

March 18, 1941.

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2,235,286

DISCHARGE MECHANISM FOR TABLET MACHINES

Filed Sept. 9, 1939

3 Sheets-Sheet 1

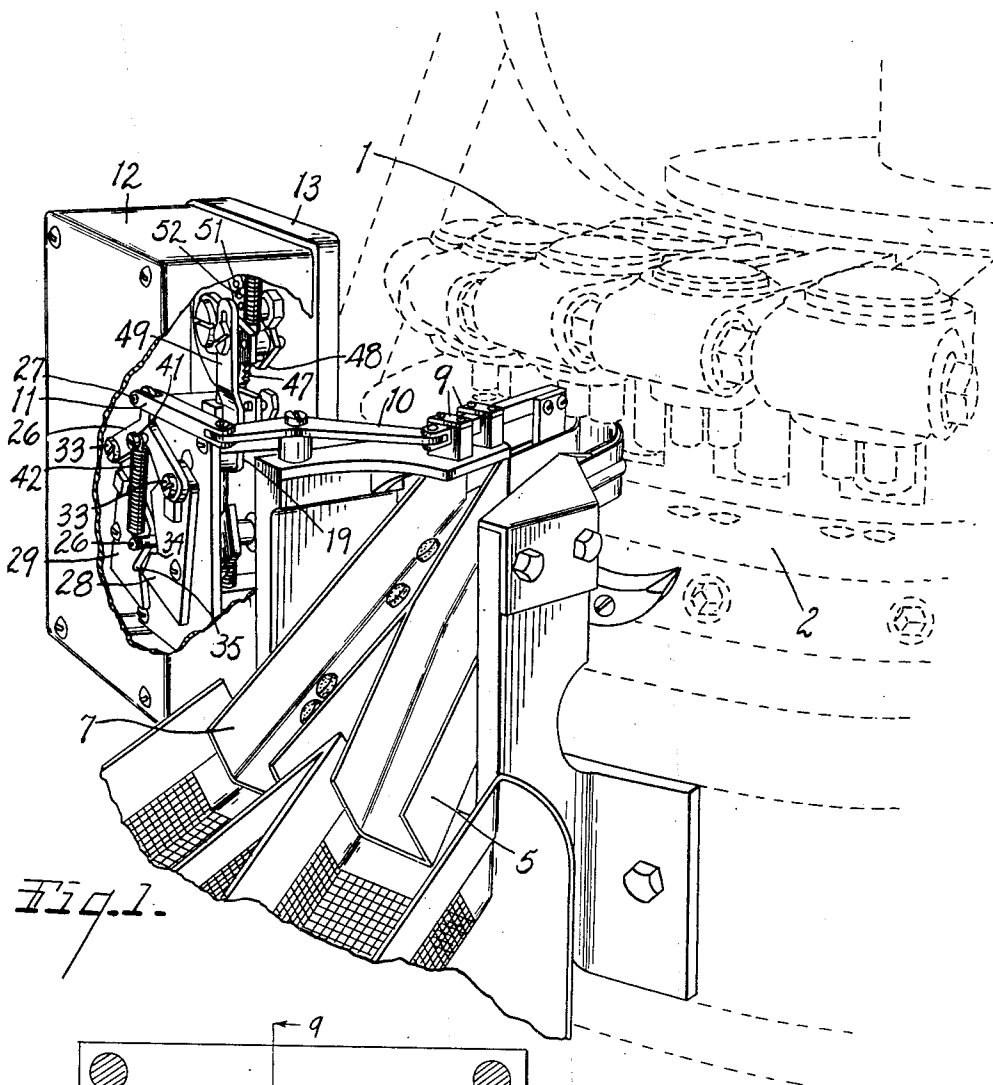


Fig. 1.

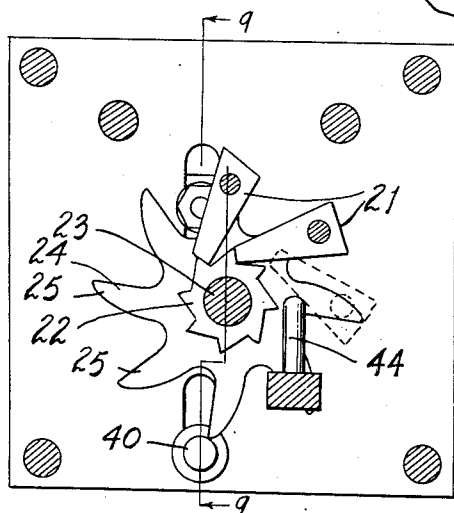


Fig. 2.

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3 Sheets-Sheet 2

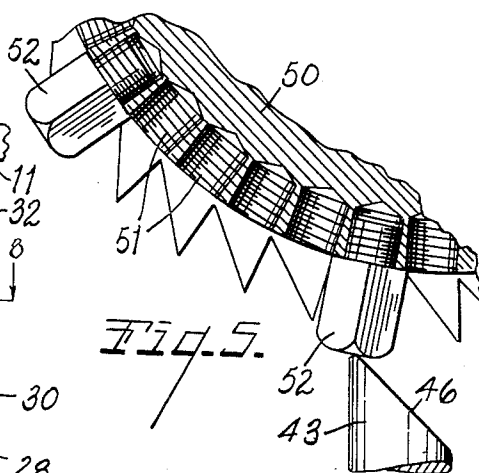
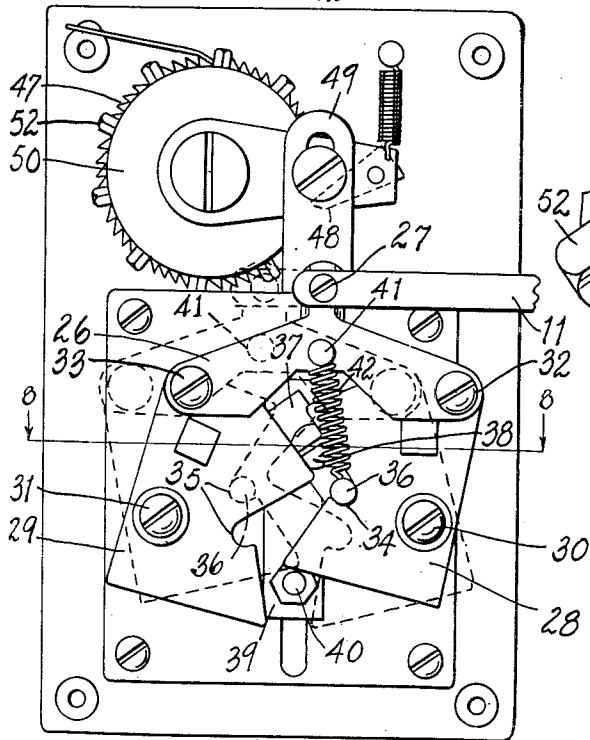
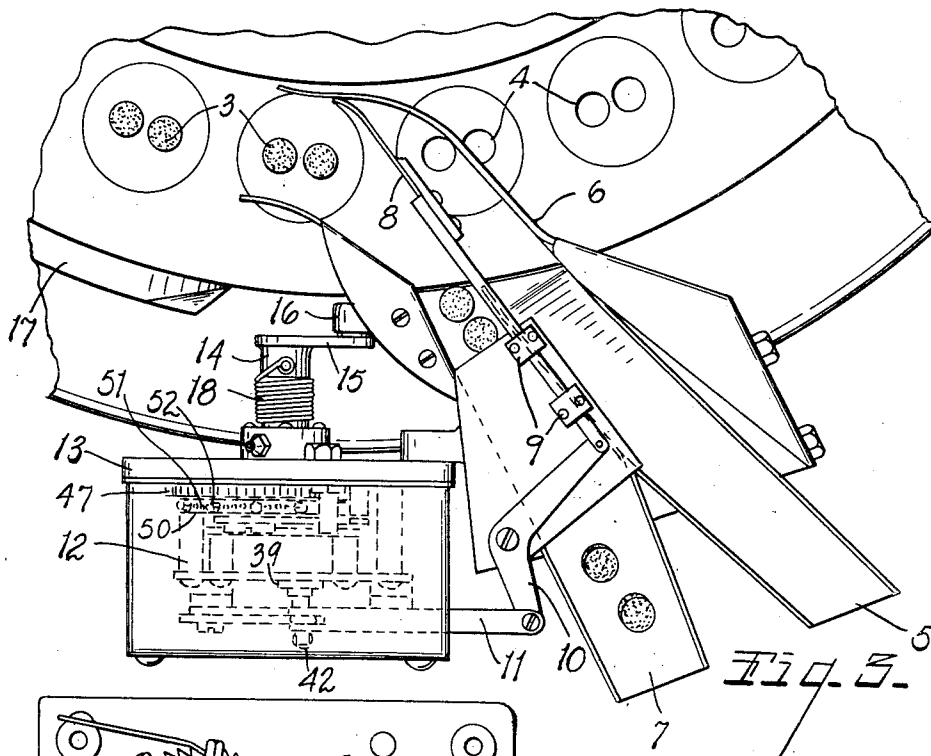


Fig. 4.

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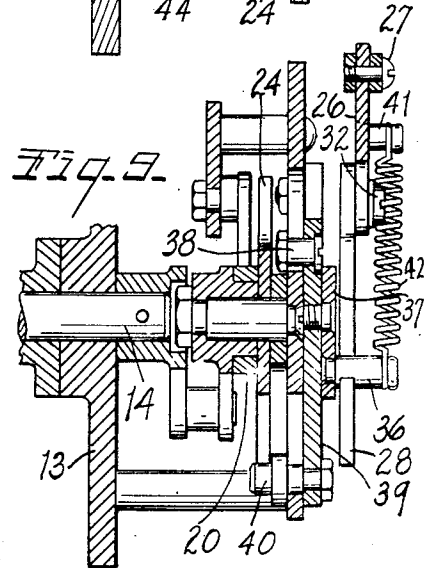
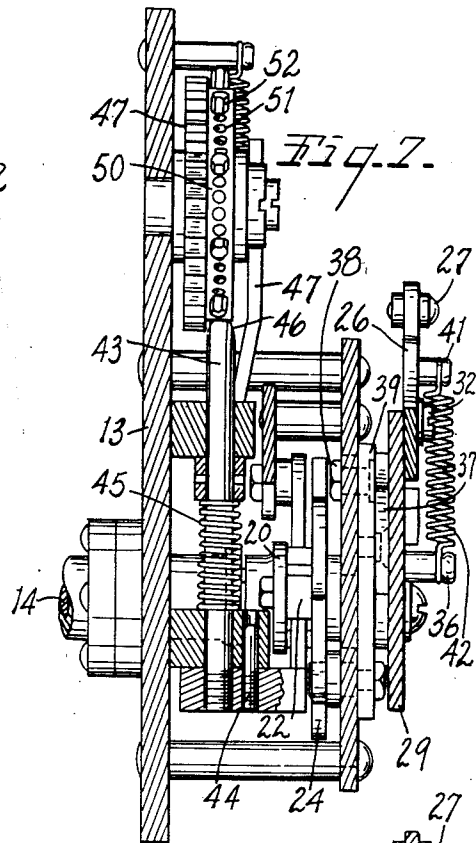
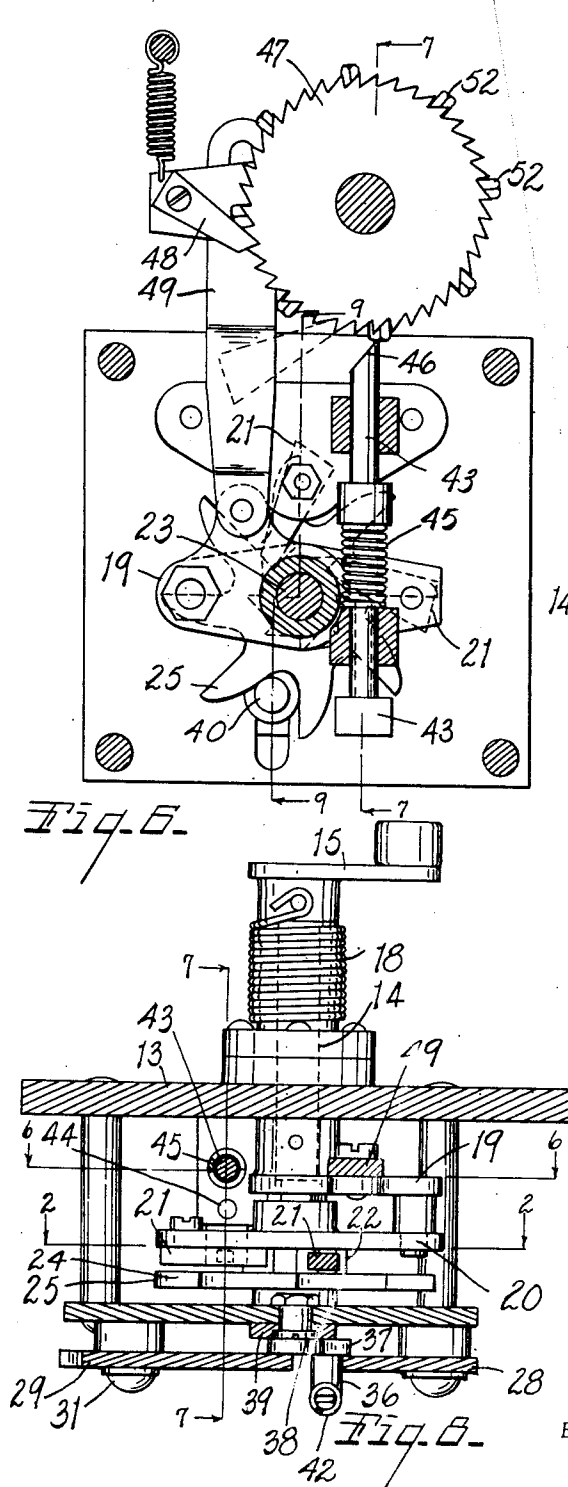
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DISCHARGE MECHANISM FOR TABLET MACHINES

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3 Sheets-Sheet 3



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DISCHARGE MECHANISM FOR TABLET MACHINES

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Application September 9, 1939, Serial No. 294,220

12 Claims. (Cl. 198—68)

This invention relates to tablet packing and counting machines and particularly to such machines for attachment to standard tablet forming machines of the type having rotary heads on the surface of the peripheries of which the tablets are formed and carried during operation of the machine.

It has for its objects:

First, to produce a new and improved machine of the type described.

Second, to produce such a machine which is positive in its operation and which may be easily adjusted to take tablets in different numbers from the same machine without complicated adjustments.

Third, to provide such a machine in which there are two troughs with wings to scrape the tablets from the surface of the revolving head, one of which wings is slidable across the head making the machine capable of satisfactory use on high speed tablet forming machinery without crushing the tablets during shifting of the wing.

Other objects and advantages pertaining to details and economies of construction and operation will appear from the description to follow. The invention is defined in the claims. A preferred embodiment of my invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view showing my new and improved machine.

Fig. 2 is a detail sectional view through a portion of the operating mechanism taken on the line 2—2 of Fig. 8.

Fig. 3 is a top plan view of a portion of my machine showing how the tablets are intercepted by the slidable wing of the advance trough.

Fig. 4 is a detail view taken from the right of the operating mechanism shown in Fig. 7 and from the bottom of the mechanism shown in Fig. 8.

Fig. 5 is a detail sectional view of the pawl release mechanism.

Fig. 6 is a detail sectional view taken on line 6—6 of Fig. 8.

Fig. 7 is a detail sectional view taken on the line 7—7 of Fig. 6.

Fig. 8 is a top plan view of the operating mechanism.

Fig. 9 is a detail sectional view taken on the line 9—9 of Figs. 2 and 6.

My improved machine designated generally at 1 consists of a rotary head 2 which moves in a counterclockwise direction as viewed in Fig. 3. The tablets 3 are formed in the recesses 4 in a conventional manner and on completion are

carried on the surface of the periphery of the head.

A trough 5 is provided extending from the head to carry tablets therefrom. A wing 6 on the far side of the trough with reference to the movement of the head extends across the surface of the head to scrape the tablets therefrom and guide them to the trough 5. This wing extends obliquely across the path of movement of the tablets and in a direction generally opposed to the movement.

A second trough 7 is provided to receive tablets. This trough has a wing 8 which is slidably mounted at the far side of the trough with reference to movement of the head. This slidable wing 8 is mounted in a suitable slideway 9 and may be moved from a retracted position out of the line of movement of the tablets obliquely across the surface of the head as shown in Fig. 3 to intercept tablets and guide them to the trough 7, the movement being in a direction generally opposed to the line of movement of the tablets so that the tablets will be scraped from the head and will be guided to the trough when the wing is in the position shown in Fig. 3. This movement permits the wing to knife its way into position and to be retracted from tablet intercepting position without crushing the tablets as might be the case if the wing were a pivoted wing.

The wing is operatively connected by bell crank lever 10 and pitman 11 to the operating mechanism indicated generally at 12, which is provided with a suitable supporting frame 13 in which a rockshaft 14 is pivoted. The rockshaft is provided with a crank 15 and a cam follower 16 which is engaged and depressed by cam 17 carried by the head 2 on each revolution of the head. A return spring 18 rocks the shaft back to place the cam follower in position for further actuation by the cam after the cam has passed on the revolution of the head.

On the rockshaft 14 is a crank or lever 19 to which is connected a lever 20 which carries a pawl 21 which is reciprocated from the full line position shown in Fig. 2 to the dotted line position there shown on every reciprocation of the rockshaft. A ratchet wheel 22 is disposed for rotation about the axis of the rockshaft on a shaft 23 which extends coaxially of the rockshaft. A cam wheel 24 having a plurality of lobes 25 is connected to said ratchet wheel to be rotated upon rotation of the ratchet wheel.

Reciprocation of the pitman 11 is brought about by means of a yoke 26 which is pivoted at 27 to the pitman. A pair of levers or plates

28 and 29 are pivoted at 30 and 31 to the frame 13 and are pivotally connected at 32 and 33 to the arms of the yoke so that on pivoting of the lever 28 from the full line position shown in Fig. 4 to the dotted line position, the pitman is shifted to the dotted line position there illustrated. A similar pivoting of the lever or plate 29 will shift the pitman back as will be apparent.

The levers or plates 28 and 29 are respectively provided with notches 34 and 35 which are opposed to one another and are adapted to receive a pin 36 on a lever 37 which is pivoted at 38 to a plunger 39 which is mounted for vertical sliding movement. The plunger 39 is provided with a pin 40 which is engaged by the cam lobes 25 on the cam wheel 24 on rotation thereof in a counterclockwise direction as viewed in Fig. 2, to provide for a downward movement of the plunger.

The downward movement of the plunger shifts the pitman as follows: At the upper portion of the stroke, the pin 36 will be engaged in either notch 34 or 35. If it is engaged in notch 34, as shown in Fig. 4, the lever or plate 28 will be pivoted in a counterclockwise direction until it assumes the dotted line position, thus shifting the pitman. Upon shifting of the pitman, the pin 41 to which the spring 42, which is likewise attached to pin 36, is fastened, shifts to the dotted line position shown in Fig. 4, causing the pin 36 by toggle action to snap over into the notch 35 so that upon the next reciprocation of the plunger 39 the pitman will be shifted back to the full line position shown in Fig. 4.

The pawl 21 is held out of engagement with the ratchet 22 by means of a plunger 43 carrying a pin 44. The plunger 43 is spring pressed upwardly by spring 45 and has at its end a cam follower portion 46.

A ratchet wheel 47 is mounted on the frame 13 and is provided with an actuating pawl 48 which is operatively connected by a pitman 49 to the crank 19 on the rockshaft 14. This pawl is arranged to rotate the ratchet wheel 47 once for every revolution of the head. Attached to the ratchet wheel 47 is a cam wheel 50 which has at its periphery a plurality of tapped holes 51 to removably receive the screw threaded cam members 52 which may be inserted in the holes so that after a given number of rotations of the head the plunger 43 will be depressed to permit the pawl 21 to rotate ratchet 22 and cam wheel 25 to actuate the slidable wing.

It will be apparent that with the mechanism above described, the slidable wing 8 will be either retracted or advanced at the end of a given number of revolutions of the head which always produces a constant number of tablets. By this means it is possible after a given number of tablets have been formed and passed through one trough to cause the tablets formed on the head to then go to the other trough so that as one bottle is filled and removed, another one can be receiving tablets from the machine.

The cam wheel 50 is so arranged that it is a simple matter to change the number of revolutions necessary to effect a shift in the position of the wing and it is not necessary to tear down the mechanism to make this change since the spacing and number of cams 52 control the operation of the mechanism which shifts the wing 8. It will be apparent that the mechanism for shifting the pitman is a highly satisfactory and positively operating mechanism which permits the shifting of the pitman back and forth by a

similar movement of the shifting mechanism and that the shifting mechanism will operate speedily so that the shifting movement of the wing will be effected without delay.

The terms and expressions which have been herein employed are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described, or portions thereof, but it is recognized that various modifications are possible within the scope of the invention claimed.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a slidable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and slidable across the surface of said head and the path of movement of said tablets, and means for advancing said slidable wing across the path of movement of said tablets and for retracting it comprising a cam carried by said head, a frame, a rockshaft, a crank thereon having a cam follower positioned to be engaged by said cam to rock said shaft on each revolution of said head, an arm operatively connected to said rockshaft for rotation on rocking thereof, a pawl on said arm, a ratchet wheel mounted for rotation about the axis of said rockshaft and engageable by said pawl, a cam wheel connected to said ratchet wheel for rotation thereby, a plunger having a cam follower engageable by said cam wheel for reciprocation of said plunger, a pitman operatively connected to said slidable wing, a yoke pivoted to said pitman, a pair of levers each pivoted to said frame and pivoted to an arm of said yoke whereby pivoting of either lever toward the other will bodily shift the yoke and the attached pitman, an arm pivoted on said plunger and having a pin at the free end thereof, a notch in each lever adapted to engage said pin on downward movement of said plunger, said notches being opposed, a spring pivoted to said yoke and to said arm in such relation to said arm that shifting of said yoke to one side or the other of said plunger will cause said arm to swing to one side or the other of said plunger by a toggle action to move said pin from one notch to the other, a spring pressed plunger holding said pawl out of engagement with its ratchet wheel, a second ratchet wheel, an operating pawl for said second ratchet wheel operatively connected to said rockshaft to rotate said second ratchet wheel one tooth division for each reciprocation of said rockshaft, a wheel operatively connected with said second ratchet wheel and having a plurality of peripheral openings, and removable cams fitted in said openings and positioned to engage said spring pressed plunger to force it against the action of the spring to release said first mentioned pawl to permit it to rotate its ratchet wheel and the cam wheel.

2. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a movable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and movable across the surface of said head and the path of movement of said tablets, and means for moving said movable wing across the path of movement of said tablets and for retracting it comprising a cam carried by said head, a frame, a rockshaft, a crank thereon having a cam follower positioned to be engaged by said cam to rock said shaft on each revolution of said head, an arm operatively connected to said rockshaft for rotation on rocking thereof, a pawl on said arm, a ratchet wheel mounted for rotation about the axis of said rockshaft and engageable by said pawl, a cam wheel connected to said ratchet wheel for rotation thereby, a plunger having a cam follower engageable by said cam wheel for reciprocation of said plunger, a pitman operatively connected to said slidable wing, a yoke pivoted to said pitman, a pair of levers each pivoted to said frame and pivoted to an arm of said yoke whereby pivoting of either lever toward the other will bodily shift the yoke and the attached pitman, an arm pivoted on said plunger and having a pin at the free end thereof, a notch in each lever adapted to engage said pin on downward movement of said plunger, said notches being opposed, a spring pivoted to said yoke and to said arm in such relation to said arm that shifting of said yoke to one side or the other of said plunger will cause said arm to swing to one side or the other of said plunger by a toggle action to move said pin from one notch to the other, a spring pressed plunger holding said pawl out of engagement with its ratchet wheel, a second ratchet wheel, an operating pawl for said second ratchet wheel operatively connected to said rockshaft to rotate said second ratchet wheel one tooth division for each reciprocation of said rockshaft, a wheel operatively connected with said second ratchet wheel and having a plurality of peripheral openings, and removable cams fitted in said openings and positioned to engage said spring pressed plunger to force it against the action of the spring to release said first mentioned pawl to permit it to rotate its ratchet wheel and the cam wheel.

3. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a slidable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and slidable across the

surface of said head and the path of movement of said tablets, and means for advancing said slidable wing across the path of movement of said tablets and for retracting it including a ratchet wheel means operable in timed relation to the rotation of said head to advance said ratchet wheel a portion of a revolution for each rotation of said head, and a second wheel driven by said ratchet wheel and having on the periphery thereof a plurality of holes to receive removable cams.

4. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a slidable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and slidable across the surface of said head and the path of movement of said tablets, and means for advancing said slidable wing across the path of movement of said tablets and for retracting it including a wheel having on the periphery thereof a plurality of holes to receive removable cams, and means to rotate said wheel a portion of a revolution for each revolution of said head.

5. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a movable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and movable across the surface of said head and the path of movement of said tablets, and means for moving said movable wing across the path of movement of said tablets and for retracting it including a ratchet wheel means operable in timed relation to the rotation of said head to advance said ratchet wheel a portion of a revolution for each rotation of said head, a second wheel driven by said ratchet wheel and having on the periphery thereof a plurality of holes to receive removable cams.

6. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a movable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and movable across the surface of said head and the path of

movement of said tablets, and means for moving said movable wing across the path of movement of said tablets and for retracting it including a wheel having on the periphery thereof a plurality of holes to receive removable cams and means to rotate said wheel a portion of a revolution for each revolution of said head.

7. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a slidable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and slidable across the surface of said head and the path of movement of said tablets, and means for advancing said slidable wing across the path of movement of said tablets and for retracting it including a rotary member, means for rotating said rotary member a partial revolution for each revolution of said head, and cam means carried by said rotary member and adjustable to different positions thereon to vary the operation of said means for advancing said wing with reference to the number of revolutions of said head.

8. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a movable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and movable across the surface of said head and the path of movement of said tablets, and means for moving said movable wing across the path of movement of said tablets and for retracting it including a rotary member, means for rotating said rotary member a partial revolution for each revolution of said head, and cam means carried by said rotary member and adjustable to different positions thereon to vary the operation of said means for moving said wing with reference to the number of revolutions of said head.

9. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending obliquely across the surface of said head and in the path of and against the direction of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a slidable wing forming an extension of the far side of said trough with reference to the direction of move-

ment of said tablets and slidable obliquely across the surface of said head and the path of movement of said tablets and against the direction of movement thereof, and means for advancing said slidable wing across the path of movement of said tablets and for retracting it from said path of movement operating in timed relation to the rotation of said head.

10. In a tablet making machine having moving means on the surface of which the finished tablets are carried, the combination of a trough extending from the moving means and having a wing extending obliquely across the surface of said moving means and in the path of and against the direction of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a slidable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and slidable obliquely across the surface of said moving means and the path of movement of said tablets and against the direction of movement thereof, and means for advancing said slidable wing across the path of movement of said tablets and for retracting it from said path of movement.

11. In a tablet making machine having a rotary head on the surface of the periphery of which the finished tablets are carried, the combination of a trough extending from the periphery of said head and having a wing extending across the surface of said head and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a slidable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and slidable across the surface of said head and the path of movement of said tablets, and means for advancing said slidable wing across the path of movement of said tablets and for retracting it from said path of movement operating in timed relation to the rotation of said head.

12. In a tablet making machine having moving means on the surface of which the finished tablets are carried, the combination of a trough extending from the moving means and having a wing extending across the surface of said moving means and in the path of movement of tablets carried thereby and on the far side of the trough with reference to the direction of movement of the tablets to intercept tablets and guide them to said trough, a second trough in advance of the first trough with reference to the direction of movement of tablets having a slidable wing forming an extension of the far side of said trough with reference to the direction of movement of said tablets and slidable across the surface of said moving means and the path of movement of said tablets, and means for advancing said slidable wing across the path of movement of said tablets and for retracting it from said path of movement.

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