(No Model.) 4 Sheets—Sheet 1.

C. C. CLAWSON.

COIN CONTROLLED WEIGHING AND WEIGHT PRINTING MACHINERY.

No. 381,339. Patented Apr. 17, 1888.

FIG. VII.

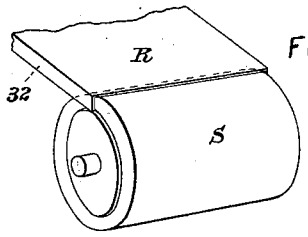


FIG. VI.

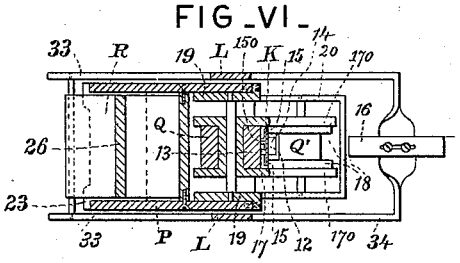


FIG. I.

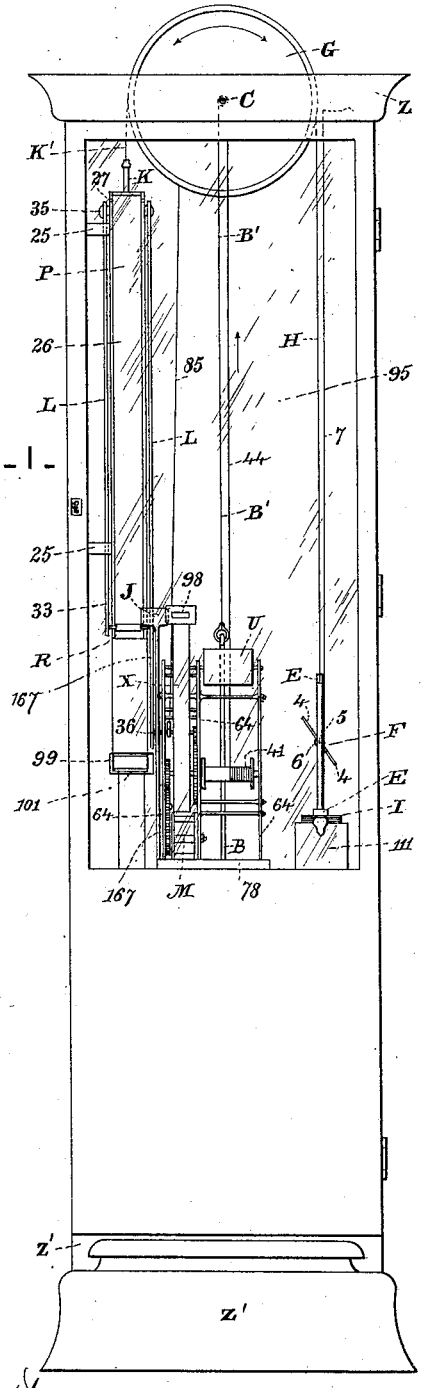
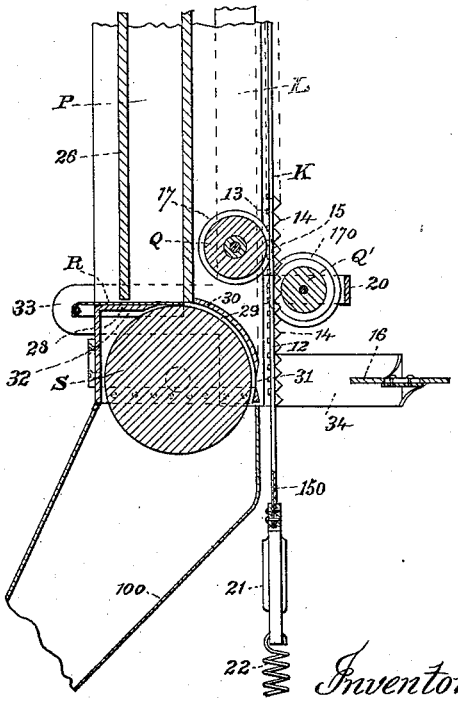


FIG. V.



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his attorney.

(No Model.) 4 Sheets—Sheet 2.

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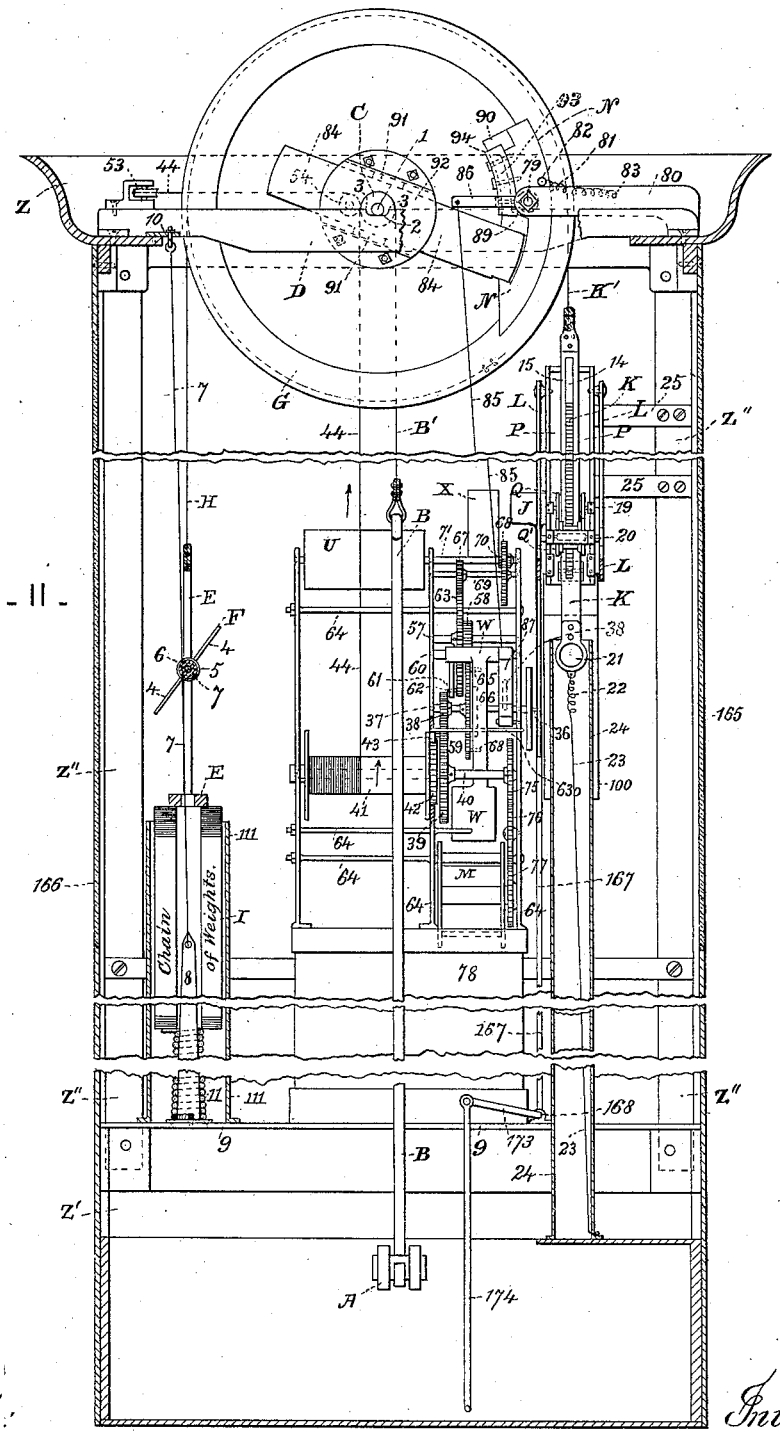
FIG. II.



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(No Model.) 4 Sheets—Sheet 3.

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COIN CONTROLLED WEIGHING AND WEIGHT PRINTING MACHINERY.

No. 381,339. Patented Apr. 17, 1888.

FIG. III.

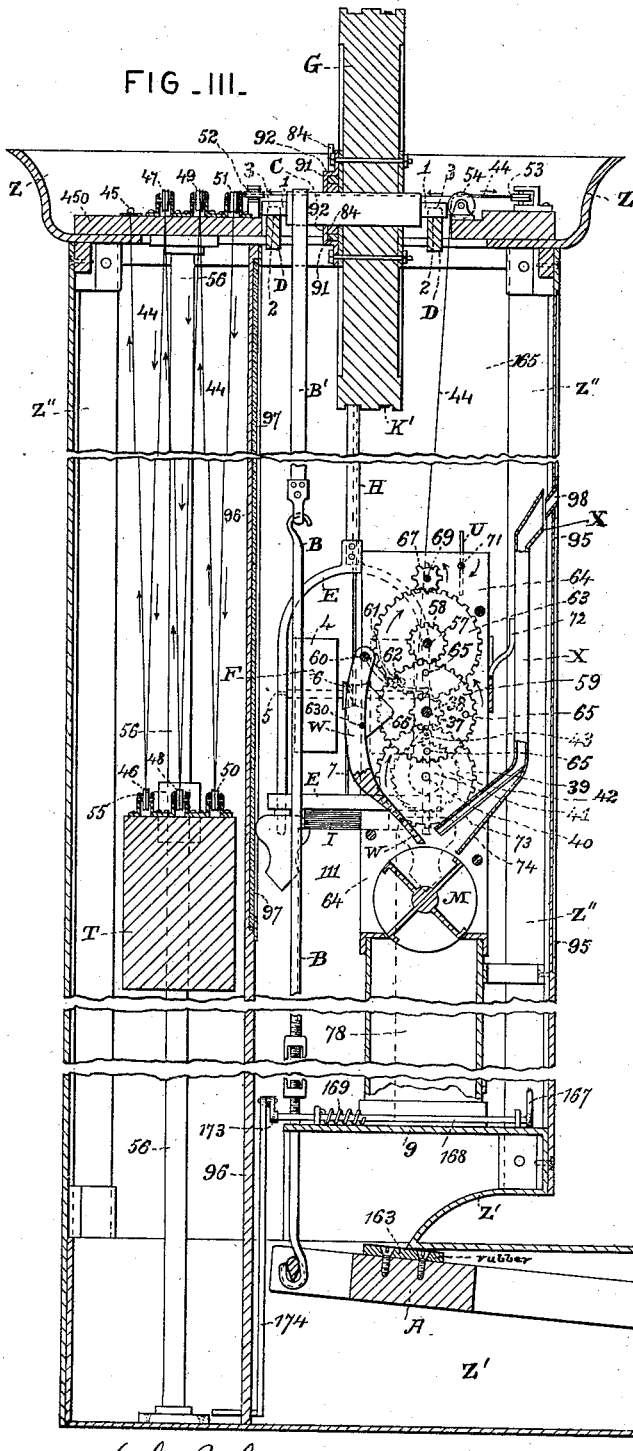
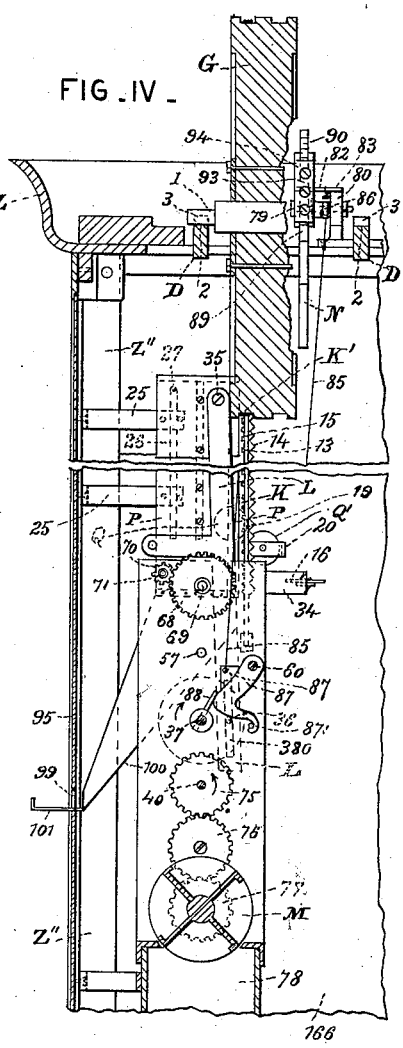


FIG. IV.



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(No Model.) 4 Sheets—Sheet 4.

C. C. CLAWSON.

COIN CONTROLLED WEIGHING AND WEIGHT PRINTING MACHINERY.

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FIG. VIII.

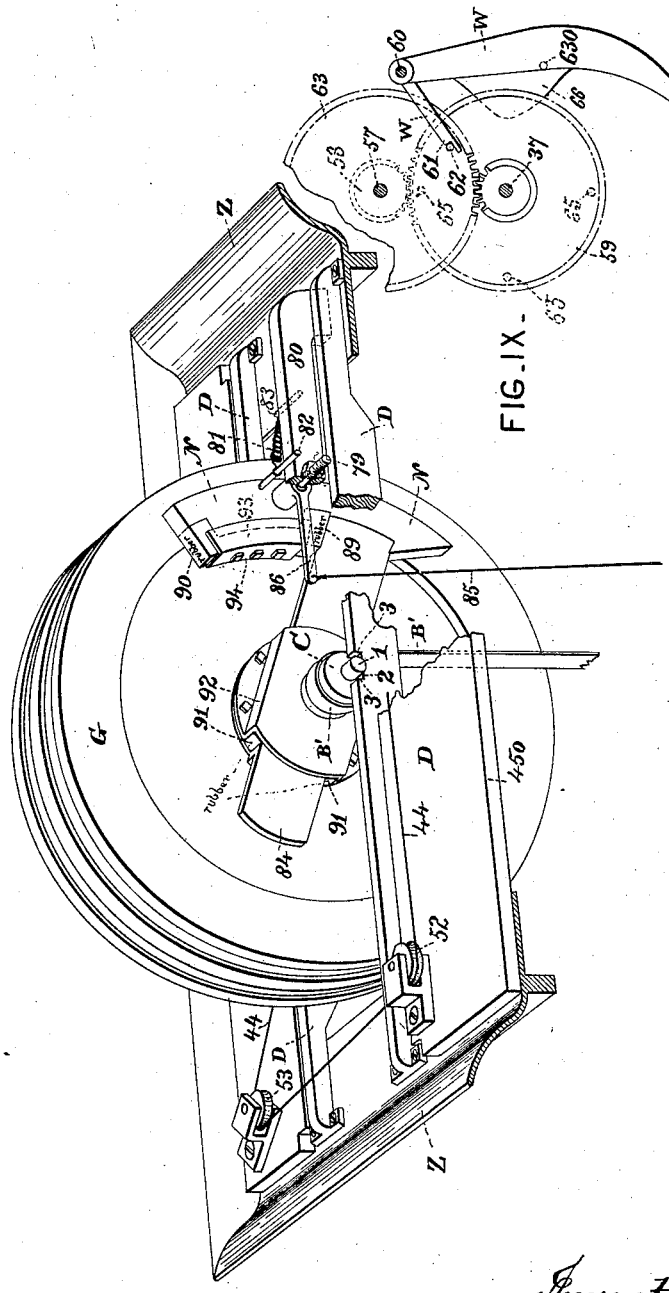

FIG. IX.

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by Chas. J. Hedrick,
his attorney.

UNITED STATES PATENT OFFICE.

CLEMENT COLERIDGE CLAWSON, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE UNITED STATES MACHINE AND INVENTIONS COMPANY, OF NEW YORK, N. Y.

COIN-CONTROLLED WEIGHING AND WEIGHT-PRINTING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 381,339, dated April 17, 1888.

Application filed December 2, 1887. Serial No. 256,798. (No model.)

To all whom it may concern:

Be it known that I, CLEMENT COLERIDGE CLAWSON, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Coin-Controlled Weighing and Weight-Printing Machinery, of which the following specification is a full, clear, and exact description.

This invention relates more particularly to machinery whereby a person may receive a ticket printed with his weight on depositing a proper coin or coins in the machine, and it is designed as an improvement upon or modification of the machine described in my Patent No. 366,303, granted July 12, 1887; but the several improvements constituting the said invention may be embodied in any machine to which they are or may be applicable.

The invention comprises, first, certain improvements in the means for supporting a lever, a drum, or other rotatory device, through which pressure is conveyed to a counterpoise whose force or counterbalancing effect increases with the motion of said rotatory device. A counterpoise of this kind is described in said patent, it being composed of a series of weights which are successively lifted by the rotation of a drum. There are also other known forms—as, for example, first, a spring or springs whose tension increases as they are retracted; second, a weighted lever-arm whose power increases as the lever-arm swings upward or from side to side; third, a weight or spring combined with a cam in such manner that they act a greater distance from the center as the cam is turned; fourth, the converse of the last mentioned, where the power to turn the rotatory device acts at a less distance from the center as the said device is turned under the influence of said power, and so on.

The improved means are to be combined with any counterpoise of the character described, but specially with a series of weights. The improvements in these means are, (*a*,) the combination, with the rotatory device, of a double bearing—namely, a bearing without sliding friction—and a pivot-bearing whereof one part turns in or on the other, the two bearings being so arranged that when the limits of the non-sliding bearing are reached the rotatory device may turn on the pivot; (*b*,) the formation of a bearing without sliding friction by means of a fulcrum-piece or fulcrum-pieces having a bearing surface or surfaces of convex curvature and resting upon a level or nearly level stationary bearing surface or surfaces whereon the said fulcrum piece or pieces may roll back and forth as the rotatory device is turned in one direction or the other; (*c*,) the formation of the double bearing by means of a journal or journals which are free to roll upon a stationary bearing surface or surfaces of limited length and are also capable of turning as pivots at the ends of said surface or surfaces where its or their traversing motion is arrested by stops, hollowed out or not, as may be desired.

Bearings without sliding friction are not, or at least the knife-edge and rolling bearings heretofore made have not been, well adapted to use in connection with counterpoises of the character specified where a large angular motion is desirable and where a balance takes place in various positions of the rotatory device. Pivot-bearings are otherwise well adapted to such use; but the sliding friction between the surfaces is apt to render the balance inexact. The combination specified under (*a*) avoids the difficulty by bringing the non-sliding bearing into action when the balance is secured and allowing the remainder of the movement to be accommodated by the pivot-bearing, whose slight friction is not specially objectionable except at the time of balancing.

When a person steps on the scale, or an object is placed thereon, the weight on the scale turns the rotatory device against the force of the counterpoise, let us say, beyond the limits of the non-sliding bearing, thus turning it also in or on its pivot-bearing. This motion, owing to the action of the acquired momentum, carries the parts beyond the position of balance, so that as soon as the motion is arrested a reverse motion takes place under the influence of the counterpoise. During this reverse motion the rotatory device first turns on the non-sliding bearing, and then, if necessary, on its pivot, until having been carried a certain distance (less than before) beyond the posi-

tion of balance it is again arrested. Vibration back and forth continues the movement at each reversal becoming less and less, until the non-sliding bearing suffices to accommodate the motion, and finally the parts come to rest and a balance is secured without friction, or practically so.

Although a rolling bearing is specially included in the above combination of (*a*,) yet the latter is not limited to that form of non-sliding bearing, but covers generally the double bearing operating in the manner described.

The improvements above specified under (*b*) is believed to be new, and is included in the invention whether there is or is not also a pivot-bearing.

The invention comprises, secondly, certain improvements in those printing mechanisms which have a movable form or series of type mounted on a yielding support or supports, so that they can be separately pushed out, in combination with a printing-finger which is independent of the means for adjusting the form or type, and is advanced after the type have been adjusted, to bring the proper character or characters in position in order to give the impression. Printing mechanism of the character specified, in combination with balancing mechanism, is described in the Patent No. 366,303, before mentioned, and my applications No. 235,672, filed April 21, 1887, and No. 240,507, filed June 7, 1887. It is also known outside of such combination, in different forms, in type-writing machines for general purposes. It is old in such mechanisms to have notches, teeth, or some substitute therefor, which are engaged by the printing-finger, so as to prevent independent motion of the type in printing.

The present improvements in the printing mechanism are, (*a*,) the attachment of the holding-teeth to a flexible support or band of soft vulcanized rubber or other like material, on which the series of type are mounted, instead of to a rigid frame carrying such band, or to the backs of separate type each on its own support; (*b*,) certain combinations of inking and guide rollers, with movable type which can be pressed out to print, and especially a rubber printing-band with or without holding-teeth and with or without side flanges.

In the weighing-machine the type are connected with the balancing mechanism, so as to be adjusted or controlled thereby.

The invention comprises, thirdly, certain improvements in mechanism for delivering cards to be printed from an upright card-box to a printing mechanism, which gives the impressions by a horizontal motion or movement parallel or nearly so with the cards as they lie in the card-box. An arrangement of this kind is described in my application for a weighing and weight-printing machine, filed April 21, 1887, No. 235,672, the cards being taken successively by a feed-roller having teeth which catch the cards and carry them downward inside a curved case. The present improvements under this head are, (*a*,) the combination, with the card-box and the printing mechanism, of a horizontally-reciprocating pusher and a curved discharge-passage extending from the side of the card-box opposite the end of the pusher and curving downward, so as to bring the face of the card opposite the printing-type; (*b*,) the formation of one side of the curved passage in the combination mentioned by the periphery of a roller, which is free to turn with the cards as they are advanced by the pusher.

In the weight-printing machine the printing-type are adjusted or controlled by the balancing mechanism, and the printing is effected by the operation of a printing-finger, which pushes out the appropriate type.

The invention comprises, fourthly, a certain improvement in means for effecting the control of any suitable weighing and weight-printing machine by the introduction of coins or tokens. This improvement consists in the combination, with balancing mechanism, a detent or lock therefor, and printing mechanism having the printing-type adjusted or controlled by said balancing mechanism, of a power-driven mechanism, which operates first to release or unlock the balancing mechanism and afterward works the printing mechanism, and a coin-motor which directly or indirectly controls the operation of said power driven mechanism.

A mechanical power or clock-work is especially intended by power-driven mechanism here and elsewhere in this specification, but other known or suitable powers may be used and are included.

The invention comprises, fifthly, certain means whereby in coin-controlled machinery using a mechanical power-driven mechanism the introduction of coins is prevented when the power-driven mechanism is run down. These means consist of a shutter movable to close the coin slot or leave it open, according to the position of said shutter, and operating mechanism having an arm or other appropriate device at a suitable point in the path of the operating weight or of other suitable part of the power-driven mechanism, so that it is struck thereby when the power is exhausted or nearly so and moves the shutter in the direction to close the coin-slot, the said shutter being held back at other times by a spring or other suitable instrumentality. These means may of course be employed whether the power-driven mechanism effects the release of the scale, or the printing and delivering of the tickets, or other object.

The invention further comprises the combination of the improved printing mechanism with balancing mechanism in general, having a counterpoise of the kind before specified, and ticket-delivery mechanism generally (either or both) with or without power-driven operating mechanism and with or without the improved coin-control, or a coin-control generally; also, the combination of the improved ticket-deliv-

ery mechanism with such balancing mechanism and printing mechanism generally with or without power-driven operating mechanism and with or without the improved coin-control, or a coin-control generally, as well as the combination of such improved printing mechanism with the improved ticket-delivery mechanism with or without balancing mechanism having a counterpoise of the kind specified, with or without power-operating mechanism and with or without the improved coin-control, or a coin-control generally; also, the combination of the improved balancing mechanism with the improved printing and ticket-delivery mechanism, or such mechanisms in general with or without power-operating mechanism and with or without the improved coin-control, or a coin-control generally.

The invention also comprises certain special constructions, combinations, and arrangements of parts, as hereinafter set forth.

The following is a description of what is considered the best mode of applying the principle of the invention, reference being had to the accompanying drawings, which form part of this specification.

Figure I is a front elevation of a coin-controlled weighing and weight-printing machine constructed in accordance with the invention; Fig. II, a view in vertical section and rear elevation on a larger scale, certain portions of the machine being omitted and certain parts broken away; Figs. III and IV, similar views in vertical section in planes at right angles to those of Figs. I and II in elevation, looking in opposite directions, respectively; Fig. V, a detail view in vertical section of a portion of the printing and ticket-delivery mechanism; Fig. VI, a detail view in horizontal section of such mechanism; Fig. VII, a detail view in perspective of a portion of the ticket delivery mechanism; Fig. VIII, a perspective view, partly in vertical section, of the upper part of the machine; and Fig. IX, a detail view, in vertical section, showing the coin-operated escapement-lever and the parts more immediately connected therewith.

The lever A of an ordinary platform-scale is connected by the rod B (see Figs. I, II, and III) with the lower end of a steel band, B′, which is wound on the axle C of a drum, G, so that when the platform is depressed the band is drawn down and the drum G is turned. This drum G constitutes the rotatory device through which the pressure of the object weighed is conveyed to the counterpoise I, formed, as shown, of a chain of weights, as described in my aforesaid patent, the top weight of the chain being connected through the stirrup E with the steel band H, whose upper end is fastened to the drum G, so that as the drum G is turned by the pull on the band B′ the band H is wound on its periphery and the weights I lifted in succession until the weight on the scale-platform is balanced. The double bearing for this rotatory device is formed by the journals 1, which are upheld by stationary cross-pieces D. They rest upon the level bearing-surfaces 2 (see Figs. II and VIII) between the stops 3, but normally out of contact therewith.

When the scale-platform is depressed and the drum G is turned, the journals 1 roll on the surfaces, thus forming a non-sliding bearing until they strike stops 3, whereupon they turn like ordinary journals or pivots, thus forming a second bearing whereof one part turns in or on the other until the increasing force of the counterpoise I arrests the motion of the drum G. As this will not take place until the parts have passed the point of balance, the force of the counterpoise will turn the drum in the opposite direction, the journals rolling to the stops 3, at the other end of the surfaces 2, when they again turn or may turn as pivots. Finally, the vibration results, simply, in rolling the journals 1 on the surfaces 2, and the balance is secured with the journals 1 out of contact with the stops 3, and, consequently, by means of a bearing without sliding friction.

In order to reduce the extent of the vibrations the fan F is placed in the stirrup E, so that the resistance of the air to the rapid rotation of the fan may moderate the motion of the stirrup and parts connected. The fan consists of wings 4, fastened to the shaft 5, whose ends are pivoted in the sides of the stirrup and which in the middle is provided with a pulley, 6, for revolving the fan by engagement with the cord 7. This cord is wrapped once around the pulley, its upper end is fastened by eye-plate 10 to the top Z of the machine-frame, and its lower end is secured to the stationary post 8, whose base is fastened to a shelf, 9, in the base Z′ of said frame. When, therefore, the stirrup E is moved up or down, the pulley 6 travels along the cord and is rotated thereby. The weights I are hollow and fit over the post 8, as in said patent. The bottom weight of the chain is connected with the upper end of a spiral tension-spring, 11, whose lower end is fastened to the post, so that if all the weights should be lifted the tension of the spring will prevent excessive motion and disarrangement.

The weights I are placed in a stationary tube, 111, mainly to conceal the weights or counterpoise, except in operation, for the purpose of increasing the interest of the public in the machine. The said tube, however, also serves as a protection to the counterpoise. It may of course be omitted.

The printing form or band K, of soft rubber, consists (see Figs. V and VI) of the backing 12, the type 13 on the face thereof, the teeth 14 on the back, opposite the spaces between the type, and the side flanges, 15. It is or may be provided with a re-enforce, 150, or strengthening-strip of cloth, as customary in bands inside dating-stamps. It is adjusted by the drum G, on which is wound the steel band K′, whose lower end is connected with the upper end of the printing form or band K. When the drum

G is turned by the weight on the scale-platform, the printing form or band K is lowered in front of the printing-finger 16, and the parts are so adjusted that when a balance is secured the characters or type 13, which represent the weight on the scale, are opposite said finger.

The type are inked by the inking roller Q, and the printing form or band K is guided by the said roller in connection with the guide-roller Q'. These rollers each have flanges 17 and 170, respectively, which lie outside the flanges 15, and portions 18 (see Fig. VI) of the periphery of the roller Q' form bearings for the back of the said flanges 15. The periphery of the roller Q', between the portions 18, is cut away for the passage of the teeth 14. The rollers Q Q' are journaled in bearing-pieces 19 and 20, respectively, which are fastened to the card-box P.

The lower end of the printing form or band K is provided with a light weight, 21, (see Figs. II and V,) to keep it stretched, and said weight is connected through a spiral tension-spring, 22, with a flexible cord, 23, whose lower end is fastened at the bottom of the tube 24, which forms a guide for the weight 21. When a person steps off the scale, the printing form or band K is lifted very rapidly. The spring 22 and cord 23 gradually arrest the motion thus imparted and prevent the weight 21 from being thrown out of the tube 24.

The card box P (see Figs. I, II, and III) is supported in an upright position by arms 25 from one of the corner-pieces Z'', which are made of angle-iron and connect together the top Z and base Z' of the machine-frame. The front 26 of this box is hinged at 27, Figs. I and IV, so that it can be swung out for the introduction of the cards. The piece 28, Fig. V, in connection with the roller S, forms the bottom of the card-box. A curved discharge-passage, 29, formed between the periphery of the roller S and the concave 30, extends from the back of the card-box down in front of the printing-finger 16. The concave 30 is provided with an opening, 31, through which the type 13 may be pushed by the printing-finger 16, in order to make an impression on the card in the lower end of the discharge-passage 29.

The bottom card is pushed from the card-box into the discharge-passage 29 by the reciprocatory pusher R, whose thickness is that of a card. It has depending side flanges, 32, (see Fig. VII,) so that it will be impossible for a card to get under the pusher. The discharge-passage 29 contains several cards which are pushed through, each by the card behind, when the pusher advances, the roller S rotating with the card, so that there is but little friction.

The pusher R is fastened to arms 33, Fig. VI, on the front, and the printing-finger 16 to arms 34 on the rear, of the printing-lever L, pivoted at 35 to the card-box P, and operated by a crank-pin, 36, Figs. II and IV, on the shaft 37. The crank-pin 36 works in a slot, 380, in the lower end of the printing-lever L. When the lever L is moved forward, the printing-finger 16 enters between two of the teeth 14 and presses the type opposite into contact with the card, and on the return movement of the said lever L the pusher R forces a new card into the discharge passage 29 and forces out the printed card. The shaft 37 is geared by a fast pinion, 38, and fast spur-wheel 39 to the shaft 40, on which is a loose drum, 41, provided with a ratchet-wheel, 42, which is engaged by the pawl 43 on the spur-wheel 39, so that the drum 41 can be turned independently of the shaft 40 for winding.

The weight T, Fig. III, which furnishes the power for printing and delivering the cards or tickets, is suspended in loops of the wire 44, which has one end fastened at 45, Fig. III, to the cross-piece 450 in the top Z, runs around the pulleys 46, 47, 48, 49, 50, 51, 52, 53, and 54, and is wound upon the drum 41. The power-weight T is guided by ears 55, sliding on stationary rods 56. The descent of the weight tends to rotate the shafts 37 and 40 in the direction of the arrows.

The shaft 57 (see Figs. II, III, and IX) is geared to the shaft 37 by the fast pinion 58 and the fast spur-wheel 59, which are of such relative size that the shaft 57 makes four revolutions to one of the other, and the escapement-lever W, fulcrumed on the rock-shaft 60, has a tooth, 61, which engages a pin, 62, on the spur-wheel 63 fast on the shaft 57, and prevents the rotation of the mechanism driven by the weight T. When the escapement-lever W is moved back, the tooth 61 is removed from the path of the pin 62 and rotation of the mechanism is permitted. The escapement-lever W is so weighted that it tends to swing forward and place the tooth 61 in the path of the revolving pin 62. The ends of a cross-piece, 630, fastened to the lever W, act as stops to limit this forward motion by contact with the frame 64, by which the various parts of the mechanism driven by the weight T are supported. After the escapement-lever W has been moved back it would, if left free, arrest the rotation of the mechanism as soon as the shaft 57 and pin 62 had completed one revolution. To prevent this, three pins, 65, are placed on the spur-wheel 59, and the escapement-lever W has an angular projection, 66, Figs. II and III, in the path of said pins, so that the escapement-lever W is moved back by the successive pins 65, and prevented from engaging the pin 62 until the shaft 37 has completed a revolution, and a ticket or card has been printed and delivered.

The fan U regulates the rotation of the power-driven mechanism, it being driven by the spur-wheel 63 through the pinion 67, Figs. II and III, and spur-wheel 68, Figs. II and IV, fast on the shaft 69 and the pinion 70 on the fan-shaft 71.

The coin to release the power-driven mechanism is directed against the lower end of the escapement-lever W by the coin-spout X, Figs. I and III, and after acting on said lever W the coil falls into the upper compartment

of the coin-holder M. The spout X is supported by a bracket, 72, fastened to the frame 64. At its lower end it is provided with narrow flanges 73, so as to support a proper coin by the edges and allow small coin to drop through. An inclined strip, 74, fastened to or formed by a continuation of the front of the spout X, conducts any small coin into the coin-holder below the escapement-lever W.

The coin-holder M is a compartment-wheel mounted on a horizontal axis in the frame 64 and driven from the shaft 40 through the gears 75, 76, and 77, Fig. IV. It makes a quarter turn forward at each revolution of the shaft 37, so that the coin, after releasing the power-driven mechanism, is carried over to the front of the holder, where it remains exposed until the mechanism is again operated. The frame 64 and the mechanism carried thereby are supported on top of the money-box 78, which is upheld by the shelf 9 of the base Z', and receives the coins as they are discharged by the coin-holder M.

As so far described the machine would operate to balance the weight of a person who should step on a scale-platform without the introduction of a coin, but would not deliver a ticket printed with the weight until a coin was introduced. To lock the balancing mechanism until a coin is introduced, the lock or detent N (see Figs. II, IV, and VIII) is provided. This is mounted on a stud, 79, screwed into the bracket 80, and is acted upon by a spiral tension-spring, 81, to hold it in engagement. The spring 81 is connected at one end with a pin, 82, on the side of the lock or detent, and at the other end with the pin, 83, on the bracket 80. The pin 82 acts as a stop by contact with the top of the bracket. The lock or detent N engages a locking-plate, 84, on the side of the drum G, as shown in Figs. II and VIII. It is withdrawn by a pull on the cord or wire 85, which is connected with an operating lever arm, 86, on the lock or detent. The lower end of the cord or wire is connected with the lever 87, which is moved by the finger 88, rotating with the shaft 37, so as to pull on the cord 85 and unlock the scale. The tail of lever 87, by engaging the pin 871 on the frame 64, limits the forward motion of the said lever. When a person steps off the scale, the drum G flies back and the locking-plate 84 is engaged by detent or lock N. To diminish the jar at such times, and also when the drum G is turned to the full extent, soft-rubber buffers 89 and 90 are provided on the lock or detent in the path of the locking-plate 84, and pieces of soft rubber, 91, are placed between the edges of said plate and the adjacent walls of its holder 92. The buffers 89 and 90 are formed in one piece with a connecting-strip, 93, and they are fastened to the lock or detent by a trough-shaped piece, 94, which embraces the rubber and a portion of the detent, and is fastened to the latter by screws. The holder 92 of the locking-plate 84 is fastened by its flanges to the drum G. A piece of rubber, 163, is also placed on top of the lever A to act as a buffer.

The standard of the machine is inclosed on all sides. The front is hinged, (see Fig. I,) so as to open and give access to the works inside. Its upper part, 95, is made of glass, so as to expose the works to view, and a vertical partition, 96, Fig. III, in front of the weight T, is provided with a mirror, 97, to reflect the said works. There is a slot, 98, in the glass for the introduction of coins, and an opening, 99, for the delivery of the printed cards, which slide down the incline 100, Figs. IV and V, onto the shelf 101 outside the machine. The sides 165 and 166 of the case, or a part thereof, are preferably also hinged and made of or provided with glass.

In order to close the coin-slot 98 when the power-driven mechanism is run down, the movable shutter J, Figs. I and II, is provided. It is arranged in proximity to the said slot 98, and is mounted on the lever-arm 167 (see also Fig. III) of a rock-shaft, 168, journaled in bearings on the shelf 9, so that the motion of said rock-shaft in one direction or the other turns the shutter across the slot or withdraws it. A torsion-spring, 169, on the rod 168 normally holds the shutter to one side, as shown. A rod, 174, connected at its upper end with an operating-arm, 173, of the shaft 168, has its lower end arranged in the path of the power-weight T, so as to be struck by the weight T when the latter is near the end of its fall, and the rock-shaft 168 is then turned to place the shutter across the slot and prevent the further introduction of coins until the weight is removed.

When a person desires to ascertain his weight by this machine, he steps upon the platform. Since the drum G is locked by the detent N no movement of the machinery takes place. A proper coin is then introduced into the machine through the slot 98. It falls through the coin-spout X, is directed against the escapement-lever W, releases the mechanism driven by the weight T, and falls into the coin-holder M. The rotation of the said mechanism first causes the finger 88 on the shaft 37 to move back the lever 87, and thus to pull on the cord 85, turn the detent N, and release the drum G, which immediately commences to revolve under the pressure conveyed from the scale-platform through the lever A, rod B, and band B', and to wind up the band H, lifting the counterpoise-weights out of the tube 111, and lowering the printing form or band K in front of the printing-finger 16. After some vibration, as before explained, the balance is secured without friction. The parts are so adjusted that a reasonable time is allowed for this to take place before the power-driven mechanism, which continues to revolve, has, by the action of the crank-pin 36 on the printing-lever L, brought up the printing-finger 16 into position to press against the printing form or band K. After such time, however, the printing-finger 16 enters between two of the teeth

14 and pushes the type 13 opposite said finger, through the opening 31, against the card in the discharge-passage 29. This prints the weight from said type which have been inked by contact with the ink-roller Q. During the advance of the printing-finger 16 the pusher R has been removed from under the pile of cards in the box P, which cards drop down, bringing the bottom card in front of the pusher R. After the printing has been effected the crank-pin 36 moves back the printing-lever L, and the pusher R, acting against the edge of the bottom card or ticket, forces it edgewise into the passage 29, rotating the roller S and discharging the newly-printed card, which falls upon the incline 100 and slides out of the machine onto the shelf 101, to be received by the person weighing. The power-driven mechanism, after one revolution of the shaft 37, is automatically arrested by the escapement-lever W engaging the pin 62, and so remains until another coin is introduced. When the person steps off the scale, the weights I descend into their tube 111, the drum G is revolved until the locking-plate 84 is engaged by the detent or lock N, which holds it stationary until the said detent is disengaged by the power-driven mechanism on the introduction of another proper coin. This reverse revolution of the drum G of course winds up the bands B′ and K′, ready for a new operation. The coin remains exposed to view in the coin-holder M until the next operation of the machine, when it is discharged into the money-box 78.

In the foregoing particular description details are given for the purpose of enabling others to make and use the invention; but it will be understood that the invention is not limited to them.

The term "coin-motor," as employed herein, signifies a contrivance of any suitable description whose condition or operation is effected by the introduction of a coin, such coin-motors being known in a variety of forms for various purposes.

I claim as my invention or discovery—

1. The combination, with a rotatory device and a counterpoise whose counterbalancing effect increases with the motion of said rotatory device, of a double bearing for said rotatory device—namely, a limited non-sliding bearing—which allows the said device to turn through a fraction of its angular movement, and a pivot-bearing whereof one part turns in or on the other when the limits of said non-sliding bearing are reached, substantially as described.

2. The combination, with a rotatory device and a counterpoise composed of a series of connected weights, of a double bearing for said rotatory device—namely, a limited non-sliding bearing and a pivot-bearing whereof one part turns in or on the other when the limits of the non-sliding bearing are reached—substantially as described.

3. The combination, with a rotatory device and a counterpoise whose counterbalancing effect increases with the motion of said device, of a bearing for said rotatory device formed by fulcrum-pieces attached to the rotatory device and having bearing surfaces of convex curvature and level stationary bearing-surfaces on which said fulcrum-pieces rest, substantially as described.

4. The combination, with a drum and a counterpoise composed of a series of connected weights, of journals for said drum, and level stationary bearing-surfaces whereon said journals rest and roll, substantially as described.

5. The combination, with a rotatory device and a counterpoise whose counterbalancing effect increases with the motion of said device, of a double bearing for said device formed by journals attached thereto, which journals roll upon stationary bearing-surfaces and turn as pivots at the ends of said surfaces, where the traversing motion is arrested by stops, substantially as described.

6. The combination, with a rotatory device and a counterpoise composed of a series of connected weights, of the bearing for said device formed by journals which roll on stationary bearing-surfaces and turn as pivots at the ends of said surfaces, where the traversing motion is arrested by stops, substantially as described.

7. The printing-form composed of the flexible or soft-rubber band with type on one side and teeth on the opposite side thereof, in combination with a printing-finger and means for adjusting the said form in front of said finger, which latter is independent of said means and is movable transversely to said form, substantially as described.

8. Vertically-movable printing-type which can be pushed out to print, in combination with the roller-guides therefor, and the printing-fingers movable transversely to the said form independently of said guides, substantially as described.

9. Vertically-movable printing-type which can be pushed out to print, in combination with the inking-roller, the guide-roller on the opposite side of the type from said inking-roller, and the horizontally-movable printing-finger, substantially as described.

10. A vertically-movable printing-form composed of type mounted on a flexible or soft-rubber band provided with side flanges, in combination with guides which overlap said side flanges, and between which the form moves, and a horizontally-movable printing-finger, substantially as described.

11. A vertically-movable printing-form having teeth on the back thereof and side flanges, in combination, a flanged guide-roller whose periphery bears against said side flanges, and is cut away for the passage of the said teeth, the flanges on the roller overlapping the flanges on the printing-form, substantially as described.

12. The combination, with balancing mechanism having a counterpoise whose counterbalancing effect automatically increases with

the motion of said mechanism, of a printing-form composed of type and holding-teeth attached to opposite sides of a flexible or soft-rubber band, and a printing-finger, said form being adjusted or controlled by the said balancing mechanism, substantially as described.

13. The combination, with balancing mechanism having a counterpoise whose counterbalancing effect automatically increases with the motion of said mechanism, of the movable type which can be pushed out to print, an inking-roller, and a printing-finger, substantially as described.

14. The combination, with a revolving drum, of the band wound on the axle for applying the power to rotate the drum, the chain of weights, the counterpoise-band connected with the said chain of weights and wound upon the said drum, the printing-type, and the band connected with said type and wound on the drum in the opposite direction to the counterpoise-band, so that the type are lowered as the weights are raised, substantially as described.

15. The combination, with the upright card-box, the movable printing type, and the horizontally-movable printing-finger, of the horizontally-reciprocating pusher, and the curved discharge-passage extending from a point opposite the end of the pusher, substantially as described.

16. The combination, with the upright card-box, of the horizontally-reciprocating pusher, and the curved discharge-passage extending from a point opposite the end of the pusher, and formed between the periphery of a roller and an inclosing concave, substantially as described.

17. The combination, with balancing mechanism and printing mechanism having printing-type adjusted or controlled by said balancing mechanism, of ticket-delivery mechanism comprising an upright card-box, a horizontally-reciprocating pusher, and a curved discharge-passage, substantially as described.

18. The combination, with balancing mechanism and printing mechanism having printing-type adjusted or controlled by said balancing mechanism, of ticket-delivery mechanism comprising an upright card-box, a horizontally-reciprocating pusher, and a curved discharge-passage formed by the periphery of a roller and an inclosing concave, substantially as described.

19. The combination, with balancing mechanism, of printing mechanism comprising type adjusted or controlled by said balancing mechanism, an inking-roller and a printing finger, and a ticket-delivery mechanism, substantially as described.

20. The combination, with balancing mechanism, of printing mechanism comprising a soft-rubber type form adjusted or controlled by said balancing mechanism, an inking-roller and a printing-finger, and ticket-delivery mechanism comprising the upright card-box, the reciprocatory pusher, and the curved discharge-passage, substantially as described.

21. The combination, with a weighing scale provided with an upright glass case or standard, and having the balancing mechanism supported and exposed to view in said case or standard, of a lock or detent which when engaged prevents motion of the balancing mechanism by the weight on the scale, a clock-work which operates to withdraw said lock or detent, and a coin-motor which releases said clock-work, substantially as described.

22. The combination, with a weighing and weight-printing machine having a power-driven mechanism to effect the printing, of a lock or detent for said machine connected with said mechanism, so as to be withdrawn thereby a suitable time in advance of the printing, and a coin-motor which releases said power-driven mechanism, substantially as described.

23. The combination, with a rotatory device and a counterpoise connected therewith whose counterbalancing force increases with the motion of said device, of a buffer or buffers for arresting the motion of said rotatory device, substantially as described.

24. The combination, with a rotatory device and a counterpoise connected therewith whose counterbalancing effect increases with the motion of said device, of the lock or detent, and a buffer or buffers, substantially as described.

25. The combination, with the rotatory device and counterpoise, of the locking-plate attached to said rotatory device, and the lock or detent carried by the machine-frame, substantially as described.

26. The combination, with the rotatory device and counterpoise, of the locking-plate held between pieces of yielding material, like soft rubber, at the edges of said plate, and a stop or stops in the path of said locking-plate, substantially as described.

27. The rocking detent or lock having a buffer at one or both ends, in combination with the rotatory device, a counterpoise, and a locking-plate on said rotatory device, substantially as described.

28. The combination, with the rotatory device and counterpoise, of the locking-plate held between pieces of yielding material, like soft rubber, at the edges of said plate, and a stop or stops also of yielding material, like soft rubber, in the path of said locking-plate, substantially as described.

29. The rocking detent or lock having a buffer at one or both ends, in combination with the rotatory device, a counterpoise, and a locking plate on said rotatory device held between pieces of yielding material, like rubber, substantially as described.

30. The rotatory device, the counterpoise, the lock or detent for said rotatory device, and the buffer or buffers, in combination with the power-driven mechanism and coin-motor, substantially as described.

31. The coin-spout having a portion in-

clined from the vertical, and provided with flanges for supporting a proper coin near its edges and allowing small coin to drop through, and provided also with an incline below such flanged portion for conducting the smaller coin, in combination with the rotatory coin-holder for receiving coin from both inclines, and an escapement-lever against which only the coins supported by the flanges are directed, substantially as described.

32. The combination, with balancing mechanism exposed to view in its case, of a tube of opaque material surrounding the counterpoise, which is drawn from said tube by the operation of said balancing mechanism, and a coin-controlled lock or detent for said balancing mechanism, substantially as described.

33. The combination, with the drum, a counterpoise, and a band connected with the counterpoise and wound on said drum, of a fan movable with said band and counterpoise and revolved by such movement, substantially as described.

34. The combination, with the balancing mechanism having a counterpoise whose counterbalancing effect increases with the motion of said mechanism, the lock or detent, the printing mechanism, and the power-driven mechanism for releasing the detent and after running a certain time effecting the printing, of the fan for moderating the motion of the balancing mechanism so that it will the sooner come to a balance, substantially as described.

35. The balancing mechanism, the lock or detent therefor, and the ticket printing and delivering mechanism, in combination with a coin-motor whereby the operation of both sets of mechanism is controlled, substantially as described.

36. The combination, with a counterpoise formed of a series of weights which are successively lifted, of a spring connected with the bottom weight, substantially as described.

37. The combination, with the rotatory drum, of a band wound thereon, a rubber printing-band attached to one end thereof, and the weight and spring at the bottom of said printing-band, substantially as described.

38. The combination, with power-driven mechanism comprising a train of gearing, of an escapement-lever engaging a revolving pin on said gearing, a coin-spout for directing a coin against said escapement-lever, and one or more pins on another part of the gearing, which, by holding back the escapement lever, permit the first-named pin to complete more than one revolution before the mechanism is arrested, substantially as described.

39. The drum having journals resting upon level stationary bearing-surfaces between stops, in combination with bands connecting the drum and its axle with the counterpoise and the power, respectively, substantially as described.

40. The combination of the scale-lever, the drum having journals resting upon level bearing-surfaces between stops, the band which conveys the pressure from the scale-lever to the axle of said drum, the series of scale-weights, the printing-form, and the bands between the drum and the scale-weights and printing-form, respectively, substantially as described.

41. The upright inclosed frame having a glass front and composed of a top and base, and the corner-pieces extending from top to base, in combination with balancing mechanism supported by and exposed to view in said frame, having a counterpoise whose effect increases with the motion of said mechanism, substantially as described.

42. The upright frame or standard of the weighing-scale, having a glass front and a vertical partition provided with a mirror on the face thereof, in combination with balancing mechanism, and a coin-controlled power-driven mechanism in front of said partition, and a weight for driving said power-driven mechanism behind said partition, said mechanism being supported by said frame, substantially as described.

43. The combination, with the mechanical power-driven mechanism, and the coin-motor which controls the same, of a shutter movable to close the coin slot or passage, and operating mechanism whereby said shutter is moved and the said slot or passage closed automatically when the power-driven mechanism is run down, substantially as described.

44. The combination, with a balancing mechanism, the detent therefor, a mechanical power-driven mechanism for releasing the detent, and a coin-motor for controlling the said power-driven mechanism, of a shutter movable to close the coin slot or passage, and operating mechanism whereby said shutter is moved and the slot or passage closed automatically when the power-driven mechanism is run down, substantially as described.

45. The combination, with a weighing and weight-printing mechanism having a coin-controlled ticket printing and delivery mechanism operated by a mechanical power, of a shutter movable to close the coin slot or passage, and operating means whereby said shutter is moved and the said slot or passage automatically closed when the power-driven mechanism is run down, substantially as described.

46. The combination, with a clock-work driven by a weight, and a coin-motor which controls said clock-work, of a shutter for closing the coin slot or passage of said coin-motor, a finger in the path of said weight, and connections between the finger and the said shutter, so that the shutter is closed automatically when the weight presses down the said finger, substantially as described.

In testimony whereof I have signed this specification in the presence of two witnesses.

CLEMENT COLERIDGE CLAWSON.

Witnesses:

S. PERIT RAWLE,

CHAS. J. HEDRICK.