March 3, 1959 R. J. EDWARDS 2,875,924

COIN CONTROLLED CUP DISPENSER AND CHANGE MAKER

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Fig. 1

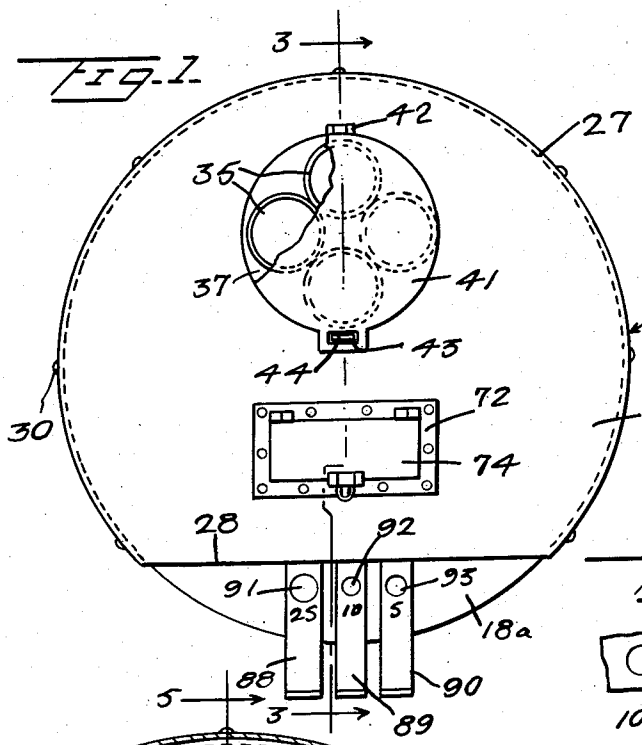


Fig. 13

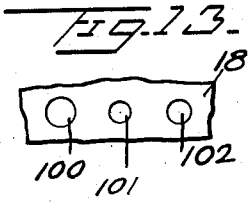
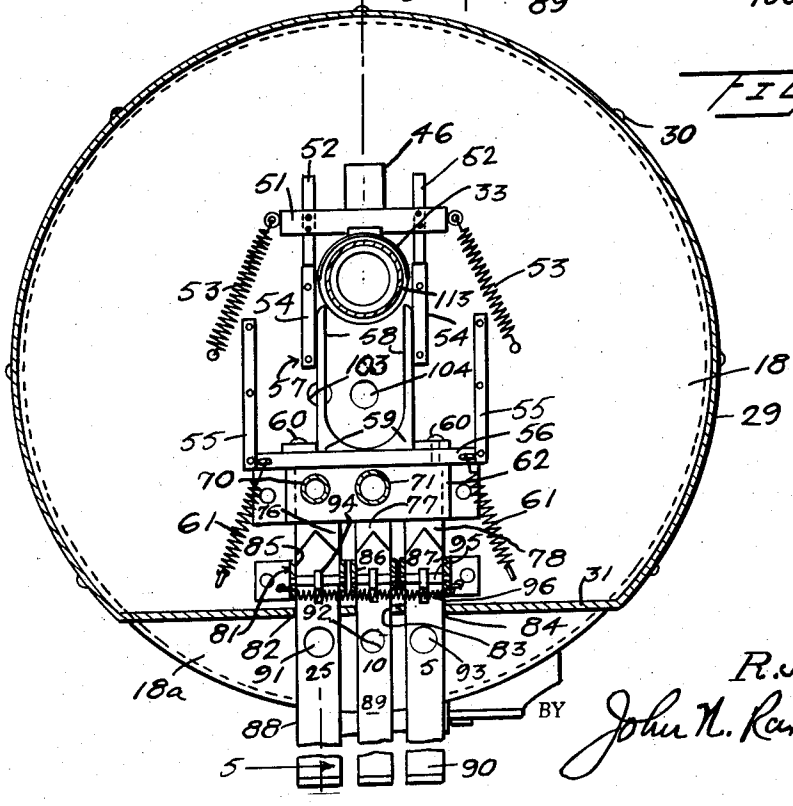


Fig. 4



INVENTOR

R. J. Edwards

BY John N. Randolph

ATTORNEY

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COIN CONTROLLED CUP DISPENSER AND CHANGE MAKER

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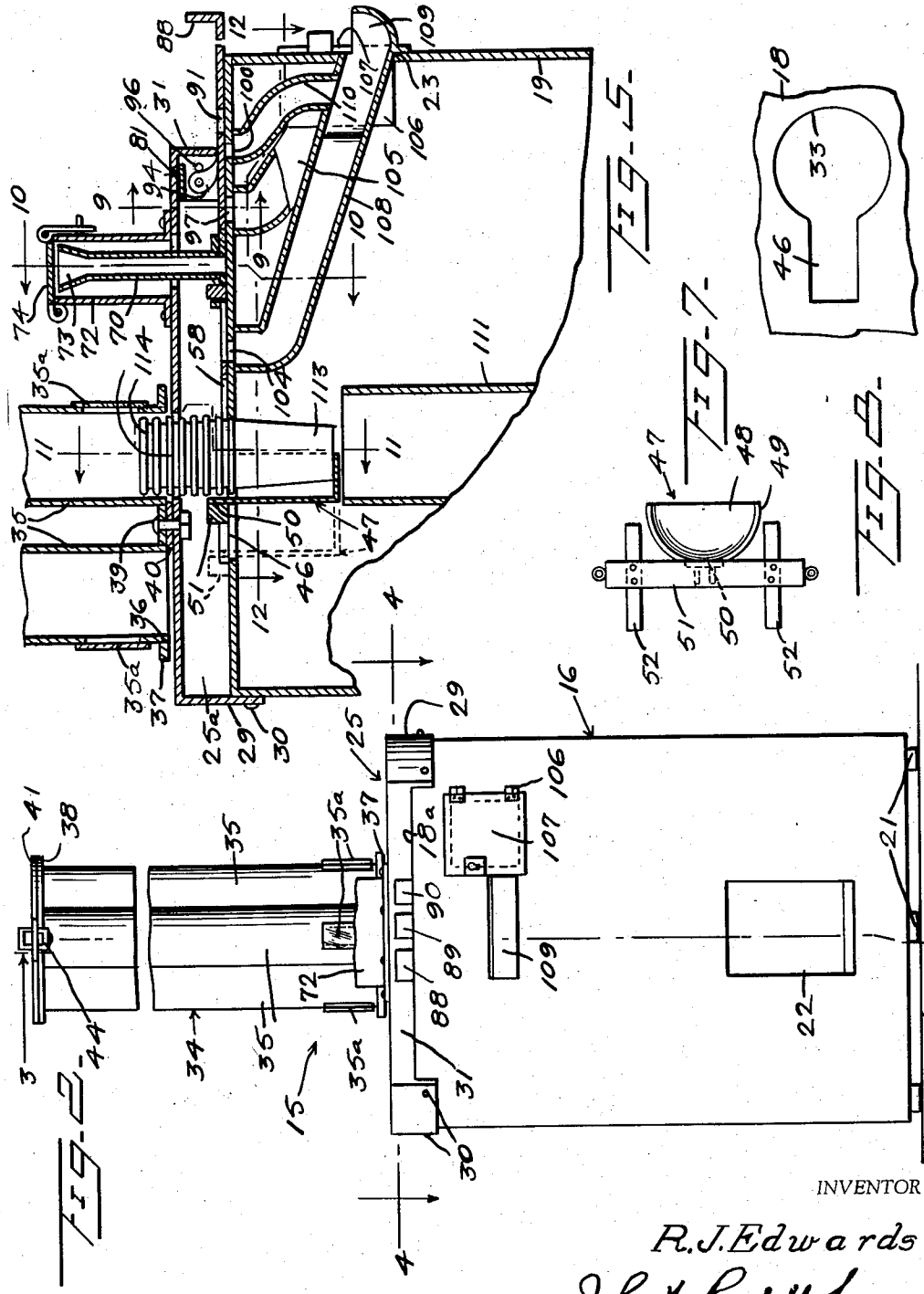


FIG. 5.

FIG. 7.

FIG. 8.

FIG. 6.

INVENTOR

R. J. Edwards

BY John M. Randolph

ATTORNEY

March 3, 1959 R. J. EDWARDS 2,875,924

COIN CONTROLLED CUP DISPENSER AND CHANGE MAKER

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Fig. 3.

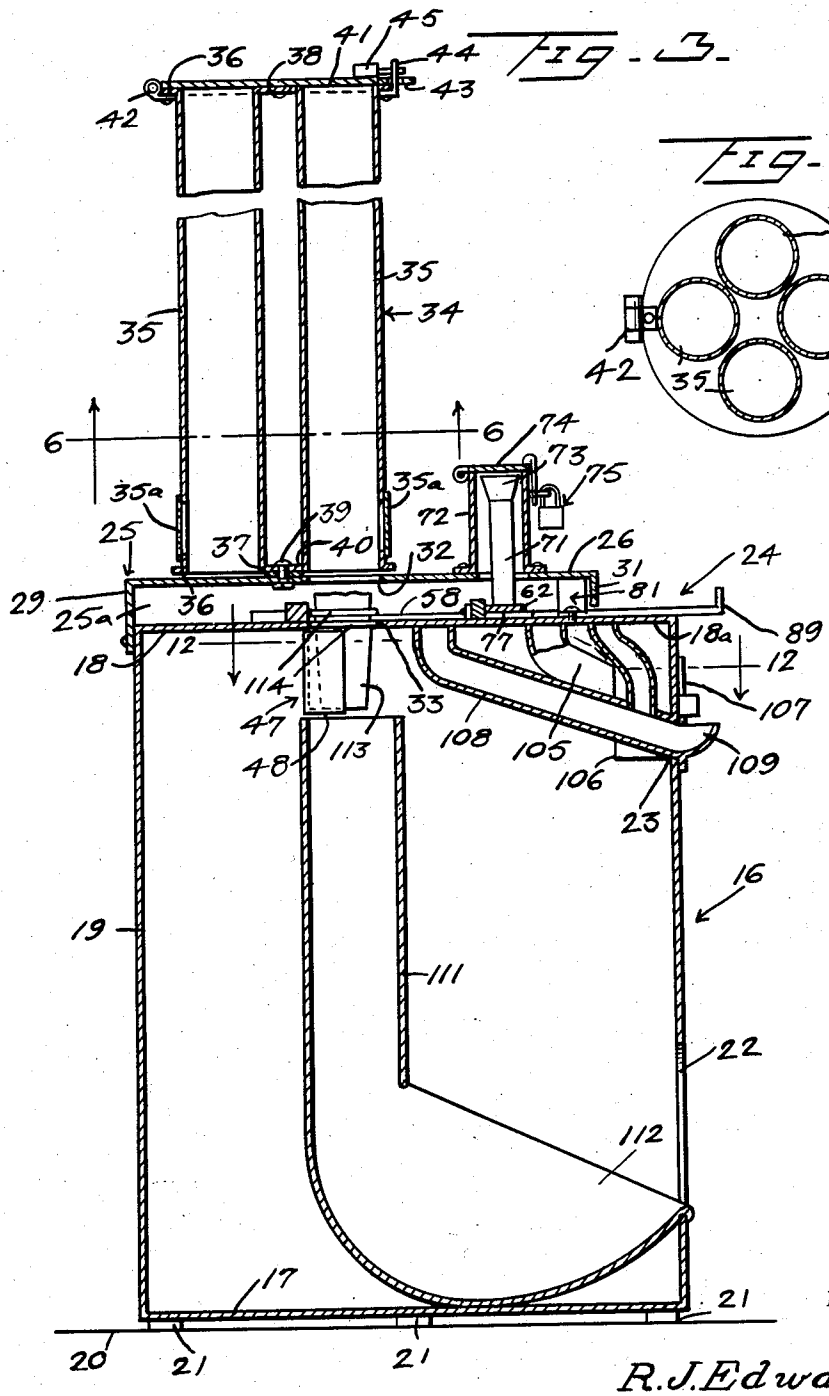


Fig. 6.

INVENTOR

R. J. Edwards

BY John N. Randolph

ATTORNEY

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COIN CONTROLLED CUP DISPENSER AND CHANGE MAKER

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Fig. 9

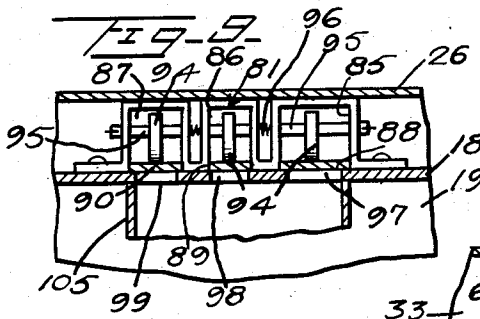


Fig. 10

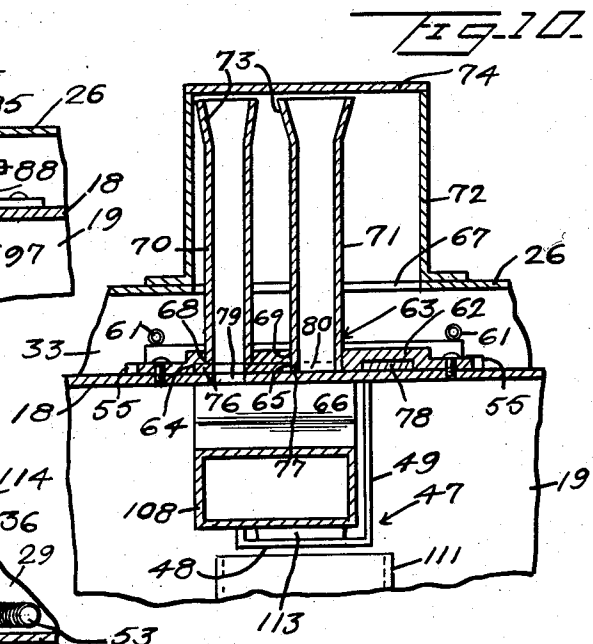


Fig. 11

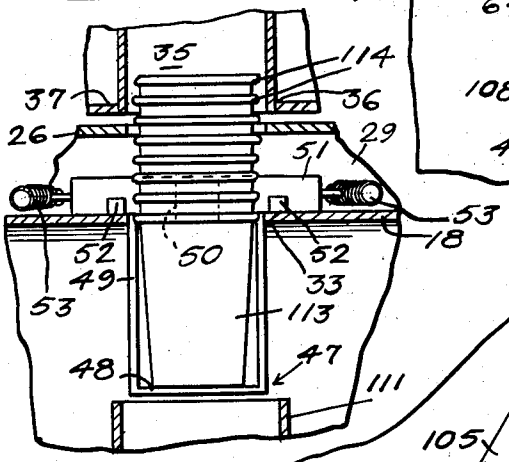
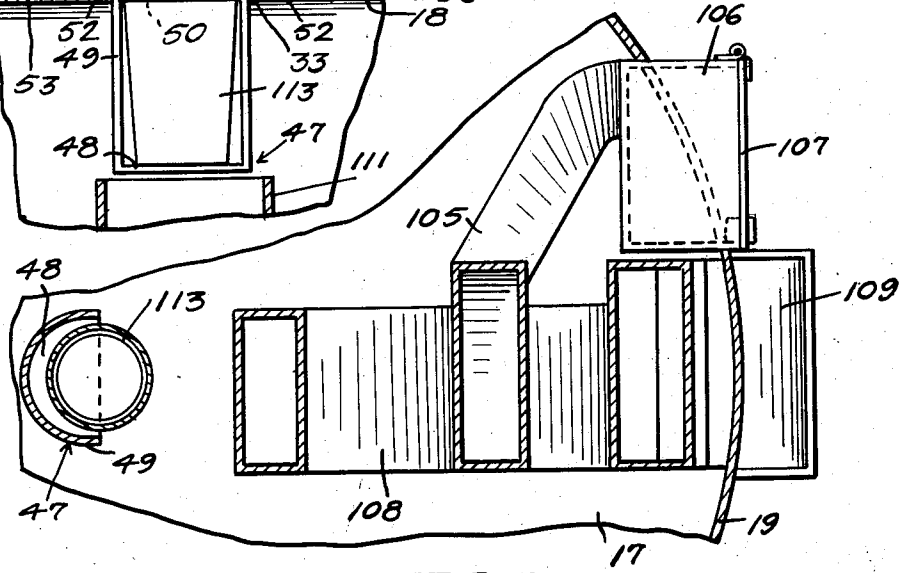


Fig. 12



INVENTOR

R. J. Edwards

BY John N. Randolph

ATTORNEY

United States Patent Office 2,875,924 Patented Mar. 3, 1959

2,875,924

COIN CONTROLLED CUP DISPENSER AND CHANGE MAKER

Ralph J. Edwards, Knoxville, Tenn.

Application June 17, 1957, Serial No. 665,907

7 Claims. (Cl. 221—298)

This invention relates to a novel holder and dispenser for disposable drinking cups of the type used as containers for hot and cold drinks such as coffee, tea, milk and soft drinks, and has for its primary object to provide a coin controlled machine capable of being operated by the customer upon deposit of a coin to effect the dispensing of a cup to a receptacle in which the cup is accessible to the customer, and for supplying change to the customer if the deposited coin is of an amount more than required for the purchase of the cup.

More particularly, it is an object of the present invention to provide a dispenser having novel means to effect release of a single cup when certain mechanism of the machine is manually actuated, after release of said mechanism for operation by the deposit of a coin.

A further object of the invention is to provide a cup dispenser having a novel magazine for containing a plurality of stacks of cups, the individual stacks of which are successively movable into positions to be dispensed by rotation of the magazine.

A further object of the invention is to provide a dispenser having a novel change making unit which operates automatically when the machine is actuated to dispense a cup for supplying the purchaser with change, where the coin deposited to enable the dispenser to be operated is of a value in excess of the amount required to purchase the cup.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a preferred embodiment thereof, and wherein:

Figure 1 is a top plan view of the cup dispenser and change maker;

Figure 2 is a front elevational view thereof, partly broken away, on a reduced scale relative to Figure 1;

Figure 3 is an enlarged fragmentary vertical sectional view, taken substantially along a plane as indicated by the lines 3—3 of Figures 1 and 2;

Figure 4 is an enlarged horizontal sectional view, taken substantially along a plane as indicated by the line 4—4 of Figure 2;

Figure 5 is a fragmentary vertical sectional view, taken substantially along a plane as indicated by the line 5—5 of Figure 4;

Figure 6 is a cross sectional view through the magazine, taken substantially along a plane as indicated by the line 6—6 of Figure 3;

Figure 7 is an enlarged plan view of a part of the cup dispensing mechanism shown removed from the machine;

Figure 8 is an enlarged fragmentary plan view of a part of the top wall of the housing;

Figure 9 is an enlarged fragmentary vertical sectional view, taken substantially along a plane as indicated by the line 9—9 of Figure 5;

Figure 10 is an enlarged fragmentary vertical sectional view, taken substantially along a plane as indicated by the line 10—10 of Figure 5;

Figure 11 is an enlarged fragmentary vertical sectional view, taken substantially along a plane as indicated by the line 11—11 of Figure 5;

Figure 12 is an enlarged fragmentary horizontal sectional view, taken substantially along a plane as indicated by the line 12—12 of Figure 5, and

Figure 13 is a fragmentary plan view of a portion of the top wall of the housing.

Referring more specifically to the drawings, the coin controlled cup dispenser and change maker in its entirety is designated generally 15 and includes a housing, designated generally 16, which is preferably but not necessarily cylindrical and which includes a substantially flat bottom wall 17, a substantially flat top wall 18, and a cylindrical side wall 19. The housing 16 is supported in a slightly elevated position relative to a floor or other supporting surface 20 by foot members 21 which are secured to the underside of the bottom 17. The cylindrical wall 19, in a portion thereof located adjacent the bottom 17, is provided with a relatively large opening 22, and said cylindrical wall is provided with a smaller opening 23 located above the opening 22 and in substantially vertical alignment therewith. The openings 22 and 23, the purpose of which will hereinafter be described, are formed in what constitutes the front portion 24 of the housing 16 and dispenser 15.

A cover member, designated generally 25, includes a substantially flat top wall 26, as best seen in Figure 1, which has an arcuate edge 27 constituting substantially more than a semicircle and a straight edge 28 which extends between the ends of the arcuate edge 27. The top wall 26 has a depending arcuate flange 29 which extends downwardly from its arcuate edge 27 and is secured to the upper portion of the housing 16 by fastenings 30 for positioning the top wall 26 of the cover 25 above, spaced from and substantially parallel to the top wall 18 of the housing. The cover member 25 is also provided with a straight depending flange 31 which extends downwardly from the straight edge 28 and the bottom edge of which rests upon a portion of the top wall 18. The cover member 25 and a portion of the housing top wall 18 which is disposed therebeneath combine to form a chamber 25*a* which is located directly above the housing 16. The portion of the top wall 18 which is disposed outwardly with respect to the flange 31 constitutes a shelf 18*a* which is disposed at the front of the dispenser 15. The top wall 26, nearer the back of the machine than the front thereof, is provided with an opening 32 which aligns with an opening 33 of the housing top wall 18.

A magazine, designated generally 34, is supported on the top wall 26 and includes a plurality, preferably four corresponding tubes 35 the open ends of which are secured in spaced openings 36 of a bottom plate 37 and a top plate 38, by means of which the tubes 35 are supported relative to one another equally spaced around the centers of the plates 37 and 38. A fastening 39 extends through the bottom plate 37 and top wall 26 for rotatably mounting the magazine 34 on the cover member 25, and said fastening 39 extends through a washer 40 which is disposed between the top wall 26 and bottom plate 37 for spacing said bottom plate from the wall 26. The fastening 39 is centrally disposed relative to the four tubes 35 and is so positioned with respect to the opening 32, that by rotation of the magazine 34, each of the tubes 35 can be brought into alignment with the opening 32. The upper ends of the tubes 35 are closed by a cover 41 which is hinged at 42 to an edge portion of the top plate 38 and which is provided with a slot 43, which is disposed remote from the hinge 42. A staple 44 extends upwardly from an edge portion of the top plate 38 through the slot 43, when the cover 41 is in a closed position, and a padlock 45, as seen in Figure 3, may be applied to the staple

44 above the cover 41 for locking the magazine 34. The tubes 35 may be transparent or opaque. If opaque, each tube near its lower end is provided with a window 35*a*.

As best seen in Figures 4 and 8, the housing top wall 18 is provided with a slot 46 which extends rearwardly from a portion of the opening 33. A cup supporting member 47, as best seen in Figures 7, 11 and 12, includes a semicircular bottom 48 and a semicylindrical wall 49 which is fixed to and extends upwardly from the arcuate edge of the bottom 48. The wall 49 has a restricted extension 50 extending upwardly from its upper edge which fits loosely in the slot 46 and the upper portion of which is secured in a bar 51 which rests on the wall 18 and extends across the slot 46. Two strips 52 are mortised in the underside of the bar 51 and likewise rest on the wall 18, on opposite sides of the slot 46. The bar 51 supports the cup holder 47 suspended below the top wall 18 and for sliding movement of said cup holder with the bar in directions longitudinally of the slot 46. A pair of pull springs 53 have corresponding ends anchored to the upper side of the wall 18 and extend rearwardly from their anchored ends and have opposite ends which are connected to the ends fo the bar 51 for normally urging said bar and the cup holder 47 forwardly, toward the opening 33. A pair of guide strips 54 are secured to the upper side of the wall 18 in spaced apart parallel relation to one another and have rear ends which straddle a part of the opening 33. The forward ends of the strips 52 normally abut the rear ends of the guide strips 54 to limit forward displacement of the bar 51 and cup holder 47 under the biasing action of the springs 53.

A second pair of guide strips 55 are secured to the upper side of the wall 18 in spaced apart substantially parallel relation to one another. The guide strips 55 are spaced apart a distance greater than the spacing between the guide strips 54 and have rear ends straddling the forward ends of the guide strips 54, as seen in Figure 4. A bar 56 is disposed on the top wall 18 between the guide strips 55 with the ends of said bar 56 slidably engaging against the inner edges of the strips 55. A fork, designated generally 57, is secured to the rear side of the bar 56 and extends therefrom toward the opening 33. The fork 57 has two tines 58 which slidably engage the inner sides or edges of the guide strips 54. The tines 58 have base portions 59 which are separately secured by fastenings 60 to the bar 56, so that the spacing between the tines 58 may be varied, if desired, to fit cups of different diameters. Two pull springs 61 are anchored to the upper side of the top wall 18 near the flange 31 and extend rearwardly from their anchored ends in converging relation to one another and have rear ends which are connected to end portions of the bar 56 for urging said bar and the fork 57 forwardly and away from the opening 33. The springs 61 normally retain the bar 56 in a retracted position in abutting engagement with a back edge of an arch member 62 which is secured to the upper side of the wall 18 and which is disposed substantially parallel to the flange 31.

The arch 62 constitutes a part of the change maker, designated generally 63. Said arch 62 is provided with three downwardly opening notches which combine with portions of the wall 18 to form slots or guideways 64, 65 and 66 which extend transversely through the arch 62. The arch 62 is located directly beneath a relatively large opening 67 of the top wall 26. The arch 62 has openings 68 and 69 which open into the slots or guideways 64 and 65, respectively, in which are secured the lower ends of tubes 70 and 71, respectively. A hood 72 which has an open bottom is disposed in the top wall 26 and has the open bottom thereof secured to said top wall around the opening 67. The tubes 70 and 71 extend upwardly from the arch 62 through the openings 67 into the hood 72 and have flared upper ends 73 which are located beneath and adjacent a hinged top wall or cover 74 of the hood 72. The cover 74 is adapted to be locked in a closed position by means of a hasp, staple and padlock or other suitable locking means, as seen in Figure 3 and designated 75. Bars or blocks 76, 77 and 78 extend through and are slidably disposed in the slots 64, 65 and 66, respectively. The bar 76 is provided with an opening 79 which registers with the bore of the tube 70 in a retracted position of said bar 76 and which is of the same diameter as the bore of said tube 70 and of a diameter and depth to accommodate two dimes. The bar 77 has an opening 80 intended to register in the same manner with the bore of the tube 71 and which is of the same diameter as said tube bore and of a diameter and depth to accommodate therein one nickel. The bar or block 78, as seen in Figure 10, is not provided with an opening.

An arch member 81 is secured to the upper side of the wall 18 and is disposed in the chamber 25*a* between th change maker 63 and the flange 31. As seen in Figure 4, the bottom edge of the flange 31 is notched to provide, in combination with the top wall 18, three guide slots 82, 83 and 84 which align with guideways 85, 86 and 87, respectively of the arch member 81. Said guideways 85, 86 and 87 in turn align the guideways 64, 65 and 66. Coin slides 88, 89 and 90 slidably engage the top wall 18 and have inner portions extending through and slidably disposed in the openings 82, 83 and 84, respectively, and the guideways 85, 86 and 87, respectively. Outer portions of the slides 88, 89 and 90 extend across and are supported on the shelf 18*a* when the slides are disposed in retracted positions, as seen in Figure 4. Parts thereof which rest on the shelf 18*a* are provided with coin receiving openings 91, 92 and 93, of the slides 88, 89 and 90, respectively. Each guideway 85, 86 and 87 contains a pawl 94 which is swingably mounted therein on a shaft 95 and which extends downwardly and forwardly of the arch member 81. A spring 96 engages the pawls 94 for yieldably urging said pawls downwardly against the upper sides of the slides 88, 89 and 90, as best seen in Figure 5. The inner or rear ends of the slides 88, 89 and 90 bear against the outer or forward ends of the blocks 76, 77 and 78, as seen in Figure 4, and the opposite inner or rear ends of said blocks bear against the forward side of the bar 56.

Between the arch member 81 and the coin changer 63, the top wall 18 is provided with openings 97, 98 and 99 which are are disposed beneath the slides 88, 89 and 90, respectively. The openings 97, 98 and 99 correspond with the openings 91, 92 and 93, respectively. The top wall 18, substantially directly beneath the flange 31, is provided with openings, 100, 101 and 102, as seen in Figure 13, which align with the openings 97, 98 and 99, respectively, and which are slightly smaller than the openings 91, 92 and 93, respectively. The top wall 18, between the guide strips 55, is provided with openings 103 and 104 which align with the bars 76 and 77 and which are at least as large in diameter as the openings 79 and 80, respectively.

A coin chute 105 has an open upper end which is secured against the underside of the top wall 18 so as to surround the openings 97, 98 and 99. The coin chute 105 extends downwardly and laterally and has its opposite end opening through the back wall of a coin box 106. The coin box 106 is mounted in and extends through a portion of the housing wall 19 and is disposed to one side of the opening 23. The exposed front of the coin box 106 is closed by a hinged door 107 which is equipped with a lock.

An open upper end of a coin return chute 108 is secured to the underside of a portion of the top wall 18 around the openings 103 and 104. Said coin return chute 108 extends downwardly and forwardly through the opening 23 and terminates in an upwardly opening receptacle 109 which is disposed externally of the wall

19. A branch coin return chute **110** has an open upper end secured to the underside of the wall **18** so as to surround the openings **100, 101** and **102**, and the open lower end of the branch chute **110** discharges into the chute **108**.

A cup conveying chute **111** is mounted in the housing **16** and has an open upper end disposed in alignment with the opening **33** and slightly below the level of the cup support **47**. The other lower end of the chute **111** terminates in an upwardly opening receptacle **112** which is disposed within the housing **16** inwardly of and adjacent the opening **22**.

With the magazine cover **41** in an open position the four magazine tubes **35** can be filled with drinking cups **113** with the cups contained in each tube **35** stacked in nested relation to one another. Assuming that one of the tubes **35** is in alignment with the opening **32**, the stacked cups contained therein will slide downwardly by gravity through the openings **32** and **33** so that the bottom of the lowermost cup **113** will rest on the bottom **48** of the cup support **47**, as seen in Figures 3, 5 and 11. In the nested stacked relationship of the cups **113**, as seen in these views, the outwardly rolled rims **114** of the cups are spaced slightly apart. The cup support **47** is of a height so that the rim of the bottommost cup **113** will be disposed in the opening **33** and slightly below the level of the upper surface of the wall **18**, while the rim **114** of the cup disposed immediately thereabove will be located somewhat above the level of the upper side of the wall **18**.

Assuming that a nickel is placed in the opening **93** of the slide **90** and said slide is pushed inwardly, the nickel will completely fill the opening **93** and will be too large to escape through the opening **102** and will accordingly pass said opening **102** with the slide **90**. The nickel will be engaged by the pawl **94** which is disposed above the slide **90** to prevent said pawl from swinging downwardly into the opening **93** and so that the opening **93** containing the nickel can pass under said pawl and through the guideway **87**. During this movement of the slide **90**, the block **78** will be pushed inwardly by the slide **90** and will in turn push the bar **56** and fork **57** inwardly or rearwardly through the chamber **25***a*. During this movement of the fork **57**, the tines **58** thereof will move between the rims **114** of the lowermost cup **113** and the cup disposed immediately thereabove, after which the inner ends of the tines **58** will contact the bar **51** to displace said bar and the cup support **47** rearwardly from the full line to the dotted line position thereof as seen in Figure 5. During this movement of the cup support **47**, the bottom **48** thereof will disengage the bottom of the lowermost cup **113** so that said bottom cup will be released to drop downwardly into and through the chute **111** to the chute receptacle **112** in which the cup is readily accessible to the customer through the housing opening **22**. As the tines **58** move rearwardly to disengage the cup holder **47** from the lowermost cup **113**, said tines due to their vertical thickness exert a slight lifting force on the next to the bottom cup **113** so that the bottom cup will not adhere thereto and will drop freely into the chute **111** when disengaged by the holder **47**. During this operation and after the opening **93** containing the nickel has passed under the pawl **94** and through the guideway **87** it will move into registration with the opening **99** whereby the nickel is released to drop by gravity through said opening **99** into and through the chute **105** to the locked coin box **106**. When the cup **113** has been discharged into the receptacle **112** the customer releases pressure on the slide **90**. When this occurs, the springs **61** will return the cup separator **56, 57**, the bar **78** and the slide **90** to the positions of said parts as seen in Figure 4. During this return movement of the slide **90** the pawl **94** of the guideway **87** will swing downwardly into the opening **93** but will be cammed out of said opening due to the fact that said pawl is inclined downwardly and forwardly.

If the coin placed in the opening **93** is smaller than said opening, as for example a dime, during the initial inward displacement of the slide **90** the opening **93** upon moving into registration with the opening **102** will lose the coin which will then drop through the opening **102** into the return chute **110** and thence by way of the return chute **108** to the return receptacle **109**. A further inward displacement of the slide **90** after the coin had thus been released will then result in the pawl **94** of the guideway **87** dropping into the opening **93** to prevent the slide **90** from being displaced inwardly sufficiently to release a cup **113**. This would likewise occur if the slide **90** were displaced inwardly without a coin being placed in the opening **93**.

The same operation of the machine will result if a quarter is placed in the opening **91** and the slide **88** is displaced inwardly or if a dime is placed in the opening **92** and the slide **89** is displaced inwardly. Also, if coins too small for these openings are placed therein, such coins will escape through the openings **100** and **101** and will be returned to the customer in the same manner as previously described. In addition to the aforedescribed operation of the machine **15** for dispensing a cup by the placing of a coin of proper denomination in the openings of any one of the slides, when a quarter is placed in the opening **91** and the slide **88** is displaced inwardly for releasing and discharging a cup **113** into the chute **111**, as the block **76** is forced inwardly or rearwardly in advance of the slide **88** it will carry with it two dimes contained in the opening **79**. Prior to the time that the cup is released and subsequent to the time that the quarter drops from the opening **91** through the opening **97** into the coin chute **105**, the opening **79** will move into registration with the opening **103** so that the two dimes, not shown, will be released to drop from the pocket **79** through the opening **103** and will then be conveyed by gravity through the chute **108** into the receptacle **109**, in which the coins will be accessible to the customer. Thereafter when the parts return to their original positions, two more dimes will drop into and fill the pocket **79**. In the same manner when the slide **89** is operated with a dime placed in the opening **92** thereof, a nickel will be carried forward in the pocket **80** and will be discharged through the opening **104**. It will be understood that only one slide is operated at any given time and that the other slides, and the other blocks engaged by said other slides, remain immovable. Thus, any one of the three slides and the bar or block engaged thereby is capable of functioning to operate the machine **15** for dispensing a cup **113**.

The windows **35***a* afford visual inspection to determine when the supply of cups has been exhausted in the tube **35** which is in registration with the opening **32**. When this occurs, the magazine **34** is rotated a quarter of a turn to position another full tube **35** in registration with the opening **32** so that the fresh supply of cups will then be supplied by gravity through the openings **32** and **33**. The stacks of cups contained in the tubes **35** which are out of registration with the opening **32** are supported by the bottommost cup resting on the top wall **26**.

Various modifications and changes are contemplated and may be resorted to, without departing from the function or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. A dispensing machine of the character described comprising a housing including a top wall, a cover member supported by said housing and having a top wall disposed above and spaced from the housing top wall, said top walls having aligned openings, a magazine supported on the top wall of the cover member including an upright tube adapted to contain a stack of nested drinking cups, said tube being disposed in alignment with

said openings whereby the drinking cups are adapted to be fed downwardly by gravity from the magazine through said openings, a cup holder having a bottom disposed beneath and spaced from the opening of the housing top wall and on which the bottom of a bottommost cup of the stack is adapted to rest for supporting the stack of cups, said cup holder including means slidably connected to the housing top wall for suspending the cup holder thereon for sliding movement in directions parallel to the plane of said housing top wall and including a part disposed above and resting on said top wall at one side of the opening thereof, a fork member slidably mounted on the housing top wall and disposed on the opposite side of the opening thereof to said part of the cup holder supporting means and having spaced tines adapted to straddle the next to the bottom cup of the stack of cups when said fork member is moved to a projected position across the housing top wall opening and toward said part of the cup holder supporting means, manually actuated means slidably supported on the housing top wall including a portion projecting outwardly from beneath said cover member and operable when displaced inwardly for moving said fork member to a projected position, said fork member in moving to a projected position engaging between the rims of the bottommost and the next to the bottommost cups and initially assuming a position to support the next to the bottommost cup and the cups disposed thereabove, and said fork member thereafter engaging said part of the cup holder supporting means for displacing the cup holder supporting means away from the cups to move the cup holder bottom out of engagement with the bottommost cup to effect release of said cup, a cup supply chute supported by said housing having an open upper end into which said bottommost cup is adapted to fall when released by the cup holder, said chute having a bottom portion defining an open top receptacle accessible to the customer and into which the cup is discharged by gravity, spring means connected to the cup holder supporting means to return the cup holder to its initial position when pressure is released on the manually actuated means, and a second spring means connected to the fork member for thereafter returning the fork member to a retracted position out of engagement with the stacked cups.

2. A dispensing machine as in claim 1, said magazine including a plurality of cup containing tubes, means rotatably mounting sail magazine on the top wall of the cover member for rotation about an axis equally spaced from the axes of said tubes whereby said tubes may be successively moved into registration with said openings by rotation of the magazine.

3. A dispensing machine as in claim 2, said magazine including a locked closure for closing the upper ends of said tubes, said closure being capable of being unlocked and moved to an open position for exposing the upper ends of the tubes for refilling the magazine.

4. A dispensing machine comprising a housing having a top wall, a cover member supported by said housing and disposed over said top wall, said top wall and cover member having vertically spaced aligned openings, a cup holder having a bottom disposed beneath and spaced from the opening of the top wall, said openings adapted to accommodate a stack of nested drinking cups and the bottom of the bottommost cup being adapted to rest upon said cup holder bottom for supporting the stack of cups,

means slidably connecting said cup holder to the housing top wall for sliding movement of the cup holder in directions parallel to the plane of the top wall, said cup holder including a part disposed above and resting on the top wall at one side of the opening thereof, a fork member slidably mounted on the housing top wall and disposed on the opposite side of the opening thereof to said part of the cup holder, said fork member having tines extending toward said part of the cup holder and adapted to straddle the next to the bottom cup of the stack of cups when said fork member is moved toward a projected position across the top wall opening and toward said cup holder part, a manually actuated means engaging the fork member and including a portion projecting outwardly from the cover member and operable for moving said fork member to a projected position, said fork member, in moving to a projected position, initially engaging between the rims of the bottommost and the next to the bottommost cups for supporting the next to the bottommost cup and the cups disposed thereabove, said fork member thereafter engaging said cup holder part for displacing the cup holder away from the cups to move the cup holder bottom out of engagement with the bottommost cup to effect release of said cup, spring means connected to the cup holder and housing to return the cup holder to its initial position when pressure is released on said manually actuated means, and a second spring means connected to the fork member for thereafter returning the fork member to a retracted position out of engagement with the stack of cups.

5. A dispensing machine as in claim 4, said cup holder bottom being disposed relative to said top wall for supporting the bottommost cup with the rim thereof positioned in the top wall opening and below the level of the upper surface of said top wall.

6. A dispensing machine as in claim 4, a magazine having a plurality of upright cup containing tubes, and means rotatably mounting said magazine on the cover member about a vertical axis equally spaced from said tubes and so disposed relative to the opening of the cover member that said tubes are successively moved into registration with the opening of the cover member by rotation of the magazine, each of said tubes being adapted to contain a stack of nested drinking cups.

7. A dispensing machine as in claim 4, means supported by said top wall and guiding said fork member in its movement toward and away from a projected position, said last mentioned means being engaged by said part of the cup holder for limiting return movement of the cup holder under the biasing action of said first mentioned spring means.

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