially closed by a removable bottom, in combination with assorting-chutes and receptacles, substantially as described.

5. In a coin-assorting machine, a partial separator consisting of a vibrating hopper open at and crossed by one or more removable pins near its lower end, in combination with assorting-chutes and receptacles, substantially as described.

6. In a coin-assorting machine, a partial

separator consisting of a hopper swinging around its support, open at and crossed by one or more removable pins near its lower end, in combination with assorting-chutes and receptacles, substantially as described.

7. In a coin-assorting machine, a partial separator consisting of a swinging hopper open at and crossed by one or more removable pins near its lower end and an operating-knob, retreating spring, and stop to vibrate the hopper, in combination with assorting-chutes and receptacles, substantially as described.

8. In a coin-separating machine, a vibratory hopper open at and crossed near its bottom by one or more removable pins, substantially as described.

9. In a coin-separating machine, a two-part separating-hopper with a removable partition between them, the lower part being partially closed by a removable bottom, substantially as described.

10. In a coin-separating machine, a two-part separating-hopper, the lower part being vibratory and partially closed by a removable bottom, in combination with a removable partition between the two parts and means for removing it from this position when the lower part is in its abnormal position, substantially as described.

11. In a coin-separating machine, a two-part separating-hopper, the lower part being vibratory and partially closed by a removable bottom, in combination with a removable partition between the two parts, operated by the movement of the lower part, substantially as described.

12. In a coin-separating machine, a two-part separating-hopper, the adjacent edges of which are formed in arcs of concentric circles, the lower part swinging on an axis through the common centers of the arcs and partially closed by a removable bottom, in combination with a removable partition between the parts, operated by the movement of the lower part, substantially as described.

13. In a coin-separating machine, a two-part separating-hopper, the lower part being vibratory and partially closed by a removable bottom and carrying a plate which partially covers it and forms a bottom for the upper part when the parts are in normal position, substantially as described.

14. In a coin-separating machine, a two-part separating-hopper, the adjacent edges of which are formed in arcs of concentric circles, the lower part swinging on an axis through the common center of the arcs and carrying a plate which partially covers it and forms a bottom for the upper part when the parts are in normal position, substantially as described.

15. In a coin-assorting machine, a partially-separating hopper, in combination with an assorting-chute composed of two or more mains having branches, substantially as described.

16. In a coin-assorting machine, a main chute along which the coins slide, branch

chutes to separate the coins, and a step in advance of these branch chutes, substantially as described.

17. In a coin-assorting machine, a main chute along which the coins slide, holes in the bottom, leading into branch chutes, runners along the holes, and a step in advance of the holes, substantially as described.

18. In a coin-distributing machine, the combination of a chute of slightly greater width than the diameter of the coin to pass along it, in combination with a narrow chute, in which the coin will run on its edge, placed below and at right angles to the mouth of the other chute, substantially as described.

19. In a coin-assorting machine, the combination of a chute of width slightly greater than the diameter of the largest coin to pass along it and means for carrying off the smaller coins, in combination with a narrow chute, in which the coin will run on its edge, placed below and at right angles to the mouth of the other chute, substantially as described.

20. A coin-assorting and change-delivering machine consisting of a partial separator and a final separator for assorting the coins, to which the coins are delivered in groups by the partial separator, receptacles to receive them, and devices for delivering change, substantially as described.

21. A coin-assorting and change-delivering machine consisting of a partial separator discharging the coins in groups into assorting-chutes, receptacles, and change-delivering devices, substantially as described.

22. In a change-delivering machine, a series of coin-receptacles, pushers for ejecting coins therefrom, joined directly by wires to selecting-bars having differently-arranged projections or teeth operated by keys singly or in different combinations, substantially as described.

23. In a change-delivering machine, a series of coin-receptacles, pushers for ejecting coins therefrom, joined to selecting-bars of different heights arranged concentrically upon a common axis and having differently-arranged curved projections or teeth operated by keys singly or in different combinations, substantially as described.

24. In a change-delivering machine, a series of coin-receptacles, pushers for ejecting coins therefrom, joined to selecting-bars of different heights loosely mounted concentrically upon a common axis operated by keys loosely mounted upon the same axis, substantially as described.

25. In a change-delivering machine, a series of coin-receptacles, pushers for ejecting coins therefrom, attached to selecting-bars of different heights loosely mounted upon a common axis and having differently-arranged teeth projecting into the part of keys loosely mounted upon the same axis with the bars, by which they may be operated singly or in different combinations, substantially as described.

26. In a change-delivering machine, a series

of pushers operated by keys which move in slots in a plate and a similar slotted locking-plate free to slide at right angles to the length of the slots and having two slots opposite
5 dummy keys, each having an inclined side, substantially as described.

27. In a cash-machine, a series of keys for delivering change and a bill-drawer held closed by catches operated by dummy keys

corresponding to amounts of change not delivered by the machine, substantially as described. 10

Subscribed by me in New York city, New York, this the 9th day of June, 1891.

THOMAS J. MCARTHUR.

Witnesses:

THOMAS EWING, Jr.,
BOYD ELIOT.