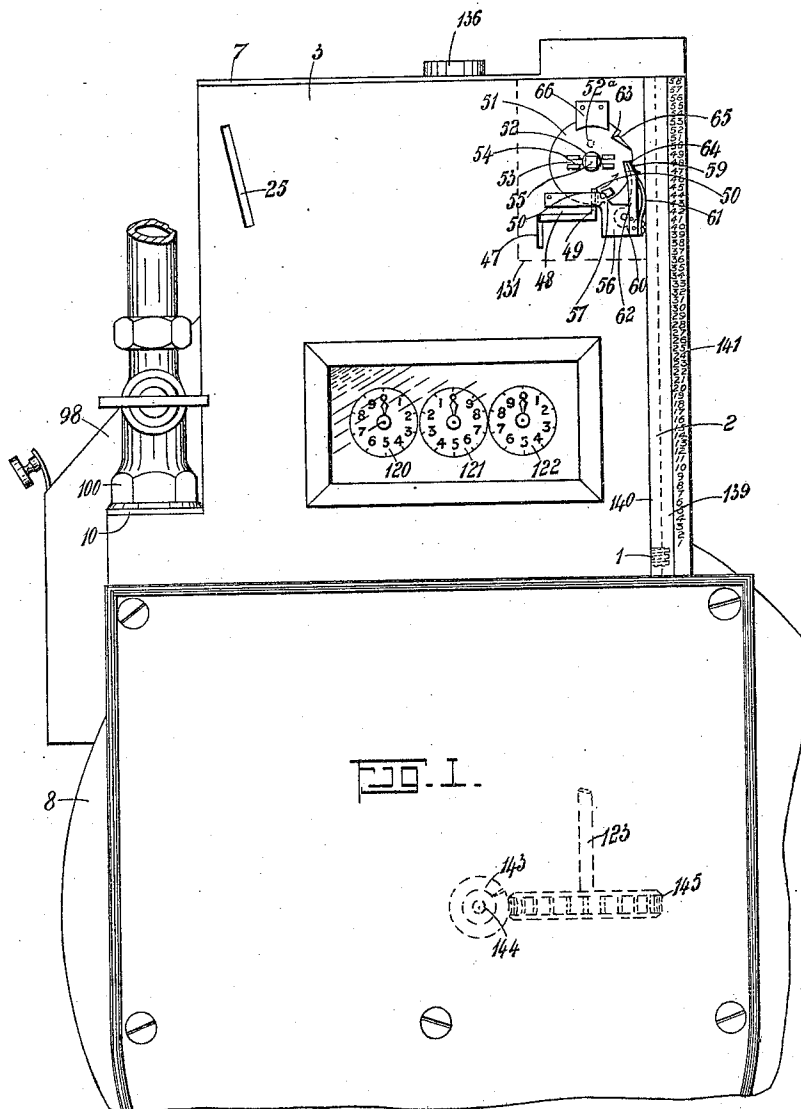


929,306.

C. E. HIBBERD.
COIN FREED MACHINE.
APPLICATION FILED AUG. 28, 1905.

Patented July 27, 1909.
6 SHEETS—SHEET 1.



Witnesses

J. M. Watson
S. P. O. Donnell

Inventor

Charles Edwin Hibberd

By *Henry H. Hayward*

Attorney

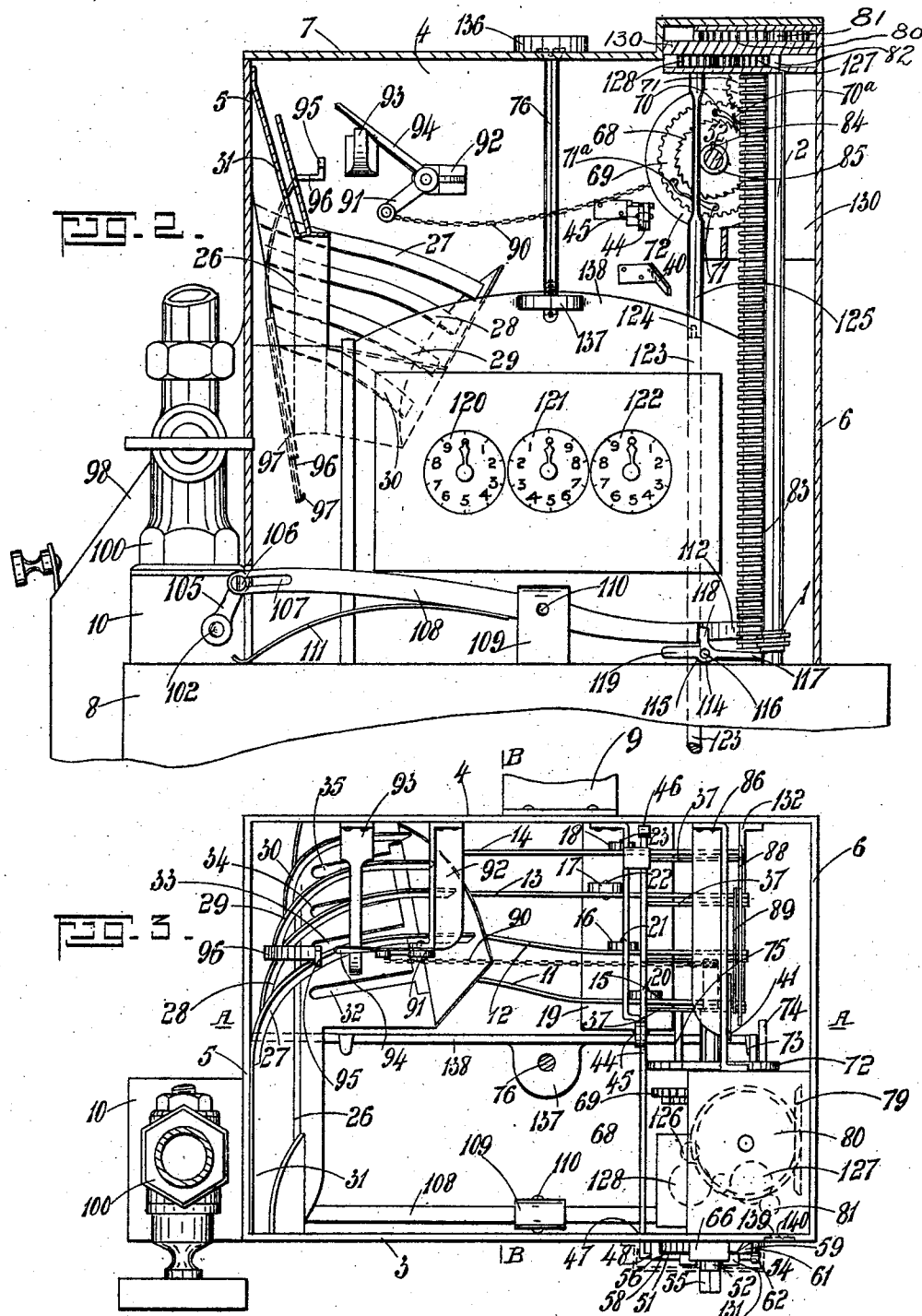
C. E. HIBBERD.
COIN FREED MACHINE.

APPLICATION FILED AUG. 28, 1905.

929,306.

Patented July 27, 1909.

6 SHEETS—SHEET 2.



Witnesses:

Edwin
E. S. Baldwin

Inventor: Charles E. Hibberd.

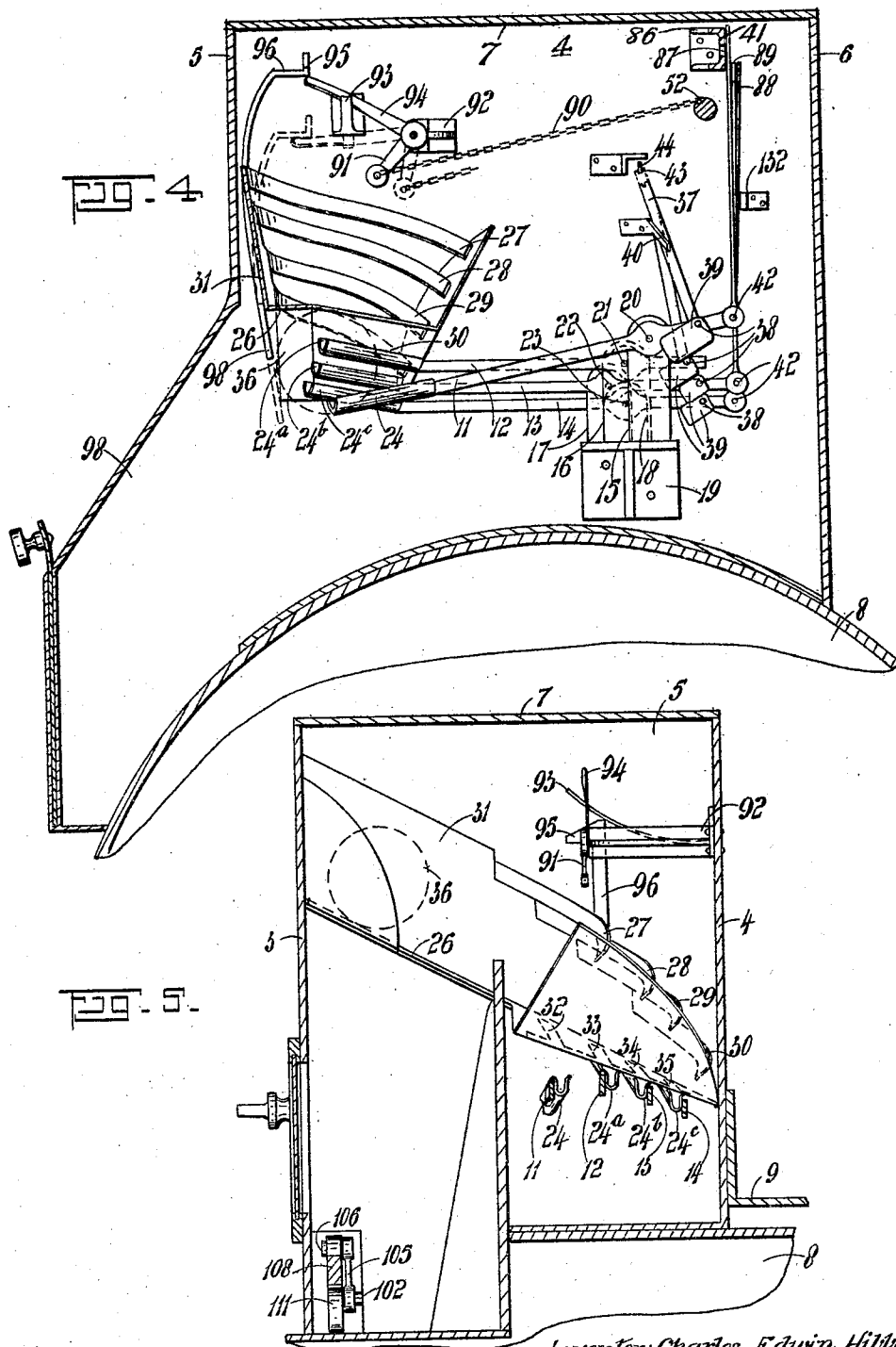
By *Harold D. Hayward* Attorney.

929,306.

C. E. HIBBERD.
COIN FREED MACHINE.
APPLICATION FILED AUG. 28, 1905.

Patented July 27, 1909.

6 SHEETS—SHEET 3.



Witnesses:

Edwin
E. S. Baldwin

Inventor: Charles Edwin Hibberd.

By *Lawrence Hayward* Attorney.

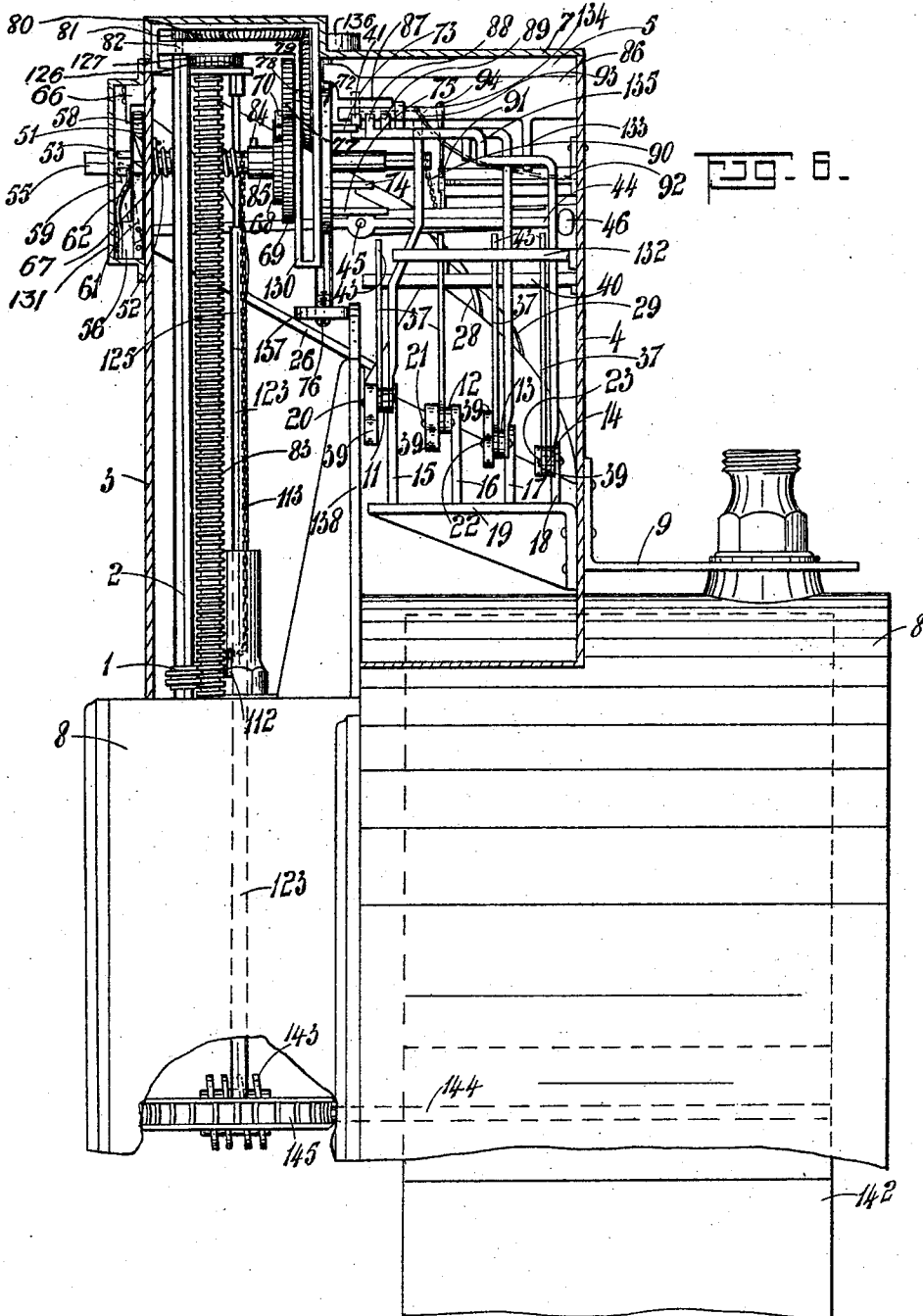
C. E. HIBBERD.
COIN FREED MACHINE.

APPLICATION FILED AUG. 28, 1905.

929,306.

Patented July 27, 1909.

6 SHEETS—SHEET 4.



Witnesses:

Stratton
E. S. Baldwin

Inventor: Charles Edwin Hibberd.

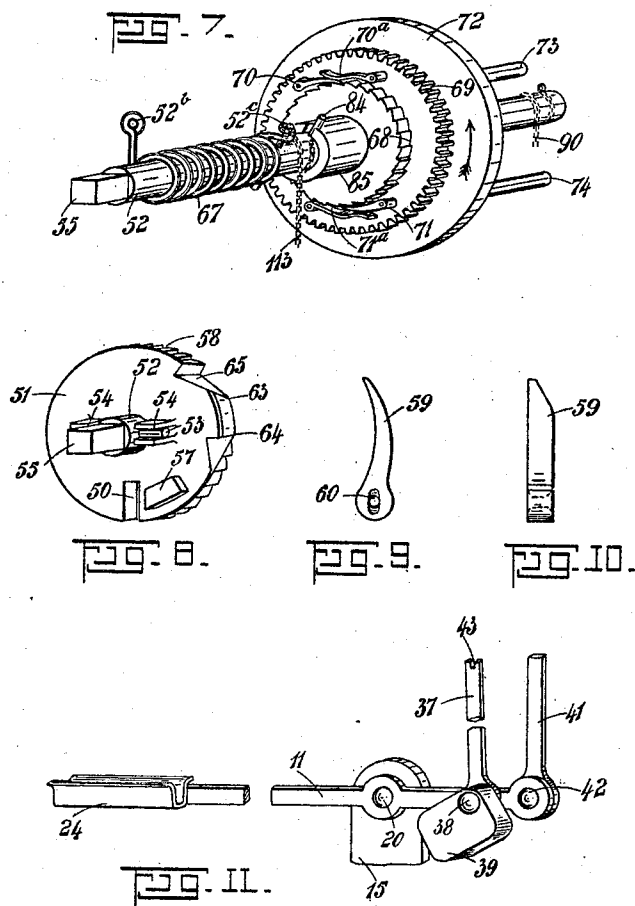
By *Harriet Dayward* Attorney.

929,306.

C. E. HIBBERD.
COIN FREED MACHINE.
APPLICATION FILED AUG. 28, 1905.

Patented July 27, 1909.

6 SHEETS—SHEET 5.



Witnesses

Stratton
S. P. O'Connell

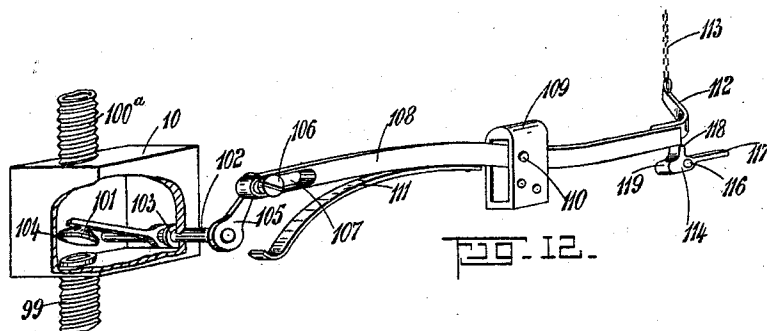
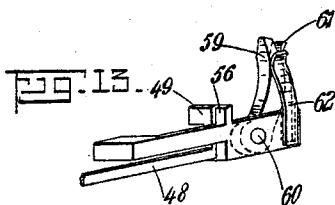
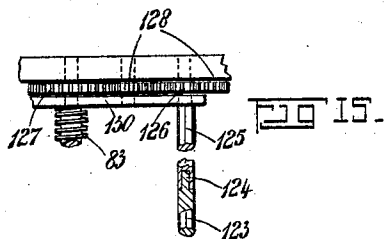
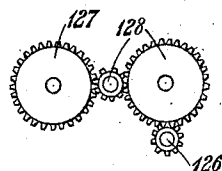
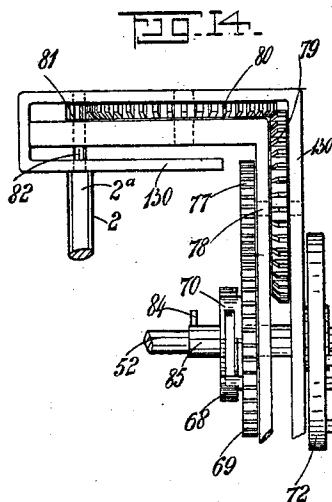
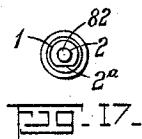
Inventor

Charles Edwin Hibberd
By *Henry H. Raymond*
Attorney

929,306.

C. E. HIBBERD.
COIN FREED MACHINE.
APPLICATION FILED AUG. 28, 1905.

Patented July 27, 1909.
6 SHEETS—SHEET 6.



Witnesses

Adrian
E. P. O. Kennell

Inventor

Charles Edwin Hibberd

By *Harry H. Raymond*

Attorney

UNITED STATES PATENT OFFICE.

CHARLES EDWIN HIBBERD, OF DEVONPORT, NEW ZEALAND, ASSIGNOR TO THE HIBBERD PREPAYMENT MACHINE SYNDICATE LIMITED, A CORPORATION OF NEW ZEALAND.

COIN-FREED MACHINE.

No. 929,306.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed August 28, 1905. Serial No. 276,088.

To all whom it may concern:

Be it known that I, CHARLES EDWIN HIBBERD, a subject of His Majesty the King of Great Britain and Ireland, residing at Albert Road, Devonport, Auckland, in the Provincial District of Auckland, in the Colony of New Zealand, have invented certain new and useful Improvements in Coin-Freed Machines, of which the following is a specification.

This invention relates to coin freed machines in which a predetermined quantity of a commodity may be obtained by the employment of a coin to release mechanism.

My improvements in machines of this class provide means by which coins of different denominations may be used in one and the same machine to obtain quantities of a given commodity corresponding to the value of the coin employed.

The coins are all passed through one slot and run down an inclined race until they meet directors, of which there is one for each size of coin. The directors change the course of the coins and direct them according to their sizes to different slots. A coin falls through its slot into a receptacle at the end of a coin lever, which lever when operated by the weight of the coin liberates mechanism hereinafter described.

Throughout this specification I shall describe my invention as applied to a gas meter and any person skilled in the art of coin freed machines will see that many of the combinations of parts hereinafter described are applicable for use in machines for delivering commodities other than gas.

The drawings herewith illustrate the invention,—

Figure 1 is a front elevation of the machine mounted upon an ordinary gas meter. Fig. 2 is a front elevation of the mechanism with the front plate of the casing removed. Fig. 3 a plan, Fig. 4 a sectional elevation on line A—A, Fig. 5 a side sectional elevation on B—B, Fig. 6 a side elevation. Fig. 7 is a perspective elevation of an axle and its associated parts. Fig. 8 is a perspective elevation of a releasing disk. Fig. 9 is a side elevation, and Fig. 10 a corresponding front elevation of a pawl. Fig. 11 is a perspective elevation of a coin lever. Fig. 12 a perspective elevation of an inlet valve lever and parts, Fig. 13 is a perspective elevation of a pawl and parts, Fig. 14 a

side elevation of toothed gearing for actuating a registering column. Fig. 15 a side elevation of mechanism for actuating a screwed column, Fig. 16 a plan of the same, and Fig. 17 is a plan of worm and column.

Referring firstly to Figs. 1, 2, 3 and 6, the worm 1 is adapted to slide vertically upon the revolubly mounted registering column 2 and this worm engages with the correspondingly screwed column 83, which is freed so that it may be revolved by an operator through a certain number of revolutions according to the value of the coin placed in the machine. The quantity of gas obtained by means of the machine is determined by the height to which the worm 1 is raised upon its column 2, the flow of the gas being utilized to revolve the column 83 and cause the downward descent of the worm which then operates mechanism to cut off the supply of gas. These operations are brought about by my mechanism which is illustrated on the drawings and contained in a casing of which 3 is the front plate, 4 the back plate, 5 and 6 the side plates and 7 the top plate. The casing is made to fit upon the gas meter 8 to which it is secured by a bracket 9, clearly shown in Fig. 6, and by the gas inlet valve box 10. Coin levers 11, 12, 13, and 14 are pivoted to uprights 15, 16, 17 and 18 of a bracket 19 upon pins 20, 21, 22 and 23, the ends of the levers being channeled to form receptacles 24, 24^a, 24^b and 24^c each to hold a coin which is passed into the machine through a slot 25 in the front plate 3. A race 26 inclines downwardly into the machine from the slot 25 and near the lower end of the race directors 27, 28, 29 and 30 are fixed at heights to obstruct and guide in different directions the coins according to their sizes.

The machine as illustrated is adapted for four coins of different values and I am presupposing that the largest coin is of least value, and is caught by the director 27, the coin of highest value is caught by the director 28, the coin of second value by the director 29 and the coin of third value by the director 30. After being passed through the slot 25 which is sloped as shown in Fig. 1, the coins fall against the correspondingly sloping side 31 of the race 26 and run down toward the directors. Coins of lowest value being caught by the director 27 are turned in their course until they fall through the slot 32 into the receptacle 24 of the lever 11. Coins of

highest value pass under the director 27 are caught by the director 28 by which they are turned in their course and fall through the slot 33 and thence into the receptacle 24^a of the coin lever 12. Coins of second value pass beneath both directors 27 and 28, are caught by the director 29 and fall through the slot 34 to the receptacle 24^b of the lever 13. Coins of third value pass beneath the directors 27, 28 and 29 are caught by the director 30 and fall through the slot 35 to the receptacle 24^c of the lever 14.

I will describe the operations which take place when a coin 36 is employed of largest size and lowest value, as shown in dotted lines in Figs. 4 and 5.

The weight of the coin is utilized to liberate mechanism and permit the person who places the coin in the machine to turn the column 83 and thereby raise the worm 1 to a height upon the registering column according to the value of the coin. The coin having passed through its slot 32 falls into the receptacle 24 of the coin lever 11 and its weight depresses the lever as shown in Figs. 4 and 5. A vertical arm 37, clearly shown in Fig. 11, pivoted to the lever 11 upon a pin 38 is weighted by a balance weight 39 to make its upper end rest against a guide bracket 40. The vertical arm 37 rises as shown by dotted lines in Fig. 4, when the coin depresses the opposite extremity of the coin lever. The arm 37 has a forked end 43 which in its upward movement is directed by the guide bracket 40 to engage and operate a releasing lever 44 which is pivoted upon a pin 45, see Fig. 6, and is normally depressed by a weight 46. The other end of the releasing lever passes through a slot 47 in the plate 3, see Fig. 1, and has a right angled extension 48 and a foot 49 adapted to engage in a slot 50 of a disk 51. This disk is clearly shown in Fig. 8. The operation of the lever 44 withdraws the foot 49 from the slot 50 and thus sets free the releasing disk 51, which is mounted freely upon an axle 52 and is in engagement therewith by means of lugs 53 integral with the axle engaging in jaws 54 integral with the disk. The axle and disk thus revolve together while the axle is free to move laterally through the disk. The end 55 of the axle is squared to receive a key.

When the foot 49 is engaged in the slot 50, as shown in Fig. 1, the releasing disk 51 is prevented from turning in the direction shown by the arrow by the foot 49 bearing against the bracket 56, see Fig. 13, which is rigidly fixed to the plate 3, and the said disk is prevented from being turned in an opposite direction by a lug 57 integral with the disk engaging with the said bracket 56.

A ratchet wheel 58 integral with the releasing disk 51 is normally prevented from turning in one direction by a pawl 59 which is pivoted within the bracket 56 upon a pin 60

and is also provided with lateral play upon the said pin by slotting its pin hole, see Figs. 9 and 10. A spring 61 fixed to the bracket tends to keep the pawl in engagement with the teeth of the ratchet wheel 58 and another spring 62 also fixed to the bracket presses the spring against the front plate 3.

The disk is prevented from turning backward throughout nearly the whole of a revolution by the pawl 59 which is then thrown out of engagement with the teeth of the ratchet wheel 58 to allow the disk to revolve in the opposite direction, and permit the axle to be returned to its normal position. This operation is effected by omitting the teeth of the ratchet wheel between the points 63 and 64 and providing a gap 65 having sloping faces. The top of the pawl 59 is also sloped so that after the teeth of the ratchet wheel leave the pawl the sloping top of the pawl engages with the sloping face of a gap 65 provided in the periphery of the disk and ratchet wheel, and the pawl is diverted to the position shown by dotted lines in Fig. 6 against the pressure of the spring 62, thus leaving the disk free to revolve backward.

The disk is prevented from moving outward from the plate 3 by a keeper 66 and the bracket 56, and tends to revolve in a direction opposite to that shown by the arrow by means of a spring 67 coiled around the axle 52, see Fig. 6, which has one end secured to the front plate 3 by a screw 52^a passing through an eye 52^b, and the other end to the axle 52 by a pin 52^c. This spring is also in compression and tends to keep the said axle in its inward position as shown in Fig. 6, and to prevent it from moving outwardly.

A toothed wheel 69 revolves with the axle in a forward direction until arrested by the following mechanism. A ratchet wheel 68 is integral with a sleeve 85 mounted freely upon the axle 52, and is connected therewith by means of a pin 84 which engages with a V-shaped slot formed in the end of the sleeve 85 and adapted to receive the said pin, and the toothed wheel 69 has pivoted upon it pawls 70 and 71 operated by springs 70^a and 71^a, the said toothed wheel being mounted freely upon the sleeve 85, and at the other end of the sleeve is mounted a disk 72 having pegs 73, 74 and 75 of different lengths projecting from its face. The wheel 69 and disk 72 with its pegs thus revolve together when the axle 52 is revolved in the direction shown by the arrow in Figs. 1 and 7, but the revolution of the axle may be continued after the movement of the wheel has been arrested, which is effected in the following manner. At the same time that the vertical arm 37 was raised, a stop bar 41 pivoted by a pin 42 upon the end of the lever 11 was also raised until it barred a slot 87 in a bracket 86, see Figs. 6 and 11. When the

peg 73 arrives at the bracket 86 its passage through the slot 87 is prevented by the stop bar 41.

The registering column 2 revolves when the wheel 69 is revolved by the axle 52, a pinion 77 engaging with the wheel 69 is mounted upon an axle 78 whereon the miter wheel 79 is also fixed, see Fig. 14. The compound spur and miter wheel 79 engages with the compound spur and miter wheel 80 which gears with a pinion 81 secured to the top pivot 82 of the registering column 2. The worm 1 fits freely upon the column 2 which has a flat side 2^a adapted to engage a flat face provided in the hole of the worm, see Fig. 17. When the column 2 is revolved the worm revolves with it and rises or falls according to the direction in which the said column is revolved, the worm engaging with the thread of the screwed column 83.

The axle 52 is returned to its normal position after the stoppage of the disk 72, wheel 69, and the ratchet wheel 68 by the pin 84 riding upon the face of the V-shaped slot in the sleeve 85 until the gap 65 in the disk 51 arrives opposite the pawl 59 when the disk may be returned to its normal position as previously described, see Figs. 7 and 8.

By referring to Fig. 6 it will be seen that if the stop bar 41 is down and the stop bar 88 raised then the peg 73, which was stopped when a coin of lowest value was used to operate the machine, will pass through the slot 87, but the stop bar 88 will arrest the peg 74 which is operated when a coin of third value is used, and similarly when the stop bars 41 and 88 are down and the stop bar 89 is raised, the pegs 73 and 74 will pass uninterruptedly through the slot 87, but the peg 75 which is operated by a coin of second value will be arrested.

When all three stop bars 41, 88 and 89 remain down, which occurs when a coin of highest value is employed, all the pegs 73, 74 and 75 will pass uninterruptedly through the slot 87, and allow a maximum movement of the disk 72, there being no stop bar provided for the coin lever 12, this lever being provided with an arm 37 only.

The coin is liberated from the receptacle 24 by a chain 90 secured at one end to the axle 52 and upon which it is coiled when the axle is revolved. The other end of the chain is attached to a bell crank lever 91 which is pivoted upon a bracket 92 and is normally kept in a raised position by a spring 93. The arm 94 of the bell crank lever is flexible and in its descent springs laterally down a sloping face of a catch 95 upon a slide 96, working in guides 97 formed by turning up the side edges of plates secured to the front and back plates of the casing. This slide extends across the ends of the receptacles 24, 24^a, 24^b, and 24^c, and prevents a coin which may be carried in either of the receptacles from pass-

ing out until the slide is raised in the following manner. The arm 94 having passed the sloping face of the catch 95 springs laterally under the hooked end of the catch. Upon the return movement of the axle and consequent slackening of the chain 90 the spring 93 raises the arm 94 and with it the slide 96 until the movement of the end of the arm in a curved path brings it out of engagement with the catch 95. The slide then falls down to its original position.

Gas is allowed to flow through the meter by the following mechanism. The valve box 10 is secured to the meter 8 by a nipple 99, see Fig. 12, which is screwed into the valve box and into the meter. The inlet cock 100, see Fig. 12, is screwed upon a nipple 100^a upon the top of the box 10. Within the box 10 I provide an inlet valve 101 which is mounted upon a spindle 102 provided with a washer 103 which bears against the side of the box 10 and prevents the escape of gas. The nipple 99 projects into the box 10 and its upper end forms a seat for the valve 101, which has a leather face 104, thereby making a gas tight joint when closed upon the nipple 99. The end of the spindle 102 outside the box 10 is provided with an arm 105 at the extremity of which is a projecting pin 106 adapted to engage in a slot 107 of an inlet valve lever 108 which is pivoted in a bracket 109 upon a pin 110. A spring 111 bearing at its end upon the top of the meter, see Fig. 2, tends to raise the arm 105 and close the inlet valve upon its seat. The end 112 of the lever is provided with a chain 113, see also Fig. 6, by which it is connected to the axle 52. When the axle 52 is turned the chain coils around the axle and raises the end 112 of the inlet valve lever, depresses the arm 105 and opens the valve 101. The cock 100 being open the gas is then free to enter the meter.

A trigger 114 is pivoted in a bracket 115 upon a pin 116 and has an arm 117 adapted to be engaged by the worm 1 when the worm reaches the bottom of its travel, and has another arm 118 which passes beneath the end 112 of the lever 108 by the action of the balance weight 119 when the worm 1 is raised.

The gas passing through the meter revolves in an ordinary manner a drum 142 which operates the usual mechanism for registering the amount consumed, such amount being indicated by the usual dials 120, 121 and 122. The vertical spindle 123, see Fig. 2, is revolved by the drum referred to through a worm 143 upon the axle 144 of the drum which gears with a worm wheel 145 upon the spindle 123. I employ the revolution of the spindle 123 to revolve the screwed column 83, see Figs. 6, 15 and 16. A square 124 is formed upon the extremity of the spindle 123 and a spindle 125 fitted thereto. Upon the other end of the spindle 125 a pinion 126 is fixed and is geared to the

toothed wheel 127 by means of idle wheels 128. The wheel 127 is fixed to the top of the screwed column 83, which is thus revolved by the spindle 123.

6 I will now describe the operation of the machine by reference to all the figures, and will assume that it is desired to obtain a quantity of gas equal to the value of a coin of second value.

10 A coin of second value is passed into the slot 25 runs down the race 26 beneath the directors 27 and 28, is diverted in its course by the director 29, and falling through the slot 34 drops into the receptacle 24^b of the coin lever 13. The weight of the coin operates the lever 13 and the coin is retained in the receptacle 24^b by the slide 96, the vertical arm 37 is raised, the releasing lever 44 operated, and the foot 49 withdrawn from the disk 51, leaving the axle free to be revolved. The stop bar 89 is raised to bar the slot 87. The operator then places a key upon the squared end 55 of the axle 52 and turns the axle in the direction shown by the arrow in Fig. 1. The pin 84 turns the ratchet wheel 86 which revolves the wheels 69, 77, 79, 80, 81 and the regulating column 2. The worm 1 revolving with the shaft 76 and gearing with the screwed column 33 rises upon the said column 2. The revolution of the column 2 is continued until the peg 75 of the disk 72 is stopped by the stop bar 89. The pin 84 then rides upon the face of the V-shaped slot in the boss 85, the axle moving outwardly against the compression of the spring 67. The chain 90 is coiled upon the axle, the bell crank lever 91 operated, and the flexible arm passed beneath the catch 95, where it remains until the chain is unwound by the revolution in a backward direction of the axle, as hereinafter described. During the revolution of the axle the chain 113 is also coiled upon the axle and raises the end 112 of the inlet valve lever 108 and the arm 118 of the trigger 114 falls by the action of the balance weight 119 beneath the end 112. The revolution of the axle is continued by the operator and with it the disk 51 is revolved until the gap 65 is brought opposite the pawl 59, which then moves laterally and out of engagement with the disk. The axle and the associated parts are then allowed to turn in a backward direction under the action of the spring 67 which has been coiled up during the revolution of the axle. When the gap 129 is opposite the pawl, the spring 62 forces the pawl into reengagement with the ratchet teeth 58. The foot 49 rises into the slot 52 and prevents further turning of the axle until a fresh coin is placed in the slot 25. The chain 90 unwinding from the axle permits the spring 93 to raise the slide 96 whereby the coin is permitted to fall from the receptacle 24^b into the till 98, whence it may be extracted by raising the slide 128

which is normally secured by a lock of any ordinary construction. The receptacle 24 released from weight of the coin rises and the vertical arm 37 and the stop bar 89 fall into their normal positions. The valve 101 having been opened by the operation of the lever 108, and the cock 100 being open, gas will pass into the meter 8, and as the gas is used the meter will operate the spindle 123 in the usual manner. The turning of the spindle 123 revolves the screwed spindle 83 as previously described, with the result that the worm 1 is lowered upon its column 2 until it contacts with the arm 117 and trips the trigger 114 allowing the lever 108 to close the valve 101 and thus stop further supply of gas until the machine is operated anew.

The toothed wheels for operating the columns 2 and 83 are carried in a bracket 130 and the disk 51 is inclosed in a casing 131.

The stop bars are retained in position by a guide bracket 132, see Fig. 6, and a guide piece 133 is provided on the bracket 86 and another guide piece 134 upon the stop bar 89 to prevent the stop bars catching one another in their vertical movements. The vertical part 135 in the stop bar 88 also acts as a guide piece for a similar purpose.

To prevent illicit tampering with the mechanism the top 7 of the casing is secured to the meter by a screw 76, see Figs. 2, 3 and 6, which passes through a hole provided in the center of a cup 136 made integral with the said top. The screw enters a screw threaded hole in a lug 137 integral with the vertical plate 138 of the meter. After the screw 76 has been screwed tight, sealing wax is poured into the cup 136 to cover the head of the screw, which cannot then be removed without breaking the sealing wax. The height of the worm 1 may be observed by looking through a pane 139 of glass, see Fig. 1, fixed in a vertical slot 140 formed in the casing. A column of numerals 141 are marked on the casing at the side of the pane, and the number of units of gas obtainable through the meter are indicated by reading the numeral opposite the top of the worm.

The height at which the directors 27, 28, 29 and 30 are placed above the race 26 is determined by the size of the coins which are to be employed for operating the machine.

The amount of gas obtainable for any given coin is determined by the position upon the disk 72 of the peg corresponding to that coin. Thus if the peg is advanced upon the disk, the registering column will receive fewer revolutions and the height to which the worm is raised upon the registering column is reduced. By fixing the peg farther back upon the disk, the revolutions of the registering column will be increased and the worm 1 raised to a greater height.

I claim—

1. In coin freed machines, a series of le-

70

75

80

85

90

95

100

105

110

115

120

125

130

vers and receptacles on their ends, in combination with means for delivering coins thereto, stop bars pivoted to said levers and brackets for retaining the stop bars in position substantially as set forth.

2. In coin freed machines, a series of coin receiving levers, vertical bifurcated arms pivoted to said levers, brackets against which the said arms rest, balance weights on said arm, a counterbalanced releasing lever arranged to act on said arms, an axle, a slotted disk turning freely on the latter and jaws and lugs carried respectively by the said disk and axle substantially as set forth.

3. In coin freed machines, a series of coin receiving levers, stop bars pivoted thereto, brackets arranged to hold said stop bars in position, an axle and a disk mounted freely thereon, said disk being provided with a slot and with pegs of different lengths substantially as set forth.

4. In coin freed machines, levers arranged to be actuated by coins, counterbalanced stop bars pivoted to said levers, guide brackets for said bars, a releasing lever for said bars, an axle, a disk turning thereon and carrying pegs of different lengths and a bell

crank lever having one arm rigid, the other flexible and spring pressed, a chain connecting said lever to said axle and means for operating said lever substantially as set forth.

5. In coin freed machines, coin actuated levers, in combination with counterbalanced stop-bars connected thereto, guide brackets for the stop bars, a releasing lever for said bars, an axle, a slotted disk mounted thereon and carrying pegs of different lengths, a coiled spring tending to turn said axle, a sleeve on said axle having an opening and an integral ratchet wheel, a wheel turning on said sleeve, pawls carried by this wheel and engaging the ratchet wheel, a lever having one arm connected intermediately to said axle and another arm that is flexible and a spring tilt and slide for actuating said lever substantially as set forth.

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

CHARLES EDWIN HIBBERD.

Witnesses:

J. HENRY MACKIE,
PERCY DELLOW.