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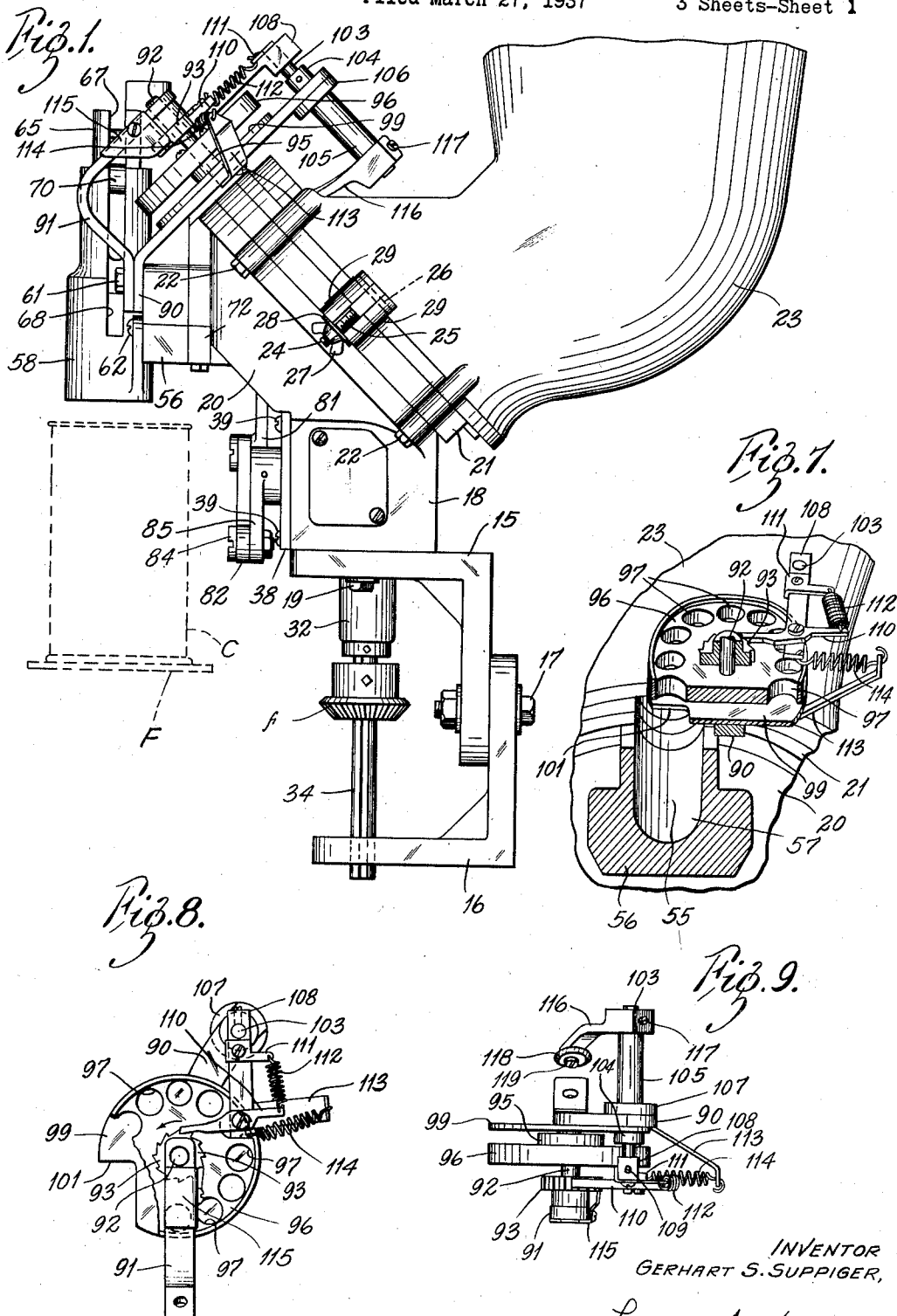
G. S. SUPPIGER

2,198,137

TABLET DEPOSITING MACHINE

Filed March 27, 1937

3 Sheets-Sheet 1



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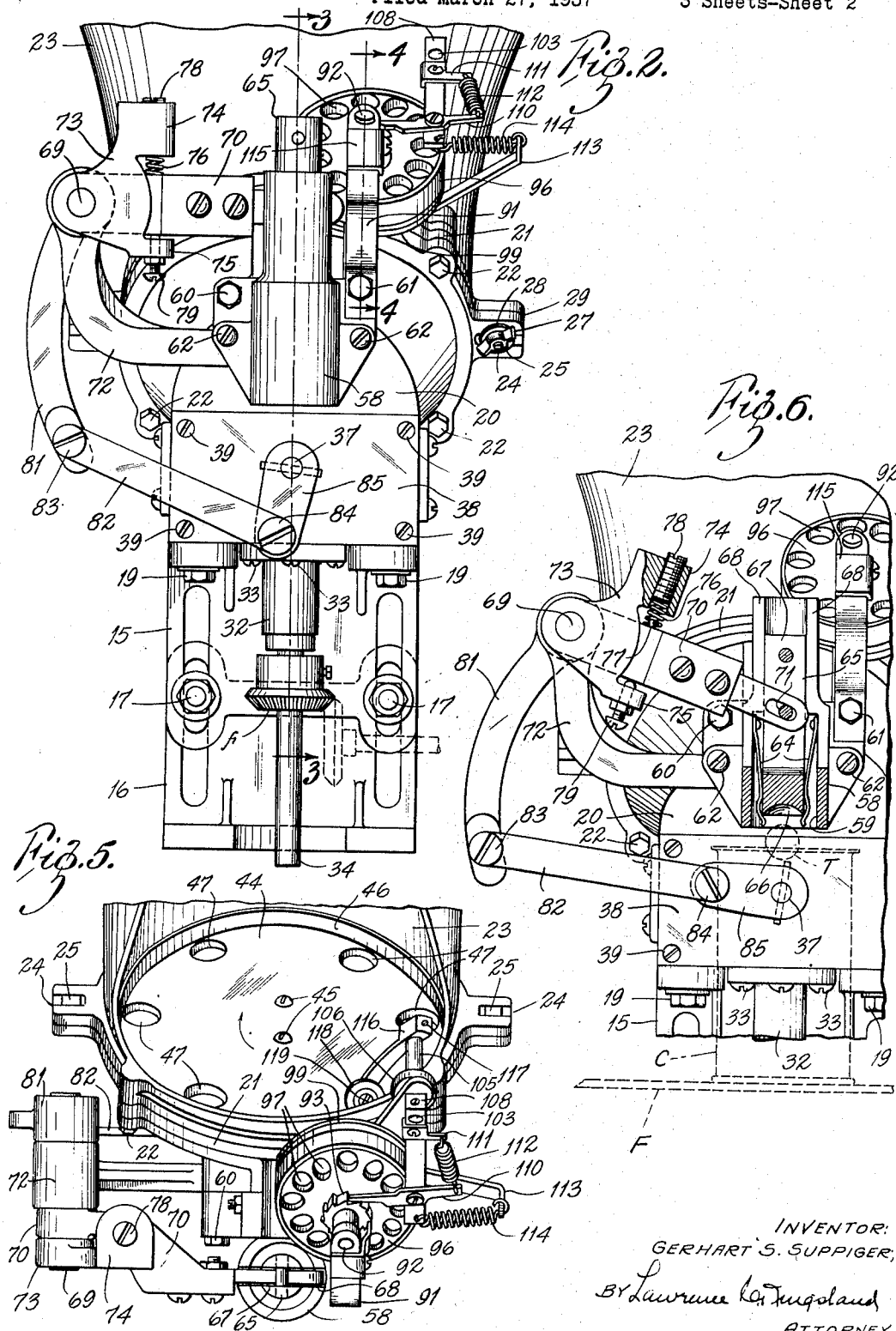
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3 Sheets-Sheet 2



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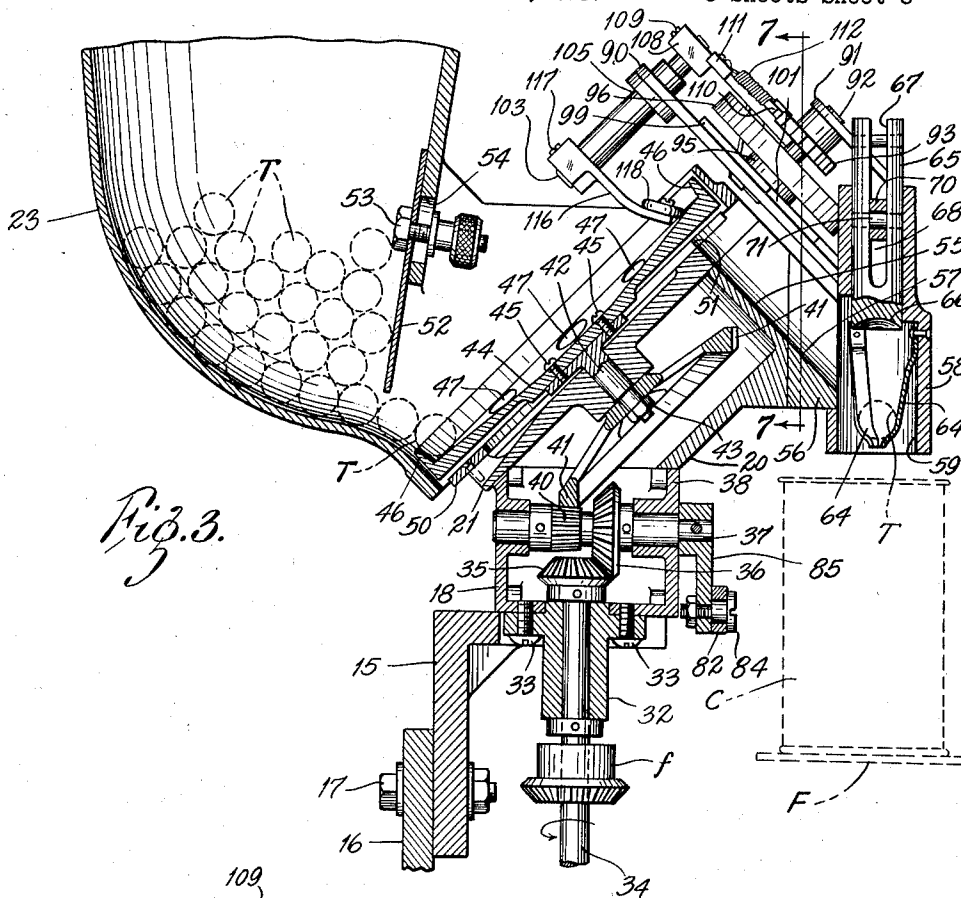
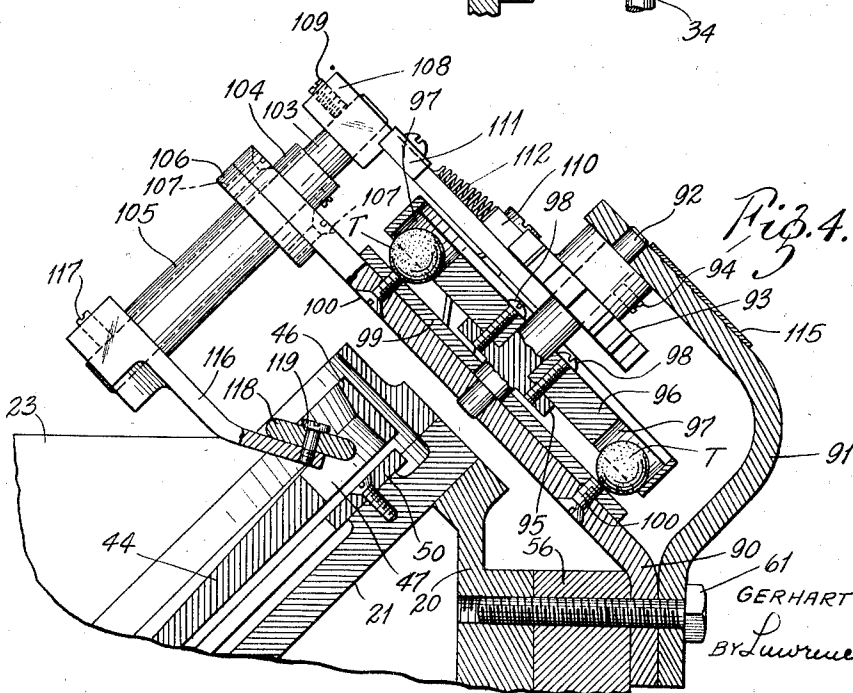
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TABLET DEPOSITING MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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TABLET DEPOSITING MACHINE

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Application March 27, 1937, Serial No. 133,351

12 Claims. (Cl. 226—2)

The present invention has to do with a machine for depositing tablets in specified numbers into receptacles. It has particular reference to a machine of this kind for depositing tablets of salt or seasoning into cans of food being preserved, although as is entirely obvious, the mechanism is not limited to this specific use.

This machine is an improvement on the machine of Letters Patent No. 2,060,645, issued November 10, 1936, of which Letters Patent I was a co-inventor.

In machines of this type, a hopper is provided, at the discharge end of which there is located a separator plate. This plate divides from the mass of tablets within the hopper certain ones which it conveys to a chute, from which chute the tablets are discharged at timed intervals into cans or the like located beneath the chute.

In the present structure there is provided a separator wheel rotatable in an angular plane with the hopper discharging onto the lower part of this wheel. The wheel is provided with openings to pick up individual tablets from the hopper. By rotation of the wheel these tablets are conveyed to an opposite point where they are released into a chute. Obstruction means are provided in a portion of this chute releasably to retain the tablets therein. Power driven means in the form of a plunger reciprocates in this chute and at the aforesaid timed intervals ejects the tablets therefrom.

Means are provided to insure the presence of a tablet in the chute at the proper time, even though the separator plate should fail to pick one up at some time. This means comprises a supplemental supply of tablets together with means operable only upon failure of the separator plate to release from the supplemental means one of its tablets into the chute.

It is an object of the invention to provide a tablet depositing mechanism including means for separating tablets from a mass supply thereof, in combination with supplemental means supplying tablets in the event that the principal separating means shall fail.

It is a further object to provide such a supplemental means automatically operable upon failure of the separating means and rendered inoperable when the separating means properly operates.

An additional object is to provide such a supplemental means that is entirely self-contained and self-operated.

It is a further object of the invention to provide a new and novel means of operating the de-

positing machine and synchronizing its several elements.

Other objects will appear from the description to ensue.

In the drawings:

Fig. 1 is a side elevation of the device.

Fig. 2 is a front elevation of the device.

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2.

Fig. 4 is a vertical section of the supplemental tablet means taken on the line 4—4 of Fig. 2.

Fig. 5 is a plan view, partly broken away, of the entire device.

Fig. 6 is a front view, partly broken away, showing the discharging means in discharging position.

Fig. 7 is a vertical section taken on the line 7—7 of Fig. 3.

Fig. 8 is a plan view of the supplemental means removed from the machine.

Fig. 9 is an elevation of supplemental means.

The machine comprises a supporting bracket 15 that may be attached to a base 16 of suitable kind by means such as removable bolts 17. Mounted upon the bracket 15 is a gear housing 18. The horizontal portion of the bracket 15 is bifurcated, as shown particularly in Fig. 2. Bolts 19 extend through these bifurcations and into the gear housing 18 whereby the latter is supported upon the bracket 15. The housing 18 includes an angularly disposed portion 20.

A table 21 is mounted upon the angular portion 20 and secured thereto by means of screws 22. A hopper 23 in turn is secured to the table 21 by quickly releasable connections 24 disposed at opposite sides thereof. These connections consist of screws 25 pivotally mounted to the hopper by pins 26. Winged nuts 27 with washers 28 are engaged over the screws 24 and may be clamped upon bifurcations 29 on the plate 21. Upon loosening of the wing nuts 27 the screws 24 may be swung about their pivots 26 until they are freed from the bifurcations 29 and the hopper then may be readily removed.

A vertical journal 32 is secured to the gear box 18 by screws 33, the journal fitting between the horizontal forks of the bracket 15. A drive shaft 34 actuated from a suitable power source has thereon a bevel gear 35 that meshes with a corresponding bevel gear 36 secured to a horizontal countershaft 37 journaled at the back in the gear housing 18 and at the front in a suitable bearing in a closure element 38. This closure element is secured to the housing by

screws 39. It is removable to give access to the gears.

The gear 36 is fixed to the shaft 37. Likewise fixed to this shaft is a bevel gear 40 that meshes with a larger gear 41 that is secured to a shaft 42 by means of a nut 43. The shaft 42 is journaled in a suitable bearing in the table 21. To its outer end is fastened a separating plate 44, the two being secured together by screws 45 extending through the plate into a flange on the shaft 42.

The separating plate is flanged as at 46 and has a series of holes 47 extending through it adjacent the flange. These holes are of such size as to receive and pass the tablets to be deposited by the machine. The number of tablets in each hole 47 obviously will be determined by the relative sizes of the holes and the tablets.

Beneath the separating plate 44 and secured to the table 21 is an annular race member 50 located immediately beneath the several openings 47. At its top this race member 50 is provided with a notch 51, as shown, the purpose of which will become evident.

The lower part of the separating plate 44 extends to the lowermost part of the hopper 23. An adjustable baffle wall 52 is held to one wall of the hopper 23 by means of a screw 53 operating in a slot 54. This baffle wall 52 permits only a restricted number of tablets T to pass beyond it and down onto the separating plate 46.

Beneath the passage 51 the housing 18 has a chute 55 therein, the chute extending downwardly and forwardly of the machine. This chute 55 is open at the top, as is shown in Fig. 3. An element 56 is secured to the front of the housing 18 and has an extension 57 of the chute 55, which extension likewise is open at the top. A vertical chute 58 is in turn secured to the element 56 and is provided with an opening 59 that is in communication with the extension 57. Bolts 60 and 61 secure the member 56 to the housing 18. Screws 62 fasten the vertical chute 58 to the element 56. Thus the several members are secured rigidly together.

Within the vertical chute 59 are provided three spring fingers 64 that are bowed at their bottom ends to be normally sufficiently close together to receive and retain a tablet T; but which may be separated to permit passage thereof. A plunger 65 reciprocates in the member 58 and its cupped lower end impinges upon the tablet retained by the spring fingers 64, parts them, and ejects the tablets therefrom.

The plunger 65 has a medial slot 67 therein with which register corresponding slots 68 in the chute member 58. A rocker arm 70 passes through the slots 67 and 68 and, with a pin and slot connection 71, is connected to the plunger 65. The rocker arm 70 is freely pivoted on a shaft 69 supported in a rigid bracket 72 that forms an extension on the element 56.

Fixedly secured to the shaft to rotate therewith is a driving arm 73 having extensions 74 and 75 respectively above and below the rocker arm 70 and spaced somewhat therefrom. A coil spring 76 extends from a hole in the projection 74, and abuts the rocker arm 70, and is held centered by a pin 77 on the rocker arm. A set screw 78 extends through the hole in the projection 74, against the spring, to adjust the tension of the spring. On the projection 75 is located an adjustable set screw 79 having a lock nut. It will be seen that by this connection, rocking of the shaft 71 from the position of Fig.

2 to that of Fig. 6 correspondingly rocks the bracket 73 which, through the spring 76, forces the plunger 65 downwardly. The distance downwardly is adjusted by means of the set screw 79.

An arm 81 is secured to the end of the shaft 71 opposite the bracket 73. A pitman 82 is pivotally secured at 83 to the actuating arm 81, and at 84 to a crank 85. The crank 85 in turn is pinned to the shaft 37. Thus upon each rotation of the shaft 37, the plunger will be forced downwardly and retracted once.

It sometimes happens that the separating plate 44 does not pick up one of the tablets. The means now to be described takes care of this situation. A base bar 90 is secured to the front of the machine by means of the bolt 61. This bar extends upwardly, backwardly and then at an angle to the right as will be seen from the drawings, particularly Fig. 8. A second bar 91 overlies the bar 90 and is likewise secured by the screw 61. A shaft 92 is journaled in the two bars and extends between them. A ratchet wheel 93 is adjustably secured by a set screw 94 to the shaft 92. The shaft is provided with a flange 95 to which is secured a disc 96 having a plurality of tablet-receiving holes 97 therethrough. As is apparent from Fig. 4, the screws 98 secure the disc to the flange 95. Beneath the disc 96 is a plate 99 attached to the bar 90 by screws 100. A notch 101 (Fig. 8) is provided adjacent the edge of the plate 99. By reference to Fig. 7, it will be seen that this notch 101 is located directly above the chute 55. As will be explained, when the disc 96 rotates until one of the holes 97 containing a tablet comes above the slot 101, the tablet will fall through the slot and into the chute 55. Means now to be described are provided for rotating the disc only when the separating plate 44 fails to pick up a tablet from the main hopper.

A shaft 103 is supported in the outer end of the bar 90. A collar 104, held in position by a set screw, engages the shaft 103 on one side of the bar 90. A sleeve 105 fits over the shaft opposite the collar 104, this sleeve having a flange 106. Screws 107 extend through the bar 90 and the flange 106 to support the sleeve 105 on the bar. A rocker arm 108 is held on the shaft 103 adjustably by a set screw 109. Upon the outer end of the rocker arm 108 is pivoted a ratchet dog 110. An adjustable collar 111 likewise fits on the rocker arm 108 and between it and the dog 110 is located a coil spring 112 urging the dog 110 in a clockwise direction, viewed in Fig. 8, against the ratchet wheel 93. A bracket 113 extends upwardly from the plate 99. Between this bracket and the outer end of the rocker arm 108 is a spring 114 tending to rock the rocker arm and its shaft in a counterclockwise direction, as shown in Fig. 8. A spring clip 115 upon the bar 91 extends downwardly adjacent the ratchet wheel 93 to maintain it against rotation backward.

Upon the end of the shaft 103 opposite the rocker arm 108 is a teller arm 116, a set screw 117 adjustably holding this arm in position. This arm has at its outer end a small wheel 118, preferably of resilient material, rotatable about a screw 119 that engages the teller arm 116. This arm extends downwardly over the separating plate 44 and the wheel 118 rides on this plate as the latter rotates.

The operation of the device is as follows:

A supply of tablets T is placed in the hopper 23. The gate 52 is adjusted to the proper eleva-

tion to permit a restricted quantity of tablets to pass through to the separating plate 44 at a time. The shaft 34 is caused to rotate and it will be understood that this shaft is synchronized in operation with a can-feeding means F by means of the shaft 34 and the gear f, details being omitted. The synchronizing mechanism is so designed (as by the relation of gear sizes, etc.) that the can conveyor will be advanced a distance to bring a new can beneath the chute 53 each time a new tablet-receiving opening 47 in the plate 44 is brought over the opening 51 to the chute 55. If desired, this arrangement can be modified so that a new can is brought for each second or more openings 47, which modification will result in the delivery of a correspondingly higher number of tablets to each can.

As the shaft 34 rotates, the countershaft 37 will correspondingly rotate. Through the gears 40 and 41, the separating plate 44 will be rotated relatively to the rotation of the countershaft in a ratio of the number of openings 47 in this plate, to one. Thus, as shown here, the plate 44 will rotate one complete time for every six revolutions of the countershaft 37 and, correspondingly, for every single rotation of the countershaft the separating plate 44 will advance one-sixth of a revolution. The separating plate, viewed in Fig. 5, rotates in a clockwise direction. As each opening 47 comes above the chute 55, its tablets or tablet drop through the chute into the spring arms 64 where they are retained. This will occur during or shortly before the can conveyor has moved the distance to bring a can C beneath the member 58. Shortly thereafter and before the can is removed, the crank 85 will rotate and through the various arms 82, 81, 73 and 79 will depress the plunger 65 to the position of Fig. 6 which, in turn, will eject the tablet from the spring arms 64, whence it will drop into the can C. The feeding means F will then convey the can away and bring a new can up to position.

Should it happen that one of the openings 47 does not receive a tablet, the following operation will occur. As the empty opening comes beneath the wheel 118 of the teller arm 116, this wheel will drop into the hole under urging of the spring 114. Such will cause a fractional rotation of the shaft 103 and the arm 108 counterclockwise, in Fig. 8, a sufficient distance to permit the ratchet dog 110, under the action of the spring 112, to drop behind the next tooth of the ratchet wheel 93. The ratchet wheel is, during this operation, prevented from rotating backwards by the clip 115. When the teller arm 116 subsequently rides out of the empty hole 47 by virtue of its movement towards the position over the chute 55, the arm will again rotate the shaft 103 in a clockwise direction, in Fig. 8. This rotation will cause the ratchet dog to advance the ratchet wheel 93 the space of one tooth. Since the teeth are spaced angularly the same as the openings 97, this will advance a new opening 97 over the notch 101 whereupon the tablet in such new opening will drop through the notch into the chute 55 to supply the tablet missing from the empty opening 47 in the separating plate.

In the event, however, that the separating plate opening 47 duly contains a tablet, the teller arm 116 will not drop to the position shown in Fig. 4, but will ride over the tablet within the opening. Consequently, the ratchet dog 110 will not be drawn back and the tooth and the disc 96 will not subsequently be advanced.

Thus when, and only when, an opening 47 of

the separating plate 44 fails to pick up a tablet, the supplemental means will supply this deficiency. Ordinarily the failure will occur only once in ten or twenty thousand times, or even less, so that it is necessary to have only a relatively small number of tablets in the supplemental supply. The disc 96 is immediately in sight to anyone inspecting the machine. In case the supplemental means is operated, the inspector will observe that a certain number of tablets need to be added to the disc 96. This disc is, of course, of arbitrary size and can be made large enough to contain as many tablets as may be desired.

The separating plate 44 may be synchronized with the plunger by loosening the nut 43, and rotating the plate and shaft 42 relative to the gear 41. The disc 96 may be synchronized with the teller arm 116 by loosening either of the set screws 109 or 117. The ratchet wheel, by loosening the set screw 94, may be adjusted relative to the disc.

It will be seen from the foregoing that a tablet depositing machine, simple in operation, but proof against failure, has been provided.

What is claimed is:

1. In a machine for depositing articles, means providing a main supply of articles, movable means continually separating in spaced relation a predetermined number of said articles from the main supply, said movable means being operable to convey the articles from the main supply and to deposit them at successive intervals in a receiver, and supplemental supply means having means engaging said separating means, said engaging means being movable into and out of spaces in the movable means when said spaces are devoid of articles, discharge means operated by movement of the engaging means to operate the supplemental supply means to supply the predetermined number of articles in the receiver to take the place of the deficiency, said engaging means causing the discharge means to operate to supply articles from the supplemental supply means into the receiver at substantially the time the space of the movable means that is thus deficient reaches its point of deposit.

2. In a machine for depositing articles, means providing a supply of articles, means for separating articles in predetermined number from said supply, said means comprising a plate having holes to receive and transport articles, a backing for said plate beneath the holes save at the point of discharge, a teller element normally urged against said plate in line with said holes, a supplemental article supply means comprising an apertured plate, said teller element being adapted to move into and out of any vacant hole in said separating plate by an up and down pivotal movement, mechanism operated solely by such up and down movement of the teller element into and out of any vacant hole to cause the supplemental supply means to furnish articles in place of those missing from the plate, said element being prevented from entering any occupied hole.

3. In a machine for depositing articles, means providing an indeterminate supply of articles, means to receive the articles, means to separate articles in predetermined number from the supply, and to convey them in such number to the receiving means, and mechanism communicating with the receiving means to supply the deficiency when the separating means fails, said mechanism including a supplementary movable element having articles therein in the predetermined number aforesaid, a second element being operatively con-

5 nected with said movable element by movable members and being itself pivotally movable, said second element being normally substantially free of movement, but being oscillatively movable into and out of empty spaces in the separating means 10 left empty by the failure of the separating means to separate out its articles, and by such movement through its connecting members causing movement of the supplementary article-containing movable element into position to discharge into the receiving means the predetermined number of articles therefrom.

4. In a machine for depositing articles, means providing a supply of articles, a wheel having a plurality of holes therethrough and spaced around adjacent the periphery thereof, a chute, movable means operating to clear the chute, driving means to move said wheel and cause the same to pass through said supply and pick up a predetermined number of articles in each hole, an arm overhanging the wheel and normally engaging the same, means having a supplemental supply of articles and movable to discharge the predetermined number thereof into the chute, and means 25 connected to said arm and said supplemental supply means, whereby when said wheel does not pick up articles in any hole, the arm may drop into said hole, and by further movement of the wheel be ejected from the hole, and by its movement into and out of the hole shift the supplemental supply means to discharge position, and means connecting said chute clearing means to said driving means.

5. In a machine for depositing articles, means 35 providing a supply of articles, a wheel having spaced holes adjacent the periphery thereof and rotatable through said supply to pick up a predetermined number of articles in each hole, a chute located adjacent the wheel, opposite the supply, and adapted to receive the articles from the wheel, means movable to discharge articles from the chute, power means, said power means being connected to rotate the wheel and to operate the chute clearing means, a supplemental 40 article supply means located above the chute and including a second wheel having spaced holes therein and adapted to have articles in the predetermined number in said slots, means backing said holes save at a certain part of said wheel above said chute, and means operable by the first wheel upon absence of articles in one of its holes to move said second wheel to position where the predetermined number of articles are discharged into the chute at substantially the time the deposit by the movable member would have supplied the articles.

6. In a machine for depositing articles, means providing a supply of articles, a chute, a rotatable separating plate having a plurality of circularly 60 arranged holes therethrough, said plate being out of horizontal and having its lower edge rotatable through the supply of articles to pick one up in each hole, a chute, means to retain articles in the chute, a backing plate below the plate to hold the articles in the holes and having a notch adjacent the chute, whereby said plate upon rotation carries articles to said chute and periodically discharges them therein, an arm over said plate, means urging said arm into engagement with the plate ahead of the chute, and on the circle of 70 said holes, a second wheel above said chute having a plurality of circularly arranged holes to contain an article in each hole, a backing plate beneath said second plate but having a notch directly above the chute, a ratchet for rotating the second

wheel to bring successive holes above the notch, said arm being movable into and out of any vacant hole in the first wheel, and by said movement advancing the ratchet one hole of the second wheel, and means operable after each hole of the first wheel reaches the chute to clear the same, said means including a resiliently driven plunger, and means to adjust the stroke thereof.

7. In a machine of the kind described, means providing a main supply of articles, movable means separating a predetermined number of such articles and transporting them, a receptacle for receiving the transported articles, periodically movable means for discharging said articles from the receptacles, supplemental means for supplying any deficiency in articles caused by the failure of the separating means, and adapted to operate to discharge articles into the receptacle to supply the deficiency, said supplemental means being operable prior to the operation of the periodically movable discharge means.

8. In a machine of the kind described, means providing a main supply of articles, a movable means separating a predetermined number of such articles in spaced points about its area and adapted to transport said articles to a discharge point at successive intervals determined by the spacing of the points in the movable means, supplemental means normally inoperative and containing an additional supply of articles, said supplemental means including means operable upon deficiency of articles in any spaced point on the moving member and adapted to supply the deficiency at the discharge point approximately at the time such deficient spaced point reaches said discharge point and after the previous spaced point has passed said discharge point.

9. In a depositing machine, means providing a main supply of articles, a movable member having spaces to receive articles and separate the same from the main supply, a movable auxiliary supply means, a teller member operating over the movable member and normally in contact therewith, a shaft to which the teller member is fixedly connected, means connecting the shaft to the auxiliary supply means to move the latter to discharge position upon rotary movement of the shaft, means urging the teller member into any deficient space presented by the movable member, and further movement of said member causing it to leave the teller member and move the same out of the space, such movement of the teller member into and out of the space causing rotary movement of the shaft and hence operating the auxiliary supply means.

10. In a depositing machine, means providing a main supply of articles, a movable member having spaces to receive articles and to separate them from the supply, a movable auxiliary supply means, a shaft for moving said auxiliary supply means, a second shaft, a teller member secured to the second shaft and normally extending against the movable member, said teller member being adapted to move into and out of any space presented to it by the movable member and deficient in articles, such movement being transmitted to the second shaft as an oscillation thereof, and a ratchet connection between the two shafts, the dog of which is displaced relative to the wheel by one of the movements of the second shaft, and the wheel of which is moved by the dog by the other of such movements.

11. In a depositing machine, means providing a supply of articles, a chute, a movable member having spaces to receive a predetermined number

of articles and to separate them from the supply, and to convey them to the chute, means to clear the chute, power means, means connecting the movable member and the chute clearing means
5 to the power means for operation of the clearing means following each deposit by the movable member of said predetermined number of articles into the chute, a supplemental article supply means, and means to operate the supplemental
10 supply means upon a deficiency of said predetermined number of articles in any space of the movable member, said means being operable to deposit the predetermined number of articles into the chute to supply the deficiency at substantially the time the same would have been
15 supplied thereto by the movable member to be ready for the corresponding operation of the chute clearing means.

12. In a machine of the kind described, a support, a main article supply means adapted to receive and transport a continuous supply of articles, and a supplemental article supply means

operable upon deficiency of articles in the first means, said main article supply means and said supplemental article supply means being adapted to discharge into a common receiver, said supplemental supply means including an article-
5 containing member secured to a rotatable shaft for rotary movement, a ratchet wheel fixed to the shaft, a second rotatable shaft mounted on the support, a teller arm secured to one end of said
10 second shaft and disposed to engage the main article supply means in the article-receiving and transporting area, said teller being movable into and out of empty article-receiving portions of
15 the main article supply means solely through a pivotal movement about the second shaft as a fixed axis, an arm fixed to the other end of the second shaft having a dog pivotally connected thereto, said dog engaging said ratchet wheel,
20 said dog being adapted to rotate said ratchet one notch by each pivotal cycle of the teller.

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