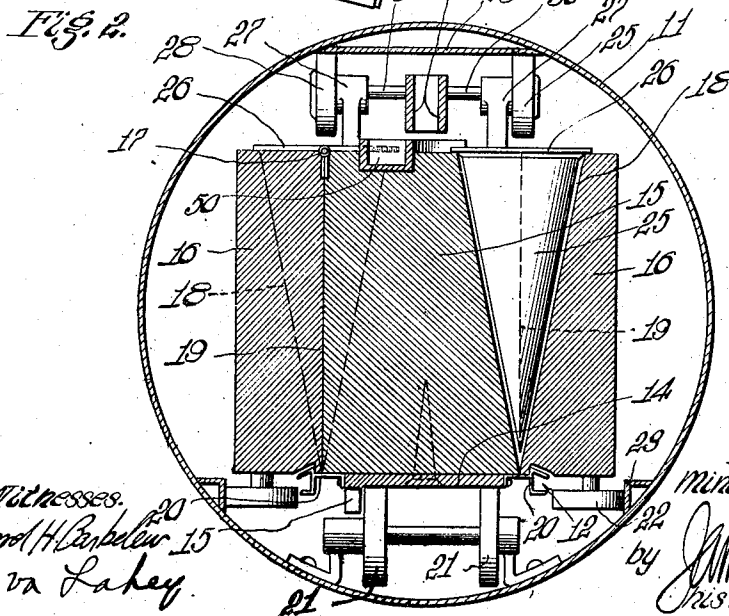
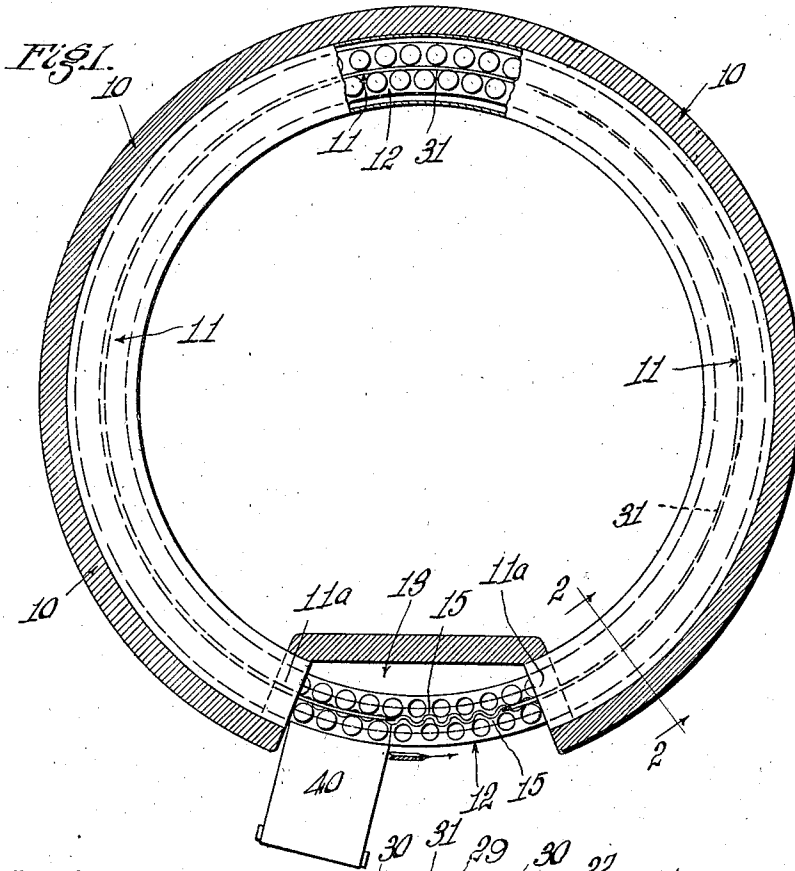


M. L. HITCHCOCK.
BAKING CONES.
APPLICATION FILED MAY 18, 1912.

1,062,157.

Patented May 20, 1913.

4 SHEETS—SHEET 1.



Witnesses:
Edward H. Bunker
Eva Lahey

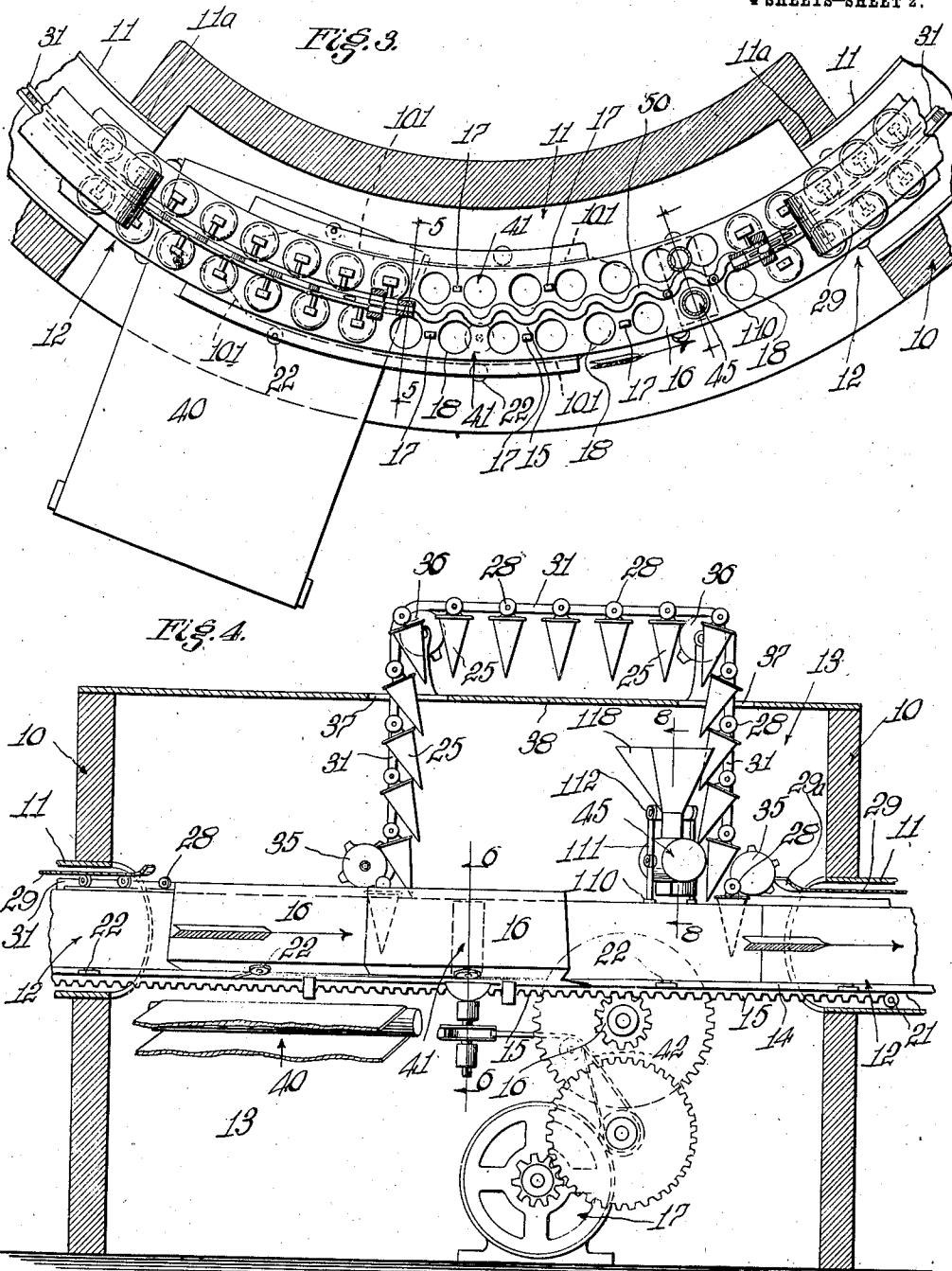
Inventor:
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4 SHEETS—SHEET 2.

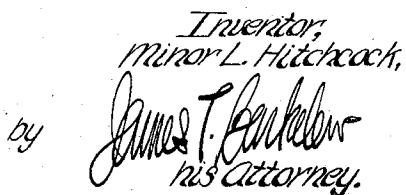


Witnesses.
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APPLICATION FILED MAY 18, 1912.

4 SHEETS—SHEET 3.



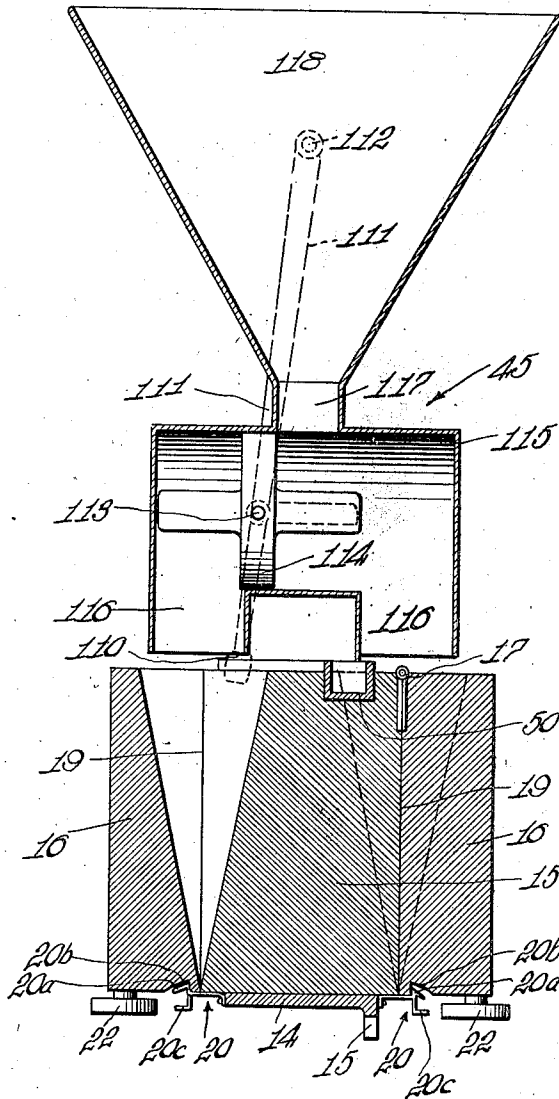
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4 SHEETS-SHEET 4.

Fig. 8.



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UNITED STATES PATENT OFFICE.

MINOR L. HITCHCOCK, OF LOS ANGELES, CALIFORNIA.

BAKING CONES.

1,062,157.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed May 18, 1912. Serial No. 698,174.

To all whom it may concern:

Be it known that I, MINOR L. HITCHCOCK, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented new and useful Improvements in Baking Cones, of which the following is a specification.

This invention relates to a mechanism and method for continuously forming and baking pastry cones such as are used in purveying ice cream and the like; and the invention consists mainly in a continuously operating method and mechanism for forming, baking and delivering the finished cones in large quantity.

The fundamental features of my present invention are based upon those shown and described in my application entitled baking device, filed Jan. 23, 1912, bearing Serial Number 672,840; in that I use a bake oven which contains a circular tube through which a continuous cone carrying wheel or ring constantly moves. This ring emerges from the tube at a suitable point and there the finished cones are dropped on a delivery plate or apron and the cone forms are then immediately prepared and charged with fresh material and pass, with the movement of the ring, again into the baking tube. I employ several novel mechanisms for accomplishing these operations, prime among which mechanisms is the construction of the cone forms and the mechanism in combination therewith to drop them at proper intervals. The cone forms are preferably made with a central vertical part (the cones being arranged with vertical axes and with their bases uppermost). These are the exterior forms which are carried by the ring. The interior forms, or cores, are operated in such manner that, when the forms are open, they become ejectors for the pastry cones, and are then lifted out of the exterior forms while the forms are being prepared (by greasing or otherwise) and are being filled with a new charge of dough. The interior forms are then again placed in the exterior forms, which have meanwhile been closed, the interior forms being pressed down into the exterior forms to squeeze the dough out into proper hollow conical shape; and the interior forms are then held down within the exterior forms during the complete "baking travel" of the ring. And here I may mention a very important feature of my invention: both the exterior and interior forms

serve to conduct heat directly to both the exterior and interior surfaces of the pastry cone, thus insuring uniform and rapid baking without the necessity of a high oven temperature. Means are employed to keep the interior forms hot while they are removed from the exterior forms, and the exterior forms are preferably of such large mass that, once heated, they retain an even temperature.

The preferred form of the mechanical details for carrying into effect these operations will be set forth in the following specification, and a typical machine is shown in the accompanying drawing, in which:

Figure 1 is a sectional plan of my complete machine. Fig. 2 is an enlarged section taken as indicated by line 2—2 of Fig. 1. Fig. 3 is an enlarged sectional plan of a portion of my apparatus. Fig. 4 is a sectional elevation of the portion shown in Fig. 3. Fig. 5 is an enlarged section taken on line 5—5 of Fig. 3. Fig. 6 is an enlarged section taken on line 6—6 of Fig. 4. Fig. 7 is a detail section taken as indicated by line 7—7 of Fig. 5. Fig. 8 is a detail section showing the charging apparatus, taken on line 8—8 of Figs. 3 and 4.

In the drawings 10 designates a suitable circular oven structure of any size, depending upon the capacity desired and upon the speed at which the continuous ring and its delivering and charging devices may be operated. At present I am contemplating an oven of an external diameter approximately eight feet, such an oven being sufficiently large for a mechanism which will turn out about 160 cones per minute (9,600 per hour) and allow one minute baking time for each cone. This oven may be fired and heated in any preferred manner.

Around the inner periphery of the oven I provide a suitable tube 11 of a diameter sufficient to hold the continuously traveling baking ring 12. Tube 11 is continuous where it is within the oven structure, so that I have a baking compartment entirely separate and distinct from the firing compartment of the oven; but the tube 11 is not in the form of a continuous ring, it has ends 11^a where it communicates with an opening or recess 13 in the exterior of the oven structure. The baking ring 12 travels in the direction indicated by the arrow out of one end of the tube 11, across the recess 13 and into the tube at its other end; and the delivery and

charging operations take place while the baking ring is traveling across this open space.

I will first describe the construction of the baking ring; then will describe the apparatus in combination therewith which effects the discharge and charging of the forms. The ring 12 has an annular base plate 14 which carries gear tooth 15 engaged by the tooth of a pinion 16 operated from any motor 17. This motor serves to drive the ring at a suitable speed through the oven. Directly mounted on the annular base plate 14 is an inner annular form member 15. This member 15 may be made up of segments; but when mounted on the base plate 14 it becomes in effect a continuous annular form member. Outer form members 16 are hinged at 17 to the member 15, members 16 being of such individual length as to preferably contain the outer half-portions of four adjacent exterior cone forms. The exterior cone forms 18 are made on vertical axes coincident with the bearing surface 19 between the members 15 and 16, so that one half of each exterior form is in the member 15 and the other half in one of members 16. A suitable catch 20 is employed to normally hold members 16 in place against the member 15 so that a tight joint is made. The whole baking ring may be revolvably supported in any suitable manner but preferably travels on suitable rollers 21 and is guided laterally by rollers 22 bearing upon tracks 23 which extend around the interior of the tube 11.

The interior cone forms 25 are made of a shape similar to the exterior forms 18 and normally fit within the exterior forms as is best shown in Fig. 2, leaving a space between the two forms which is filled by the pastry cone. At the upper end of interior form 25 there is a cap 26 which covers the upper end of the exterior form and which forces the upper edge of the pastry cone into a smooth even line. Suitable standards 27 are mounted on caps 26 and carry rollers 28 which normally roll under an overhead plate 29 to keep the interior cone forms 25 down tightly in position as shown in Fig. 2. A continuous chain 31 is provided to carry the interior cone forms when they depart from the exterior forms, (see Fig. 4). The chain carries studs 30 which loosely engage in hollow bearings 27^a of rollers 28; this construction providing for the suspension of the inner cones but allowing them freedom of movement. Chain 31 travels around with the ring 12, being held in position by reason of the interior cone forms 25 being held tightly in place in the exterior forms in the ring, except at a space between two wheels 35 where the chain passes upwardly and over to upper wheels 36. During this upward passage the chain passes through open-

ings 37 in plate 38 which forms the upper wall of the recess 13, the chain between wheels 36 traveling through the interior of the oven and being thereby subjected to the high interior temperature. This is particularly for the purpose of keeping the cones 25 hot while they are removed from the exterior forms, thus obviating the necessity of their being reheated when they again enter the tube 11 with the exterior form and with the new charge of dough. A sufficient number of extra cones 25 is supplied to provide for the increased travel of the cones to pass up through the oven.

Where the ring 12 emerges from the tube 11 at the left in Figs. 3 and 4, there are means employed to open the exterior cone forms so as to drop the finished cones on to an apron or belt 40. The construction of the apparatus for effecting this operation is shown in Fig. 5 and will be hereinafter explained. By this apparatus two successive sets of forms are always maintained open, as is shown in Figs. 3 and 4; one set being open over the delivery belt or apron 40 and the next set being open over the greasing brushes 41 (shown in detail in Fig. 6). These greasing brushes stand in the position illustrated and are continuously revolved through suitable belt connections 42 with the motor 17. Grease is fed to them from any suitable source in quantities sufficient for thoroughly coating the surfaces of the exterior forms 18 while they remain open. Immediately after passing the greasing brushes the exterior forms are closed and then pass under the charging device 45 (illustrated in detail in Fig. 8). This charging device is operated by a sinuous cam groove 50 mounted on the upper side of form member 15; and its operation is to drop into each exterior form 18 just sufficient dough to form a complete pastry cone when the interior cone forms 25 have been again placed in their normal positions. The interior cone forms enter the exterior forms directly after the exterior forms have passed the charging apparatus, the chain 31 passing down near the charging apparatus as shown in Fig. 4. The cones 25 are so arranged and timed that they will drop into their proper forms 18; and the onward passage of the baking ring immediately brings the wheels 28 of the interior cones against the inclined end 29^a of the overhead plate 29 and the cones are thereby forced tightly into position as shown in Fig. 2. The baking operation then immediately commences, the tube 11 being kept at a uniform temperature. The large heat capacity of the exterior form members 15 and 16 serves to keep their temperature very close to the actual baking temperature, and heat is thus applied directly and immediately to the exterior and interior of the pastry cones as they pass

around through the baking tube. The baking period is the time occupied in passing through the tube from one end to the other; and this period will depend upon the time required for efficiently baking the cone.

The mechanism for discharging the finished pastry cones from the forms is shown in detail in Figs. 5 and 7. Normally the inner cone forms 25 rest in position as shown in Fig. 2. The outer forms are closely locked together by means of the catches 20. These catches are preferably composed of spring metal and have catch portions 20^a which enter notches 20^b in form portions 16 and hold the portions 16 tightly against the inner portion 15. When the forms reach a position approximately above the discharging belt 40 the projections 20^c of the catches 20 are engaged by surfaces 100 on the forward end of opening cams 101, the catches being forced down to the position shown in Fig. 5 and thereby releasing the catch point 20^a from the notches 20^b. The opening cams 101 are in such position as to engage their point portions 102 under rollers 22 and, as the arms move around, the rollers are moved up from the cams and the form portions 16 are thrown to the positions illustrated in Fig. 5. The caps 26 of inner cones 25 rest upon the upper surfaces of portions 15 and 16 and the cones are thereby thrown to the positions shown in Fig. 5. This operation of the forms immediately frees the pastry cones and allows them to drop out on to the delivery belt 40. The free suspension of the interior cones on the studs 30 allows the cones 25 to be moved to the positions illustrated in Fig. 5. The opening cams 101 are of sufficient extent to keep at least two successive sections of the forms open at all times; one of the sections being open over the delivery belt 40 and the other open over the greasing devices 41 (illustrated in detail in Fig. 6). These greasing devices are comprised in cylindrical brushes 105 mounted on hollow shafts 106, the brushes and shafts projecting up into the open forms. The brushes are continuously revolved as hereinbefore noted and any suitable greasing material is fed through connections 107 to the hollow shafts and thence out through openings 108 in the upper ends of the shafts, the grease trickling down over the brush 105 and thence being distributed over the inner surfaces of the forms.

During the time while the pastry cones are being ejected over the belt the interior cones 25 remain within the exterior forms. Before the exterior forms reach the greasing devices the interior cones 25 are removed therefrom in the manner shown in Fig. 4. Immediately after passing the greasing devices the exterior forms are allowed to close and the forms within pass

under the charging mechanism 45. This charging mechanism consists in a device operated by sinuous cam groove 50 to charge each of the forms with a certain amount of dough. Cam groove 50 is arranged as is best shown in Figs. 3 and 8 and is engaged by a number of followers 110 mounted on the lower ends of arms 111 pivoted at 112. These arms are attached at 113 to a piston 114; and the cam portion is to reciprocate the piston in its cylinder 115. Cylinder 115 has discharge openings 116 at its ends and an inlet opening 117 in its center upper portion communicating with a hopper 118 in which the dough is placed. The reciprocation of the piston serves to allow dough to first drop into one end of the cylinder and then be pressed out of that end into the form immediately below; and the arrangement of the cam and the followers is such that the dough will be pressed out at a time when a form is immediately below. The amount of dough will depend upon the size of the charging apparatus; and this amount may be made just sufficient to be squeezed out into a pastry cone when the exterior cones 25 are again inserted after the exterior forms have been supplied with their dough charge.

It will be seen that my process is a continuous one, and that the machine is in continuous operation producing pastry cones without cessation. In this manner I am enabled to produce a large quantity of uniformly baked cones in a short time with a small, simple and inexpensive apparatus. The basis of this apparatus is my continuously rotating ring carrying the cone forms and the mechanism for delivering the completed cones and for charging the forms with raw material. This is the combination which I wish to cover broadly in the following claims; the specific details of construction may be varied to suit individual requirements without departing from the spirit of my invention.

Having described my invention, I claim:

1. In combination, a bake oven structure, a circularly arranged tube extending continuously through said structure and having ends communicating with space exterior thereto, a continuous circular ring extending around through said tube and across a space between the ends thereof, means to continuously move said ring around through the tube, exterior forms carried by said ring each comprising two separable parts, interior forms adapted normally to fit within the exterior forms, a continuous flexible carrier for said interior forms, guiding means for said flexible carrier to move the interior forms away from the exterior forms during the portion of the travel between the two ends of the tube, means to normally press the interior forms

tightly into place in the exterior forms, charging mechanism operated by the movement of the exterior forms to supply each form with a suitable charge of raw material during that portion of its travel when the interior forms are removed therefrom, and means to move and part the separated parts of the exterior forms to discharge the finished article therefrom during their travel between the ends of the tube.

2. In combination with a heating means, a revoluble form carrying ring supported on suitable bearings, exterior forms carried by said ring each comprising a relatively stationary half and a relatively movable half hinged to the stationary half at its upper edge, an inner form normally resting within the exterior form and having a cap resting upon the upper surfaces of the exterior form halves, means to normally hold the exterior form halves together, and means to move the relatively movable half away from the other.

3. In combination with a heating means, a revoluble form carrying member supported on suitable bearings, exterior forms carried by said member each comprising a relatively stationary half and a relatively radially movable half, means to normally hold the movable half against the stationary half, and means to separate the halves during a portion of the member's revolution.

4. In combination with a heating means, a movable mold construction embodying a ring supported on suitable bearings in a horizontal plane to rotate about its own axis, said ring having in its peripheral face a plurality of recesses, a plurality of members hinged to the upper peripheral edge of said ring and normally pressing against the peripheral face thereof, said members having in their faces recesses adapted to register with the first mentioned recesses to form a complete mold and being capable of swinging outwardly on their hinges to open the mold below.

5. In combination with a heating means, a movable mold construction embodying a ring supported on suitable bearings in a horizontal plane to rotate about its own axis, said ring having in its peripheral face a plurality of recesses, a plurality of members hinged to the upper peripheral edge of said ring and normally pressing against the peripheral face thereof, said members having in their faces recesses adapted to

register with the first mentioned recesses to form a complete mold, means to normally hold said members in position against the said ring, and means to swing said members outwardly at their lower ends during a portion of the rotary travel of said ring.

6. In combination with a heating means, a movable mold construction embodying a ring supported on suitable bearings in a horizontal plane to rotate about its own axis, said ring having in its peripheral face a plurality of recesses, a plurality of members hinged to the upper peripheral edge of said ring and normally pressing against the peripheral face thereof, said members having in their faces recesses adapted to register with the first mentioned recesses to form a complete mold, inner forms normally fitting within the said molds, each inner form having a cap resting upon the upper face of the ring and its corresponding hinged member.

7. In combination with a heating means, a movable mold construction embodying a ring supported on suitable bearings in a horizontal plane to rotate about its own axis, said ring having in its peripheral face a plurality of recesses, a plurality of members hinged to the upper peripheral edge of said ring and normally pressing against the peripheral face thereof, said members having in their faces recesses adapted to register with the first mentioned recesses to form a complete mold, inner forms normally fitting within the said molds, each inner form having a cap resting upon the upper face of the ring and its corresponding hinged member, means to withdraw said inner forms from the molds during the latter portion of that period of travel during which the hinged mold members are swung away from said ring, and during the first portion of the succeeding period of travel during which the hinged mold members are normally pressed against the ring, and means to charge the said molds during that period of travel immediately prior to replacement of the inner forms in the molds.

In witness that I claim the foregoing I have hereunto subscribed my name this 2nd day of May 1912.

MINOR L. HITCHCOCK.

Witnesses:

JAMES T. BARKELEW,
ELWOOD H. BARKELEW.