

May 16, 1933.

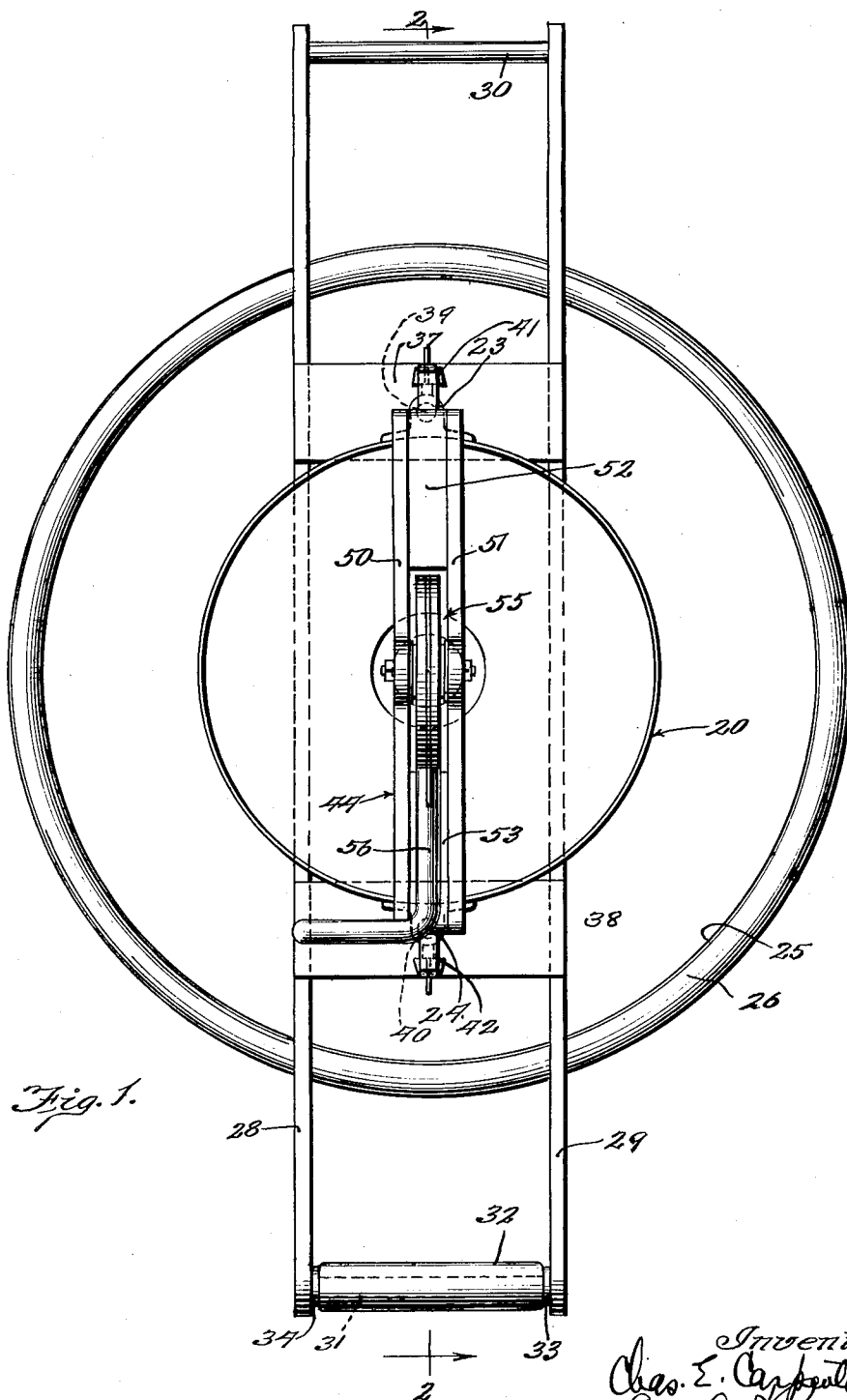
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1,909,570

DOUGHNUT MACHINE AND THE LIKE

Original Filed March 12, 1931

5 Sheets-Sheet 1



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DOUGHNUT MACHINE AND THE LIKE

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5 Sheets-Sheet 2

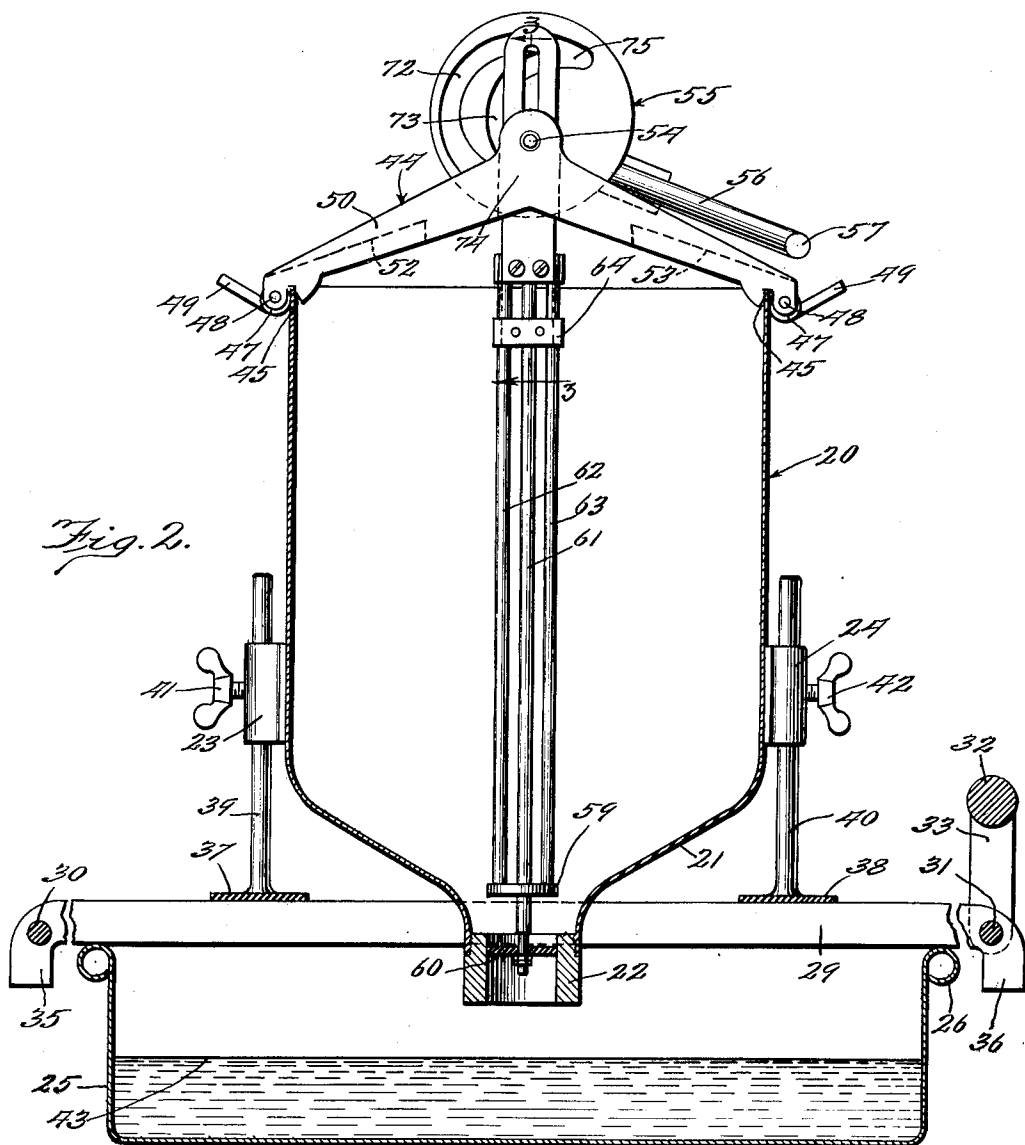
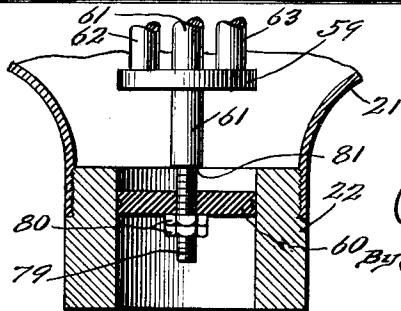


Fig. 16.



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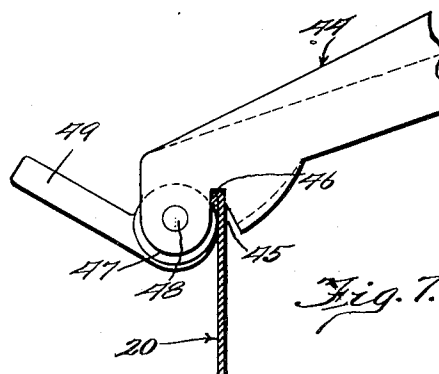
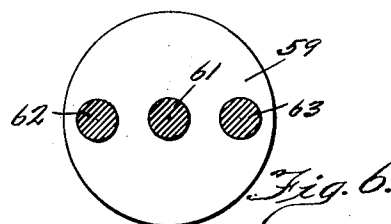
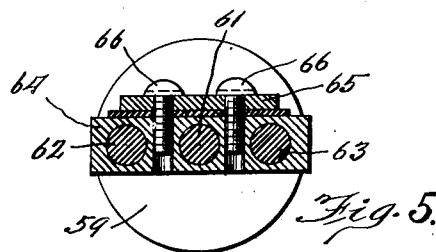
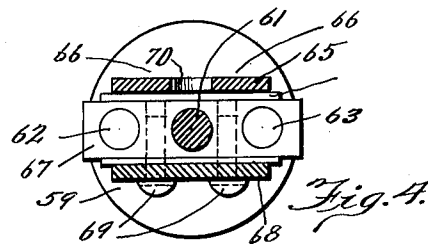
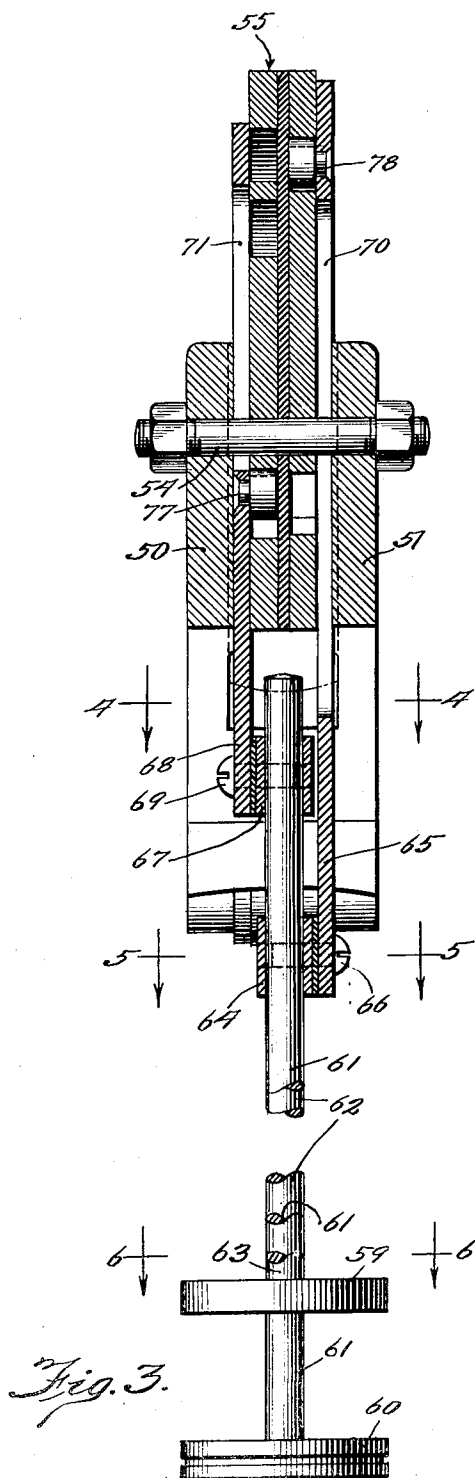
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DOUGHNUT MACHINE AND THE LIKE

Original Filed March 12, 1931

5 Sheets-Sheet 3



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DOUGHNUT MACHINE AND THE LIKE

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5 Sheets-Sheet 4

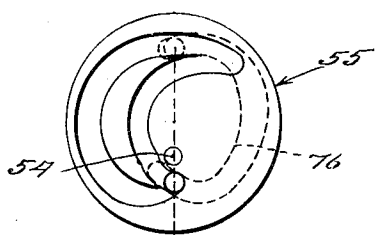


Fig. 8.

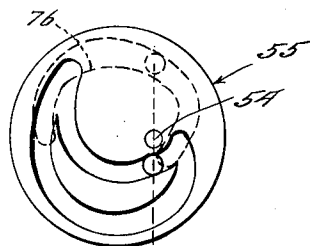


Fig. 9.

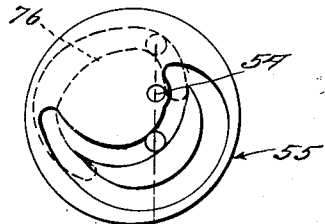


Fig. 10.

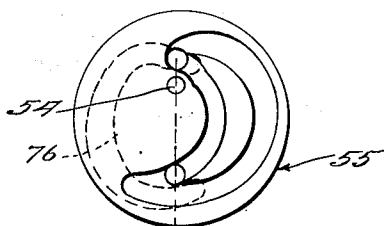


Fig. 11.

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DOUGHNUT MACHINE AND THE LIKE

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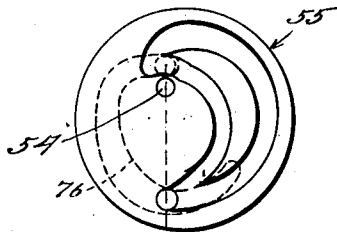


Fig. 12.

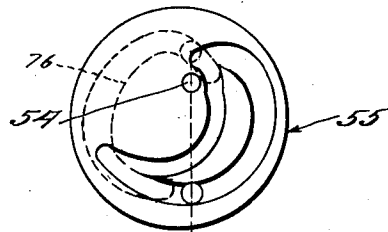


Fig. 13.

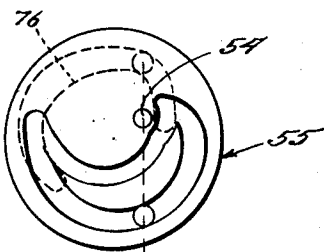
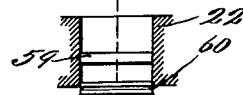


Fig. 14.

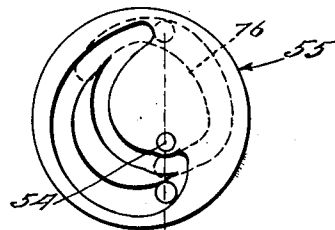


Fig. 15.

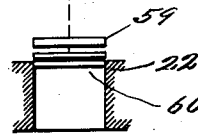
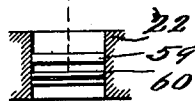


Fig. 17.

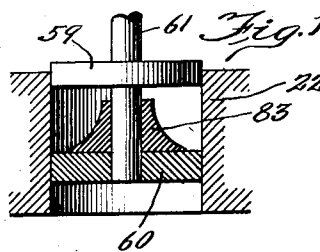
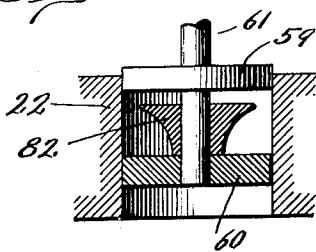


Fig. 18.

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UNITED STATES PATENT OFFICE

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DOUGHNUT MACHINE AND THE LIKE

Application filed March 12, 1931, Serial No. 521,993. Renewed September 17, 1932.

The present invention has to do with improvements in doughnut machines and the like. The invention has to do with improvements in machines for producing doughnuts and the like in such places as restaurants and bake shops where the production is on a commercial scale but is usually relatively small for commercial production. Machines embodying the features herein disclosed are therefore particularly intended for the production of the doughnuts on a larger scale than is usually required for home work, but on a smaller scale than is necessary for large commercial institutions. While the features of construction herein disclosed are especially intended for use in machines of the general size hereinbefore referred to, still certain of said features may also be used to advantage in connection with small machines such as used for homes, or in large commercial machines.

One feature of the invention relates to improvements in the doughnut forming and feeding mechanism. In this connection, it is an object to provide a construction in which the sequence of operations of the doughnut forming and feeding mechanism is produced by a direct back and forth or reciprocating movement of the operating handle as distinct from a complete turning or rotary movement thereof. Generally, the doughnut forming and delivering devices include two companion parts, including a plunger and a valve device both of which operate in proper timing or sequence within or in reference to a delivery throat. The timing of the relative movements of these parts is important because during one stage of the operation the fresh charge or batch of dough must be taken into the throat from the hopper, and on another portion of the movement said batch of dough or charge must be delivered from the throat in the form of a perforated doughnut.

One object of the invention is to provide a cam device which is so arranged that the plunger and the valve will be caused to move through these proper movements and in proper sequence throughout the entire cycle.

In this connection, it is an object to so arrange the cam devices that the plunger and the valve will move through their proper relative movements at all times, taking account of the fact that relative movements on the back stroke are not a mere reversal of the movements of the front stroke, but must be performed in a different sequence and timing.

A further object of the invention is to provide an arrangement which can be readily attached to or detached from the hopper or can in which the body of dough is carried.

Another feature of the invention relates to the provision of means for conveniently supporting the dough hopper or can above the frying pan into which the formed doughnuts are delivered. In this connection it is a further object to provide an arrangement such that the dough hopper and the doughnut forming devices are directly supported by the frying pan itself and in such a manner that the same can be readily moved around in order to drop the formed doughnuts into different positions in the frying pan.

A further feature of the invention relates to the provision of an arrangement whereby it is possible to raise or lower the doughnut forming mechanism with respect to the hot grease in the frying pan. This makes it possible to adjust the distance which the formed doughnuts must drop from the delivery opening of the doughnut forming mechanism down into the grease. This feature is of advantage since the level of the hot liquid grease changes from time to time and furthermore the grease wastes away during the cooking operation itself, so that its level falls.

Another object of the invention relates to the provision of an improved means for adjusting the size of the doughnuts formed and delivered into the frying pan. In this connection it is an object to produce an arrangement such that the stroke of the valve of the doughnut forming mechanism is variable, and an arrangement such that the valve always moves to the same position on the lower limit of its stroke, but moves to a

variable position on the upper limit of stroke.

Other objects and uses of the invention will appear from a detailed description of the same, which consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings:

Figure 1 shows a plan view of a machine embodying the features of the present invention, the doughnut forming and delivering mechanism being shown in position on top of the frying pan;

Figure 2 shows a vertical section substantially on the line 2—2 of Figure 1, looking in the direction of the arrows;

Figure 3 shows a vertical longitudinal section through the plunger and valve operating mechanisms including the cam block, being taken substantially on the line 3—3 of Figure 2, looking in the direction of the arrows, but on enlarged scale;

Figure 4 shows a cross section on the line 4—4 of Figure 3, looking in the direction of the arrows;

Figure 5 shows a cross section on the line 5—5 of Figure 3, looking in the direction of the arrows;

Figure 6 shows a cross section on the line 6—6 of Figure 3, looking in the direction of the arrows;

Figure 7 shows a fragmentary detail view of the cam locking device for securing the bracket to the upper edge of the hopper;

Figures 8, 9, 10, 11, 12, 13, 14, and 15 show more or less diagrammatically eight consecutive positions in the back and forth rocking movement of the cam block, and show also the relative corresponding position of the plunger and valve devices;

Figure 16 shows a fragmentary detail view of the adjustment connection for the cut-off valve of the doughnut forming mechanism; and Figures 17 and 18 show modified forms of the throat and valve arrangements.

In the construction illustrated, there is provided a dough hopper or container 20, the lower portion 21 of which tapers and connects to a downwardly extending throat 22. The hopper 20 is provided with a pair of oppositely placed side lugs 23 and 24 which are secured to the hopper in any convenient manner as by riveting, welding, or otherwise. The frying or grease pan is shown at 25. It is relatively shallow, and as shown in Figure 1 is preferably circular in form. The upper edge 26 of this pan is conveniently curled or beaded over so as to provide a rounded and relatively smooth top surface. Any suitable burner 27 is provided for heating the pan.

A pair of bars 28 and 29 are extended across the pan and rested edgewise on the curled or rounded upper edge portion 26 thereof. These bars are joined together at

one end by a cross piece 30. At their other end they are joined together by a cross piece or rod 31, and a handle 32 is preferably connected to the cross piece 31 by means of upwardly extending levers or brackets 33 and 34 respectively.

Preferably the ends of the bars 28 and 29 are turned downwardly as shown at 35 and 36 respectively, so that said end portions can not be pulled past the upper edge of the pan. The result is that the frame established by the bars 28 and 29 and the end cross pieces 30 and 31 can be readily shifted or slid around to different positions on the top of the pan, such manipulation being readily performed by the use of the handle 32.

There are cross bars 37 and 38 which are extended across and secured to the upper edges of the bars 28 and 29 beneath the positions of the lugs or brackets 23 and 24, respectively. Rods 39 and 40 extend upwardly from the cross bars 37 and 38 and through the lugs 23 and 24 so that the hopper 20 can be raised and lowered to any desired position of adjustment with respect to the frying pan 25. Wing nuts 41 and 42 establish a convenient means for locking the hopper in any selected vertical adjustment.

The normal level of the liquid grease within the frying pan is shown at 43 in Figure 2. This level, however, will change from time to time and will gradually work lower as the grease is consumed during the frying of the doughnuts. It is desirable that the lower delivery end of the throat 24 should stand approximately a certain distance above the level of the liquid grease; and the vertical adjustability of the dough hopper with respect to the cross bars 28 and 29 makes it possible to accomplish this result.

There is a bracket 44 extended across the upper open end of the hopper 20. The detailed construction of one end of this bracket is shown in Figure 7. In that figure, it is apparent that each end of the bracket 44 is upwardly notched on its lower side as shown at 45 so as to receive the upper edge of the hopper 20; and preferably the upper edge of the hopper is folded over or doubled as shown at 46 so as to establish a double thickness for purposes of reinforcement, and also to establish a slight downwardly facing shoulder around the outer face of the upper edge of the hopper.

There is an eccentric wedge block 47 pivotally connected to each end of the bracket 44 by a pin 48; and each of said wedge blocks 47 is provided with an outwardly extending finger piece 49 by means of which it may be turned so as to create the wedge function desired.

The cross bracket 44 is provided with a pair of upwardly extending side flanges 50 and 51, the depth of which is greatest at the center of the structure. These side flanges

are connected together in the end portions of the bracket by means of the webs 52 and 53, but said webs are eliminated in the central portion of the cross bracket 44, thereby establishing a central opening in said bracket.

A shaft pin 54 is extended across between the central portions of the flanges 50 and 51. A cam block designated in its entirety by the numeral 55 is journaled on the cross pin 54, and a handle 56 is connected to said cam block and reaches outwardly therefrom, being provided with a convenient hand grip 57 by means of which the cam block can be rocked back and forth between the two extremities of rocking movement. On one stroke, the valve and plunger devices are forced down, whereas on the return stroke they are drawn up, the movements in both cases being properly synchronized and timed as will be presently explained.

There is a plunger 59 and a valve 60 of proper size to work nicely in the throat 22. The valve 60 is carried and operated by a central rod 61, and a plunger 59 is carried and operated by a pair of side rods 62 and 63, which extend up parallel to and at the sides of the rod 61. The upper end of the rod 61 is secured to a block 64 by soldering or otherwise. At its back side the block 64 is connected to a plate 65 by means of a pair of screws 66.

The upper ends of the rods 62 and 63 are connected to a block 67 by soldering or otherwise, and at its front side the block 67 connects to a plate 68 by means of a pair of screws 69. The rod 61 is also preferably carried up through the block 67 by a sliding fit therein; and the rods 62 and 63 extend through the block 64 with a sliding fit therein.

The two plates 65 and 68 reach up at the back and front faces of the cam block 55. For this purpose said plates also extend through the central open portion of the cross bracket 44 and between the flanges 50 and 51 thereof.

The upper ends of the plates 65 and 68 are respectively slotted as shown at 70 and 71 to receive the cross pin 54, so that said plates are guided in their vertical reciprocations by means of the cross pin. The lower ends of the rods 61, 62 and 63 are guided in their vertical reciprocations by reason of the fact that the plunger 59 and the valve 60 are constantly engaged, one or the other, with the throat 22. That is to say, as the parts are reciprocated, the valve 60 is located within the throat whenever the plunger 59 travels above the throat, and in like manner the plunger 59 is located within the throat when the valve 60 travels below the throat. The arrangement is therefore such that both the upper and lower ends

of the reciprocating parts are continuously guided.

The front face of the cam block 55 is provided with a cam groove having the interconnected arms 72 and 73, which arms are connected together at their inner and outer ends as shown at 74 and 75, respectively. This cam slot therefore constitutes a closed track having a different contour on the outgoing path from its contour on the incoming or return path.

The back side of the cam block 55 is provided with a cam groove, the shape of which is shown by the dotted lines in Figures 8 to 15 inclusive, the same being designated 76. This groove is a one-track groove so that the pin travelling therein follows the same track on the return stroke as on the outstroke.

The plate 68 has on its upper end a pin or stud 77 which carries a roller, the same travelling in the cam track 72, 73, 74, 75, so that said cam track therefore controls the movements of the plunger 59. The upper end of the plate 65 carries a pin or stud 78 having a roller travelling in the cam track 76; and therefore said cam track controls the movements of the valve 60.

At this point, I may mention that the valve 60 is adjustably carried by the lower end of the rod 61, for which purpose the lower end of the rod 61 is threaded as shown at 79 and extends loosely through the valve 60 so that a pair of lock-nuts 80 on the lower threaded end 79 serve as an abutment or support for the valve 60 in its lowered position. A shoulder 81 is provided on the rod 61 above the position of the valve 60, and serves to limit relative movement between the parts in that direction.

With the above arrangement, the downward movement of the rod 61 will always force the valve 60 down to the same lowermost position, there being sufficient friction between the valve 60 and the threaded portion of the rod so that the valve 60 does not naturally drop down. However, on the up-stroke, of the rod 61, the friction between the valve 60 and the bore of the throat 22 is greater than the friction between the valve 60 and the threaded portion of the rod. This causes the valve 60 to hold back until it is engaged by the lock-nuts 80 after which the further up travel of the rod 61 pulls the valve 60 with it; and the upper limit of this movement of the valve 60 depends on the adjustment of the lock-nuts 80.

Examination and comparison of Figures 8 to 15 inclusive, will show the following operations;

At the initial position of Figure 8, the valve stands within the throat 22 at an elevation which depends upon the exact adjustment of the lock-nuts 80. In this initial position, the plunger 59 stands a sufficient

distance above the upper end of the throat to establish the desired opening for entry of a batch of dough between the plunger and the valve and into the upper portion of the throat. Upon rocking the cam block to the position of Figure 9, the valve 60 travels downwards in the throat and the plunger 59 is drawn up slightly to still further increase the separation between the parts. This will effectively draw the batch of dough between the plunger and the valve.

Upon moving to the position of Figure 10, the valve 60 continues to travel downwards and the plunger 59 also moves down towards the upper end of the throat; and these movements are continued to the position of Figure 11. In that figure, the plunger 59 has entered the upper portion of the throat and the valve 60 has passed out of the lower end of the throat; and the movement to the position of Figure 12 is a further movement to accentuate the conditions just referred to. In the position of Figure 12, the plunger 59 has been forced down to its lowest position, the valve 60 having been below and outside of the throat for some time, so that the dough batch is being forced out of the lower end of the throat and around the valve 60, this result being due also to the diminishing clearance between the plunger 59 and the valve 60.

Figure 12 represents the end of the first one-half or forward portion of the stroke of the handle 57. During the entire forward stroke, the pin or stud 77 and its roller were travelling in the inner track portion 73 of the corresponding cam groove. Upon commencing the back stroke of the handle, the pin or stud 77 and its roller enter the outer leg or branch 72 of the corresponding cam groove. This is of greater radius than the branch or track 73, so the effect is to hold the plunger 59 downwards at a lower elevation than the positions of said plunger at corresponding handle positions on the forward stroke. The result is that as the back stroke commences, the valve 60 is drawn up as shown in Figure 13, so as to close the lower end of the throat, thereby cutting off the doughnut and perforating the same, this action taking place with substantially no upward movement of the plunger 59. In moving to the position of Figure 14, the valve 60 has been drawn up relatively close to the plunger 59, the exact clearance depending upon the adjustment of the locknuts 80. In moving on to the position of Figure 15, both the plunger 59 and the valve 60 are travelling upwards relatively close together, but it will be observed that at no time does the valve 60 travel out of the upper end of the throat.

Finally, the parts move from the position of Figure 15, back to the position of Figure

8; and during this movement the plunger 59 is drawn up higher into the hopper while the valve 60 remains substantially stationary.

It will be noted that the construction herein disclosed is such that the machine can be readily moved around to different positions over the frying pan, such manipulations being performed with the left hand for example, and at the same time at each selected position for placement of a doughnut, the handle 57 can be moved back and forth so as to form and drop a doughnut into the frying pan at such position. This provides an arrangement which is very convenient and flexible in its operation and control, since the operator can immediately move the device to whatever position may be at the time unoccupied by a frying doughnut.

It will also be observed that the bracket 44 can be very readily attached to or disconnected from the upper portion of the dough hopper, this making it possible to readily remove the operating devices including the plunger and the valve and connected parts, so that the same can be readily cleaned and so that the inside of the hopper and throat can also be readily cleaned.

In the modified construction of Figure 17, the plunger 60 is provided with an upwardly extending inverted thimble section 82 which surrounds the rod 61 but does not extend up high enough to interfere with the movements of the plunger member 59. The upper portion of this thimble member 82 is larger in diameter than its lower portion. The result is that during the suction or intake stroke the dough seems to be forced to swirl around into a rounded cross section against the upper face of the valve member 60, and during the delivery operation the dough is delivered into a more perfectly formed doughnut.

In the modified construction of Figure 18, the valve member 60 is surrounded by an upwardly tapered thimble 83 which is inverted as compared to the thimble 82 of Figure 17. This type of construction gives a delivery of the dough in the form of a relatively thin ribbon, resulting in the production of a rather elongated and thin doughnut.

While I have herein shown and described only a certain embodiment of the features of my present invention, still I do not intend to limit myself thereto except as I may do so in the claims.

I claim:

1. In a doughnut machine, the combination with a dough hopper having a downwardly extending delivery throat, of a bracket extending across the upper end of said hopper, means for removably connecting said bracket to the hopper, a rocking

cam block, means for journalling the same to the bracket to permit rocking movement of said cam block about a horizontal axis, there being cam tracks on the two faces of the cam block, one of said cam tracks being a single track, and the other track being a closed track having an outgoing branch and a returning branch connected together at the ends of said branches, a plunger and a valve member located and working in and through the throat aforesaid, upwardly extending rod connections from said valve and said plunger to positions adjacent to the faces of the cam block, studs on the upper ends of said rod connections and working in the cam tracks of the cam block, the stud of the plunger rod connection working in the closed track and the stud of the valve rod connection working in the single track, and means for rocking the cam block back and forth between its extremities of movement, the arrangement being such that the stud of the valve connection works in the single track and the stud of the plunger connection works in the closed track, whereby the valve is caused to move upwards at a greater rate of travel during the first portion of the returning movement than the plunger, and the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction action between the plunger and the valve during the last portions of the returning movement substantially as described.

2. In a doughnut machine, the combination with a dough hopper having a downwardly extending delivery throat, of a bracket extending across the upper end of said hopper, means for removably connecting said bracket to the hopper, a rocking cam block, means for journalling the same to the bracket to permit rocking movement of said cam block about a horizontal axis, there being cam tracks on the two faces of the cam block, a plunger and a valve member located and working in and through the throat aforesaid, upwardly extending rod connections from said valve and said plunger to positions adjacent to the faces of the cam block, studs on the upper ends of the rod connections and working in the cam tracks of the cam block, and means for rocking the cam block back and forth between its extremities of movement, the arrangement being such that the valve is caused to move upwards at a greater rate of travel during the first portion of the returning movement than the plunger, and the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction action between the plunger and the valve during the

last portions of the returning movement, substantially as described.

3. In a doughnut machine, the combination with a dough hopper having a downwardly extending delivery throat, of a bracket, means for connecting the same to the upper portion of the hopper, a rocking cam block, means for journalling the same to the bracket to permit rocking movement of said cam block about a horizontal axis, there being cam tracks on the two faces of the cam block, one of said cam tracks being a single track, and the other track being a closed track having an outgoing branch and returning branch connected together at the ends of said branches, a plunger and a valve member located and working in and through the throat aforesaid, upwardly extending rod connections from said valve and said plunger to positions adjacent to the faces of the cam block, studs on the upper ends of said rod connections and working in the cam tracks of the cam block, the stud of the plunger rod connection working in the closed track and the stud of the valve rod connection working in the single track, means for rocking the cam block back and forth between its extremities of movement, the arrangement being such that the stud of the valve connection works in the single track and the stud of the plunger connection works in the closed track, whereby the valve is caused to move upwards at a greater rate of travel during the first portion of the returning movement than the plunger, and the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction action between the plunger and the valve during the last portions of the returning movement, substantially as described.

4. In a doughnut machine, the combination with a dough hopper having a downwardly extending delivery throat, of a bracket, means for connecting the same to the upper portion of the hopper, a rocking cam block, means for journalling the same to the bracket to permit rocking movement of said cam block about a horizontal axis, there being cam tracks on the two faces of the cam block, one of said cam tracks being a single track, and the other cam track being a closed track having an outgoing branch and a returning branch connected together at the ends of said branches, a plunger and a valve member located and working in and through the throat aforesaid, operative connections between the valve member and the single cam track, operative connections between the plunger member and the double cam track, means for rocking the cam block back and forth between its extremities of movement, the arrangement being such that the valve is caused to move

upwards at a greater rate of travel during the first portion of the returning movement than the plunger, and the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction action between the plunger and the valve during the last portions of the returning movement, substantially as described.

5. In a doughnut machine, the combination with a dough hopper having a downwardly extending delivery throat, of a rocking cam block, means for journalling the same above the hopper to permit rocking movement thereof, there being cam tracks on the two faces of the cam block, one of said cam tracks being a single track, and the other cam track being a closed track having an outgoing branch and a returning branch connected together at the ends of said branches, a plunger and a valve member located and working in and through the throat aforesaid, operative connections between the valve member and the single cam track, operative connections between the plunger member and the double cam track, means for rocking the cam block back and forth between its extremities of movement, the arrangement being such that the valve is caused to move upwards at a greater rate of travel during the first portion of the returning movement than the plunger, and the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction between the plunger and the valve during the last portions of the returning movement, substantially as described.

6. In a doughnut machine, the combination with a dough hopper having a downwardly extending delivery throat, of a rocking cam block, means for journaling the same above the hopper to permit rocking movement thereof, there being cam tracks on the two faces of the cam block, a plunger and a valve member located and working in and through the throat aforesaid, operative connections between the plunger member and the valve member and the respective cam tracks, and means for rocking the cam block back and forth between its extremities of movement, the arrangement being such that the valve is caused to move upwards at a greater rate of travel during the first portion of the returning movement than the plunger, and the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction between the plunger and the valve during the last portions of the return movement, substantially as described.

7. In a doughnut machine, the combina-

tion with a dough hopper having a downwardly extending delivery throat, of a rocking member journaled above the hopper to permit rocking movement thereof, of a pair of cam tracks in conjunction with said member, a plunger and a valve member working in and through the throat aforesaid, and operative connections between the plunger and one cam track and operative connections between the valve and the other cam track, the arrangement being such that the valve is caused to move upwards at a greater rate of travel during the first portion of the returning movement than the plunger, and the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction between the plunger and the valve during the last portions of the returning movement, substantially as described.

8. In a doughnut machine, the combination with a hopper having a downwardly extending delivery throat, of a valve member and a plunger member working in and through said throat, a vertically reciprocating rod for the valve member, a vertically reciprocating rod for the plunger member, means for reciprocating said rods in timed relationship with respect to each other, a rigid connection between the plunger member and its rod, a slip connection between the valve member and its rod, and means for adjusting the slip connection aforesaid for the purpose specified, substantially as described.

9. In a machine of the class described, the combination with a hopper having a downwardly extending delivery throat, of a plunger member and a valve member working in and through said throat, a rod for the plunger member, a rod for the valve member, a fixed connection between the plunger member and its rod, a fixed stop on the valve member rod for limiting upward movement of the valve member with respect to said rod, and an adjustable stop on the valve member rod for limiting the downward movement of the valve member with respect to said rod, substantially as described.

10. In a machine of the class described, the combination with a hopper having a downwardly extending delivery throat, of a plunger member and a valve member working in and through said throat, means for reciprocating the plunger member through fixed upper and lower limits of reciprocation, and means for reciprocating the valve member between a fixed lower limit of reciprocation and an adjustably variable upper limit of reciprocation, substantially as described.

11. In a machine of the class described, the combination with a hopper having a

downwardly extending delivery throat, of a plunger member and a valve member working in and through said throat, means for reciprocating the plunger member, and means for reciprocating the valve member, the valve member reciprocating means serving to move the valve member to a fixed lower limit of reciprocation and serving to move the valve member to a variable adjustable upper limit of reciprocation, substantially as described. 70

one cam track and operative connections between the valve and the other cam track, the arrangement being such that the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction between the plunger and the valve during the last portions of the returning movement, substantially as described. 75

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12. In a machine of the class described, the combination with a pan for frying doughnuts and the like, said pan having an upwardly extending flange of a dough hopper having a downwardly extending delivery throat, supporting means for said dough hopper mounted on said flange and in position above the pan, and means for adjusting the elevation of the dough hopper and delivery throat with respect to the pan, substantially as described. 80

13. In a machine of the class described, the combination with a pan for frying doughnuts and the like, said pan having an upwardly extending flange of a dough hopper having a downwardly extending delivery throat, supporting means for said dough hopper and delivery throat mounted on said flange and above the pan and for permitting movement thereof to different positions with respect to the pan, and means for adjusting the elevation of the dough hopper and the delivery throat with respect to the pan, substantially as described. 85
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14. In a doughnut machine, the combination with a dough hopper having a downwardly extending delivery throat, of a rocking cam block, means for journaling the same above the hopper to permit rocking movement thereof, there being cam tracks on the two faces of the cam block, a plunger and a valve member located and working in and through the throat aforesaid, operative connections between the plunger member and the valve member and the respective cam tracks, and means for rocking the cam block back and forth between its extremities of movement, the arrangement being such that the plunger is caused to move upwards at a greater rate of travel than the valve during the final portion of the returning movement, to thereby create a suction between the plunger and the valve during the last portions of the return movement, substantially as described. 105
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15. In a doughnut machine, the combination with a dough hopper having a downwardly extending delivery throat, of a rocking member journaled above the hopper to permit rocking movement thereof, of a pair of cam tracks in conjunction with said member, a plunger and a valve member working in and through the throat aforesaid, and operative connections between the plunger and 125
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