

March 4, 1941.

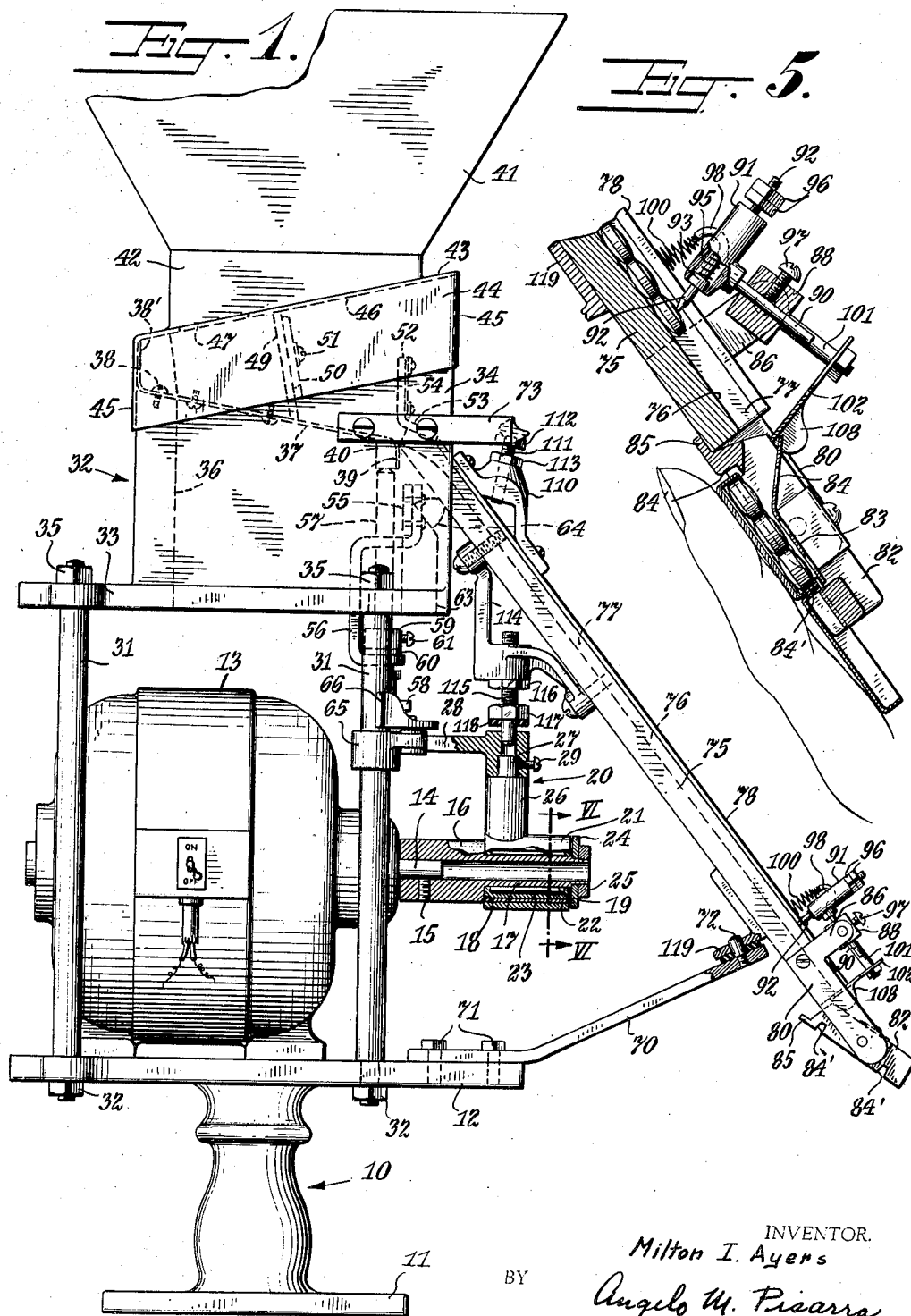
M. I. AYERS

2,233,466

UNIT FEEDING APPARATUS AND PARTS THEREOF

Filed Sept. 22, 1938

4 Sheets-Sheet 1



March 4, 1941.

M. I. AYERS

2,233,466

UNIT FEEDING APPARATUS AND PARTS THEREOF

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4 Sheets-Sheet 2

Fig. 2.

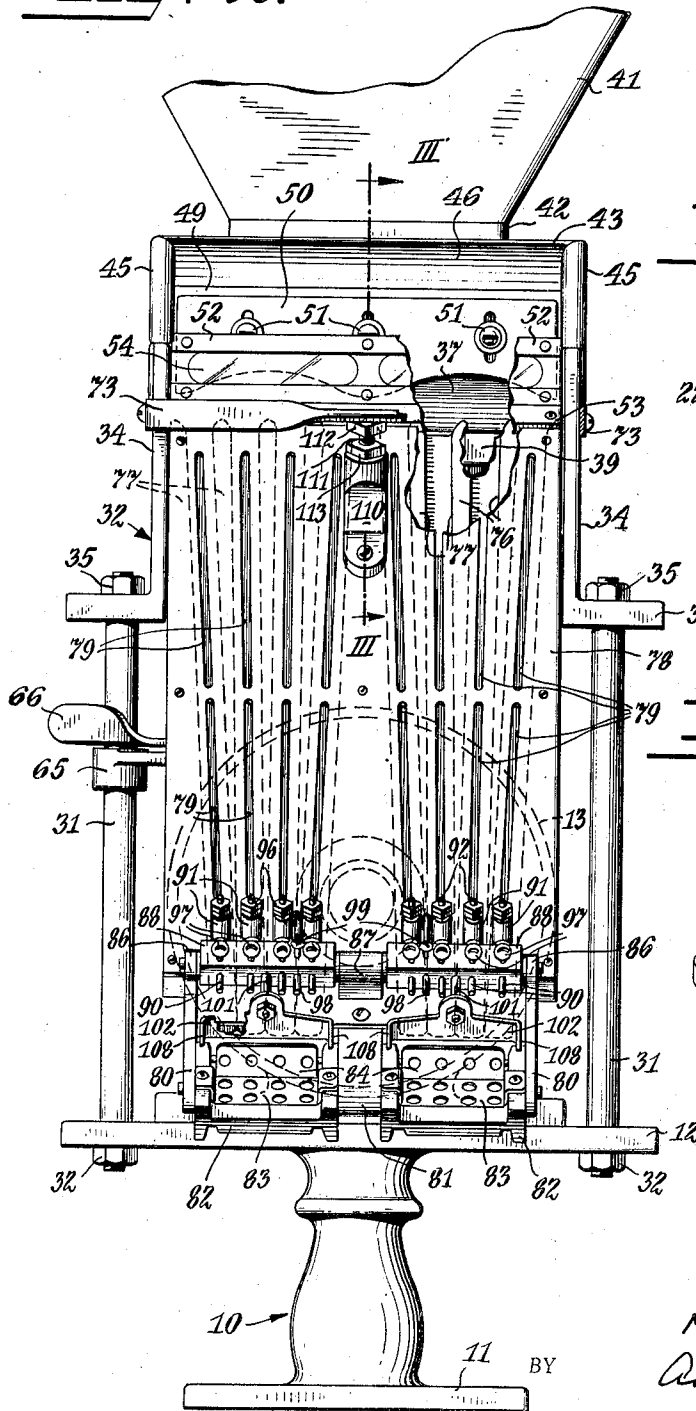


Fig. 6.

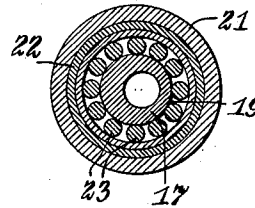
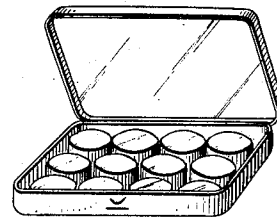


Fig. 7.



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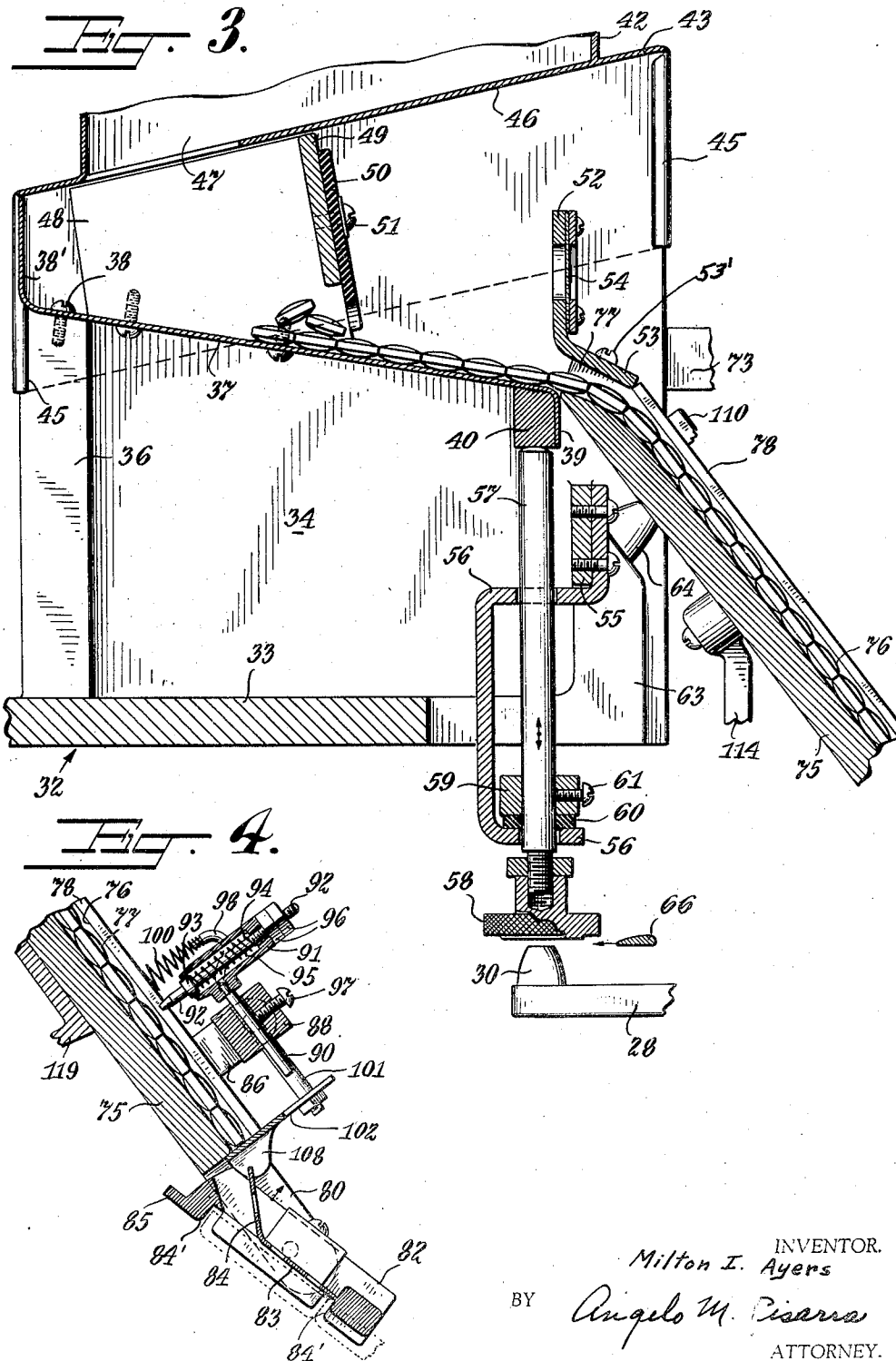
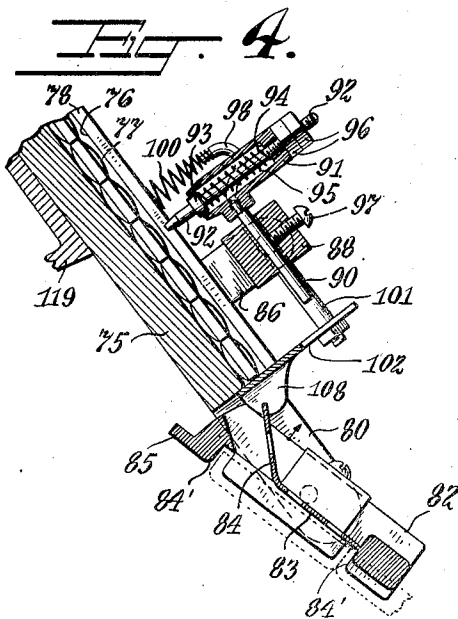
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UNIT FEEDING APPARATUS AND PARTS THEREOF

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4 Sheets-Sheet 3



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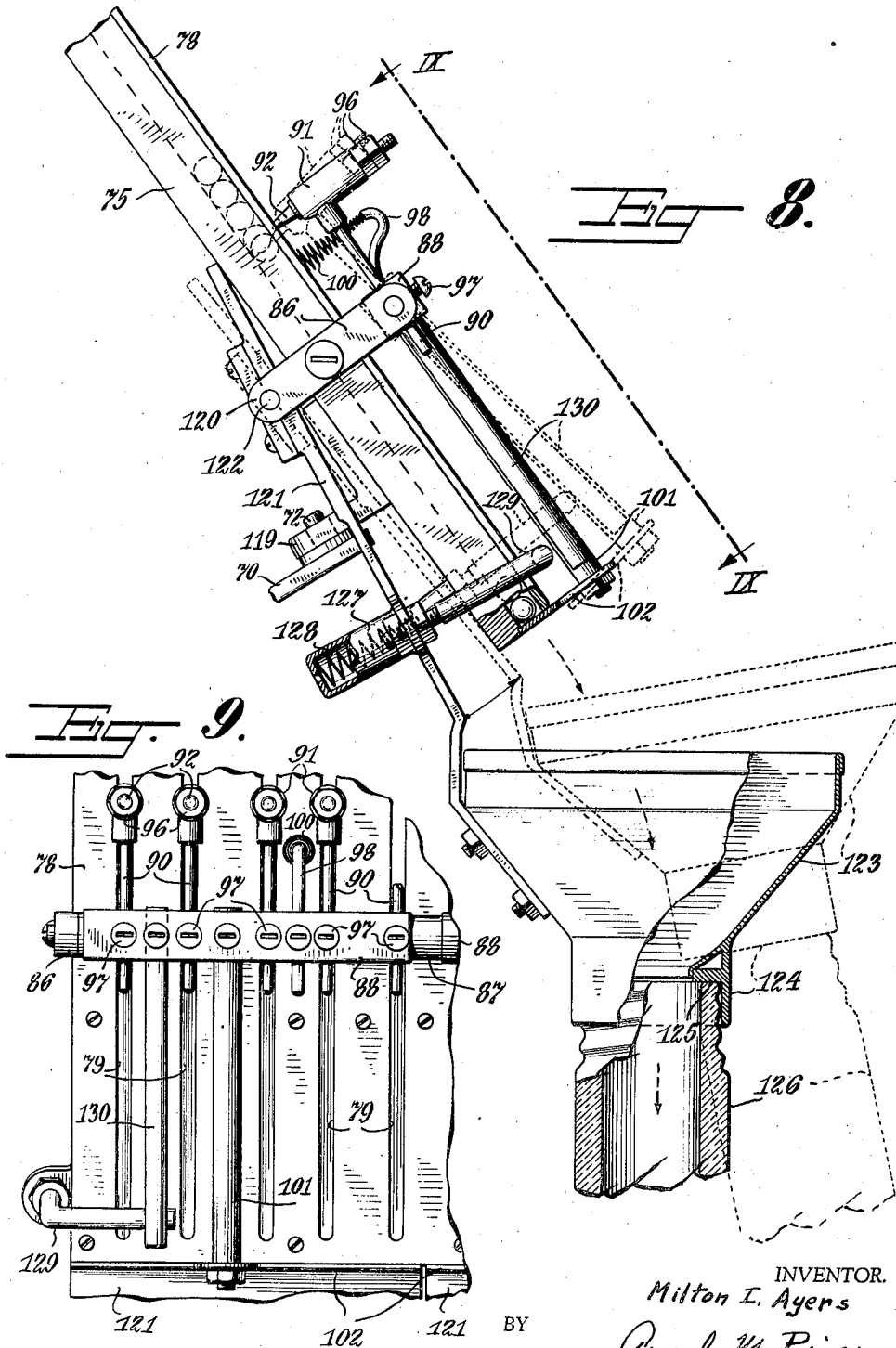
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UNIT FEEDING APPARATUS AND PARTS THEREOF

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,233,466

UNIT FEEDING APPARATUS AND PARTS
THEREOF

Milton I. Ayers, Bloomfield, N. J.

Application September 22, 1938, Serial No. 231,139

18 Claims. (Cl. 226—14)

This invention relates to dispensing and feeding apparatus and parts thereof. In one of its aspects the invention is directed to an apparatus for feeding and counting units, such as discs, tablets, capsules, pills and the like whereby a predetermined number of units may be readily and easily fed into a container in an easy and efficient manner. Further, the invention is directed to novel counting fixtures and improved parts thereof.

An object of my invention is to provide a feeding machine, which is rugged, relatively inexpensive to manufacture, easy to operate, substantially fool proof and adapted to be used with a wide variety of materials of different weights, shapes, sizes and compositions.

Another object of my invention is to provide a feeding machine having adjustments for varying the quantity of units to be fed to a container, for varying the pressure on a unit above the desired number to retain the same in place for a definite period of time, for varying the degree of vibration of the units, and for varying the speed of feeding the units to their respective channels.

A still further object of my invention is to provide fixtures of an improved and novel type.

These and many other objects of my invention will be readily apparent from the following description and drawings wherein,

Figure 1 represents a side view of an apparatus embodying my invention.

Figure 2 represents a front view of the apparatus shown in Figure 1.

Figure 3 represents a cross sectional view taken on line III—III of Figure 2 in the direction of the arrows.

Figure 4 represents a longitudinal cross sectional view of the lower part of the apparatus shown in Figure 2 and illustrates the position of the gate when in operative position and the position of the guide when the gate is in said position.

Figure 5 represents a view similar to Figure 4 and shows the relative positions of the gate, guide and retaining pin when the gate is in its inoperative or open position.

Figure 6 is an enlarged cross sectional view taken on line VI—VI of Figure 1 in the direction of the arrows.

Figure 7 represents the arrangement of the tablets as fed into the container from the apparatus shown in Figures 1-6.

Figure 8 represents an alternative arrangement which may be substituted for that illustrated in Figures 4 and 5.

Figure 9 is a fragmentary top plan view of Figure 8 on the line IX—IX of Figure 8 in the direction of the arrows.

According to the invention there is a pedestal 10 extending upwardly from a base 11 and supporting a platform 12 on which is fixedly mounted an electric motor 13 which is preferably a constant speed motor. The motor 13 has an outwardly extending rotor shaft 14 and rigidly secured to said shaft 14 by a locking stud bolt 15 is an elongated cylindrical sleeve 16 extending outwardly from the shaft 14.

The outer half length 17 of the sleeve 16 is of reduced diameter to provide a bearing shoulder 18 and the outer surface 19 thereof is cylindrical and is eccentric with respect to the rotor shaft 14 as shown in Figure 6.

Oscillatory vertical motion is imparted by the constant speed rotor eccentric 16 to a follower 20. The follower 20 consists of a cylindrical lower sleeve 21 concentrically mounted on a cylindrical bushing 22 concentrically mounted on roller bearing rods 23 concentrically mounted on cylindrical eccentric 19. The roller bearing rods 23 are rotatably mounted in end annular members so that the bearing rods may be mounted and dismounted as a unit bearing member. The inner ends of the roller bearing, the bushing and the lower sleeve of the follower all may abut against the shoulder 18 and the outer ends thereof may abut against a retaining washer 24 maintained in position at the outer end of the sleeve 16 by a nut 25 making threaded engagement with the sleeve 16. Integral with the sleeve 21 and extending upwardly therefrom is upright 26 whose upper extremity is of reduced diameter to provide a projection 27 over which fits one end of a horizontally disposed arm 28 extending towards the rear of the platform 12. The arm 28 is secured to the upright 26 by a locking stud bolt 29 extending through one end of the arm 28 and frictionally bearing against projection 27 and the other end of arm 28 has a resilient striking nipple 30 of leather or rubber secured thereto and extending upwardly therefrom.

Four supporting and spacing standards or rods 31 are mounted on and supported by the platform 12. The standards 31 are spaced around the motor 13 and are secured to the support 12 by nuts 32 making threaded engagement with the reduced ends of the standards extending through openings of corresponding size in platform 12. Located above said motor 13 is a hopper support 32 consisting of a cast member having a flat base 33 and a pair of sides 34 integral

therewith and extending upwardly therefrom and having an open front end.

The base 33 extends beyond the sides 34 and has openings therein through which pass the reduced ends of standards 31 on which the base rests and is secured thereto by nuts 35. The upright sides 34 are of the same size and shape and are disposed parallel to each other. The upper edge of each upright extends rearwardly downward from the front of the support 32 towards the rear thereof. The upright sides are preferably disposed equidistant from and parallel to the rotor shaft 14. The rear of the support 32 also may be open and integral with the side walls 34 at the rear portions thereof are plate supporting ribs 36 whose upper faces extend downwardly forward from the rear towards the front of support 32.

A feeding plate 37 of relatively thin but rigid and rugged metallic construction which may be easily vibrated is freely disposed between the side walls 34 and is anchored at one end to the support 32 by locking stud bolts 38 extending through openings therein and making threaded engagement with tapped openings in the upper parts of the ribs 36 on which said plate 37 rests.

Integral with the rear end of said plate 37 is an upwardly extending flange 38' extending across the upper part of the opening between side walls 34 and upwardly to the upper limit of the rear edges of said side walls. Said plate 37 extends downwardly forward towards the front of said support 32 and terminates at a line well within said front. The front of said plate 37 is bent downwardly to provide an apron 39. And secured to the plate 37 at its lower face is an elongated bumper 40 located in the lower corner thereof and having its bottom face flush with the lower edge of apron 39. The member 40 may be composed of metal, hard rubber or any other suitable material.

A hopper 41 having a neck 42 somewhat smaller than the support 32 and an annular flange 43 integral with the neck is removably secured to the side walls 34 by depending side plates 44 integral with the flange and having inwardly curved vertical end spring clamps 45 which grip the outer edges of the side walls 34 to hold the hopper in position. The hopper 41 has a bottom 46 located at the lower edge of neck 42 and bottom 46 is disposed at an appropriate angle to the horizontal and it extends rearwardly downwardly towards the rear of support 42. The bottom 46 terminates at a material distance from the rear edge of the neck to provide an opening 47 through which may pass the tablets, pills or other units to the feeding plate 37. At the approximate center length of feeding plate 37 and secured thereto by side arms 48 is a cross bar 49 spaced above and extending across said plate 37. A leather or rubber yielding strip 50 extends below and is adjustably secured to the cross bar 49 by bolts 51 extending through vertical slots therein so that the space between the lower edge thereof and the feeding face of plate 37 may be varied when desired.

A deflector guide 52 is located between walls 34 and has an apron 53 extending downwardly towards the front of support 32. The guide 52 is located near the forward end of feed plate 37 and is spaced therefrom to provide a mouth through which the tablets or the like may move. The guide 52 has a transparent covering of glass 54 for openings therein so that the operator may see whether the tablets are being properly fed.

Extending between said side walls 34 and integral therewith is a cross bar 55 located slightly forwardly of and materially below the lower edge of apron 39. A guide bracket having a pair of horizontally disposed sections 56 vertically spaced from each other is secured to said cross bar 55 and depends therefrom. Said sections 56 have aligned openings therein accommodating a slide striking rod 57 having a knurled bumper head 58 making threaded engagement with the lower end of said rod 57. The position of the bumper head 58 with respect to the rod 57 may be varied by merely turning the head 58 in the desired direction to increase or decrease the overall length of the sliding bumper which is the combination of rod 57 and head 58. Mounted on the rod 57 along the length thereof and above lower section 56 is a bumper stop 59 having a resilient washer 60 of rubber or leather secured to the lower face thereof. The stop 59 is maintained in fixed position by a lock stud bolt 61 and the position of the stop may be varied at will. The rod 57 and head 58 are in alignment with the striking member 30 which is close to the bumper head 58. Adjacent the bar 55 and integral with walls 34 is a cross rib 63 having a resilient bumper 64 of rubber, leather or the like secured thereto and disposed at an angle to the vertical.

When the motor is energized the rotor 14 is driven at constant speed. The eccentric 17 is driven at constant speed by rotor 14. The eccentric 17 imparts a reciprocating motion to the follower 20 which in turn through its striking nipple 30 imparts a reciprocating motion to the rod 57 which in turn strikes the bumper 40 cause the cantilever plate 37 to be vibrated to feed the tablets or the like towards the apron 39 of said plate.

The speed of feeding of said units may be controlled by controlling the amplitude of vibration of the plate 37. The amplitude of vibration of the plate 37 may be controlled by varying the overall length of the striker by merely turning the head 58 up or down on rod 57 to increase or decrease the amplitude of vibration and therefore to increase or decrease the feeding speed of the units along the plate 37. In order that the feed plate 37 may be subjected to no striking from the striking member 57 and remain stationary even while the motor is running and the follower 20 is driven thereby, an arm 65 is secured to a standard 31 and has pivoted thereto a cam 66 which when swung in one direction lifts the head 58 above the maximum vertical position of nipple 30. When it is desired to subject the plate 37 to the driving action of follower 20, the cam 66 is retracted and the head 58 is struck by the nipple 30.

A rigid fixture supporting arm 70, which is bent upwardly, has one end thereof firmly secured to the platform 12 by bolts 71 and a pin bolt 72 is secured to the upper and free end thereof. A rigid U bar 73 fixture retainer is secured to the approximate level of the feed plate 37 and the cross bar thereof is spaced a material distance beyond said walls.

A fixture for receiving and aligning a plurality of separate batteries of units is removably secured to the support. The fixture may include a cast lower plate 75 having two sets of four grooves 76 of uniform width extending the entire length thereof and defined by downwardly converging side walls 77. The contour of the front upper end of plate 75 is curved towards the bottom face thereof and the upper ends of

the ribs defined by the walls 77 are curved to aid in feeding of tablets from the plate 37 to the grooves or channels. As shown each plate 75 may have two separate batteries of grooves or chutes, with each battery consisting of 4 grooves and spaced from the other battery. A cover plate 78 having longitudinal peep slots 79 is secured to the upper face of plate 75 to provide a shallow space between the lower face of cover 78 and the lower face of grooves 76 so that the tablets may feed thereinto only in a flat formation.

Secured to the lower end of the fixture is mechanism for controlling the discharge of the units therefrom, for guiding said units into a container and for actuating mechanism for maintaining therein those units above a predetermined count, all of these operations being possible by actuation of the container. And, I prefer that one of these devices may be used for each battery. As shown in Figures 1, 4 and 5, each of these devices may be employed to appropriately guide the discharge unit in flat formation of four rows with three tablets in each row in a flat container as shown in Figure 7. An end plate 80 is secured to each side of the plate 75 and extends appreciably beyond the lower extremity thereof and a support member 81 located between the batteries of grooves is also secured to the lower part of plate 75 and extends beyond the lower extremity thereof.

Pivotally mounted on said support 81 and between each end plate 80 is a rigid cast member 82 having sides and a cross bar lower portion with a large opening between the sides and secured thereto is a perforated peep and guide plate 83 having an upwardly inclined guide plate 84 integral therewith and disposed at an obtuse angle relative thereto. A pair of crosswise grooves 84' are in the sides of member 82 and the rear of member 82 is a cross bar having a downwardly forward inclined face from top to bottom and a stop toe 85 to limit the degree of movement of the device in a clockwise direction.

Integral with said plate 80 and extending upwardly therefrom is a plate 86 and a plate 87 is secured to the top plate 78 and is located between the batteries of grooves. Between each plate 86 and plate 87 there extends a member 88 having journals located in bearing openings in plates 86 and 87. The so pivotally mounted member 88 has a plurality of spaced openings therein through which extend rods 90. Firmly secured to the upper end of each rod 90 is a housing 91 through which extends a blunt ended pin 92 having a threaded upper section and a collar 93 near the lower end thereof, the diameter of the collar 93 being slightly less than the internal diameter of the housing 91. Between the collar 93 and shoulder 94 at the upper end of the housing 91 is a compression spring 95 which tends to force the pin 92 out of the housing. Nuts 96 make threaded engagement with a portion of the pin above the housing and hold the pin to the housing. These nuts may be turned down or up on the pin to vary the pressure exerted on the pin by the spring.

The rods 90 are so disposed that the pins of the housings carried thereby are located in the longitudinal slots 79 in the cover plate 78. The location of the pins 92 from the end of plate 75 is determined by the number of units to be discharged at any one time and so that this may be varied at will the rods 90 may be slid in the member 88 and locked in position by stud bolt 97. A force take up or cushion and return

may be a simple rod 98 inserted in an opening through member 88 and secured thereto by bolt 99. The rod is bent inwardly towards plate 78 at its other end and the small end of a cone spring 100 is secured thereto and the large end rests on the cover plate 78 at a place between two of the elongated peep slots.

The spring 100 acting through the rod 98 continuously exerts force in a direction tending to rotate the member 88 to swing the pins 92 away from the cover plate 78. A rod 101 is secured to element 88 and carries a gate 102 at its lower end. The gate is located just below the lower extremity of plate 75 and when in closed position retains between plates 75 and 78 the rows of units therein. The gate 102 has a pair of wings 108 which are struck by the sides of member 82 during actuation thereof to lift the gate above the lower face of top plate 78.

When it is desired to fill a container the sides of the same are located in the grooves 84 and the container and member 82 are swung in the direction of the arrow shown in Figure 4 to the position shown in Figure 5. During this swinging movement the wings 108 of the gate are struck by the member 82 and the gate 102 is lifted.

During lifting of the gate the pins 92 are simultaneously swung through the openings 79 and the pins push against the tablets thereunder. When the gate 102 reaches its maximum open position, the pins 92 have attained their maximum inward position and all of the tablets below those contacted and held by the pins, discharge from the lower ends of grooves 76 and over the inclined face and guided by the guide to be arranged in the container in the manner shown in Figure 7. Upon release of the member 82, the container now filled is removed therefrom and the gate 102, pins 92 and member 82 return to their original positions.

Secured to the upper plate 75 at the upper part thereof is an inverted V bracket 110 having a bolt 111 making a threaded engagement therewith. The bolt has a head 112 whose position relative to the bracket 110 may be varied and carries a locking nut 113. Secured to the upper part of the grooved plate 75 on its longitudinal center line and depending therefrom is a V bracket 114 having a vertically disposed rod 115 making threaded engagement therewith. The rod 115 carries a locking nut 116 to lock the rod in any particular vertical position and a lower nut 117 has a resilient rubber or leather bumper washer 118 secured to the lower face of nut 117 and spaced from the lower end of rod 115. Anchored to the lower end of plate 75 is a bracket having an arm 119 with an opening therein depending from the under side of plate 75.

The fixture may be combined with the previously described mechanism so that the upper end of the plate 75 is located at the same level or just slightly below the upper end of apron 39 and is slightly spaced therefrom, with bar 52, carrying window 54, being freely disposed between walls 34 because it is part of the fixture and is secured to plate 75 by bolt 53.

The upper edge of plate 78 may be closely adjacent guide 53. The head 112 of bolt 111 is so adjusted that it firmly and tightly bears against the cross arm of member 73 and the upper part of plate 75 is thereby held against resilient bumper 64. The lower end of rod 115 is located in the vertical opening of arm 28 and the pin 72 is located in the opening in arm 119.

When it is desired to fill a bottle or like container rather than a flat container, as shown in Figures 4, 5 and 7, I prefer that the fixture have a gate and pin actuating mechanism, as shown in Figures 8 and 9. Each member 86 is elongated to provide a projection 120 extending below plate 75. A rigid bar 121 is pivoted near one end thereof to projection 120 by pin 122 and is spaced from and extends along the bottom of plate 75 to a point beyond the end thereof and thereat carries a funnel unit discharge guide 123 having a neck 124 with a flange 125 adapted to be actuating by a container 126.

Intermediate the pivot 122 and guide 123, a housing 127 for a compression spring 128 depends from said bar. An inverted L shaped rod 129 has one end thereof extending into said housing and its other end located between the top plate 78 and a bar 130 extending downwardly from the member 88. When the container 126 is inserted into neck 124 and forced against the flange 125, the guide funnel 123 is swung to its upper position. As the guide 123 is swung upwardly in the direction of the arrow, as shown in Figure 8, the bar 121 is swung about pivot 122 and against the action of spring 128 and the bar 129 is swung upwardly to the dotted line position.

This causes the gate 102 to be completely open and the pins to firmly hold the units above those to be discharged and all of the units below those held by the pins discharge into container 126. When the container is lowered and removed from neck 124, the elements all assume their original positions.

In operation, the units which may be of any size, shape or weight are fed in bulk to the hopper 41. In Figures 1-6, there is illustrated a machine particularly adapted to feed units, such as tablets or discs into a flat container and in the arrangement shown in Figure 7 of three rows of tablets, each row consisting of four tablets. The bulk tablets feed through mouth 47 and pile up behind yielding member 50 and on plate 37. The motor 13 is energized to drive the rotor 14 thereof at approximately constant speed. The rotor 14 drives the eccentric 17 which in turn imparts a vertical oscillatory motion to the vertical arm 26 of the follower 20, to the arm 28 and the vertically disposed striking nipple 30. One end of the arm 28 periodically strikes the bumper 118 of nut 117 to vibrate the entire fixture. Simultaneously therewith the nipple 30 periodically strikes the bumper nut 58 to impart oscillatory vertical motion to striking rod 57 which in turn periodically strikes bumper 40 to impart a vibratory motion to the plate 37. As the plate 37 is vibrated the tablets are vibrated so that they feed forwardly flatwise in a single layer between the member 50 and plate 37 and further forwardly to the end of the plate 37 over to the receiving mouths of the chutes or grooves 76 of the plate 75 which is vibrating.

At the mouth of the chutes the tablets are kept in motion and adjust themselves to feed into said chutes which are vibrating and thus are aligned therein and feed therein in single file. The tablets in the chutes are continuously maintained in motion towards and away from the lower surfaces of the chutes 76 and top plate 78. The rate of feeding of the tablets along the plate 37 may be varied by varying the amplitude of vibration of said plate and this may be accomplished by turning the nut 58 up or down on rod 57 to change the position of the lower surface of the nut 58 with respect to the maximum vertical po-

sition of the nipple 30. And, the speed of vibration of the fixture may be varied by turning the bumper nut 117 up or down to vary the position of the lower face of bumper 118 with respect to the maximum vertical position of the striking part of arm 28. Any variation of the speed of vibration of the fixture varies the speed of discharge of the units when the gate is opened. After the nuts 58 and 117 have been properly adjusted, and with the motor energized, the operator inserts with the palm of his hand the sides of the bottom of the container shown in Figure 7 in the grooves 84 of the sides.

The front side of the bottom of the container is located in the forward groove 84 and the rear side of the bottom of the container and the side of the top of the container hinged thereto are located in the rear groove. The forward part of the hand is tipped upwardly to swing the container and sides about the pivot and as this pivotal movement takes place the wings of the gate 102 are struck by the sides to lift the gate 102.

As the gate is lifted, each pin 92 is swung downwardly into the slot 79 and contacts the tablet above a predetermined number to hold the same in place and maintain all of those thereabove from discharging. The spring 94 controls the pressure on the tablets by pins 92. When the lower edge of the gate 102 is located above the lower face of cover plate 75, four rows of tablets discharge into the container which vibrates with the fixture so that the units arrange themselves in the manner shown in Figure 7. Then the pressure is removed from the bottom of the container and the container and cast member swing downwardly to the position shown in Figure 4 where the gate 102 closes the discharge end of the chutes and the pins 92 are raised above the lower face of cover plate 79. The filled container is removed therefrom and the above operations are repeated to fill the next container. With the two batteries of grooves one may use both hands and simultaneously fill two containers.

When it is desired to fill a bottle of units without regard to the position of one unit with respect to the other, the fixture, which differs from the fixture in Figure 1 by the modified construction shown in Figures 8 and 9, replaces the fixture shown in Figure 1. In this case, both hands may also be used to simultaneously fill two bottles with a predetermined number of units. The neck of each bottle is inserted in the neck 124 and forces against flange 125 which lifts the funnel upwardly towards the discharge gate 102 and swings bar 121 about pivot 122. The inverted L bar strikes the rod to swing the pins 92 into contact with the unit above the predetermined number and the gate is opened and the predetermined number of units discharge into the funnel and therethrough into the bottle. When the bottle is lowered the elements which were in the dotted line position when the funnel was raised now have assumed the normal full line position.

What is claimed:

1. A tablet, capsule, pill or like unit feeding apparatus comprising means for containing in bulk units to be fed, means for receiving said units from said first means, reciprocating means for vibrating said second means in the direction of its thickness to feed said units therealong, a chute for receiving said units from said second means and for aligning them in single file therein, the receiving end of said chute disposed as low as the

discharge end of said second means whereby said units will discharge from said second means into said chute reciprocating means for agitating said chute to maintain in motion said units therein, an eccentric, a motor for driving said eccentric, both of said reciprocating means driven by said eccentric, both of said reciprocating means including a common reciprocating element carried by and driven by said eccentric.

2. A tablet, capsule, pill or like unit feeding apparatus comprising means for containing in bulk units to be fed, means for receiving said units from said first means, reciprocating means for vibrating said second means in the direction of its thickness to feed said units therealong, a chute for receiving said units from said second means and for aligning them in single file therein, the receiving end of said chute disposed in close proximity to the discharge end of said second means and as low as the discharge end of said second means whereby said units will discharge from said second means into said chute reciprocating means for agitating said chute to maintain in motion said units therein, a motor, a rotor shaft carried by and driven by said motor, an eccentric carried by said shaft and driven thereby, both of said reciprocating means including a common reciprocating element carried by and driven by said eccentric.

3. A tablet, capsule, pill or like unit feeding apparatus comprising a hopper for containing in bulk units to be fed, an incline plate for receiving said units from said hopper, a chute for receiving said units from said plate and aligning them in single file therein, the receiving end of said chute disposed in close proximity to and as low as the discharge end of said plate whereby said units will discharge from said plate into said chute, a motor, a rotor shaft carried by and driven by said motor, an eccentric secured to said shaft and driven thereby, reciprocating means supported by said eccentric and driven thereby, vertically disposed sliding means driven by said reciprocating means to vibrate said plate, means secured to said chute and driven by said reciprocating means to agitate said chute.

4. A tablet, capsule, pill or like unit feeding apparatus comprising a hopper for containing in bulk units to be fed, an incline plate for receiving said units from said hopper, a chute for receiving said units from said plate and aligning them in single file therein, a motor including a rotor shaft, an eccentric secured to said shaft and driven thereby, reciprocating means supported by said eccentric and driven thereby, a vertically disposed sliding means driven by said reciprocating means to vibrate said plate, said sliding means including an adjustable element whose position relative to the maximum upper position of said reciprocating means may be varied to vary the degree of vibration of said plate during actuation thereof by said sliding means when driven by said reciprocating means and means secured to said chute and driven by said reciprocating means to agitate said chute.

5. A tablet, capsule, pill or like unit feeding apparatus comprising a motor including a driven rotor shaft, a support therefor, a hopper for containing in bulk units to be fed, a support for said hopper including a pair of vertically disposed elements, an incline plate for receiving units from said hopper and located between said elements, an incline chute for receiving units from said plate and aligning the same therein, the mouth of said chute located adjacent the lower end of said plate, an eccentric secured to said shaft and

driven thereby, reciprocating means carried by said eccentric and driven thereby, sliding means located between said elements and driven by said reciprocating means to vibrate said plate in the direction of its thickness, means driven by said reciprocating means to agitate said chute, said last means secured to said chute and depending therefrom, said last means including a vertically adjustable element for varying the degree of agitation of said chute when driven by said reciprocating means.

6. A tablet, capsule, pill or like unit feeding apparatus comprising a motor including a driven rotor shaft, a pedestal, said motor mounted on and secured to said pedestal, a hopper for containing in bulk units to be fed, a support for said hopper including a pair of side walls, an incline plate for receiving units from said hopper and located between said side walls, the upper end of said plate fixedly secured to said support and its other end being free to vibrate, said plate located above said motor, an incline chute for receiving units from said plate and aligning them therein, the upper part of said chute located between said walls and adjacent the lower end of said plate, the receiving end of said chute located in close proximity to the discharge end of said plate and as low as the discharge end of said plate whereby said units will discharge from said plate into said chute, a plurality of standards for spacing said support from said pedestal, an eccentric secured to said shaft and driven thereby, vertically reciprocating means carried by said eccentric and driven thereby, means driven by said reciprocating means to vibrate said plate in the direction of its thickness, and means driven by said reciprocating means to agitate said chute.

7. A tablet, capsule, pill or like unit feeding apparatus comprising a motor including a rotor shaft, a pedestal supporting said motor, a plurality of standards secured to said pedestal and spaced around said motor, a hopper for containing in bulk units to be fed, a support for said hopper, said support secured to said standards and supported thereby above said motor, an incline feed plate for receiving units from said hopper, the upper end of said plate secured to said support, an eccentric carried by said shaft and driven thereby, an incline chute for receiving said units from said plate and aligning them therein, the receiving end of said chute disposed in close proximity to the discharge end of said feed plate and as low as the discharge end of said feed plate whereby said units will discharge from said feed plate into said chute, means secured to said pedestal and supporting the lower end of said chute and reciprocating means carried by and driven by said eccentric for vibrating said plate and agitating said chute.

8. A tablet, capsule, pill or like unit feeding apparatus comprising a motor including a rotor shaft, a pedestal supporting said motor, a plurality of standards secured to said pedestal and spaced around said motor, a hopper for containing in bulk units to be fed, a support for said hopper, said support including a pair of side walls and secured to said standards, said support located above said motor, an incline feed plate for receiving units from said hopper and located between said walls, the upper end thereof secured to said support, an eccentric carried by said shaft and driven thereby, an incline chute for receiving units from said plate and aligning them in single file therein, reciprocating

means driven by said eccentric, means driven by said reciprocating means for vibrating said plate, said last means being adjustable to vary the degree of vibration of said plate, and means

5 driven by said reciprocating means to agitate said chute, said last means being adjustable to vary the degree of agitation of said chute.

9. A tablet, pill, capsule or like unit feeding apparatus comprising a hopper for containing

10 in bulk units to be fed, a plate element for receiving said units from said hopper, a chute element for receiving said units from said plate and aligning them in single file therein, the receiving

15 end of said chute element disposed in close proximity to and as low as the discharge end of said plate element whereby said units will discharge from said plate element into said chute element

20 means for agitating said plate to feed said units therealong and towards said chute, and means for agitating said chute to maintain in motion

25 said units therein, one of said means being adjustable independently of the other to vary the degree of agitation of the element agitated thereby, both of said means including a common reciprocating element, a motor, a shaft carried by

30 and driven by said motor, an eccentric carried by and driven by said shaft, said common reciprocating element carried by and driven by said eccentric.

30 10. A tablet, capsule, pill or like unit feeding apparatus comprising means for containing in bulk units to be fed, means for receiving units from said first means, reciprocating means for vibrating said second means to feed said units

35 therealong, a chute for receiving said units from said second means and for aligning said units in single file, the receiving end of said chute disposed in close proximity to and as low as the discharge end of said second means whereby said

40 units will discharge from said second means into said chute, reciprocating means for agitating said chute to agitate said units therein, both of said reciprocating means being adjustable to vary the degree of vibration of said second means

45 and said chute, one of said reciprocating means being adjustable independently of the other, a motor, a shaft carried by and driven by said motor, an eccentric carried by and driven by said shaft, both of said reciprocating means including a common reciprocating element, said

50 reciprocating element carried by and driven by said eccentric.

11. A tablet, capsule, pill or like unit feeding and measuring apparatus comprising a hopper

55 for containing in bulk units to be fed, an incline plate for receiving said units from said hopper, reciprocating means for vibrating said plate to feed said units towards the lower end thereof, an incline chute for receiving said units

60 one by one in single file, the receiving end of said chute located adjacent the lower end of said plate, a gate normally closing the discharge end of said chute and supported by said chute, normally inoperative unit retaining means supported by said chute, means connecting said retaining means and said gate, pivoted means

65 for guiding units discharged from the chute into a container and actuable by movement of the container, said gate and retaining means actuated by movement of the container simultaneously to move the retaining means to operative

70 position to maintain in said chute all of said units above a predetermined number and to open said gate whereby the predetermined number of units discharged from the chute are

guided into the container by said pivoted means.

12. A tablet, capsule, pill or like unit feeding and counting apparatus comprising a pedestal, a motor having a rotor shaft mounted on

5 said pedestal, a hopper for containing in bulk units to be fed, a support for said hopper, said support located above said motor, a plurality of standards secured to said pedestal and support, said standards spaced around said motor,

10 said support including a plurality of sides, an incline cantilever plate for receiving said units from said hopper, the upper end of said plate secured to said support, a demountable counting

15 fixture including a plurality of grooves for receiving and aligning said units in single file therein, the upper ends of said grooves located adjacent the free end of said plate, an eccentric carried and driven by said shaft, reciprocating

20 means for vibrating said plate and fixture, said reciprocating means including a vertically disposed striking element and a horizontally disposed striking element, said reciprocating means mounted on and driven by said eccentric.

13. A tablet, capsule, pill or like unit feeding and counting apparatus comprising a pedestal,

25 a motor located on and secured to said pedestal, a rotor shaft carried by and driven by said motor, an eccentric secured to and driven by said shaft, a hopper for containing in bulk units to be fed, a hopper support including a plurality

30 of sides, an incline plate secured to said support and located between said walls, a plurality of standards spaced around said motor and securing said support to said pedestal, a demountable chute for receiving units from said plate, the

35 lower end of said chute supported by said pedestal and the upper end thereof supported by said support and located adjacent the lower end of said plate, reciprocating means for said plate and chute, said reciprocating means including

40 means supported by and driven by said eccentric.

14. A tablet, capsule, pill or like unit counting fixture comprising a plate having a plurality of grooves therein, a cover plate therefor, one of

45 said plates having a plurality of openings therein, pivoted means supported by one of said plates near the discharge end thereof, a plurality of pins adapted to be moved through said openings, a plurality of rods connecting said pivoted means

50 and said pins, a gate for closing the discharge end of said grooves, said gate connected to said pivoted means, resilient means tending to rotate said pivoted means to maintain said gate in closed position and said pins in inoperative position,

55 an independently operable individual resilient pressure take-up spring for each pin, a pivoted rod supported by one of said plates, a discharge funnel guide connected to one end of said rod, means actuable by said rod upon

60 actuation of said guide to rotate said pivoted means whereby the gate is opened and the pins are depressed through said openings and into operative position.

15. A tablet, capsule, pill or like unit counting fixture comprising a chute having an opening

65 therein, pivoted means carried by said chute, pivoted guide means actuable by a container to guide into the container actuated thereby units discharged from said chute, a gate for closing

70 the discharge end of said chute, said gate connected to said pivoted means, a retaining pin adapted to be moved through said opening, means connecting said pin and said pivoted

75 means, resilient means tending to rotate said pivoted means to maintain said gate in closed

position and said pin in inoperative position, said pivoted means adapted to be counterrotated against the action of said resilient means by actuation of said guide by said container to
 5 move said pin to operative position and said gate to inoperative position whereupon a predetermined number of units will discharge from said chute and be guided into said container by said guide means, and a pressure take-up spring
 10 for said pin.

16. A tablet or like unit counting fixture comprising a plurality of spaced plates having therebetween a plurality of grooves accommodating said units in single file, side by side, formation,
 15 pivoted means supported by one of said plates, a gate connected to said means, one of said plates having openings therein communicating with said grooves, a plurality of retaining pins adapted to extend through said open-
 20 ings, means connecting said pins to said pivoted means, pivoted means adapted to accommodate a flat container and to be actuated by said container and a guide comprising a plurality of elements disposed at an obtuse angle
 25 with respect to each other, said guide secured to said second mentioned pivoted means, one element of said guide extending upwardly from said other element thereof.

17. A tablet or like unit counting fixture comprising a plurality of spaced plates having
 30 therebetween a plurality of grooves accommodating said units in flat single file side to side formation, pivoted means supported by one of

said plates, a gate connected to said pivoted means, one of said plates having openings therein over said grooves, a plurality of retaining pins adapted to extend through said openings, connecting means for said pins and pivoted means,
 5 resilient means for actuating said pins with respect to said connecting means, a pivoted guide supported by one of said plates and adapted to be actuated by a flat container to actuate said gate and pins upon movement thereof and to
 10 guide a predetermined number of units discharged from said grooves in flat formation into said container.

18. A tablet, capsule, pill or like unit counting fixture comprising a plate having a plurality of
 15 sets of elongated grooves therein, a cover plate therefor, one of said plates having an opening therein over each groove, a plurality of individual pivoted means supported by one of said plates, a gate connected to each pivoted means,
 20 a plurality of retaining pins adapted to be moved through said openings, connecting rods for said pivoted means and pins, said rods being independently adjustable with respect to said pivoted means, individual spring means for each
 25 pin, a pivoted guide located near the discharge end of each set of grooves to guide into a container the units discharged from said plate and actuable by said container, said retaining pins and said gate being simultaneously actuated by
 30 pivotal movement of said guide.

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