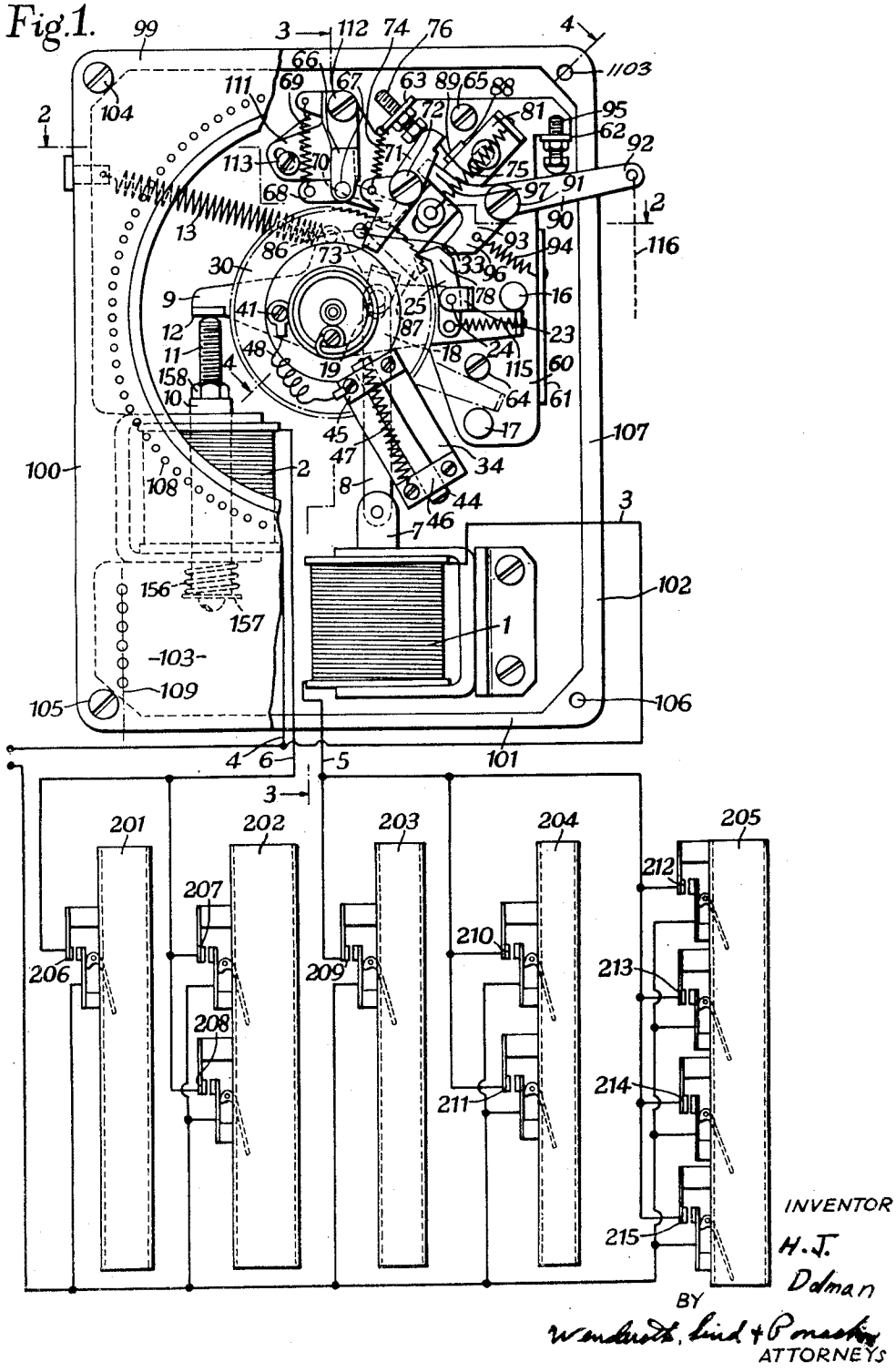
Aug. 12, 1952 H. J. DOLMAN 2,606,639

COIN COMPUTING DEVICE FOR COIN CONTROLLED APPARATUS

Filed April 3, 1945 5 Sheets-Sheet 1

Fig. 1.



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COIN COMPUTING DEVICE FOR COIN CONTROLLED APPARATUS

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Fig.2.

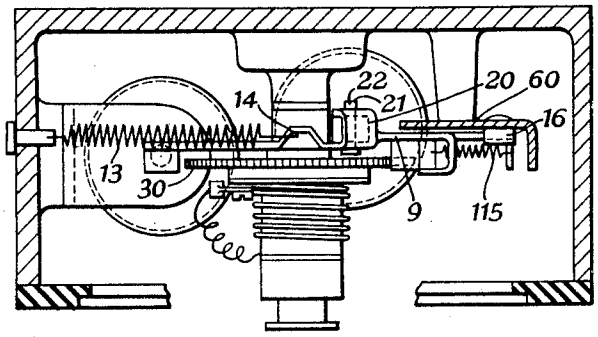


Fig.3.

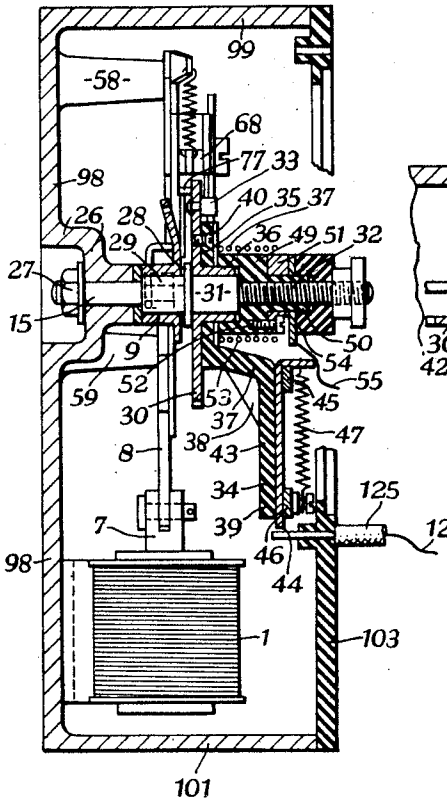
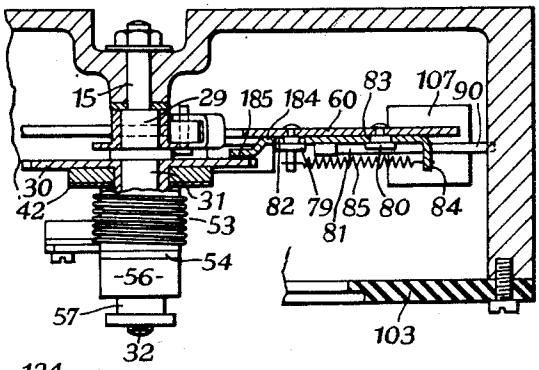


Fig.4.



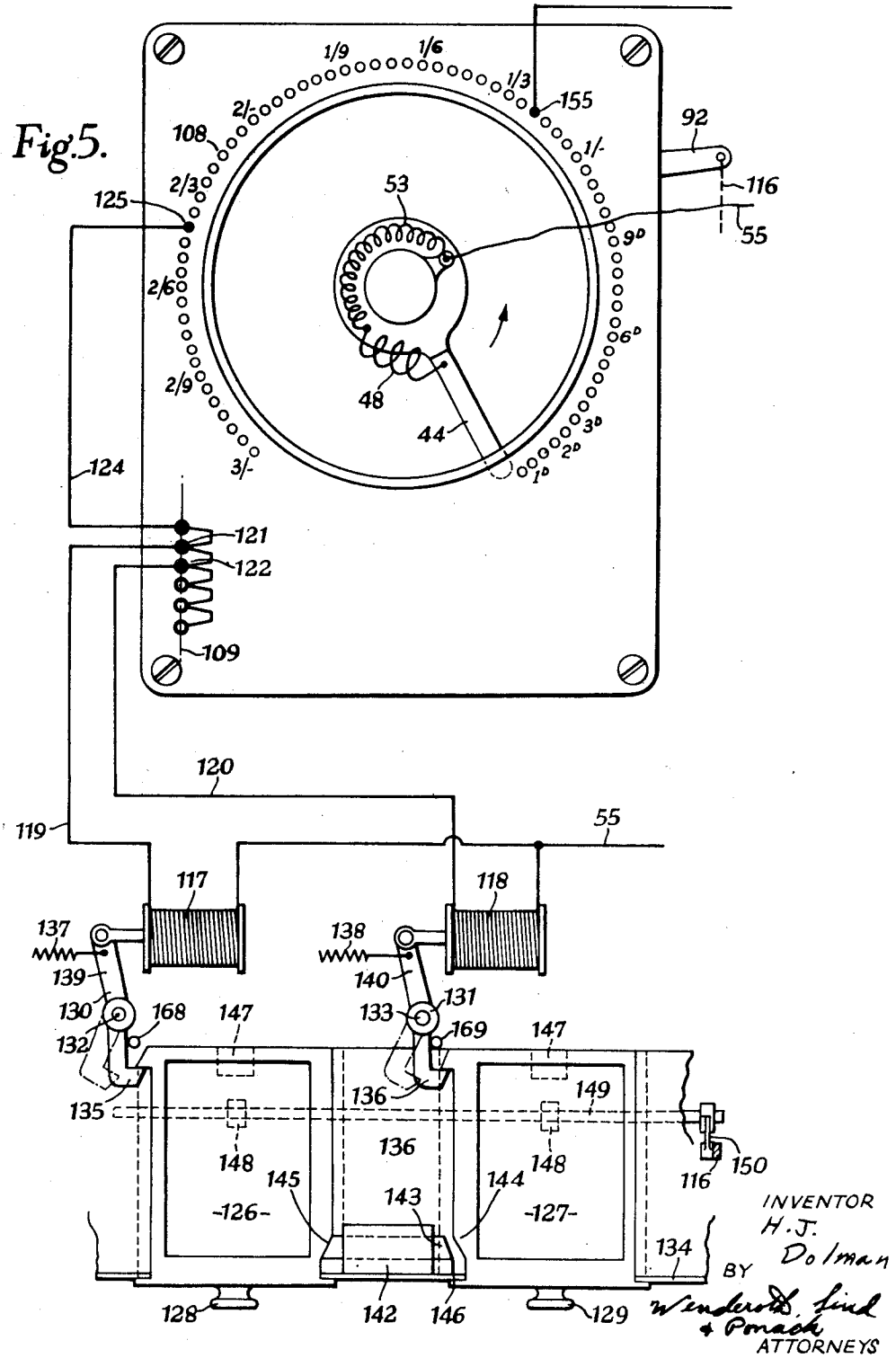
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COIN COMPUTING DEVICE FOR COIN CONTROLLED APPARATUS

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Fig. 5.



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COIN COMPUTING DEVICE FOR COIN CONTROLLED APPARATUS

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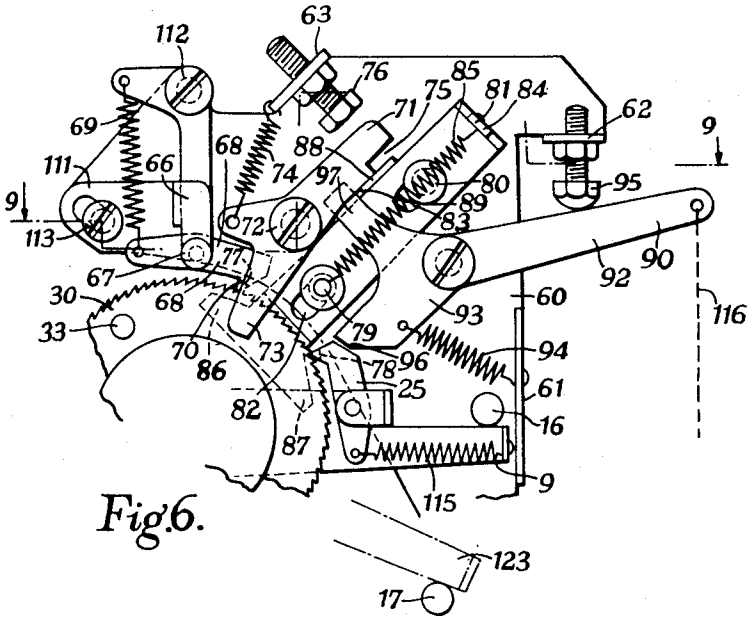


Fig.6.

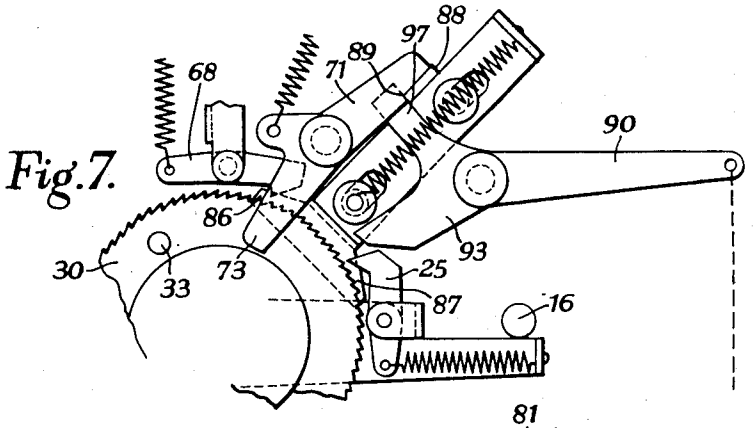


Fig.7.

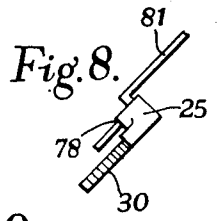
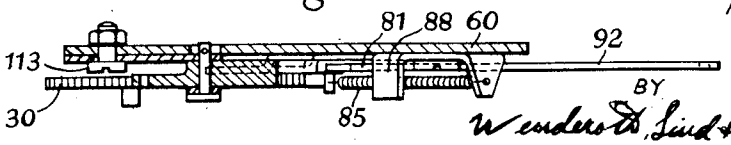


Fig.8.

Fig.9.



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Fig.10.

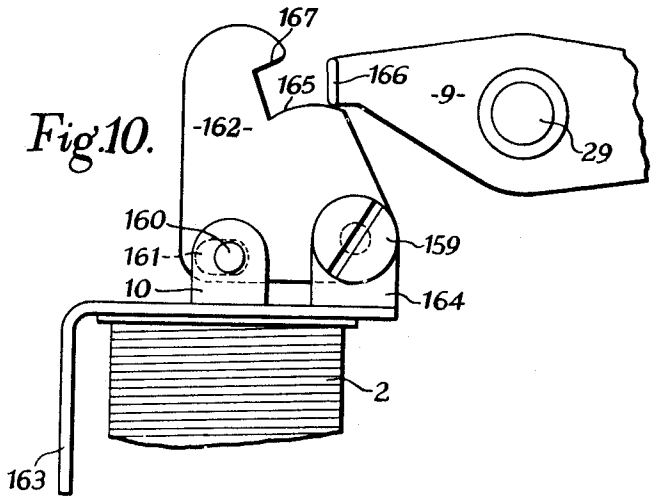


Fig.11.

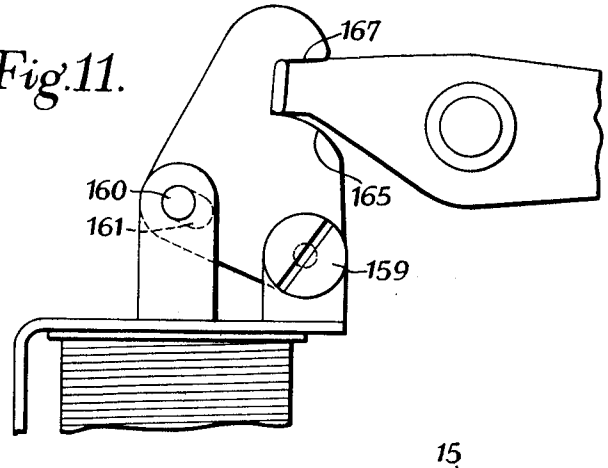
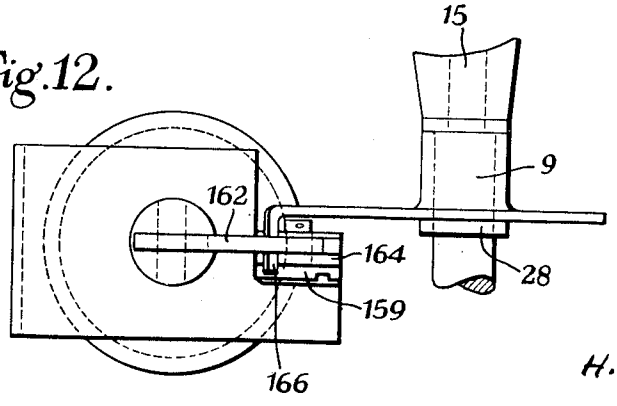


Fig.12.



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UNITED STATES PATENT OFFICE

2,606,639

COIN COMPUTING DEVICE FOR COIN-CONTROLLED APPARATUS

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Application April 3, 1945, Serial No. 586,408
In Great Britain April 6, 1944

2 Claims. (Cl. 194—9)

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This invention relates to coin computing devices for coin controlled apparatus of the type comprising a totaliser that is displaced electrically from its initial position by the passage of a coin or coins into the apparatus and to an extent dependent on the value of such coinage, and in which said displacement is utilised in operating the coin controlled apparatus, e. g. an article delivery mechanism.

The object of the present invention is to provide an improved device of simple construction.

Another object of the invention is to avoid overrunning of the drive mechanism of the totalizer.

One form of the present invention is diagrammatically indicated in the accompanying drawings in which:

Fig. 1 shows a front elevation of the totaliser mechanism with part of the front cover 103 removed, and also includes electrical wiring whereby solenoids are energized by the inserted coins closing switches as they pass down the coin passageways.

Fig. 2 is a plan on the line 2—2 of Fig. 1 with the parts mounted on the back plate 60 above the disc 30 omitted for clearness.

Fig. 3 is a side section on the line 3—3 of Fig. 1, but with the cranked arm 34 as in section.

Fig. 4 is a section on the line 4—4 of Fig. 1.

Fig. 5 is a diagram showing how the computing device may control the operation of a coin controlled mechanism.

Fig. 6 is a view showing to a larger scale the disengaging member 81, retaining member 71 and movable stop member 90, all in the same positions as those indicated in Fig. 1.

Fig. 7 is a view corresponding to Fig. 6 but showing the parts 81, 71, and 90 in their displaced positions due to the sliding of an article delivery drawer. Certain parts are omitted from this drawing for clearness.

Fig. 8 is a view to an enlarged scale showing the lifting surface on the driving pawl.

Fig. 9 is a view on the line 9—9 of Fig. 6 but with the screw 75, retaining member 71 and stop 95 omitted for clearness.

Figs. 10, 11 and 12 show details of an actuating member to prevent over-running of the driving member 9.

It is understood that the vending machine comprises the known types of coin slots in the outer casing of the machine communicating with passageways that lead to the interior mechanism, and extending into said passageways are pairs of contact fingers adapted to be momentarily brought together by the passage of a coin. If desired two or more such pairs of fingers may be included in series in a passageway or passageways.

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Thus a ½d. passageway 201 may include one pair of contacts 206, a 1d. passageway 202 may include two pairs of contacts 207 and 208, a 3d. passageway 203 may include one pair of contacts 209, a 6d. passageway 204 may include two pairs of contacts 210 and 211, and a 1/– passageway 205 may include four pairs of contacts 212, 213, 214 and 215, as shown in Fig. 1.

Such pairs of fingers as above described constitute electric switches located in the coin insertion passageways and their use will be hereinafter described.

Each switch is connected through an electric supply to a solenoid so that each time said switch is closed (by the passage of a coin) the solenoid is energized.

Two such solenoids are illustrated (particularly see Fig. 1) in which 1 indicates a solenoid operable by a threepenny bit, (i. e. the wires are connected to a switch in a threepenny bit coin passageway) and 2 a solenoid operable by a halfpenny, the solenoid 1 being secured to the back 98 of the mechanism and 2 to the side 100.

The wires, 3, 4 of said solenoids lead through a common electric supply not shown, to one finger of the switches in the respective coin passageways, and the wires 5, 6 to the second fingers of said switches. It will thus be appreciated that each time the switch in the threepenny bit passageway is momentarily closed, the solenoid 1 will be energized, whilst closure of the switch in the halfpenny passageway energizes the solenoid 2.

The armature 7 of the solenoid 1 is connected by a link 8 to the right hand side (as seen in Fig. 1) of an oscillating member 9 which is pivoted on a spindle 15 (Fig. 3) and the armature 10 of the solenoid 2 is extended to provide a tappet 11 which is adapted to drive said member 9 through a lug 12 provided at the left hand side thereof.

Instead of operating one solenoid through a link and one through a tappet, both said solenoids may act on the same side of the pivotal axis of the member 9 and thus may both work through tappets or both through links.

Referring to Fig. 3, the spindle 15 passes through a boss 26 on the back 98 of the mechanism and is secured thereto by a nut 27 and it is increased in diameter at 29 where the oscillating member 9 pivots.

A spring 13 secured at one end to a fixed part of the mechanism and at the other end to an ear 14 on the member 9 biasses said member in an anticlockwise direction against a stop 16 whilst movement in the clockwise direction is limited by a stop 17.

The stops 16 and 17 are constituted by screws secured to the backplate 60 to be hereinafter described.

The solenoids 1 and 2 are so wired that energization of either of them acts to move the member 9 in a clockwise direction against the action of the spring 13.

It will be seen from Fig. 1 that the upper end 18 of the link 8 is slotted at 19 while an extension 20 of the member 9 is bent over so as to provide two bearings for a pin 21, see especially Fig. 2. When assembling the mechanism, the pin 21 is passed through one of its bearings, through the slot 19 and then through the second bearing and is finally secured by a split pin 22. This arrangement allows of lost motion between the link 8 and the member 9 and so permits said member to rock a short distance in a clockwise direction without moving the armature 7.

The member 9 is also bent over at 23 to provide a pair of bearings for a second pin 24 said pin providing a pivotal mounting for a driving pawl 25, said pawl being biassed by a spring 115 so that it normally engages the teeth of a totaliser disc 30.

Referring particularly to Figs. 3 and 4, the spindle 15 includes a fixed distance piece 28 arranged at such a distance from the boss 26 that the member 9 may freely oscillate. The continuation of the spindle 15 remote from the boss provides at 31 a free bearing for the totaliser disc 30 and an associated cranked arm 34, and said spindle is then cut down and screw threaded at 32.

The totaliser disc 30 includes a stop 33 for a purpose to be hereinafter described.

Secured to the face of the disc 30 is the cranked arm 34 above referred to, constructed from insulating material, e. g. ebonite. The arm 34 comprises a disc portion 35, adapted to pass over a boss 36 provided on the disc 30, a cranked portion 37 webbed at 38, and a channelled portion 39. The arm 34 is secured to the face of the disc 30 by means of counter-sunk screws, one of which 40, is indicated in Fig. 3. A terminal screw 41 is screwed into the ebonite disc 35.

The portion 39 is channelled at 43 throughout its length and said channel provides a slideway for a brass contact finger 44. Bridge pieces 45 and 46 screwed to the portion 39 permit only of longitudinal movement of the finger 44. The finger 44 is turned up at its inner end (i. e. the end towards the spindle 15) said turned up end providing an anchor for one end of a coil spring 47 whose other end is connected to the outer bridge piece 46. It will thus be seen that the finger 44 is biassed radially outwards as regards the spindle 15. A conductor wire 48 connects the terminal 41 to the bridge piece 45 and hence to the finger 44 due to the latter having slidable contact with the lower side of said bridge piece. It will be seen that the tip of the finger 44 traces a circle when the cranked arm 34 is moved by the rotary disc 30.

A thin insulation disc 42 (see Fig. 4) is also passed over the boss 36 and this acts to protect the heads of the screws, such as 40, from contact with any electric conductors. A hole is pierced

in the disc 42 to permit the terminal 41 to pass therethrough.

An ebonite sleeve 49 is then screwed on to the screw 32 so that it bears firmly against the right hand end (as seen in Fig. 3) of the free bearing 31, but a slight clearance (say .002") is left between said sleeve and the disc 42. Further the boss 36 is some .002" shorter than the length of the bearing 31. The above arrangement ensures that the sleeve 49 is rigidly secured to the spindle 15 but leaves the disc 30 and associated cranked arm 34 free to rotate on the bearing 31.

The sleeve 49 is turned down at 50 and a brass ring 51 is slidden along said turned down portion and secured thereto by means of a screw 52. A coil spring 53 is then fitted over the sleeve 49, one end of said spring being anchored under the terminal 41 and the other under the screw 52.

A washer 54 providing an attachment for a conductor 55 is also slidden over the portion 50 and is held in position by an insulating cap 56 which in turn is held firmly by the nut 57.

The spring 53 serves two purposes, firstly its direction of operation is arranged so that it tends to turn the disc 30 and arm 34 in a clockwise direction, and secondly it serves as an electric conductor acting to connect the terminal 41 to the screw 52 and consequently the finger 44 to the conductor 55.

The construction of the disengaging member, retaining device and movable stop member will now be described. See Figs. 6, 7, 8 and 9.

Webs 58 and 59 projecting from the back 98 provide supports for the back plate 60 hereinbefore referred to, said plate including forwardly bent flanges 61, 62 and 63, for purposes to be hereinafter described, and said plate 60 is secured to the webs 58, 59 by counter-sunk screws 64, 65.

A plate 111 is secured to the back plate 60 by screws 112 and 113 and said plate includes a U-shaped flange 66 which provides a pair of bearings for a pin 67 that carries a non-return pawl 68, said pawl being biassed by a spring 69 anchored to the plate 111 so that its tooth 70 normally engages with a tooth on the periphery of the disc 30. The plate 111 is adjustably secured by the screws 112 and 113 in that a small pivotal adjustment is provided by passing the screw 113 through a slot in the plate. This permits accurate engagement of the pawl 68 with the teeth of the disc 30.

A three armed lever 71 is pivotally secured to the back plate 60 by means of a screw 72, a collar (not shown) being provided between said lever 71 and the back plate 60 so it is normally free to pivot in a plane in front of the pawl 68 (as seen in Fig. 6), thus its tail 73 lies in front of the disc 30 as seen in that figure. The lever 71 is biassed in a clockwise direction by a spring 74 and is cut away at 75 for a purpose to be hereinafter described. An adjustable stop 76 screwed to the flange 63 limits movement of the lever 71 in an anticlockwise direction. In the initial position of the totaliser as shown in Fig. 1, the stop 33 on the disc 30, due to the spring 53, acts through the tail 73 to hold the lever 71 against said stop 76.

The pawls 25 and 68 are constructed of greater width than that of the disc 30 with which they engage, the arrangement being such that said greater width lies to the left of the disc 30 as viewed in Fig. 3, where, however, only the pawl 68 is shown, and further, such greater width is cut away to provide a lifting surface 77 for a

purpose to be hereinafter described. The pawl 25 is cut away in similar manner to provide a lifting surface 78, see Fig. 8.

To the backplate 60 there is also attached by means of screws 79, 80 a slide 81, said slide being slotted at 82, 83 and turned up into a flange 84 so that, due to a spring 85 secured to said flange 84 and the screw 79, the slide 81 normally assumes the position with the upper end of its slots 82, 83 in contact with the screws, as seen in Fig. 1, i. e. the slide will normally be in the position shown in that figure. Referring particularly to Fig. 4, the slide 81 is located adjacent the backplate 60 and the left hand portion thereof is cranked slightly forward at 184 so that the extreme (lower) end 185 of the slide 81 lies in the same plane as the lifting surfaces 77, 78 of the pawls 68, 25 and below said lifting surfaces. The lower end 185 is extended to provide lifting prongs 86, 87 (see Fig. 1) adapted to engage when desired with the lifting surfaces 77, 78 as will be hereinafter described. It will be observed that when the slide 81 is slidden against the action of the spring 85 this will act to lift the said pawls 68, 25 and disengage them from the toothed disc 30 and thus said slide constitutes a disengaging member adapted to disengage the pawls from the said disc.

The disengaging member 81 is provided with a turned up tongue at 88, said tongue being adapted to engage with its lower edge 89 against the cut away portion 75 of the lever 71 when said lever has rocked in a clockwise direction, i. e. when the stop 33 on the disc 30 has been moved clear of the tail 73 of the lever, coincident with the member 81 being in its uppermost or stressed position, and it acts to detain the disengaging member in that position, thus said lever 71 constitutes a detaining member that acts to detain the member 81 in its uppermost position.

In a plane intermediate the retaining member 71 and the disengaging member 81 there is provided a second three armed lever 90, said lever being pivoted on a screw 91 and a collar (not shown) is provided behind the lever to maintain it in the required plane.

One arm 92 of the lever 90 is connected by suitable linkage (diagrammatically indicated by 116) to an article delivery mechanism, e. g. to a manually reciprocable drawer. The second arm 93 of the lever 90 includes an anchor for a spring 94, whose other end is secured to the flange 61, said spring biassing the lever 90 in a anticlockwise direction against an adjustable stop 95 secured to the flange 62.

The tip of the arm 93 comprises a flat surface 96 and normally lies parallel to the back of the pawl 25 but is spaced a short distance, say .002" therefrom to prevent jamming between said surface and back when the lever 90 is rocked.

It will be appreciated that the arm 93 in the position indicated in Fig. 1 acts to stop the pawl 25 being lifted from the disc 30, but that when the lever 90 is moved to bring its arm 93 clear from the pawl, said pawl may then be brought clear from the disc, and thus the lever 90 constitutes a movable stop member that acts to hold the pawl in engagement with said disc.

The third arm 97, which as previously explained lies in a plane between that of the disengaging member 81 and the detaining member 71, normally lies below and spaced apart from the edge 89 of the tongue 88. The space left therebetween is sufficient to permit the lever 90 to turn clear of the pawl 25 before engagement ensues between the said third arm 97 and the edge 89.

The majority of the mechanism so far described, i. e. with the exception of the drawer mechanism, coin passageways, etc. is enclosed within a box like structure comprising the back 98, sides 99, 100, 101, 102, and a cover or front 103, the latter being constituted by a sheet of ebonite or other insulating material screwed to the sides at 103, 104, 105, 106. A portion of the side 102 at 107 is removed to allow the arm 92 of the three armed lever 90 to extend therethrough.

Referring to the cover 103 which is only shown in part in Figs. 1–4, a circular panel is removed from the upper portion thereof, the centre of such circle corresponding to the centre of the spindle 15, and around said panel there is drilled a circular row of holes 108, the radius of such circle being approximately the same as that of the circle traced by the tip of the contact finger 44 when said finger is in its outermost position.

If desired there may also be provided a row of holes 109, electrically connected together, at some position below the circular panel for a purpose to be hereinafter described.

Each hole in the circular row 108 corresponds to a tooth of the disc 30, that is to say that each time the disc 30 is turned through an angle corresponding to the distance between one tooth and the next, the contact finger 44 will also be moved through the same angle and this will bring its tip opposite the next succeeding hole, and so on. Thus if the disc 30 is moved from zero (its initial position) through six teeth, the tip of the finger 44 will also be moved to lie adjacent the sixth hole.

It will be observed from Figs. 1 and 5 that the initial or zero position of the disc 30 corresponds to the finger 44 being at approximately 5 o'clock, this position being fixed due to the stop 33 engaging the tail 73 of the lever 71 and said lever being engaged by the stop 76.

As illustrated in the drawings, each tooth of the disc 30 corresponds to one halfpenny, and accordingly each hole in the circular row 108 also corresponds to one halfpenny, but it is obvious that any desired standard could be used. Further for the purpose of illustration it is indicated that the disc may turn through a maximum angle corresponding to three shillings, i. e. seventy-two teeth and seventy-two holes.

Referring particularly to Fig. 5, in a convenient form the wire 55 leads to a source of electric power (not shown), thence to two solenoids 117, 118 (in parallel), from which the conductors 119, 120 include plugs 121, 122, which are inserted in two of the sockets in the row 109.

As previously described, these sockets 109 are electrically connected and the row constitutes a junction box from which the single wire 124, provided with a plug 125, leads to one of the sockets or holes in the circular row 108.

Fig. 5 shows diagrammatically the article delivery mechanisms comprising reciprocable drawers 126 and 127 that in this case are intended to operate at 2/4d. They are provided with handles 128 and 129 that may be grasped by a purchaser to obtain access to the contents. 134 represents the outside casing of the vending machine.

The drawers 126, 127 are each provided with a locking unit comprising two-armed levers 130, 131, pivoted about fixed points 132, 133, whose claws 135, 136 normally prevent the drawers being opened, springs 137, 138 being provided that bias the levers in an anticlockwise direction as

viewed in Fig. 5. Pins 168, 169 provide stops for the levers 130, 131.

The arms 139, 140 of said levers 130, 131 are connected through links to the armatures of the solenoids 117, 118 respectively, so that when said solenoids are energized, the levers 130, 131 will be rocked in a clockwise direction to free the drawers for operation by a purchaser.

It will be appreciated that the plug 125 may be inserted in any one of the sockets 168 and hence said plug and its associated wiring 121, 119 and solenoid 117 comprises an adjustable electric control circuit that may be energized to move the corresponding locking unit 130 and release the associated drawer 126.

Similarly the plug 125 and its associated wiring 122, 120 and solenoid 118 comprises an adjustable electric control circuit that may be energized to move the corresponding locking unit 131 and release the drawer 127.

Instead of using two solenoids 117, 118, one only (e. g. 117) may be used, and the levers 130, 131 mechanically coupled together.

Mechanical means are provided to prevent more than one released drawer being operated at a time.

Thus fixed to the bed of the vending machine between the drawers is a guide 142 that provides a mounting for a slide 143. Angular notches 144, 145 are cut in the sides of the drawers and the ends of the slide are cut to correspond with the notches. The length of the slide is such that when completely, say, to the left as seen in Fig. 5, the point 146 is just clear of the drawer 127 and thus said drawer is free to be slidden when unlocked.

This arrangement renders unavailable any drawer other than the one chosen, since an attempt to slide the drawer 126 will act to move the slide 143 towards the right, as seen in Fig. 5, into the path of the drawer 127, and thus render said drawer 127 unavailable.

Beneath and at or towards the back of each drawer there is provided a downwardly extending lug 147 and this is adapted to coact with a lever 148 fixed to a rod 149 pivotally mounted in the casing of the machine. The rod 149 has rigidly secured thereto a lever 150 which is attached by the linkage 116 to the arm 92 of the lever 90 so that when a drawer has been slightly opened the lug 147 strikes the lever 148 causing the rod 149 to turn about its pivots which depresses the lever 150 and moves the arm 92, and this acts, as will be hereinafter described, to return the totaliser disc to zero.

The lug 147 is extended rearwardly so that it holds the lever 150 in its depressed position all the time the drawer is open so that the arm 90 is held down throughout that time.

The apparatus works in the following manner:

The parts are normally in the position indicated in Fig. 1, with the oscillating member 9 in an approximately horizontal position and its right hand end bearing against the stop 16; the totaliser disc 30, due to the spring 53, engaging its stop 33 against the tail 73 of the detaining member 71 and thus pressing said member against the stop 76; the cranked arm 34 at approximately 5 o'clock; the pawls 25 and 68 engaging teeth in the rotary disc 30; the disengaging member 81 in its lowermost or unstressed position clear of the pawls 25, 68; the movable stop member 90 in its extreme anticlockwise position against the stop 95 and the solenoids 1 and 2 in their uppermost and lowermost positions respectively.

The coin passageway switches are in their open positions (i. e. the circuits to the solenoids 1, 2 are incomplete) and the drawers are locked by the members 130, 131.

For the purpose of the description it will be assumed that it is desired to operate the vending machine for say 1/2d. and 2/4d. and that the drawers in Fig. 5 are the 2/4d. ones.

A plug 155 will be inserted in the 28th hole and a plug 125 in the 56th hole, the former leading to the 1/2d. drawers (not shown in the drawings) and the latter being connected to the wire 124 as indicated.

It will also be assumed that the machine is provided with ½d., 1d., 3d., 6d., and 1/– slots on the outside, thus there will be five coin passageways leading to the interior of the machine. The ½d. passageway will include one switch and the 1d. two, these being included in the circuit to the solenoid 2. The 3d. passageway one switch, the 6d. two and the 1/– four, all in the circuit to the solenoid 1. It is to be understood that after passing the switches, the coin passageways lead to a till.

Further it will be assumed that there are two drawers to be made operable at each of the above prices.

It is to be understood, however, that any desired number of passageways and drawers may be utilised. Further, drawers may be provided to operate at any price between zero and the maximum number of holes in the row 168.

If now a purchaser wishes to obtain an article at say 2/4d. and the money he possesses includes 1/–, two 6d., 3d. and 1d., the device will work as follows:

The 1/– is placed in the 1/– slot and during its movement down the passageway it closes in turn each of the four switches. These switches which, as above mentioned, are included in the circuit to the solenoid 1, will each act to complete said circuit and energize the solenoid. Thus the solenoid 1 is momentarily energized four times in succession. Each movement of the armature 7, through the link 8, pulls the right hand end of the oscillating member 9 down against the stop 17—this position is illustrated in chain lines at 123 in Fig. 6—this acts to drag the pawl 25 downwards across six teeth of the disc 30, and also to stress the spring 13, movement of the disc being prevented by the non-return pawl 68. The spring 13 then reasserts itself to return the member 9 to its original position against the stop 16, but during this return motion, since the pawl 25 will engage the totaliser disc 30 it will act to turn said disc and the cranked arm 34 through an angle corresponding to six teeth. Thus the solenoid comprises means operated by the inserted coin adapted to drive the rotary toothed disc 30 in one direction.

Similar movement of the member 9, and consequently of the disc 30 and cranked arm 34, takes place for each of the 6d. bits, but only twice instead of four times in each case, and the 3d. bit operates it once only.

Each switch (two) in the 1d. passageway on being closed by the passage of a coin completes the circuit to the solenoid 2 and this, through its tappet 11, lifts the left hand side of the member 9 through a distance corresponding to one tooth at each energization. The sum of the number of teeth moved by the totaliser disc 30 as above described will be fifty-six, and this movement will bring the cranked arm 34 so that its finger 44 is in contact with the plug 125.

It will be observed that the totaliser disc 30 is displaced electrically (through the solenoids 1

and 2) to an extent dependent on the total value of the coins inserted, in this case 2/4d., and that in such position it acts to complete the control circuit concerned and release the locking unit of the corresponding article delivery mechanisms.

Referring again to Fig. 5 it will be appreciated that rotation of the finger 44 to the fifty-sixth hole would complete the circuit to the solenoids 117 and 118, thus rocking the levers 130 and 131 to the chain line position to unlock the drawers 126, 127. Thus the control circuit corresponding to the value of the coins inserted (2/4d.) is energized and its locking unit moved to release the drawers.

The purchaser then pulls the chosen drawer (say 127) and this acts to render unavailable the drawer 126 and in a similar manner any other drawers at 2/4d. and also to present the article so that it may be removed.

The operation of pulling the drawer 127 acts by depressing the lever 148, and turning the rod 149 and lever 150 and hence moving the linkage 116 to pull downwards the arm 92 of the stop member 90 (this position is illustrated in Fig. 7), and this returns the totaliser to its initial position as the following action takes place (see especially Figs. 6, 7 and 9).

The stop member 90 turns in a clockwise direction, first bringing the tip of its arm 93 clear of the back of the pawl 25; the arm 97 then strikes the edge 89 of the tongue 88 and slides the disengaging member 81 upwards. This, through its prongs 86 and 87, lifts the pawls 25 and 68, thus freeing the disc 30 to return to zero under the action of the spring 53. To ensure that the member 81 is held up until the disc 30 has returned to zero, the lever 71 comes into operation. Thus as the member 81 is raised to the top of its stroke, the lever 71 (which since the stop 33 has moved clear of its tail 73 at first rests against the left hand side of the tongue 88 as seen in Fig. 6) turns further in a clockwise direction to bring its cut away portion 75 beneath the edge 89 of the tongue 88 (see Fig. 7) and so detain the disengaging member at the top of its stroke. The last movement of the disc 30 as it comes to zero causes its stop 33 to strike the tail 73 forcing the cut away portion 75 out of engagement with the edge 89, and thus the disengaging member 81 is no longer held up thereby.

The return of the drawer completes the operation of the mechanism as this permits the arm 90 to return to the position shown in Fig. 1, and the device is ready for the next actuation.

It will be appreciated that the operation of the device for 1/2d. is identical with that described for 2/4d., except that the plug 155 will complete the circuit to the locking elements of one or more 1/2d. drawers.

With a device as above described, should it be found necesary to sell the articles at a different price, it is only necessary to open the vending machine, move a plug to the revised price, say from 1/2d. to 1/2½d., i. e. socket 28 to socket 29, and the machine is then operable at the new price.

The device as so far described permits of constructing a coin freed vending machine suitable for selling articles at different prices, the examples given being 1/2d. and 2/4d., but it is clear that the machine may include drawers all operable at one price or a plurality of prices by merely removing plugs or providing additional plugs (such as 125) and providing the corresponding locking units, and it is also clear that any one article may readily be adjusted to sell at a different price by moving a plug from one socket to another.

Referring to the operation of the solenoids in general, it will be appreciated that the length of stroke of solenoids 1 and 2 is of considerable importance, that is to say, solenoid 1 has to move exactly six teeth and solenoid 2 has to move only 1. Further, the force exerted by a solenoid is considerable and also the force necessary to return it quickly after operation is considerable. The speed is necessary to allow for a subsequent operation.

Bearing the above points in mind and referring to Fig. 1, the limitation of the solenoid 1 to six teeth is clearly controlled by the stops 16 and 17, but as the spring 13 is strong enough to return the member 9 very quickly from the chain line position, there is a possibility that the disc 30 will over-run, since the springs on the pawls 25, 68 are relatively light, and so drag past the pawl 25 and turn through an angle corresponding to say seven or more teeth. The chief object of holding the pawl 25 closely against the disc 30 (only .002" clearance) by the stop 93 is to avoid the over-running.

The stroke of the solenoid 2 is controlled by the spring 156 and washer 157 combined with the adjustment provided by the nut 158 which results in the tappet 11 only being able to move through a distance corresponding to one tooth. If necessary means may be provided to prevent the tappet overdriving the totaliser.

For example in place of the fixed tappet 11 there may be provided a pivoted plate member 162 comprising a cam surface 165 and a hooked stop 167, and it is slotted at 161. The plate 162 is pivotally secured by the screw 159 and split pin to an upstanding flange 164 provided on the bracket 163. The end of the armature 10 is bifurcated and the plate is secured thereto by means of a pin 160.

With this device, when the solenoid 2 is energized, the armature 10 rises and pivots the plate 162 about the screw 159. This turns the member 9 in a clockwise direction due to the cam 165 driving it through the bent over end 166 of said member.

The arrangement of the cam 165 and hook 167 is such that when the member 9 has turned through a predetermined angle (in the case of the solenoid 2 through an angle corresponding to one tooth of the totaliser disc 30) the hooked stop 167 will be deflected to the right sufficiently to engage the top edge of the end 166 and so prevent further movement of said member 9.

As regards the solenoids 117 and 118, it is only necessary in this case to bring the arms 130 and 131 clear of the drawers 126 and 127 so that the exact control of the solenoids is unnecessary.

Other features of the apparatus herein described are claimed in the specifications of the copending applications referred to below:

No. 585,622, now abandoned, relates to a method of coupling the coin computing device with a plurality of article delivery mechanisms so as to obtain effective control thereof without involving complex electric circuits.

No. 585,623 relates to mechanism for returning the totaliser to its initial position when an article is delivered, and is directed to making its operation more reliable.

In No. 586,409, now abandoned, overdriving of the totaliser due to the energy of motion was

prevented by locking the driving pawl to the totaliser at the end of the driving stroke.

No. 588,493, now abandoned, referred to the use of plug and socket connections in the electric circuits for controlling the locking means, to permit of ready adjustment in the price of the articles to be sold.

What I claim is:

1. A coin computing device for coin controlled apparatus comprising a ratchet member, a plurality of coin-controlled solenoids, a common oscillatable member connected to each of said solenoids movable to and from an initial position, a cam forming a part of the connection of one said solenoid to said oscillatable member and operable by said one solenoid to actuate said oscillatable member, a locking surface on said cam engaging said oscillatable member at the end of its stroke remote from said initial position, a driving pawl pivotally mounted on said oscillatable member having a uni-directional driving connection with said ratchet member and a retaining member cooperating with said ratchet member to prevent reverse motion thereof.

2. A coin computing device as claimed in claim 1, in which the connection between another of said solenoids and said oscillatable member comprises a lost motion device.

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