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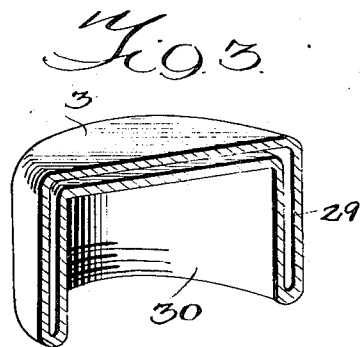
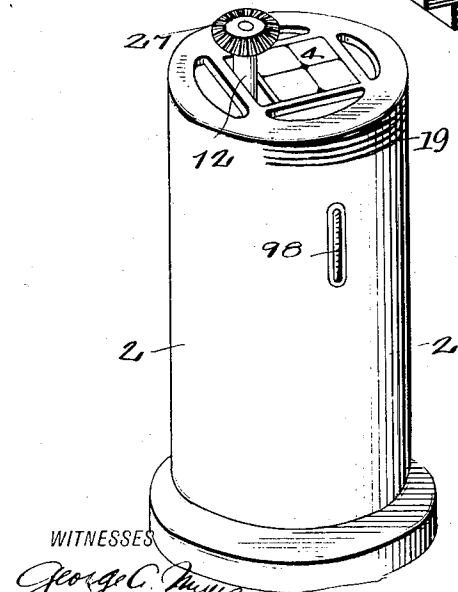
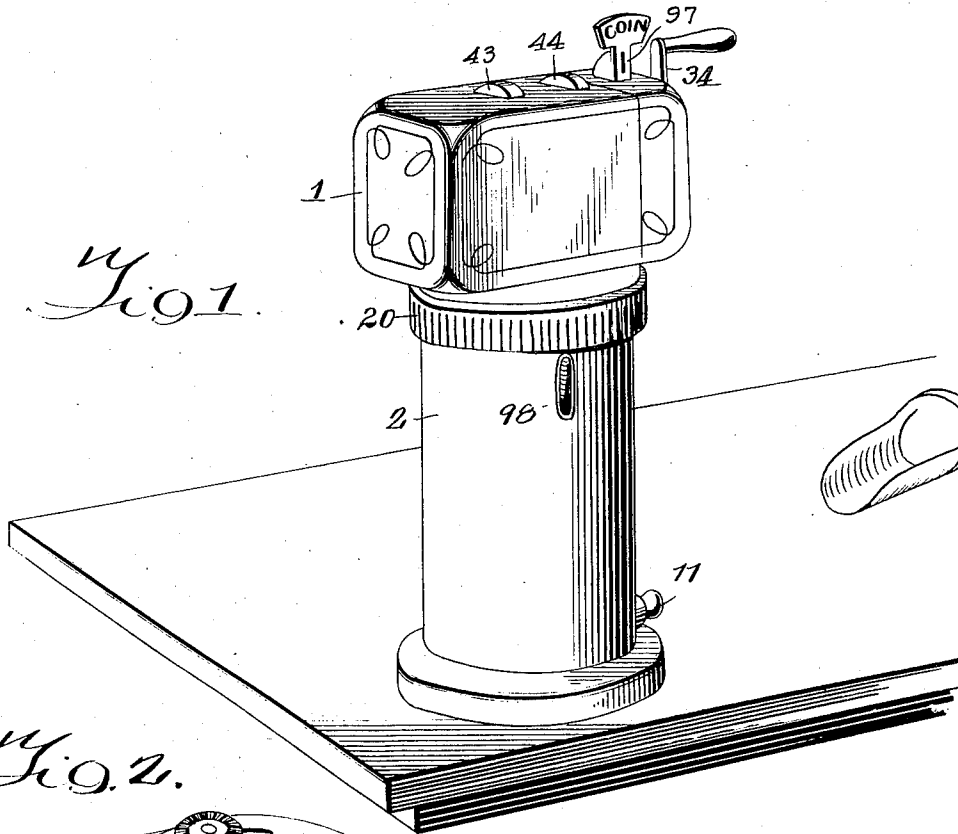
L. C. MILES ET AL

1,509,249

VENDING MACHINE

Filed July 8, 1922

6 Sheets-Sheet 1



WITNESSES

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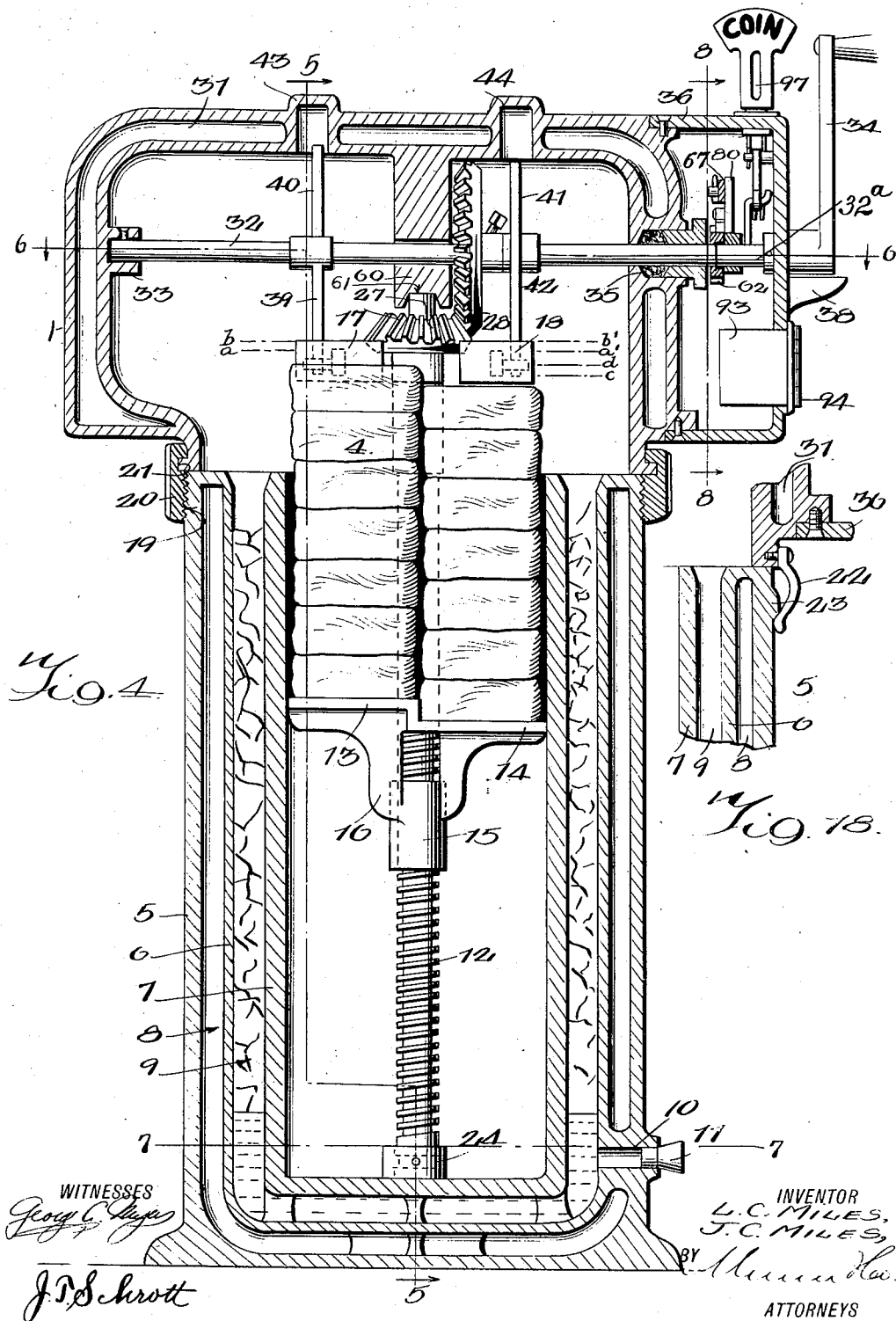
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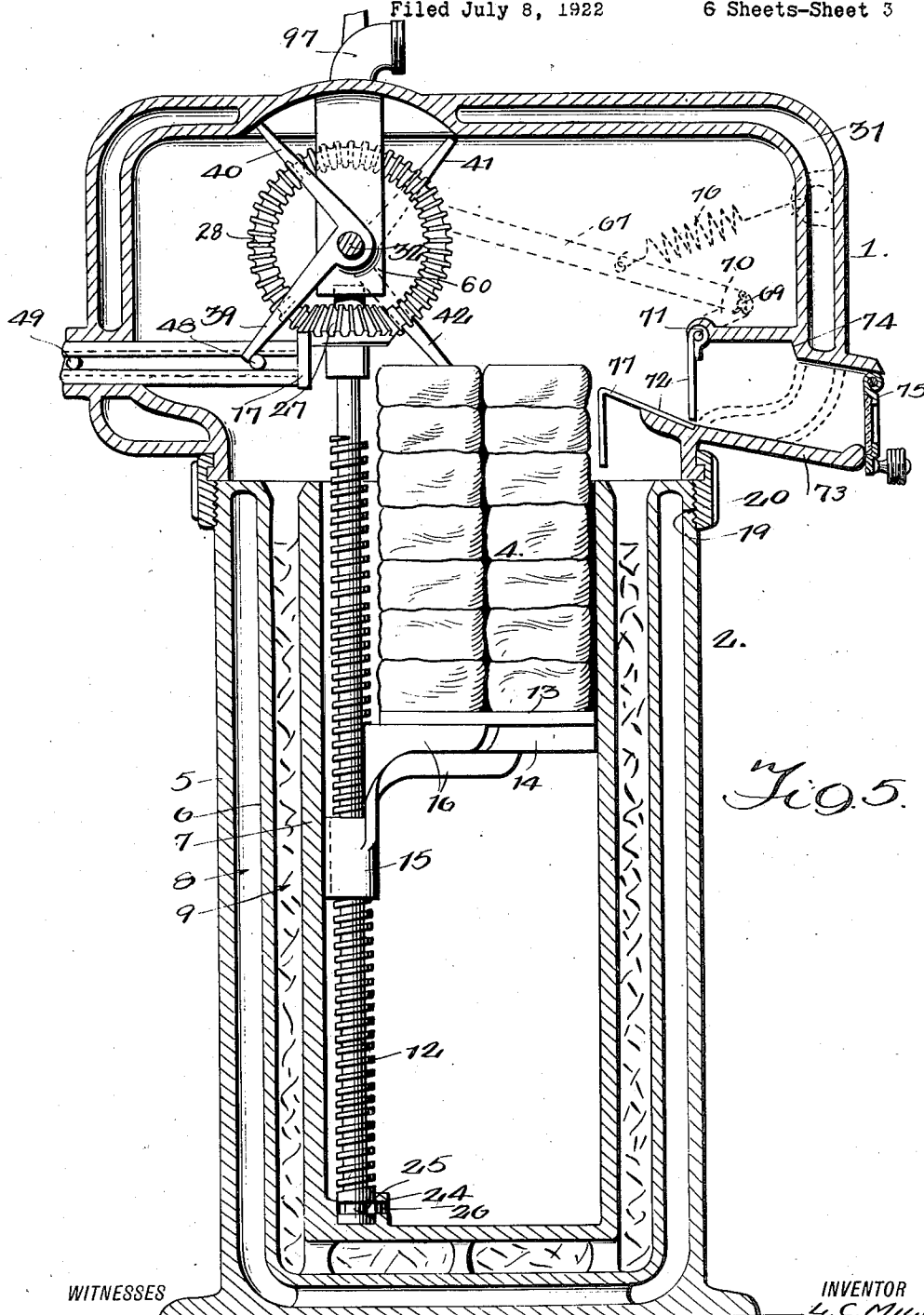


Fig. 5.

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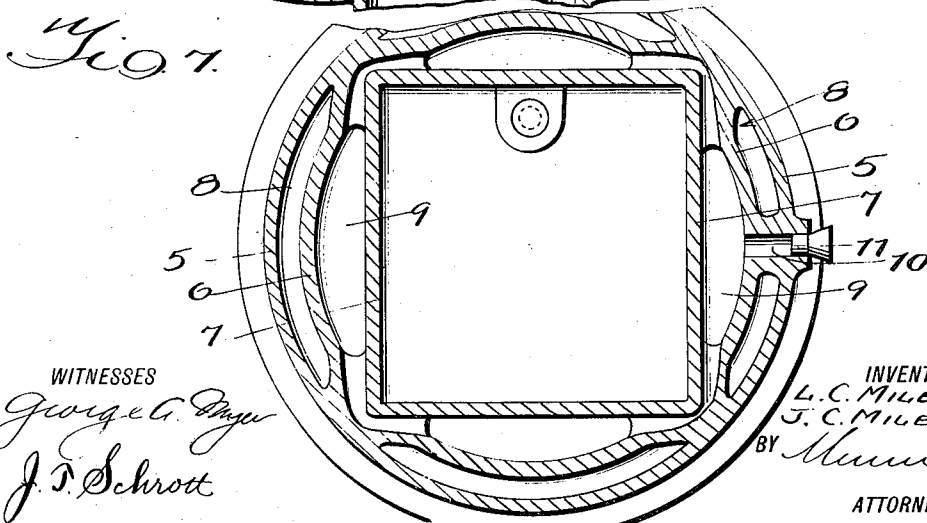
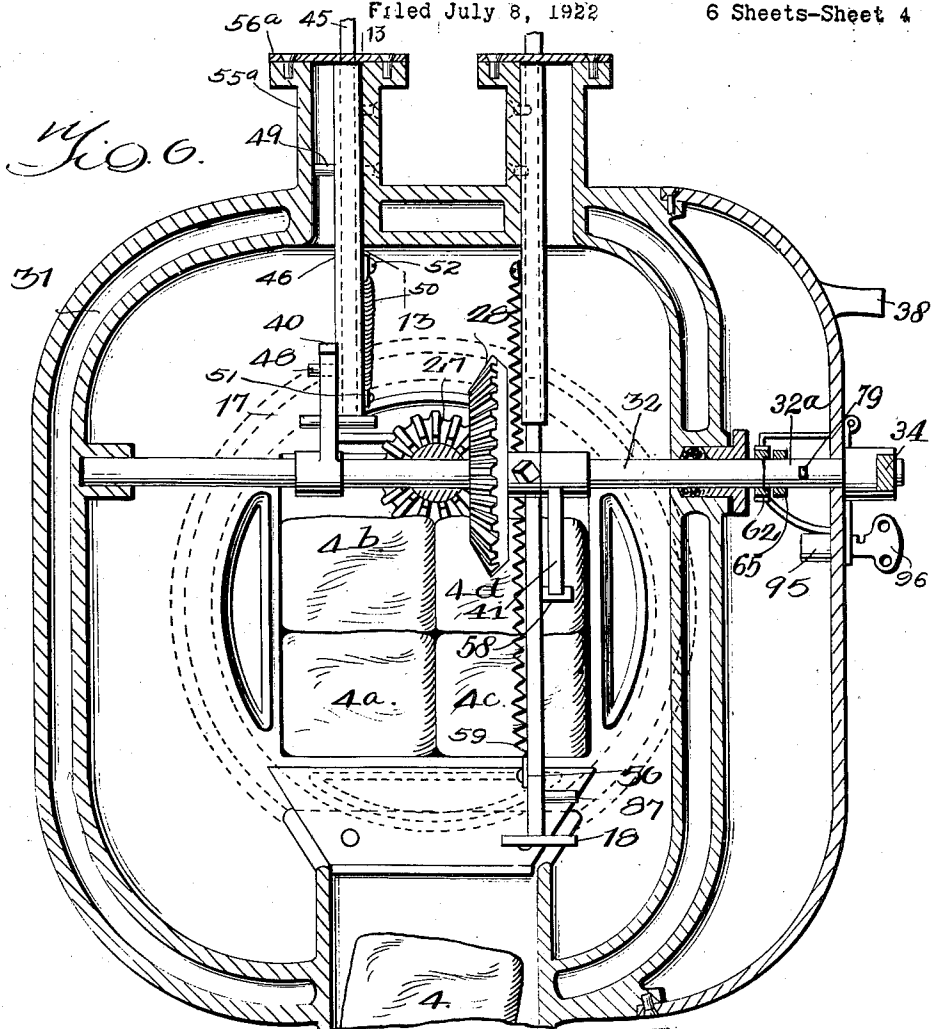
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L. C. MILES ET AL

VENDING MACHINE

Filed July 8, 1922

6 Sheets-Sheet 4



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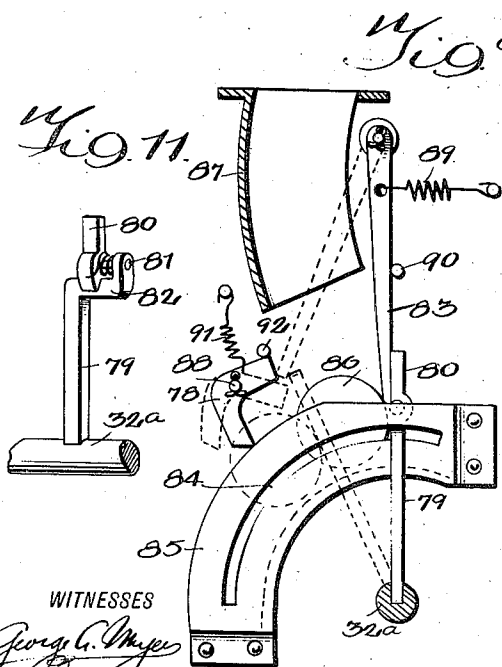
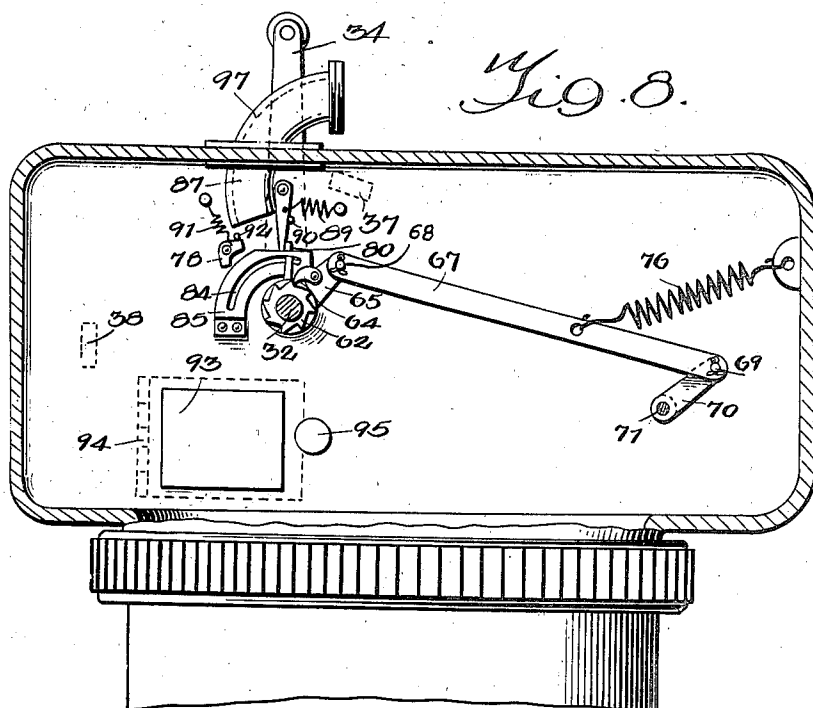
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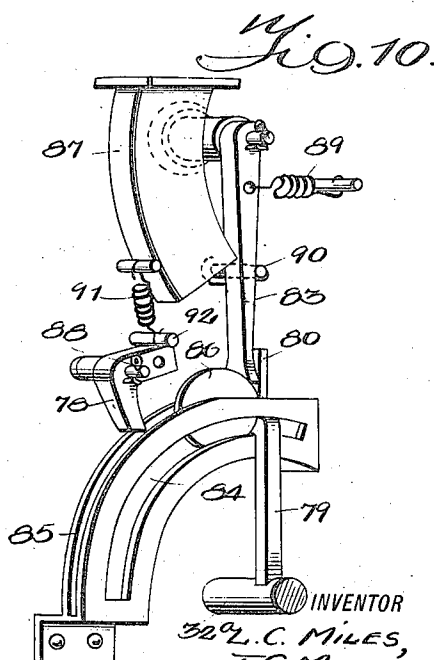
VENDING MACHINE

Filed July 8, 1922

6 Sheets-Sheet 5



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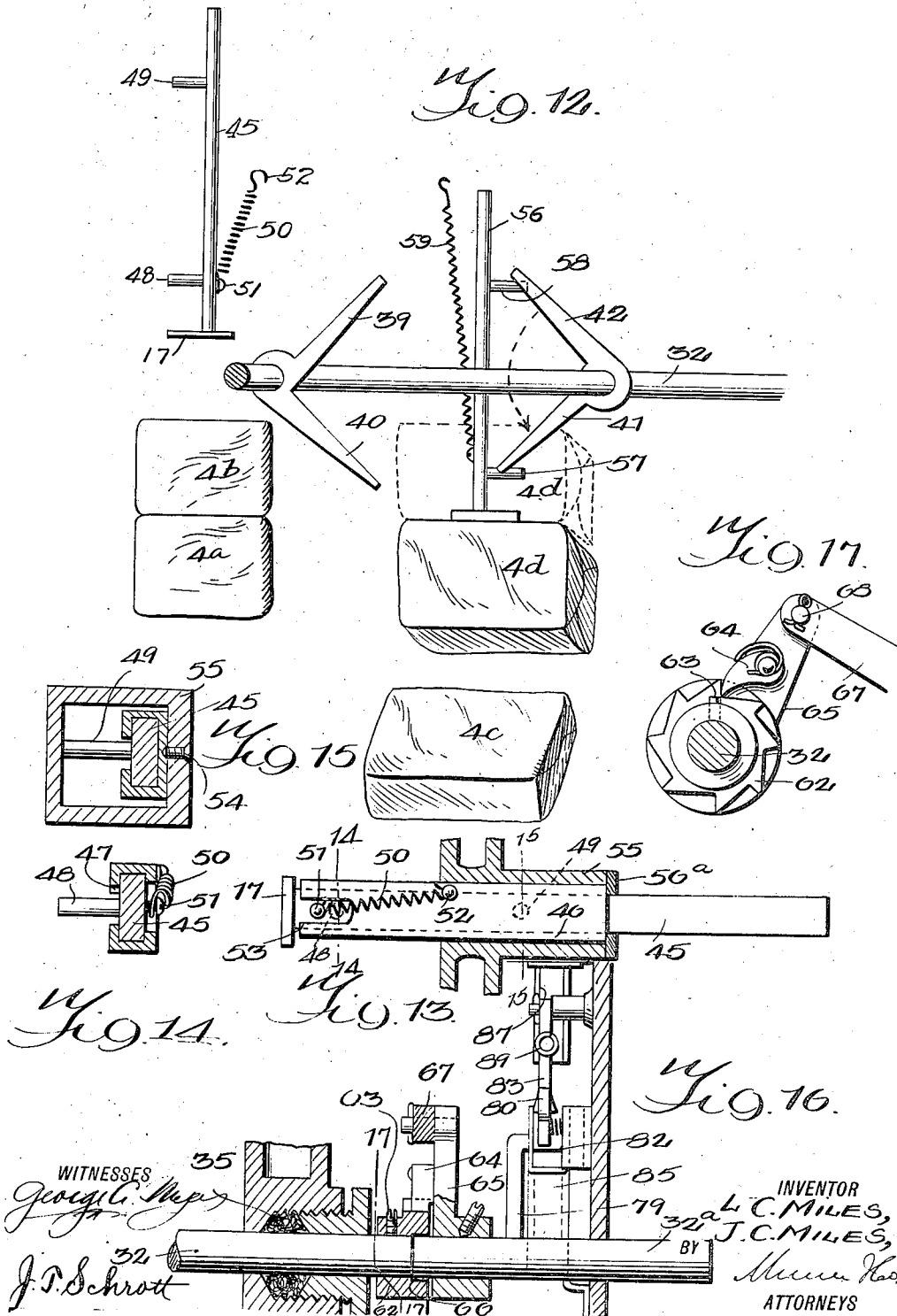
L. C. MILES ET AL

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VENDING MACHINE

Filed July 8, 1922

6 Sheets-Sheet 6



UNITED STATES PATENT OFFICE.

LEWIS CARLISLE MILES AND JOHN CARLISLE MILES, OF BOISE, IDAHO.

VENDING MACHINE.

Application filed July 8, 1922. Serial No. 573,626.

To all whom it may concern:

Be it known that we, LEWIS CARLISLE MILES and JOHN CARLISLE MILES, citizens of the United States, and residents of Boise, in the county of Ada and State of Idaho, have invented certain new and useful Improvements in Vending Machines, of which the following is a specification.

Our invention relates to improvements in vending machines and it consists in the constructions, combinations and mode of operation herein described and claimed.

An object of the invention is to provide a machine for vending perishable confections such as Eskimo pies, ice-creams, and combinations thereof, means being installed in the machine for keeping such confections in a salable state for a reasonable period of time.

A further object of the invention is to provide a machine for the purpose described comprising a vending mechanism which is intended to remain in the possession of the retailer, a container of vendable articles which is to be furnished to the retailer for attachment to the vending mechanism, and a cap to close the container during transit between the place of supply and that of the retailer.

A further object of the invention is to provide a machine for vending frozen confections through the instrumentalities of which the purchaser may wait upon himself and thereby eliminate the intermediate handling which is ordinarily required of the retailer.

A further object of the invention is to provide a machine for vending frozen confections, the shell of which is so insulated (by vacuum spaces or otherwise) to such a degree of efficiency that the container as well as the entirely assembled machine, may be shipped long distances without danger of the contents spoiling.

A further object of the invention is to provide a machine for vending not only frozen confections, as stated above, but also many other kinds of perishable articles which can be confined in package sizes.

Other objects and advantages reside in the special construction and operation of various mechanical parts as described in the following specification, reference being had to the accompanying drawings, in which:

Fig. 1 is a perspective view of the vend-

ing machine, illustrating approximately how it will appear when constructed,

Fig. 2 is a detail perspective view of the container portion of the machine,

Fig. 3 is a detail sectional perspective view of the vacuum cap which is screwed on the container to seal the contents during transit,

Fig. 4 is a longitudinal section of the vending machine,

Fig. 5 is a cross section thereof on the line 5—5 of Fig. 4,

Fig. 6 is a horizontal section taken on the line 6—6 of Fig. 4,

Fig. 7 is a detail cross section through the bottom of the container taken on the line 7—7 of Fig. 4,

Fig. 8 is a detail section of the ratchet and coin mechanism taken on the line 8—8 of Fig. 4,

Fig. 9 is a detail elevation of the coin mechanism, parts being shown in section,

Fig. 10 is a perspective view of the coin mechanism, illustrating substantially the same parts as shown in Fig. 9,

Fig. 11 is a detail perspective view of the coin lever,

Fig. 12 is a diagram illustrating the action of the pushers which displace the articles from the tops of the layers,

Fig. 13 is a detail section taken on the line 13—13 of Fig. 6 and illustrating the guide frame of one of the pushers,

Fig. 14 is a cross section on the line 14—14 of Fig. 13,

Fig. 15 is a cross section on the line 15—15 of Fig. 13,

Fig. 16 is a detail section of the ratchet and coin mechanism shown at the right in Fig. 4,

Fig. 17 is a detail cross section on the line 17—17 of Fig. 16, and

Fig. 18 (Sheet 2) is a detail section illustrating the use of spring clamps for securing the vending mechanism to the article container instead of the swivelled collar in Fig. 4.

A brief survey of the invention will aid the reader in its understanding. The machine is adapted primarily to the vending of Eskimo pies, ice-creams, and other perishable confections, but is equally well adapted to vending other articles of a wide variety whether foods or not. Three major parts constitute the invention; the vending mechanism 1, the container 2 and the cap 3.

The container 2 brings the vendable article 4 from the manufacturer to the retailer. The cap 3 is screwed onto the container to keep the contents in the desired condition during transit, and this condition is readily maintained by virtue of the fact that both the container and cap are provided with surrounding vacuum spaces which excellently insulate the contents against the passage of heat.

Upon arriving at the place of the retailer, the cap 3 is removed and the vending mechanism 1 placed in its stead, being secured there by a coupling of any approved design. The operation of the machine is such that the column of vendable articles 4 (Fig. 4) is moved up into the vending mechanism step-by-step, this method of feeding being regarded as preferable because thereby the warmest articles will always be served first, the coldest articles being those which must remain at the bottom and hence be served last.

A modification of the manner of feeding would obviously be to feed the articles into the vending mechanism 1 by gravity (reversing the arrangement in Fig. 4) but, as just stated, the upward feed is preferable because by this arrangement the natural tendency of cold air to settle at the bottom is more readily taken advantage of. The following description is divided into three subjects, representing the aforesaid major parts of the invention, taking first

The container 2, which comprises outer, intermediate and inner walls 5, 6 and 7, which respectively define vacuum and ice spaces 8 and 9 as shown in the drawings. The space 8 is necessarily a complete enclosure from which the air is exhausted by any suitable means, in order to leave a vacuum for the purpose of insulating the vendable articles 4 against the absorption of heat from the outside. Although the vacuum space is doubtless the most efficient as an insulating medium, it may be stated that other insulating means, such as packings, etc., may be employed if desired. Both the vacuum and ice spaces are carried beneath the bottom of the inner container 7, but the use or non-use of this particular feature is optional.

An outlet 10 enables the draining of water from the ice space 9, a plug 11 being used to close the opening. The purpose of the space 9 is to enable packing the container with ice at such time when it is doubtful that the articles 4 are sufficiently cold to keep over a relatively long period of time. Under ordinary conditions, as when the articles 4 have a quick sale, the ice packing will be unnecessary because the articles are put into the container in a chilled state and the vacuum space will act to keep them so for a reasonable time.

Inside of the container 2 there is a square-threaded elevating screw 12 which carries the platforms 13-14 through the medium of the elevating hub 15. Suitable bracing means 16 supports the platform on the hub. The part 13 of the platform is one-half the thickness of the article 4 higher than the part 14, this arrangement being necessary for the contemplated operation of the pushers 17 and 18 of the vending mechanism 1.

Screw threads 19 at the top of the container 2, enable securing the vending mechanism in place by means of a similarly threaded coupling collar 20 which is peripherally serrated to facilitate manipulation. This collar is swivelled on the vending mechanism at 21. The mode of connecting the vending mechanism and container is not necessarily confined to the use of a coupling collar. Spring clamps 22 (Fig. 18) may be used instead, and in this instance a peripheral rib 23 on the container 2 (in place of the threads) furnishes a place for the spring clamps to grip and so hold the two parts firmly together.

The lower end of the elevating screw 12 rests in a bearing 24 on the bottom of the container, this bearing both fixing the position of the screw and furnishing a resting place for it during operation. It is to be observed in Fig. 5 that the lower end of the screw has an annular groove 25 in registration with a threaded opening 26 in the bearing. A screw may be inserted in this opening to enter the groove and thus provide a swivel mounting for the screw, but it will probably be desirable to omit the screw and merely depend on the bearing 24 to hold the elevating screw 12 in place.

The upper end of the elevating screw 12 extends slightly beyond the top edge of the container 2, thereby projecting a sufficient distance into the vending mechanism 1 to effect the engagement of the pinion 27 (on the screw) with the gear 28. This gear is adapted to be revolved in approximately quarter turns, and in doing so, turns the pinion 27 and elevating screw 12 to raise the platform 13, 14 a little at a time and so bring the articles 4 into position to be discharged from the machine.

The cap 3 is deep enough to enclose the extending part of the elevating screw 12 when fitted in place on the container 2. Little else can be said of the cap 3 (Fig. 3) than that it too has a vacuum space 29 to correspond with the vacuum space 8 of the container, and threads 30 to engage the threads 19 of the container. When fitted in place for transit, the cap 3 completes a vacuum space around the vendable article.

The vending mechanism 1 is surrounded by a vacuum space 31 only in so far as the pushers 17 and 18 and the directly associated mechanism is concerned, this arrange-

ment providing a substantial continuation of the vacuum space 8 of the container 2 when the vending mechanism is fitted in place by means of the coupling collar 20 mentioned before. A shaft 32 extends cross-wise of the vending mechanism, resting in a bearing 33 at the inner end and having an operating crank 34 on the outer end. That portion of the shaft 32 adjacent to the crank 34 passes through a stuffing box 35 in the vacuum-spaced wall and then through a chamber defined by a cover 36 containing the ratchet and coin devices. The crank 34 operates between back and front stops 37 and 38 (Fig. 8), and when the crank is pushed toward the stop 38 (assuming a coin to have been inserted) the gear 28 will move a quarter-turn, partially rotate the pinion 27 and screw 12, slightly elevate the platform 13, 14 and cause each of the pusher arms 39, 40 and 41, 42 to turn a distance of 90 degrees, corresponding to the quarter turn of the crank shaft 32 and of the gear 28.

The pusher arms are arranged in pairs and are so disposed on the crank shaft 32 that the individual arms are 90 degrees apart. The arms 39 and 40 operate the pusher 17 twice before the other set of arms has moved around into position to operate the pusher 18, whereupon the pusher 18 is also operated twice. By the time that the arms 41 and 42 have accomplished the double operation of the pusher 18, the arms 39 and 40 will again have come into position to operate the pusher 17 as stated before. According to this mode of operation, the vendable articles are displaced from the top of the four layers in this order; 4^a first, 4^b second, 4^c third and 4^d last (Figs. 6 and 12).

Domes 43 and 44 make room for the passage of the respective pairs of arms. The pusher 17 is carried by a pusher bar 45 (Fig. 13) which is mounted in a rectangular sleeve 46. This sleeve has a slot 47 on one side for the passage of pins 48 and 49 with which the arms 39 and 40 cooperate in pushing the articles 4^a and 4^b off (Fig. 12).

A spring 50 tends to hold the pusher 17 in a retracted position against the end of the sleeve 46. One end of this spring is fastened at 51 to the pusher bar 45, the other end being fastened at 52 to the sleeve 46. The adjacent side of the sleeve has a slotted opening 53 (Fig. 13) to enable reaching the pusher bar by the fastening 51. The sleeve is secured at 54 (Fig. 15) in a rearward extension 55 of the vending mechanism casing this extension being ample enough to admit the rearward pin 49 when the pusher 17 is in the retracted position.

While the drawing shows a cover plate 56^a closing the exposed end of the extension 55 and also shows the pusher bar 45 extending through the cover plate, it would obvi-

ously be desirable to enclose the pusher bar so that no part of the mechanism be exposed. As the drawing is intended largely for the purpose of illustration, the showing made is deemed sufficient. An arrangement identical with that described for the pusher 17 is made for the pusher 18, the bar 56 of which has pins 57 and 58 to be engaged by the arms 41 and 42 at the proper time. A spring 59, connected like the spring 50, serves to retract the pusher 18 when the second pin 58 has been disengaged by the arm 42 after the last article 4^d has been pushed off.

A centering bearing 60 is intended to stabilize the upper end of the elevator screw 12 when the whole machine is assembled. Each container of vendable articles must carry its own elevator screw 12 and pinion 27 because it would be impracticable and undesirable to require the vendor to insert an elevator screw into the hub 15 of the elevator platform each time that he finds it necessary to replace a container then in use under his vending mechanism. As the depression 61 of the bearing 60 is shallow and flaring, it will be an easy matter for the vendor to find the position for the upper end of the elevator screw when fitting the vending mechanism on the container.

The ratchet device, referred to above, consists of a ratchet wheel 62 fixed at 63 (Fig. 16) on the end of the crank shaft 32, and a pawl 64 carried by an arm 65 on the extension 32^a of the crank shaft. As it is necessary that the crank shaft 32 rotate in one direction only and the crank 34 move back and forth alternately, it in turn becomes necessary to provide the ratchet device just described. The ratchet 62 extends sufficiently far beyond the end of the shaft 32 to provide a recess 66 to receive the inner end of the extension 32^a and form a supporting bearing therefor.

A link 67 is pivotally connected at 68 to the upper end of the pawl arm 65 and at the other end is connected at 69 to an arm 70 at one end of a rod 71 which carries the trap door 72 (Fig. 5). This trap door constitutes the inner closure of a chute 73 into which the articles 4 are discharged by the two pushers. The door 72 opens into a recess 74 in the roof of the chute (Fig. 5).

Upon moving the crank 34 rearwardly toward the front stop 38, the shaft 32 is correspondingly rotated by means of the pawl 64 and ratchet 62, this rotation of the shaft causing the operation of a pusher to discharge one of the articles, the same operation moving the link 67 toward the left (Fig. 5) and rocking the trap door 72 upwardly into the recess 74 so as to make way for the discharged article. A glass-panelled door 75 closes the mouth of the chute so as

to prevent the entrance of dust, and in a measure aid in keeping warm air out. The purchaser must raise the door 75 in order to secure the article which has been deposited in the chute 73.

A spring 76, connected between the link 67 and an adjacent wall of the casing (Figs. 5 and 8) serve to return the crank 34 against the back stop 37, and the trap door 72 against the bottom of the floor plate 77 (Fig. 5) which leads into the chute. Rearward movement of the crank 34 is not possible unless a coin of the proper denomination be inserted into the coin mechanism, whereupon it becomes (for the time being) a part of that mechanism in displacing the pawl 78 (Fig. 9) which would otherwise prevent a full movement of the crank.

The coin mechanism comprises a lever 79 with a dog 80 pivotally mounted at 81 on the angularly bent end 82. This dog is rigid on the movement of the crank 34 in one direction but capable of yielding on the return movement, this for the purpose of passing the auxiliary lever 83.

The horizontally angled portion 82 of the coin lever 79 moves in the arcuate slot 84 of the coin trough 85 into which the coin 86 falls upon being inserted into the chute 87. The coin falls into position in front of the lower end of the auxiliary lever 83 and thereupon moving the crank 34 rearwardly, the coin lever 79 pushes the auxiliary lever 83 (through dog 80) and the coin 86 toward the pawl 78, and since the coin precedes both levers, the pawl is forced to rock on its pivotal mounting 88 into such a position (see dotted lines) that when it is engaged by the dog of the coin lever further movement of the latter will simply continue the rocking of the pawl and let the coin lever 79 by.

A spring 89 pulls the auxiliary lever 83 back against a stop 90 and, similarly, a spring 91 pulls the pawl 78 back against a stop 92. One side of the chute 87 is open (as shown) to allow for the swinging of the auxiliary lever 83 and the upper end of the coin trough 85 is also opened so as to allow for the operation of the dog 80 which, with the coin lever 79 describes approximately a ninety degree arc of a circle.

A coin receptacle 93 is located beneath the trough 85 to catch the coins as they fall. This receptacle is hinged at 94 and is fastened by means of a lock 95 and key 96 (Fig. 6). Upon desiring to empty the coin receptacle, the vendor has only to undo the lock and swing it outwardly on its hinges whereupon the coins may be removed.

The operation may be briefly reviewed to advantage. The purchaser inserts a coin of the proper denomination in the exposed portion 97 of the chute 87 (Figs. 8 and 9).

The coin falls into position in the trough 85 in front of the auxiliary lever 83 and coin lever 79. Upon moving the crank 34 rearwardly (counter-clockwise, Figs. 8 and 9) the pawl 78 is caused to rock into the dotted line position which is such a position as will allow the dog 80 of the coin lever to pass. The crank 34 may be moved the entire 90 degrees or one-quarter circle required to displace one of the articles 4.

The movement of the crank 34 is transmitted to the shaft 32 by means of the ratchet and pawl devices 62, 64 described in connection with Fig. 16. Let the reader imagine the pusher mechanism to be two steps behind the position shown in Fig. 5 so that the position in diagrammatic Fig. 12 is assumed. A prior operation of the crank 34 caused the pusher arm 41 to engage the pin 57, move the pusher bar 56 forwardly and cause the pusher 18 to shove the last article 4^d over into the place of the article 4^c and thereby cause the article 4^c to fall into the chute 73 (Fig. 5). This having been accomplished, the arm 41 disengages the pin 57 and the last pusher arm 42 comes into engagement with the pin 58.

The next operation of the crank 34 will cause the pusher arm 42 to move the pusher 18 the rest of the way and displace the last article 4^d in a manner precisely as before. The completion of this last movement brings the respective pusher arms into the positions indicated in Fig. 5, at which time the pusher arm 39 is in engagement with the pin 48 in readiness to actuate the pusher 17 and displace the articles in the order previously described and indicated by the characters 4^a, 4^b, 4^c and 4^d. The pusher arms 39, 40 first displace the uppermost articles from the layers on the adjacent side of the machine, whereupon the pusher arms 41, 42 follow by displacing the uppermost articles on the two layers on that side of the machine. The action of the pairs of pusher arms therefore alternates between the double layers of articles and it would seem but an obvious step to increase the number of pairs of arms for vending articles from larger machines, and reduce the number of arms for more simply arranged machines.

Mention has been made above of the side 13 of the platform being one-half the thickness of the article 4 higher than the side 14. This arrangement is necessary to compensate for the action of the pushers 17 and 18. The platform is slightly elevated with each partial turn of the elevator screw 12, the degrees of elevation being approximately of the dimensions indicated by the dot and dash lines in Fig. 4, these being indicated *a*, *b*, *c*, *d*, *a'* and *b'*.

Assuming the parts (including the articles 4) to be in the position in Fig. 5, a

movement of the crank 34 (as in performing the vending operation) will result in elevating the layers of articles 4 a distance equalling that between the dot and dash lines so that the top of the highest layer (left in Fig. 4) will approximately reach the line *a*, at which position the first article 4^a will be pushed off. The following vending movement of the crank 34 will elevate the article 4^b to the line *b*, the articles 4^c and 4^a in the meanwhile having been elevated first to the position *c*, then to the position *d*.

A subsequent vending operation of the crank 34 will elevate the layers of articles at the right (now the highest) to the line *a'*, at which time the article 4^c is pushed off, and the next operation of the crank will elevate the remaining article 4^a to the line *b'*, at which it too is pushed off. The articles in the layers at the left are now highest and the former proceeding is repeated.

The action of the coin mechanism is doubtless clear enough but the above description in connection with Fig. 9 may be supplemented by describing the action when no coin is inserted and an attempt be made to obtain one of the articles 4. It would require but a short turn of the crank 34 to move the auxiliary lever 83 against the adjacent heel of the pawl 78 by means of the dog 80 of the lever 79 which normally engages in back of the auxiliary lever. At such a time (dotted lines Fig. 9) the end of the auxiliary lever interposes an obstacle to the further movement of the coin lever 79, the pawl 78 being unable to move because the pressure is applied to the heel at a point slightly above the pivot 88 and in the direction of the stop 92. However, the insertion of a coin and the subsequent pulling of the crank 34, causes the displacement of the pawl so that the aforesaid heel moves downwardly in front of the dog 80 while the auxiliary lever 83 is moved aside out of range of the end of the coin lever, thus letting the coin lever pass and permitting the operation of the machine.

Instead of providing guides for the platform 13, 14 in the compartment 7 of the container, this compartment is made of a rectangular shape (Figs. 6 and 7), thereby serving the purpose of a guide both for the platform and for the layers of articles upon it. Figs. 1 and 2 illustrate the use of a thermometer 98 to indicate the temperature of the vacuum space 8, and in actual practice some means will be provided for indicating the quantity of vendable articles remaining in the container.

While the construction and arrangement of the improved vending machine as herein described and claimed, is that of a generally

preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

We claim:—

1. A vending machine comprising means to contain the vendable articles, means to cover the container during transit to the vendor, and vending mechanism adapted to be installed on top of the container which then acts as a base in place of said cover so that said articles may be vended therefrom.

2. A vending machine comprising means to contain the vendable articles, a cover for the container to preserve the contents during transit to the vendor, vending mechanism to replace the cover so that said articles may be vended, and means to secure the vending mechanism upon the container.

3. A vending machine comprising means to contain vendable articles, means to cover the container to protect the contents during transit to the vendor, means by which said cover is secured on the container, vending mechanism in the possession of the vendor adapted to replace the cover so that the articles may be vended, and means carried by the vending mechanism and adapted to engage the securing means formerly employed by the cover to hold the vending mechanism in place.

4. A vending machine comprising a container of vendable articles, means in said container by which said articles are supported, a vending mechanism, means by which said mechanism is secured in place on top of the container to receive said articles, and instrumentalities associated both with the container and the vending mechanism to move said supporting means and feed said articles from the container upward into the vending mechanism.

5. A vending machine comprising a container of vendable articles, means conveyed with the container supporting said articles therein in a column, a vending mechanism, means by which the vending mechanism is affixed to the container when the latter reaches the vendor, and instrumentalities associated both with the container and the vending mechanism for intermittently moving the supporting means and thus advancing the column of articles toward the vending mechanism step by step.

6. A vending machine comprising a container of vendable articles, means to support said articles in a column, and means to move said supporting means and column of articles, the aforesaid elements constituting one unit; vending mechanism comprising means adapted to engage said support-moving means and advance the column of articles toward the vending mech-

anism, said mechanism constituting the second unit, and means for securing the vending unit upon each of a plurality of containers accordingly as the contents are exhausted.

7. A vending machine comprising a container, means upon which a column of vendable articles is supported within the container, and means carrying the supporting means and having an engageable element, the aforesaid elements constituting one unit; a vending mechanism including means to engage said engageable element when said mechanism is fitted in place on the container, means to operate said engaging parts and thereby to advance the supporting means and column of articles toward the vending mechanism, means to displace the articles from the column one at a time, the aforesaid elements constituting the second unit; and means to secure the vending unit upon each of a plurality of containers to thereby vend the articles until the containers are exhausted.

8. A vending machine comprising a container with advancing means carrying means to support articles to be vended, said container constituting one unit; and a vending mechanism constituting the second unit and adapted to be fitted in operative position upon the first unit and others like it, having means to periodically actuate said advancing means, and means to displace the vendable articles as the supporting means is advanced toward the vending mechanism step by step.

9. A vending machine comprising a container having revoluble advancing means carrying means which support a plurality of vendable articles and constituting one unit; and a vending mechanism constituting the second unit and adapted to be fitted upon the individuals of a plurality of container units for the vending of the articles, having a member to operatively engage said revoluble advancing means when the vending mechanism is fitted in place, means to actuate said member periodically to correspondingly advance the supporting means toward the vending mechanism, and means operatively associated with said actuating means to displace an article at each actuation.

10. A vending machine constituting three units; first, a container of vendable articles having accessible means whereby they are projected out of the container, second, vending mechanism having means to secure it in place upon each of a plurality of container units to vend the contents, means then engaging said accessible means, means to actuate said engaging means to advance the articles into the vending mechanism, and means carried by said actuating means to

displace the articles one at a time, and, third, a cover occupying said securing place on the container during transit to the vendor, being then adapted to be displaced by said vending unit.

11. A vending machine constituting three units; first, a container of vendable articles, having means embodied therein to insulate the contents against the passage of heat, second, vending mechanism adapted to be fitted in place upon and into communication with the interior of the container for the vending of the articles, also embodying means to prevent the passage of heat to the interior, and third, a cover to close the container during transit to the place where the vending unit is to be affixed, also embodying means to prevent the passage of heat to the interior of the container.

12. A vending machine constituting three units; first, a container of vendable articles open at one end for the packing and removal of said articles and having a suitably disposed surrounding vacuum space, second, vending mechanism adapted to be placed over and in communication with said open end for the removal of said articles, and having a surrounding vacuum space to thereby insulate the entire machine when in operation, and, third, a cover for the open end of the container during transit also having a surrounding vacuum space.

13. A vending machine comprising a container of vendable articles and adapted to serve as a stand, a vending mechanism adapted to surmount the container, movable means by which the articles are supported within the containers, means forming part of the vending mechanism for actuating said movable means to feed the articles into the vending mechanism, and associated means for displacing an article at each movement.

14. A vending machine comprising a container of vendable articles, movable means supporting the articles within the container and adjoining parts of the container to be guided thereby, moving means adapted to move the supporting means, a vending mechanism adapted to surmount the container, a manually partially revoluble shaft with means to then engage said moving means to shift the supporting means a predetermined distance with each operation of the shaft, and means associated with the shaft to push off one of the articles with each moving operation.

15. A vending machine comprising means which contains a quantity of vendable articles, mechanism by which said articles are bodily projected out of the container, a casing adapted to be fitted over the open end of said container means, and vending mechanism adapted to periodically actuate

said projecting mechanism to move said articles toward the interior of the casing and displace them to one side one by one.

16. A vending machine comprising a container of vendable articles, means supporting a column of said articles and being guided by adjacent parts of the container, a screw carrying the supporting means and having a swivel mounting in the container, means carried by the screw at the exposed end adapted to revolve the screw, vending mechanism adapted to be fitted over the open end of the container, a shaft carried by the vending mechanism having revolving means to then engage said revoluble means, means to partially revolve the shaft at each vending operation to thereby advance the column of articles into the vending mechanism a predetermined amount, and a pusher apparatus then actuated by the shaft to displace one of the articles from said column.

17. A vending machine comprising a container having means for advancing and supporting a double column of vendable articles, a vending mechanism adapted to be fitted over the open end of the container, a shaft carried by the vending mechanism having means to then engage and actuate the advancing means a predetermined amount with each vending operation of the shaft to correspondingly advance the double column into the vending mechanism, and a pusher apparatus actuated with each operation of the shaft to push the uppermost articles on the double column causing one article to fall off on a first operation and the second article to fall off on the next operation.

18. A vending machine comprising a container having means for advancing and supporting a double column of vendable articles, a vending mechanism adapted to be fitted over the open end of the container, a shaft carried by the vending mechanism having means to then engage and actuate the advancing means a predetermined amount with each vending operation of the shaft to correspondingly advance the double column into the vending mechanism, a pusher apparatus actuated with each operation of the shaft to push the uppermost articles on the double column causing one article to fall off on a first operation and the second article to fall off on the next operation, and a chute to receive the articles having a trap door actuated each time by the shaft to let the articles pass through.

19. A vending machine comprising a container of vendable articles, an advancing screw occupying a position at one side of the article chamber and having an exposed end at the open end of the chamber, means which is movable along the screw to sup-

port the articles and being guided by the adjacent walls of the container, a vending mechanism to be fitted over the open end of the container, intermittently and partially revoluble means adapted to then engage the exposed end of the screw for the advancement of the articles into the vending mechanism a predetermined amount, and means associated with said revoluble means for displacing one of the articles at each advancement.

20. A vending mechanism comprising a container of vendable articles, a screw occupying a position at one side of the article chamber having the bottom end swivelly mounted and the other end projecting out of the opening of said chamber, a pinion carried by said end of the screw, a platform movable on the screw, guided in the article chamber and carrying said articles; vending mechanism to be fitted in place over the open end of the chamber, a partially and intermittently revoluble shaft having a gear to then engage said pinion for the advancement of the platform and said articles toward the vending mechanism, a pusher for displacing the top articles, and means carried by the shaft for actuating the pusher at each vending operation.

21. A vending machine comprising a container of vendable articles and means adapted to project said articles out of the container, vending mechanism into which the articles are adapted to be projected, intermittently and partially revoluble means to operate said projecting means, a pusher operating across the tops of said projected articles, and means on said revoluble means to impart a succession of impulses to said pusher for the individual displacement of a plurality of articles then in position.

22. A vending machine comprising a container of vendable articles, means for supporting said articles, a feed screw carrying the supporting means swivelly mounted on the bottom of the container and having the upper end loose at the open end of the container, vending mechanism adapted to be fitted over the open end of the container, means embodied therein to receive and stabilize the loose end of the screw, manually operated means to intermittently and partially revolve the screw to feed the articles into the vending mechanism a predetermined distance at a time, and a pusher device actuated with each operation of the manual means to displace single articles from the top.

23. In a vending machine, a container having a feed screw swivelled at one end and loose at the other, an article support carried by the screw, a vending mechanism adapted to be fitted in position on the container, means in the vending mechanism to

receive the loose end and stabilize the feed screw, and means associated with said receiving means to operate the feed screw and move the article support.

24. A vending machine comprising a container of vendable articles, a feed screw carrying supporting means of several columns of said articles, vending mechanism adapted to be fitted in place upon the container, an intermittently manually operated shaft with means to revolve said feed screw and advance said article columns at distances equal to fractions of the depth of one of the articles, a pusher disposed to operate transversely of said columns, and means carried by the shaft adapted to impart an impulse to the pusher at each fractional advancement of said columns and accordingly displace the uppermost layer in position to be displaced.

25. In a vending machine, means to push off the uppermost layers from a plurality of columns of vendable articles, spaced pins carried by the pusher equal in number to the columns, arms equal in numbers to the pins, means to move the respective arms into engagement with the pins in succession to advance the pusher, and means drawing back on the pusher to keep the respective pins and arms in engagement until a succeeding advancing operation.

26. A vending machine comprising a container of vendable articles, a vending mechanism occupying a position over the open end of the container, means to feed the articles from the container into the vending mechanism, a guide frame situated in the casing of said mechanism, a pusher mounted to move on said frame, means included in said mechanism to move the pusher and displace an article, and means associated with the pusher to be engaged by said pushing means to actuate the pusher.

27. In a vending machine, a vending mechanism having a guide frame with a slotted side, a pusher having a bar mounted to slide in said frame, a plurality of spaced pins projecting from the bar through said slot, a revoluble shaft having an equal plurality of pusher arms adapted to successively engage the respective pins to accordingly advance the pusher with each operation, and a spring normally holding the pusher against the guide frame before the operation of the arms commences, and subsequently hold the pins in engagement with the respective arms.

28. In a vending machine, a vending mechanism having a pair of pushers each being carried by a bar, a pin projecting from each bar, means to extend one bar and pusher to the limit of a predetermined movement, similar means to extend the other bar and pusher to the limit of a predetermined

movement, and means to then return the first pusher to the original position.

29. In a vending machine, a vending mechanism having a plurality of pushers each carried by a pusher bar, a pin projecting from each bar, independent means adapted to engage the pins and successively move the pushers and bars to the limit of a predetermined movement, and means associated with each bar to draw the pusher back to the original position after said limit of movement has been reached and the adjacent pusher has been moved to the limit of its movement.

30. In a vending machine, a vending mechanism including a pair of pushers each carried by a pusher arm, a pair of pins projecting from each arm, a revoluble shaft, a pair of pusher arms associated with one pusher and adapted to successively engage the pins to advance said pusher to the limit of a predetermined movement, a pair of similar pusher arms associated with the other pusher so disposed on the shaft as to begin advancing the other pusher when the other pusher has reached the limit of its movement, and means associated with each pusher bar to draw it back from the limit of advancement when the other pusher begins its advancing movement.

31. In a vending machine, a vending mechanism including a pusher for displacing a vendable article, means adapted to advance the pusher, means to actuate the pusher-advancing means in one direction, a chute to receive the displaced article, a trap door closing the chute, means by which the door is opened by the operation of the actuating means in one direction, and means to simultaneously close the door and return the actuating means for a succeeding operation.

32. In a vending machine, a vending mechanism including a pusher for displacing a vendable article, a shaft with an arm to engage a finger carried by a bar on which the pusher is mounted, a shaft section having connecting means by which the shaft is partially rotated in one direction, a chute into which the displaced article falls, a trap door closing the chute, a connection between the door and said shaft section to open the door as said section is rotated, and means to return said shaft section when released and to close the trap door.

33. A vending machine comprising a container of vendable articles, a vending mechanism surmounting the container, pushers included in said mechanism and adapted to displace said articles, a shaft having arms to successively actuate the pushers, a shaft section with connecting means for operating the shaft in one direction, and coin-controlled means for locking said shaft normally preventing the operation of said shaft

section but releasing said section for operation upon the insertion of a coin.

34. In a vending machine, a pair of pushers for displacing the upper layers of a plurality of columns of vendable articles, turnable means carrying individual sets of arms to actuate each pusher, said arms being placed on the turnable means so that one set imparts pushing impulses to one pusher

equal to the number of articles to be displaced on that side, whereupon the other set imparts pushing impulses to the other pusher equal to the number of articles to be displaced on the other side, said impulses commencing when the first pusher has reached the end of its movement.

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