O. COLBORNE.

PIE FILLING MACHINE.

APPLICATION FILED APR. 3, 1909.

**956,684.**

**Patented May 3, 1910.**

2 SHEETS—SHEET 1.

Fig. 1

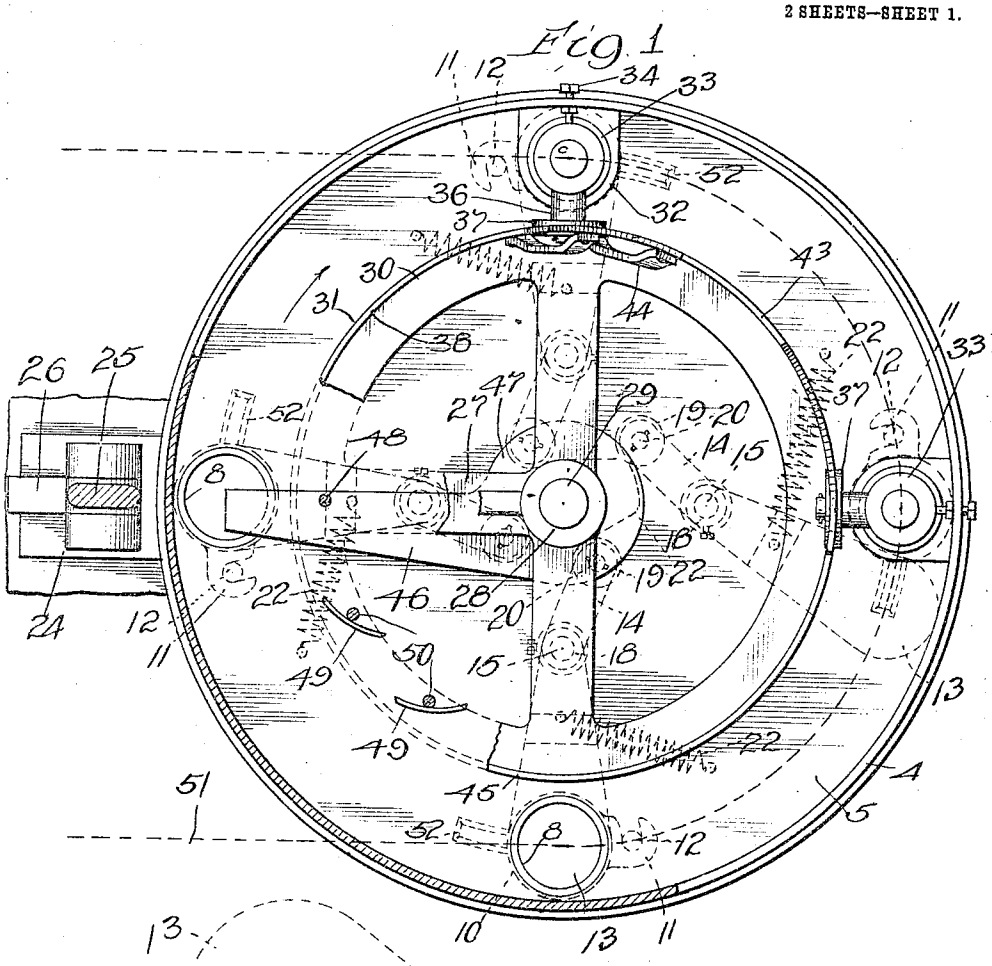


Fig. 2

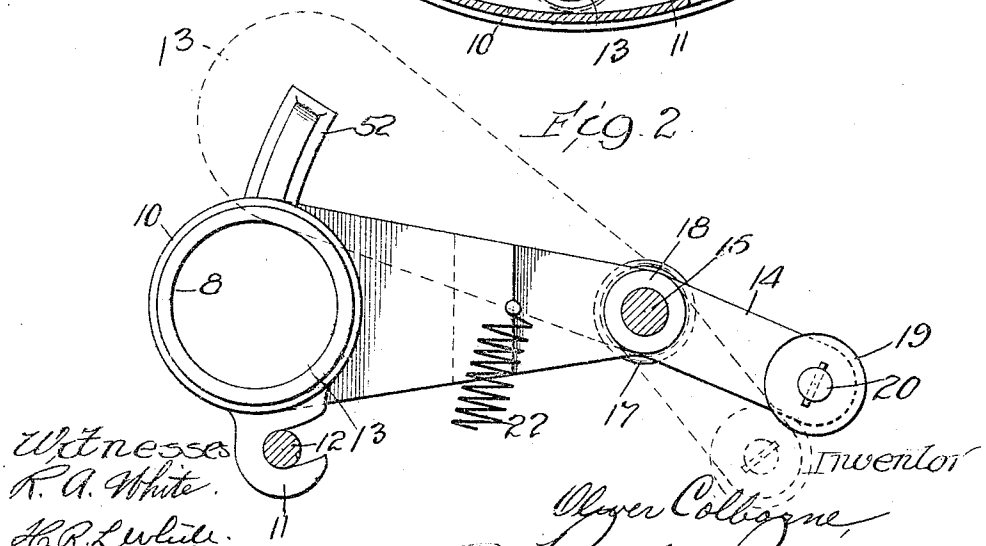


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Fig 3

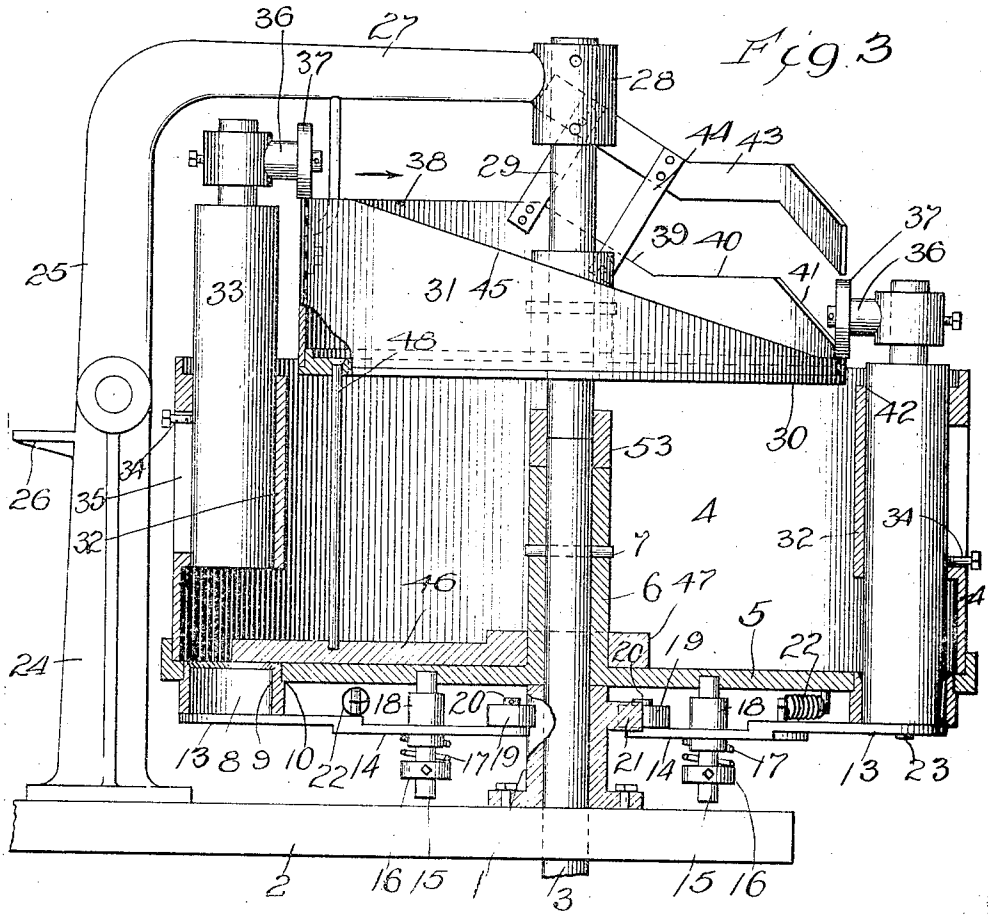
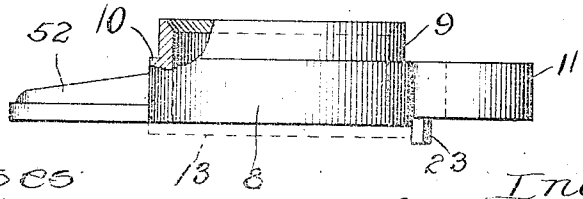



Fig 4

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# UNITED STATES PATENT OFFICE.

OLIVER COLBORNE, OF CHICAGO, ILLINOIS.

## PIE-FILLING MACHINE.

956,684. Specification of Letters Patent. Patented May 3, 1910.

Application filed April 3, 1909. Serial No. 487,739.

*To all whom it may concern:*

Be it known that I, OLIVER COLBORNE, a citizen of the United States of America, and a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Pie-Filling Machines, of which the following is a specification.

The main objects of this invention are to provide an improved construction of pie filling machines adapted to automatically fill the pie crust with a filling material; to provide improved means for measuring the filling material and delivering it to the pie crust; to provide a machine in which the operating mechanism in the tank may be quickly removed or replaced; and to provide a device of this class which is particularly adapted for filling pies which are being carried along by a continuously moving conveyer.

A specific construction embodying this invention is shown in the accompanying drawings, in which:

Figure 1 is a fragmentary plan view, with parts removed, of a pie filling device embodying this invention. Fig. 2 is an enlarged plan view of one of the nozzles and its controlling valve plate. Fig. 3 is a side elevation of the device with parts in section. Fig. 4 is an enlarged side elevation, partly in section, of one of the nozzles.

In the construction shown in the drawings, a bearing sleeve or pedestal 1 is rigidly secured to the floor or other support 2, and journaled therein is the drive shaft 3 which extends below said floor and is rotated by any suitable means, not shown. The receptacle or tank 4, which is adapted to contain the filling material to be delivered to the pies, is provided on its bottom 5 with an upwardly directed axial sleeve or hub 6 through which the upper end of said shaft extends, and is rigidly secured to said shaft by means of the pin 7 extending therethrough and through the shaft, so that said tank is caused to rotate with the shaft. The tank is provided in its bottom 5 and near the periphery thereof with a plurality of openings in which are rigidly but removably secured the measuring nozzles 8, which are of a size to contain the desired quantity of filling material for a single pie. Each of said nozzles, as shown more clearly in Fig. 4, is provided at its upper end with a reduced portion 9 which fits tightly in one of the openings in said bottom, and a peripheral shoulder 10 is provided at the base of said reduced portion and is adapted to abut against the lower side of the bottom when the top of the reduced portion is flush with the upper surface of the bottom. For the purpose of holding the nozzles in place, each is provided on one side with a hook 11 adapted to engage a bolt 12 projecting downwardly from the bottom of the tank, and which may be provided with a nut or other means, not shown, on which the hook rests to prevent the nozzle from falling. Means are provided for controlling the outlet openings in said nozzles and permitting the filling material to be discharged into the tins at the proper intervals. For this purpose each nozzle is provided with a laterally swinging valve gate or closure 13 adapted to fit closely to the lower end thereof and having an inwardly directed lever arm 14 by means of which it is operated. Each of said arms is pivotally supported on the bottom of the tank to permit the closure to travel with the nozzles, and is mounted on a stud shaft 15 which is rigidly secured to the bottom of the tank. Each of said stud shafts is provided with a collar 16 on its lower end, on which is supported a spring 17 which bears at its upper end against said arm and holds the valve closure firmly seated against the outlet opening of the nozzle, and each arm is provided with an elongated bearing hub 18 through which the stud shaft extends and which acts to hold the closure truly seated against the nozzle.

A cam roller 19 is journaled on a bearing stud 20 on the inner end of each arm 14, and is adapted to travel on the sleeve 1. On one side of said sleeve is a cam 21 which lies in the paths of said rollers and acts to turn the arms on their pivots and swing the valve closures from beneath the nozzles to open the latter. Each of said arms is provided with a coiled spring 22 which is secured at one end to the arm and at the other end to the bottom of the tank and normally acts to hold the closure in closed position. A stop 23 is carried on the bottom of the nozzle for the closure to abut against when in closed position. At one side of said tank is a standard 24, and an arm 25 is hinged on the top

of said standard and is adapted to be turned outwardly from the tank until it rests on a stop 26 on the standard. The upper portion of said arm is bent at a right angle to the lower portion thereof, and when the arm is in operative position, as shown in Fig. 3, said upper portion extends inwardly over the tank. On the inner end of said arm is an apertured head 28, the bore of which is in axial alinement with the shaft 3 when the arm is in operative position, and a shaft 29 is rigidly secured in said head and extends downwardly in alinement with and into close proximity to said shaft 3. Rigidly secured on the lower end of said shaft 29, above the lower end thereof, is an annular spider 30 on which is rigidly secured a cam track 31 preferably of sheet metal. On the inner side of the tank, above each of said nozzles and in axial alinement therewith, is a guide sleeve or cylinder 32, and slidably mounted in each cylinder is a plunger 33 which is adapted to control communication between the tank and the nozzle below the same and to eject the filling material from the nozzles when the valves are open. To prevent the plungers from rotating in the guide cylinders and to permit them to reciprocate, a pin 34 is secured in the side of each plunger and projects outwardly through a slot 35 in the tank.

Adjustably secured on the upper end of each plunger is a horizontally directed axle 36, on which is journaled a roller 37 adapted to travel on the cam track 31 and raise and lower the plunger. Said cam track is provided with a high horizontal portion 38 which is situated on the side of the shaft 3 opposite from the valve operating cam 21, and when the roller 37 is traveling thereon the plunger is held retracted from the nozzle and at a distance above the bottom of the tank. Leading downwardly from said portion 38, in the direction of the travel of the tank, as indicated by the arrow in Fig. 3, is a short inclined part 39 which terminates in an intermediate horizontal part 40. An inclined part 41 extends downwardly from said intermediate part 40 to a low horizontal part 42. Above said parts 39, 40, and 41 is a second track 43 which conforms to said parts and acts to hold the rollers thereon and force the plungers downwardly. Said second track may be supported in any desired manner, but, as shown, is carried by arms 44 secured to the cam 31. A long inclined portion 45 leads upwardly from said low portion 42 to said high portion 38.

For the purpose of directing the filling material in the tank toward the nozzles, a deflecting arm 46 has an apertured inner end 47 through which the sleeve extends, and the outer end thereof projects toward the wall of the tank. A bar 48 is carried on said spider, and the lower end thereof projects into a socket in said arm and prevents the arm from traveling with the tank. The rear side of said arm is inclined forwardly from the inner end of the arm, and as the tank is rotated the material on the bottom is moved thereby toward the nozzles. Said arm lies flat on the bottom of the tank and acts to scrape the material from said bottom as the tank becomes empty. Deflecting blades 49 are also supported from said spider by means of rods 50, and are inclined to the direction of rotation of the tank and serve to move the material toward the periphery of the tank.

The operation of the construction shown is as follows: Any preferred construction of conveyer adapted to carry the pie tins may be provided to travel beneath the nozzles along the path indicated by the dotted line 51 in Fig. 1. This conveyer should, of course, travel at a speed equal to that of the nozzles 8 during the rotation of the tank. The conveyer should also be provided with pie tin supports, not shown, spaced at suitable intervals to register with the nozzles when passing around the axis of the tank. The filling material is placed in the tank, and when the shaft 3 is rotated the tank is caused to rotate therewith and carry the rollers along the cam track 31. When said rollers are on the high portion 38 of said track, the plungers are withdrawn from the nozzles, and the filling material flows into said nozzles and is retained therein by the valve closures 13. When the roller descends from the high portion to the intermediate portion 40, the lower end of the plunger just enters the top of the nozzle in which it fits closely, and cuts off communication between the tank and the nozzle. As the roller 37 travels along said portion 40, the roller 19 contacts with the cam 21, which causes the inner end of the arm to swing rearwardly and thereby move the valve closure from beneath the nozzle. The roller 37 then descends the inclined portion 41, and the plunger travels downwardly in the nozzle and forces all of the material therefrom. When said valve is open, it is prevented from being raised above the bottom of the nozzle by the spring 17 by means of a guard arm 52 on the side of the nozzle. As the roller 37 travels along the low portion 42, the arm 14 passes the cam 21, and the spring 22 retracts the valve closure which in closing wipes the bottom of the plunger. The roller 37 then ascends the inwardly inclined portion 45 and retracts the plunger from the nozzle, which again fills with material. As the tank revolves, the deflector blades 49 work the material toward the nozzles, and as the tank becomes nearly empty, the arm 46 scrapes the material from the bottom and works it toward the nozzles. A sleeve 53 rests on the top of the sleeve 6 and overlaps

the abutting ends of the shafts 3 and 29, and when it is desired to remove the cam track from the tank for the purpose of cleaning the tank, or for any other reason, the studs 34 are removed from the plungers, and the plungers are lifted out of their guide cylinders or are turned so as to move the rollers 37 clear of the cam tracks. The sleeve 53 is first raised clear of the end of the shaft 3, and the arm 25 is then swung outwardly and carries the track therewith. Each of said nozzles holds sufficient filling material for one pie, and if the quantity is to be changed for different kinds or sizes of pies, the nozzles may be quickly replaced by larger or shorter ones, as desired.

Although but one specific embodiment of this invention is herein shown, it will be understood that numerous details of the construction may be altered or omitted without departing from the spirit of this invention.

I claim:

1. A pie filling machine, comprising a rotary tank, a measuring nozzle in the bottom thereof, means adapted to open and close the outlet end of said nozzle, and means adapted to close the inlet end of said nozzle and to force material from the outlet end when said outlet end thereof is open.

2. A pie filling machine, comprising a rotary tank, a measuring nozzle opening therefrom and adapted to be filled from the contents of the tank, means adapted to normally close the outlet end of said nozzle, and means adapted to close the inlet end of said nozzle and force the contents of the nozzle to flow out when said outlet end is open.

3. A pie filling machine, comprising a rotary tank adapted to contain filling material, a nozzle removably mounted in said tank flush with the bottom thereof, and adapted to receive filling material from said tank, a plunger adapted to be moved into and out of the nozzle, a valve controlling the outlet end of said nozzle, and means for opening said valve when the plunger enters the nozzle.

4. A pie filling machine, comprising a rotary tank, a measuring nozzle communicating therewith, a plunger supported in the tank in alinement with said nozzle and adapted to fit closely therein, means for forcing said plunger into the nozzle, a valve controlling the outlet end of said nozzle, and means for automatically operating said valve and plunger to discharge measured quantities of material while said tank is in motion.

5. A pie filling machine, comprising a tank mounted to rotate on a vertically disposed axis, a measuring nozzle on said tank, a closure for the outlet of said nozzle, a plunger mounted in the tank and adapted to control communication between the tank and nozzle, and means operated through the rotation of the tank and adapted to operate said closure and plunger to discharge successive measured quantities of material from the tank.

6. A pie filling machine, comprising a tank, a shaft adapted to rotate the same, a stationary cam, a plurality of nozzles opening from the bottom of the tank, closures for said nozzles pivoted on the bottom of the tank and adapted to be operated by said cam, reciprocating plungers mounted in the tank, one above each nozzle, a stationary cam track, and means connected with said plungers and adapted through engagement with said track to move the plungers into and out of said nozzles.

7. A pie filling machine, comprising a rotatable shaft, a tank mounted on said shaft and adapted to rotate therewith, a plurality of measuring nozzles removably secured in the bottom of the tank, a closure for each nozzle, an arm on each closure and pivoted to the bottom of the tank, a stationary cam adapted to engage said arms and operate the closures through the rotation of the tank, and means in said tank adapted to enter the inner ends of said nozzles and force material from the nozzles when the closures are open.

8. A pie filling machine, comprising a tank, means for rotating the same, a plurality of measuring nozzles in the bottom of said tank, valve mechanism adapted to open and close the outer ends of said nozzles, a guide supported on the tank above each nozzle, a reciprocating plunger in each guide, a roller on the upper end of each plunger, and a stationary cam track for said rollers adapted to move said plungers into and out of said nozzles as the tank rotates.

9. A pie filling machine, comprising a tank adapted to contain filling material, means on said tank adapted to automatically discharge predetermined quantities of said material from the tank, a stationary cam in the upper portion of said tank adapted to operate said means, and a jointed support for said cam adapting it to be swung clear of the tank.

10. A pie filling machine, comprising a tank, means for rotating said tank, measuring devices in the bottom of said tank, guides in the tank above said measuring devices, a plunger in each guide adapted to force material from the measuring devices, a standard adjacent said tank, an arm hinged thereon, a stationary cam supported on said arm above the tank, and means on each plunger adapted to travel on said cam and operate such plunger.

11. A pie filling machine, comprising a tank adapted to contain filling material, means for rotating said tank, valve-controlled measuring nozzles in said tank, operating means adapted to discharge measured

quantities of said material from said nozzles at intervals during the rotation of the tank, and means in the tank adapted through the rotation thereof to move the material toward said nozzles.

12. A pie filling machine, comprising a tank mounted to rotate on a vertical axis, and having a flat bottom a nozzle extending downward from said tank, and detachably secured thereto closures for the inlet and outlet ends of said nozzle, means operated through the rotation of said tank for opening and closing said closures alternately and adapted to cause said nozzle to discharge measured quantities of material from said tank at predetermined intervals of the rotation thereof, and a sweep extending into said tank and adapted through the rotation of the tank to urge the material therein toward said nozzle.

13. A pie filling machine, comprising a tank mounted to rotate on a vertical axis, a nozzle extending downward from said tank, and removable therefrom closures for the inlet and outlet ends of said nozzle, means operated through the rotation of said tank for opening and closing said closures alternately and adapted to cause said nozzle to discharge measured quantities of material from said tank at predetermined intervals of the rotation thereof, and a stationary sweep extending into said tank and inclined to a radial direction so as to urge the material in the tank toward said nozzle through the rotation of the tank.

Signed at Chicago this 1st day of April, 1909.

OLIVER COLBORNE.

Witnesses:

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MARY M. DU