June 19, 1923. 1,459,504

A. D. GROVER ET AL

VENDING MACHINE

Original Filed Oct. 12, 1915 2 Sheets-Sheet 1

Fig. 1.

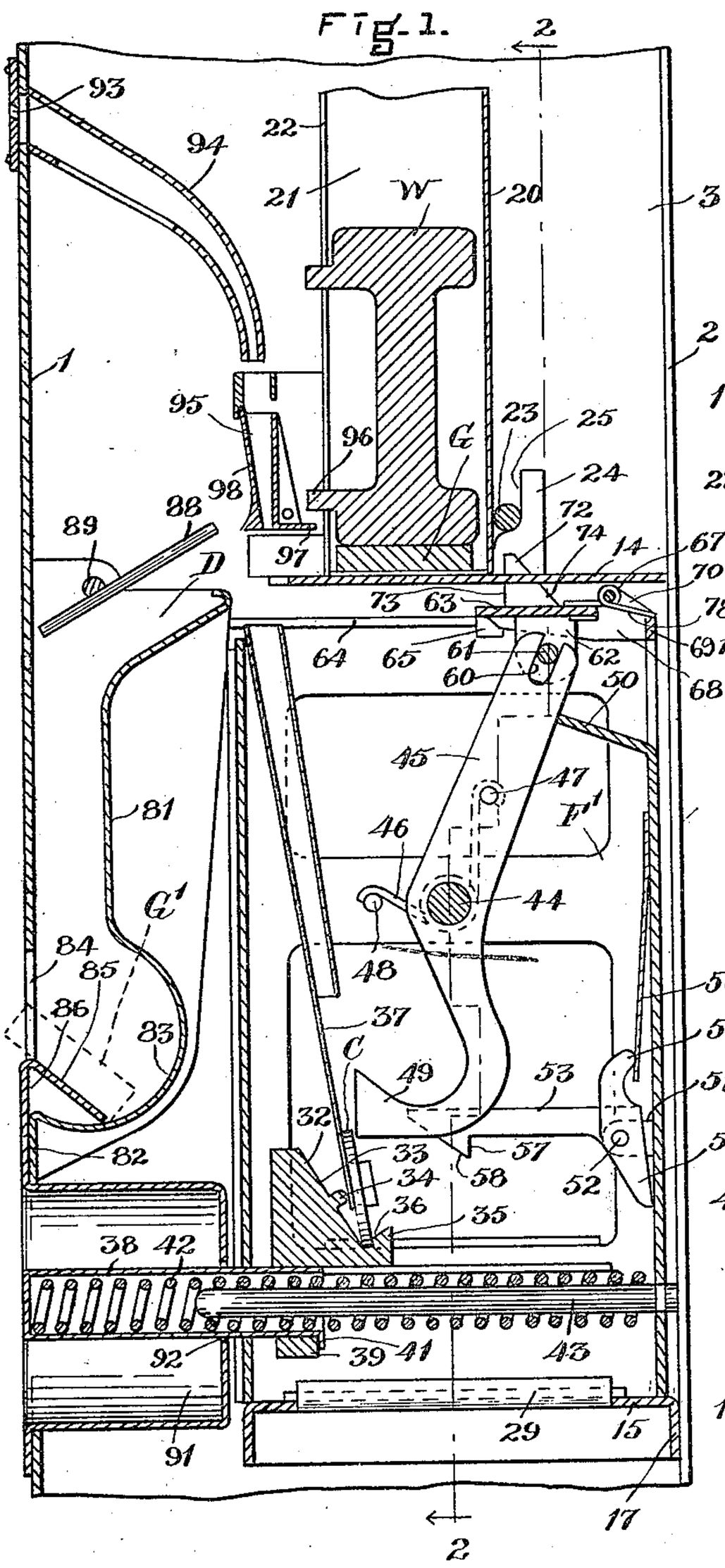

Fig. 2.

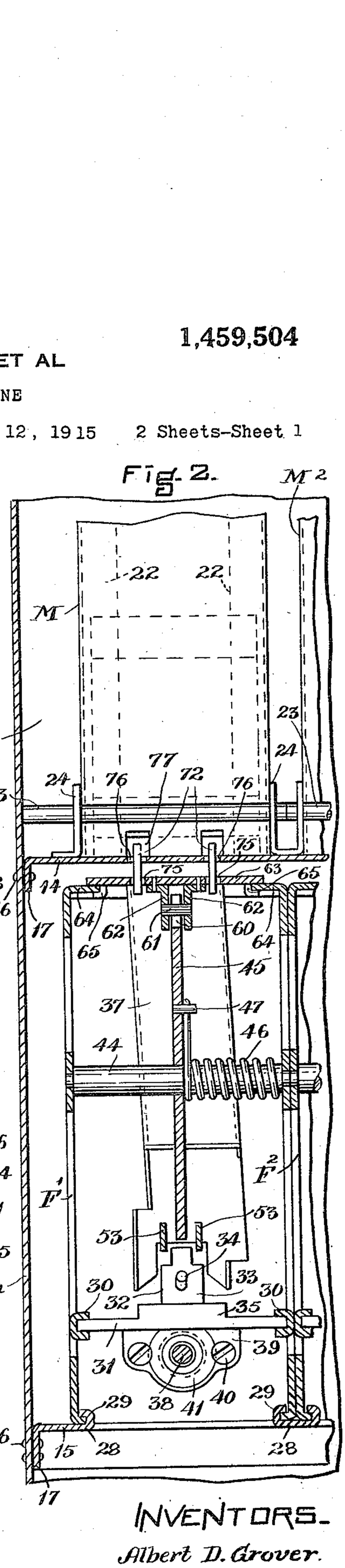

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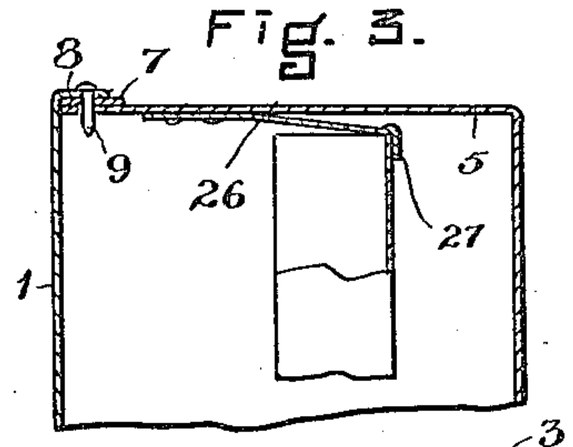
Fig. 3.



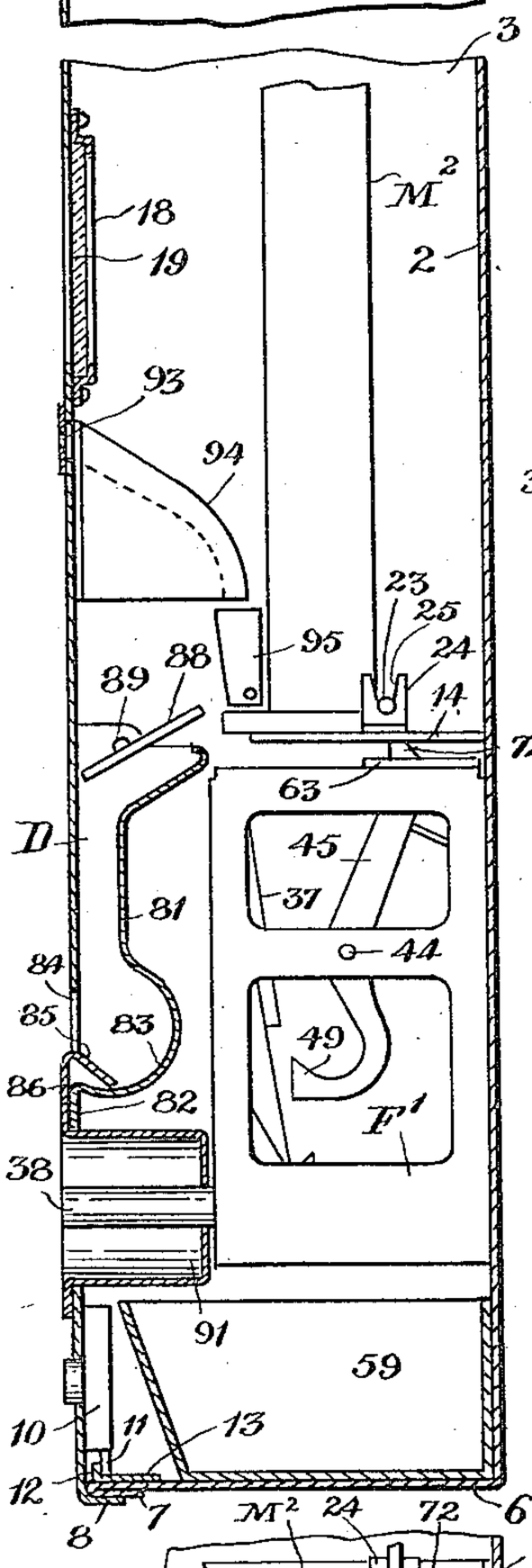
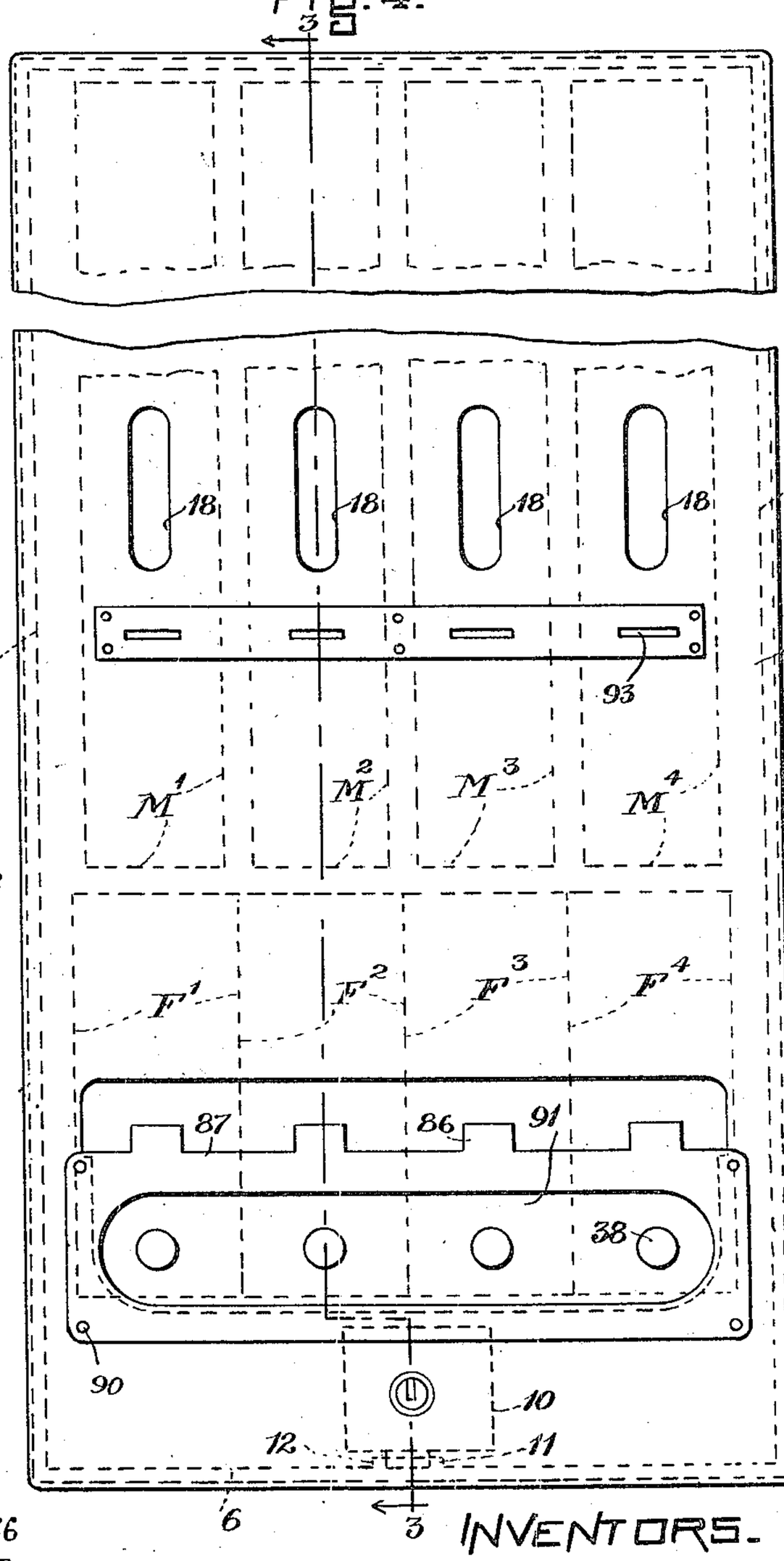


Fig. 4.



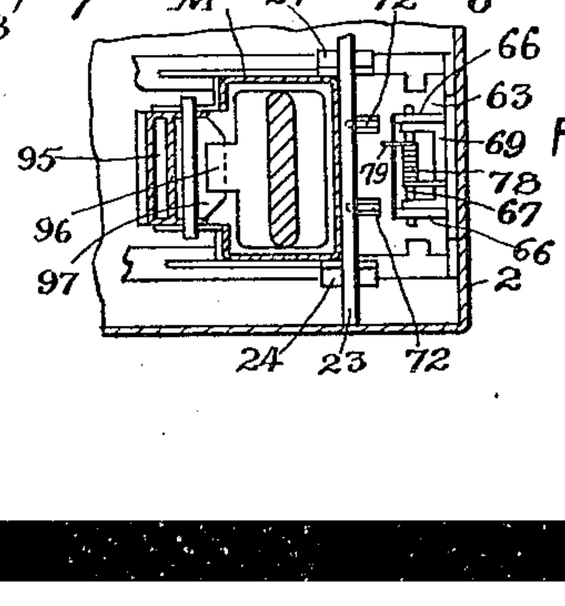


Fig. 5.

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UNITED STATES PATENT OFFICE.

ALBERT D. GROVER, OF NEW YORK, N. Y., AND EARL E. BARBER, OF BOSTON, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO AUTOSALES CORPORATION, A CORPORATION OF NEW YORK.

VENDING MACHINE.

Application filed October 12, 1915, Serial No. 55,371. Renewed January 17, 1921. Serial No. 437,964.

To all whom it may concern:

Be it known that we, ALBERT D. GROVER and EARL E. BARBER, citizens of the United States, and residents, respectively, of New York, county and State of New York, and Boston, county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Vending Machines, of which the following is a specification.

Our invention relates to vending machines adapted to be operated upon the deposition of a proper coin for the delivery of a suitable commodity, and has for its general object the provision of a machine embodying various features of novelty over the constructions in prior machines. Our machine is of the magazine type and is so compact in its arrangement of parts that a machine containing several magazines takes up comparatively little room. The different parts that go to make up our machine are enclosed in a substantially rectangular casing, preferably made of sheet metal, beyond which no parts project to cause obstruction or unsightliness. Our machine is thus excellently adapted for use in places where but little space is available—as, for instance, on railroad cars.

This application is a division, in part, of our co-pending case, Serial No. 711,797, filed July 27, 1912. Owing to official requirements for division, the claims in said parent case are restricted to the coin-controlled features of our invention, and the subject-matter of the present application relates to the delivery mechanism of our machine and other structural features which had to be divided out of the aforesaid co-pending application.

One object of our invention as claimed in this case is to provide a multiple-magazine machine in which the operating mechanism associated with each magazine is carried by a framework which is removable as a unit from the machine, independently of the other mechanisms. Also, the magazines associated with the ejecting mechanisms are so mounted in the casing as to be readily removable independently of each other.

A further object of our present invention is to provide a novel form of delivery-chute for the ejected packages. This delivery-chute is mounted on the removable front wall of the casing and is provided with means for preventing the ejected package from falling out and supporting it in a position to be easily withdrawn by the purchaser.

Another feature of novelty which characterizes the invention of this case is the means whereby the hand-operated plunger does not project beyond the plane of the front wall of the casing, a closed cup-shaped chamber being provided to house the projecting portion of the plunger.

A further object of our present invention is to provide a simple form of delivery mechanism which slides on top of a framework and carries a pivoted spring-pressed member adapted to engage the lowermost article in the magazine.

The above and other objects and advantages of our invention will become apparent from a detailed description of the accompanying drawings, in which—

Fig. 1, is a longitudinal view in cross-section of a machine embodying our invention, the parts being shown in normal position and portions of the casing being shown broken away.

Fig. 2, is a cross-sectional view at right angles to Fig. 1 taken approximately on line 2—2 of Fig. 1.

Fig. 3, is a longitudinal cross-section approximately on line 3—3 of Fig. 4, showing the construction of the entire casing of the machine.

Fig. 4, is a front exterior view of a machine constructed in accordance with our invention; and

Fig. 5, is a fragmentary view in plan showing the ejecting fingers of the delivery mechanism.

The various parts which make up the mechanism of our invention are housed in a substantially rectangular casing constructed preferably of sheet metal and comprising a front wall or panel 1, rear wall 2, sides 3 and 4, a top or cover 5 and bottom 6. In other words, the casing in its preferred form consists of a flat plate section and a box-like section. The free edge of the box-like section is bent back upon itself as shown at 7 to provide a double thickness of metal for reinforcement. The front panel or plate section 1 is formed with a continuous flange 8 which is adapted to fit over the reinforced edge 7 of the box-like section, as clearly shown in Fig. 3. In this way a tight closure is effected between the two sections of the

casing and the reinforcement along the line of closure prevents the parts from being easily separated by the attempted insertion of a hand tool. The front panel or plate section 1 is removably mounted on the box-like section by means of pins or lugs 9 secured to the top portion of the flange 8 and extending downwardly through corresponding openings in the top of the casing, as shown in Fig. 3. A lock 10 of any suitable construction is secured upon the inner side of the front panel near the bottom, and the bolt 11 of the lock is adapted to engage the upstanding lug 12 of the locking plate 13 secured to the bottom 6 of the casing in any suitable manner. To remove the front panel it is, therefore, only necessary to unlock it at the bottom and then swing the panel outwardly at its lower end sufficiently to permit its being lifted out of engagement with the casing at the top.

In the casing are secured two transverse shelves or partitions—an upper shelf 14 and a lower shelf 15. These shelves are held in place in any suitable manner—as, for instance, by means of rivets 16, which pass through the sides of the casing and through flanges 17 formed at the two ends of the shelves. The upper shelf 14 is arranged to support a series of magazines or compartments in which the vendable articles are stacked. The number of magazines may vary, depending upon the size and capacity intended for the machine. In the particular form shown in the drawings, the machine contains four magazines indicated in dotted lines in Fig. 4 at M^1, M^2, M^3 and M^4. The front panel 1 is preferably provided with side openings 18, one in front of each magazine, these openings being covered by a piece of glass 19 or other transparent material suitably held in place on the inside of the plate section 1. Each of these magazines is a unit in itself and is removable from the casing independently of the other magazines. The magazine is substantially rectangular in form and is proportioned to accommodate the vendable articles. The magazines are preferably constructed of sheet metal and comprise a rear wall 20, sides 21 and front flanges 22. To the rear wall of each magazine near the bottom thereof is secured a horizontal rod 23 in any desired manner. The shelf 14 is provided with upwardly extending lugs or brackets 24 arranged in pairs and having vertical slots 25 adapted to receive the ends of the rod 23. By means of this arrangement, the magazines are readily placed in proper position on the shelf 14 and are easily removed independently of each other. As the rods 23 fit snugly in the slotted brackets 24, the magazines are firmly held in place without danger of disarrangement during the operation or transportion of the machine. As seen from Figs. 3 and 5, the brackets 24 extend forward sufficiently to engage the sides of the magazines. This positively prevents lateral movement of the magazines. Such movement is also prevented by the rods 23 abutting against each other, as seen from Fig. 2. A spring 26 may be provided at the top of the casing to hook over the top of each magazine at 27 to assist in maintaining the magazines in an upright position when the machine is moved about.

Beneath each magazine is arranged a coin-controlled ejecting mechanism adapted to be operated upon the insertion of a proper coin to eject the goods from the associated magazine. Each mechanism is carried by a framework slidably mounted on the lower shelf 15 and removable independently of the other mechanisms. As the particular machine shown in the drawings is a four-compartment machine, there are four of these frameworks, diagrammatically indicated in Fig. 4 at F^1, F^2, F^3 and F^4. As these frameworks and the mechanisms carried thereby are identical in construction, it will be necessary to describe only one of the frameworks and its mechanism. Referring to Fig. 2, it will be seen that the framework F^1 is at its lower end provided with a pair of inwardly turned flanges 28 adapted to interlock with upwardly and outwardly turned flanges 29 formed on the shelf 15. The flanges 29 are arranged in pairs, one pair for each framework, so that each framework may be slid into position on the shelf, or removed therefrom without disturbing the frameworks. As seen from Fig. 2, the adjacent sides of the frameworks are quite close together. On each side of the framework near the bottom is provided a pair of inwardly turned flanges 30 spaced apart to form a pair of opposite guide grooves or channels for the base plate 31 of the coin-carrier 32. This coin-carrier is formed with an inclined surface 33 from which projects a pin 34. From the lower end of the inclined surface extends a ledge or shoulder 35 which provides a coin-retaining groove or recess 36 for a proper coin. The coin-carrier and its associated parts are claimed in our aforesaid co-pending application, Serial No. 711,797, and we do not, therefore, make any claims in this case to the coin-carrier construction. When a proper coin is deposited, it rests at its lower end in the groove 36 and is held in an inclined position either by the lower end of the coin-chute 37 or the pin 34, as indicated in Fig. 1, where the deposited coin is shown at C. The purpose of the pin 34 is to bear against the center of the coin and co-operate with the shoulder 35 to hold a coin in rigid position on the carrier. Should the deposited check be a washer or other disc with a central perforation, the disc or check will fall back on the inclined surface 33 of the coin-carrier into an inoperative position. The coin-chute

37, which guides the coin to the coin-carrier is secured in position by any suitable means. The coin-carrier is operated by means of the plunger 38 which is in the form of a hollow rod secured to the downward extension 39 of the carrier. Screws 40 on the extension 39 engage the annular flange 41 formed at the rear end of the plunger 38 and hold the same in fixed position to the coin-carrier. A coil spring 42 bears at one end against the front head of the hollow plunger and at the other end against the rear of the framework, to automatically return the coin-carrier to its normal position, as shown in Fig. 1. The spring 42 is coiled about a guide rod 43 extending forwardly from the rear wall of the framework. This guide rod extends partially in the hollow plunger and prevents the spring from buckling when the plunger is pushed in. If desired, the machine may be provided with any of the well known full-stroke mechanisms of the prior art to compel full inward movement of the coin-carrier before it can return to normal position. As such full-stroke devices are well known in the prior art, we have not deemed it necessary to show or describe any particular form thereof.

In the sides of each framework is journaled a transverse shaft 44 which carries an operating lever 45. As will be explained later on in detail, the upper end of the lever 45 is connected with the ejecting mechanism which is slidably mounted on top of the framework. A spring 46 normally holds the lever 45 in the position shown in Fig. 1. This spring is coiled about the shaft 44 and bears at one end against the pin 47 on the lever 45, while the other end engages the pin 48 projecting inwardly from one side of the framework. When the lever 45 is in normal position, its lower end 49 is in such relation to the coin-carrier and the lower end of the coin-chute 37 that a coin will, at its upper edge, project slightly above said lower end 49 and in close proximity thereto. This is clearly shown in Fig. 1. The coin-carrier and lever 45 are approximately in vertical alignment as seen from Fig. 2, so that the upper edge of the coin will engage the lower end 49 approximately in a central line passing through the coin. The spring 46 tends to rock the lever 45 in a clockwise direction (as viewed in Fig. 1). The movement of the lever in this direction is limited by the stop 50 which bears against the lever near its upper end. This stop is preferably formed by bending a portion of the rear wall forwardly. To the rear wall of the casing is fixed a pair of brackets 51, only one of which is shown in Fig. 1. On a pin 52, journaled in these brackets, is mounted a coin stripper comprising a pair of spaced stripping arms 53. Each of these arms has an upper extension 54 and a lower extension 55. A leaf spring 56 secured to the rear wall of the framework bears at its lower end against the upper extension 54 to hold the arms 53 in a substantially horizontal position, as shown in Fig. 1. The lower extension 55 limits the downward movement of the coin-stripper by abutting against the rear wall of the framework. The stripping arms are at their free ends provided with hook portions 57 having inclined surfaces 58. As seen from Fig. 2, the arms of the coin-stripper are arranged on either side of the operating lever 45.

The operation of the coin-controlled mechanism, as far as described, will now be clearly understood and may be briefly stated as follows: Assuming that a proper coin has descended through the chute 37 to the coin-carrier 32, it will lean against the lower end of the coin-chute with its upper edge in close proximity to the lower end 49 of the operating lever 45. This is clearly shown in Fig. 1. If now the plunger 38 be pushed inwardly against the tension of the spring 42, the coin-carrier 32 is moved rearwardly carrying with it the coin C. It will be clear from Fig. 1 that it needs but a very slight movement of the coin-carrier to bring the pin 34 against the coin. As the coin-carrier is moved inwardly, the upper edge of the coin engages the lower end 49 of the operating lever 45 and rocks the same in a counter-clockwise direction (as viewed in Fig. 1). During this movement of the coin-carrier, the coin is held in rigid position thereon by means of the pin 34 and the shoulder 35. In this way the coin forms a rigid movable connection between the coin-carrier and the operating lever 45. When the coin comes into engagement with the stripping arms 53, it rides under the inclined surfaces 58 and rocks the arms upwardly until it passes by the hooked portion 57, whereupon the arms are rocked down under the influence of the spring 56. When the coin-carrier returns, the coin encounters the hooked portion 57 of the stripping arms 53 and is thereby tilted rearwardly until it falls from the coin-carrier into the coin-box 59 at the bottom of the casing.

As seen from Figs. 1 and 2, the upper end of the lever 45 has a slot 60 in which engages the pin 61 carried by a pair of spaced lugs or ears 62 extending downwardly from the ejector plate 63. This plate is mounted to slide over the top flanges 64 of the framework. The sides of the plate 63 extend over the flanges 64, as seen from Fig. 2, and retaining lugs 65 are provided on the plate 63 to engage the underside of the flanges 64 to prevent vertical displacement of the ejector plate. The lugs 65 may be conveniently struck up from the metal of the ejector plate itself. At its rear the plate 63 is provided with a pair of spaced bearing lugs 66, as

best shown in Fig. 5. A pin 67 is supported at its ends in the lugs 66 and has rotatably mounted thereon a substantially U-shaped framework which comprises a pair of forwardly extending arms 68 arranged beneath the plate 63 and connected at the rear by a cross-piece 69. The arms 68 are provided with upwardly extending portions 70 through which the pin 67 passes. The plate 63 is provided with an opening or cut-away portion 71 to allow the arms 68 to extend above the plate. The arms 68 are provided at their free ends with upright ejecting lugs 72 having a vertical front surface 73 and an inclined or cam-shaped rear surface 74. These ejecting lugs extend through slots 75 in the ejector plate 63 and also through slots 76 formed in the transverse shelf or partition 14. The rear wall of each magazine is at its lower end provided with slots 77 through which the ejecting lugs 72 may freely pass to engage the lowermost article in the magazine and push the same out of the magazine. The spring 78 coiled about the pin 67 bears at one end on the ejector plate 63, as shown at 79 in Fig. 5, and at the other end on the cross-piece 69 of the ejecting framework, as shown at 80 in Figs. 1 and 5. The spring 78 thus tends to throw the ejecting lugs 72 upwardly and hold them in an upright position, as shown in Fig. 1. The operation of the ejecting mechanism will now be clearly understood and is as follows: When the lever 45 is operated through the medium of the deposited coin, as heretofore described in detail, the plate 63 is moved forwardly over the supporting framework. During this movement of the ejector plate 63, the lugs 72 engage the lowermost article G (which is intended to represent a small box or package containing any suitable commodity), and push the same out of the magazine into the delivery-chute D carried by the front panel 1 of the casing. During the return movement of the ejector mechanism the ejecting lugs 72 are automatically depressed and ride under the stack of articles. As soon as the lugs have cleared the lowermost package, they snap up into ejecting position under the action of spring 78.

The delivery chute D is preferably formed out of sheet metal and is secured to the front panel in any suitable way. At its lower end, the rear wall 81 of the delivery chute terminates in a flange 82 which rests against the front panel for receiving suitable fastening devices, such as screws, bolts or the like. The rear wall 81 is curved rearwardly at 83 to form a deep recess or chamber opposite the delivery opening 84 in the front panel. To prevent the ejected goods from falling out of the chamber 83, we provide a rearwardly-inclined shelf or ledge 85 which extends into the mouth of the delivery-chute, as shown in Figs. 1 and 3. The shelf 85 is carried by or forms part of an extension 86 provided on the plate 87. The form of this plate is best shown in Fig. 4. As the machine illustrated in the drawings has four magazines, there will, of course, be four delivery-chutes, or a common delivery-chute may extend across the front panel to receive the goods from all of the magazines. There are as many retaining shelves 85 as there are magazines and each shelf is arranged in vertical alignment with each magazine, so as to receive the goods ejected from that magazine. These retaining ledges need not be very wide. The position of a delivered package on the shelf is indicated in dotted lines at G^1 in Fig. 1. This not only prevents the package from falling out of the delivery chute but supports it in position to be easily withdrawn by the patron. If desired, one or more guide rods 88 may be fixed at the upper end of the delivery chute to assist in directing the ejected package properly down the chute. These rods may be secured to a cross-bar 89 mounted in the sides of the chute D.

The plate 87 is secured to the front panel by means of rivets 90 or in any other suitable way. This plate is formed with a recess 91 into which the plungers 38 extend. The recess 91, therefore, forms a housing for the projecting ends of the plungers which terminate substantially flush with the front of the casing. The openings 92 in the rear wall of the recess 91 for receiving the plungers are sufficiently large to permit the lower end of the panel to be swung outwardly about the pins 9 as a pivot. As the openings 92 are at a considerable distance from the point of rotation of the front panel, they need not be very much larger than the diameter of the plungers.

The coin is deposited into the machine through a coin-entrance slot 93, of which there are as many as there are magazines. The deposited coin is guided into the coin-chute 37 through the passage way 94 and the pivoted coin switch 95. The purpose of the coin-switch 95 is to automatically refund a deposited coin when the associated magazine is empty. Although this coin-refunding feature is not claimed in this case, since it forms the subject-matter of another divisional case of our aforesaid co-pending application, we will here briefly describe the operation thereof, so as to complete the description of what is shown in the drawings. On top of the goods in each magazine rests a weight W provided with an extension 96. When the supply of goods is exhausted, the extension 96 engages the rearward projection 97 on the coin-switch 95 and tilts the same rearwardly into such a position that the deposited coin is not guided

into the coin-chute 37 but is deflected over the surface 98 of the coin-switch into the refunding chute D, whence it may be recovered by the intending purchaser.

While we have herein shown a specific form of machine embodying the various features of our invention, it is understood that we do not intend to be limited to such a construction, but that various changes and modifications may be made without departing from the scope of the invention as defined in the appended claims. Furthermore, it is apparent that certain features of our invention may be used without certain other features.

Having thus described our invention what we claim as new and desire to secure by Letters Patent of the United States, is:

1. In a vending machine having an outer casing, a transverse shelf or partition secured in said casing, a plurality of unit frameworks mounted on said transverse shelf side by side, ejecting mechanism mounted in each of said frameworks, cooperating means on said shelf and said frameworks for rigidly securing each framework on the shelf independently of the others, a second transverse shelf secured in said casing above said frameworks, a plurality of magazines mounted on said second shelf side by side in vertical alignment with said frameworks, and cooperating means on said second shelf and said magazines for removably securing each magazine in place on said second shelf independently of the others.

2. In a vending machine having an outer casing, a transverse shelf or partition secured in said casing, pairs of slotted upstanding lugs on said shelf, and a plurality of magazines provided each at the lower end with a horizontal rod adapted to engage a pair of said lugs by entering the slots thereof, whereby said magazines are removably mounted on said shelf side by side, independently of each other, a plurality of frameworks mounted in said casing below said transverse shelf, and delivery mechanisms mounted in said frame-works, said magazines being supported on said shelf entirely independently of said mechanism-carrying frame-works

3. In a vending machine having a closed outer casing, the front wall or panel of which is readily removable, a magazine mounted within said casing independently of said removable front wall, a delivery chute carried by said front wall, mechanism mounted with in said casing below said magazine and independently of said removable front wall for delivering goods from said magazine forwardly into said chute, and a hand-operable member projecting through said front wall or panel below said delivery chute for operating said mechanism.

4. In a vending machine having a closed outer casing, the front wall or panel of which is readily removable, a delivery chute carried by said front wall, and a rearwardly and downwardly inclined shelf or ledge at the mouth of said chute for holding the goods in position to be easily withdrawn.

5. In a vending machine having a closed outer casing, the front wall or panel of which is readily removable, a delivery chute carried by said front wall, mechanism within the casing for delivering goods into said chute, a hand-operated member below said delivery chute for operating said mechanism, and a plate secured to said front wall and having a rearwardly extending recess or chamber formed therein for accommodating the exposed portion of said hand-operated member, said plate being at its upper end provided with a rearwardly inclined shelf or ledge which projects into the mouth of the delivery chute for supporting the goods in position to be easily withdrawn.

6. In a vending machine having a delivery opening in one of its walls, a plate secured to said wall and having at its upper end a plurality of inwardly inclined ledges or shelves which are suitably spaced apart and project into said opening for supporting the goods in position to be easily withdrawn.

7. In a vending machine, a casing having a magazine for containing the vendable articles, a framework removably mounted in said casing below said magazine, a plate slidably mounted on top of said framework, an ejector pivotally mounted on said plate and adapted to eject the lowermost article out of said magazine, means for yieldably holding said ejector in ejecting position, said holding means permitting the ejector to slide under the column of articles during the return movement of said plate, a swinging lever mounted between the side walls of said removable framework and connected with said plate, and hand operable means for actuating said lever.

8. In a vending machine, a casing provided with a removable front plate or panel having a delivery opening, a descending delivery chute secured to said plate and terminating in an enlarged recess or chamber back of said delivery opening, a magazine mounted within said casing above and to the rear of said delivery chute, ejecting mechanism mounted independently of said front plate below said magazine and back of said delivery chute, and a hand-operable plunger below said delivery opening for operating said ejecting mechanism.

9. In a vending machine, an outer casing, a horizontal transverse shelf or partition secured between the vertical side walls of said casing in the lower portion thereof, said shelf being provided with pairs of locking projections or flanges running substan-

tially parallel with the sides of the casing, a plurality of substantially rectangular unit frameworks mounted on said transverse shelf side by side in close proximity to each other, ejecting mechanism mounted in each framework between the side walls thereof, the ejecting mechanism of each framework including a hand-operated plunger which projects forwardly through the front wall of the framework, each framework and its ejecting mechanism being complete in itself and independent of the other frameworks, lugs or flanges on the lower end of each framework to engage and interlock with a pair of lugs or flanges on said shelf when the framework is slid rearwardly into proper position on the shelf, whereby each framework is securely held on said shelf independently of the others and is readily removable without disturbing the others by sliding it forwardly out of engagement with the projections on the shelf, an upright goods magazine removably positioned over each framework so that the ejecting mechanism of that framework will upon operation of the plunger eject the goods from the lower end of the magazine, a removable front panel on said casing, said front panel having openings to allow said plungers to project therethrough for manual operation, an open delivery chamber or recess provided on said front panel above said plunger openings, and a plurality of delivery chutes mounted on the inside wall of said removable panel to guide the ejected packages from the magazines to said delivery chamber.

10. In a vending machine, an outer casing, a horizontal transverse shelf or partition secured between the vertical side walls of said casing in the lower portion thereof, a substantially rectangular framework mounted on said shelf, ejecting mechanism mounted in said framework between the side walls thereof, said ejecting mechanism including a hand-operated plunger which projects forwardly through the front wall of the framework, cooperating means on said shelf and said framework for rigidly securing the framework to the shelf, said cooperating means being easily separable to permit the ready removal of said framework, a goods magazine removably positioned over said framework so that the ejecting mechanism will upon operation of the plunger eject the goods from the lower end of the magazine, a removable front panel on said casing, said front panel having a large opening in alignment with said plunger, the front end of said plunger being substantially flush with the outer wall of said panel, a cylindrical wall or housing arranged between said plunger opening in the panel and the front wall of said framework, said cylindrical wall forming a chamber for the projecting portion of the plunger, an open delivery chamber or recess provided on said front panel above said plunger opening, and a delivery chute mounted on the inside wall of said removable panel to guide the ejected packages from the magazines to the delivery chamber.

In witness whereof, we hereunto subscribe our names on the days below written.

ALBERT D. GROVER.
Subscribed Sept. 24th, 1915.
EARL E. BARBER.
Subscribed Sept. 22, 1915.