

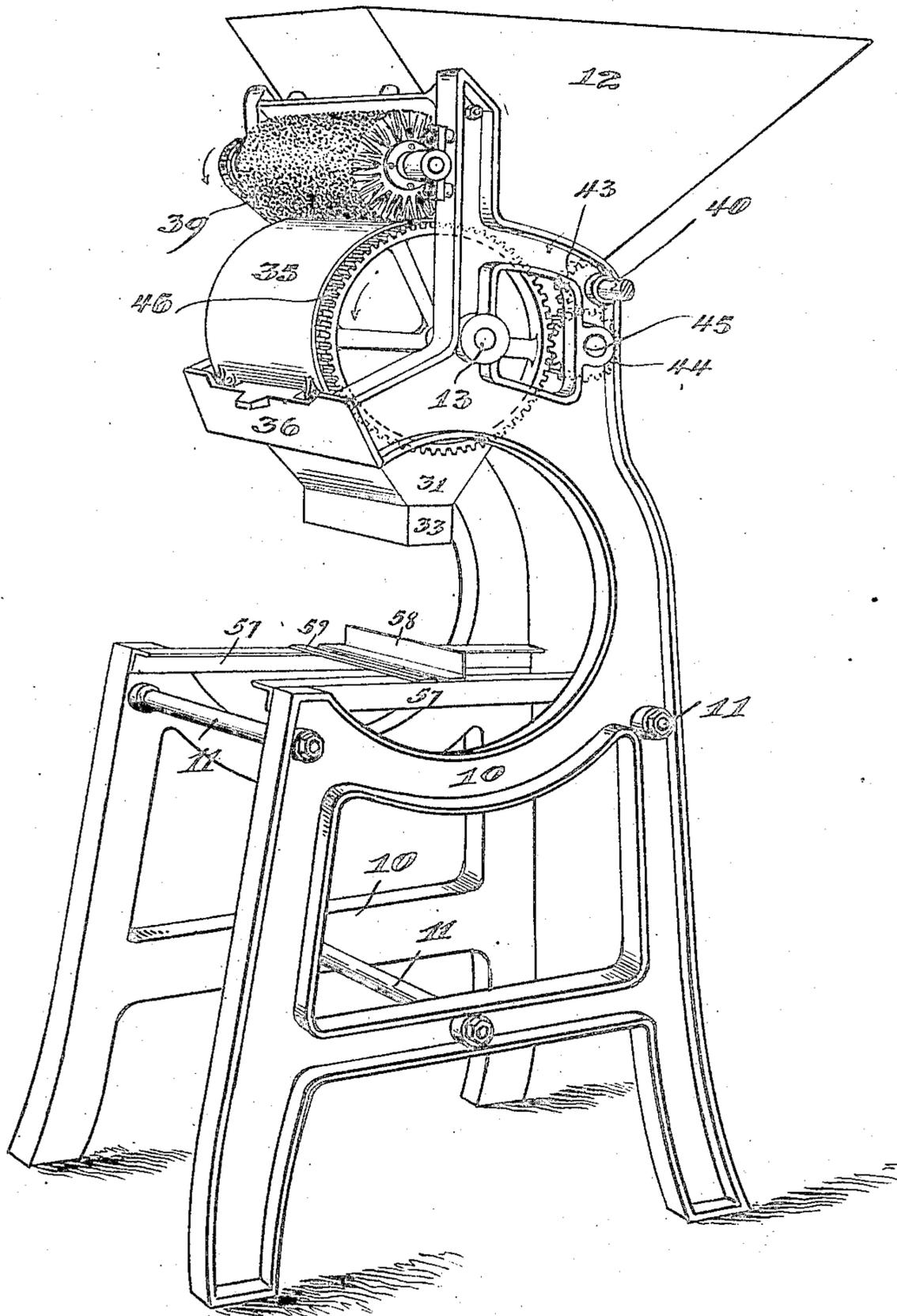
No. 821,186.

PATENTED MAY 22, 1906.

F. M. PETERS.  
FILLING MACHINE.  
APPLICATION FILED SEPT. 25, 1903.

4 SHEETS—SHEET 1.

Fig. 1.



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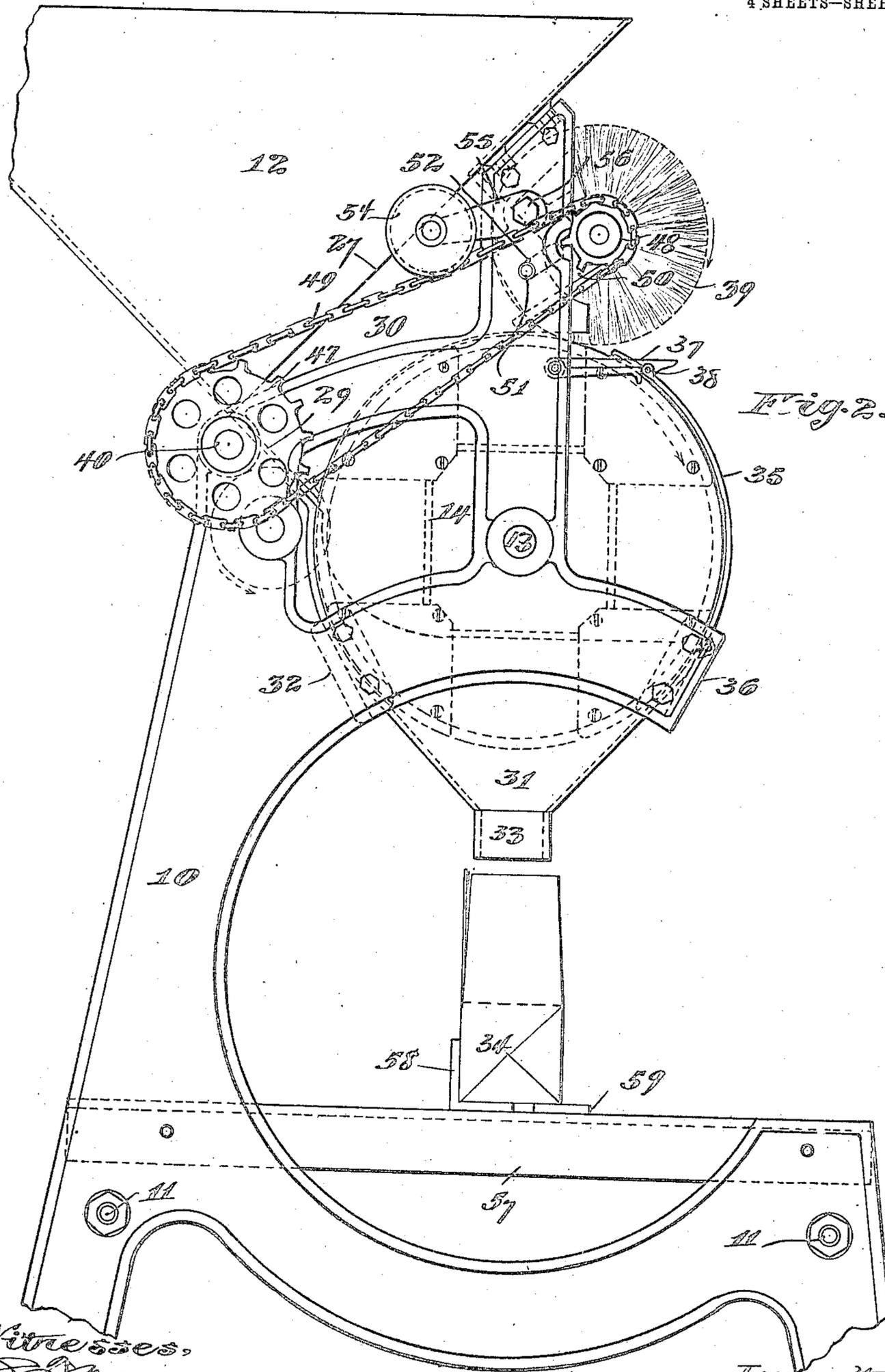


Fig. 2.

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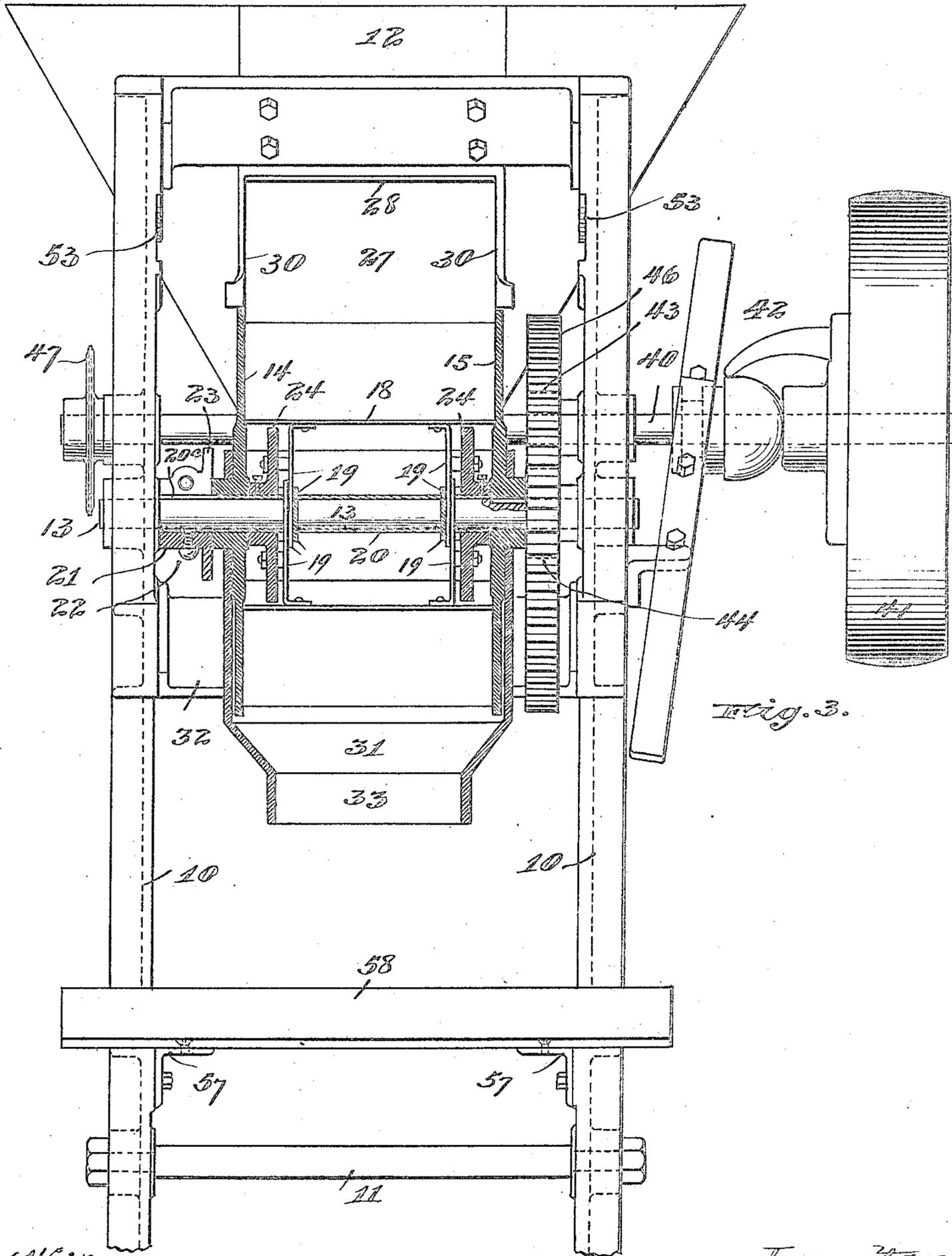
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4 SHEETS—SHEET 3.



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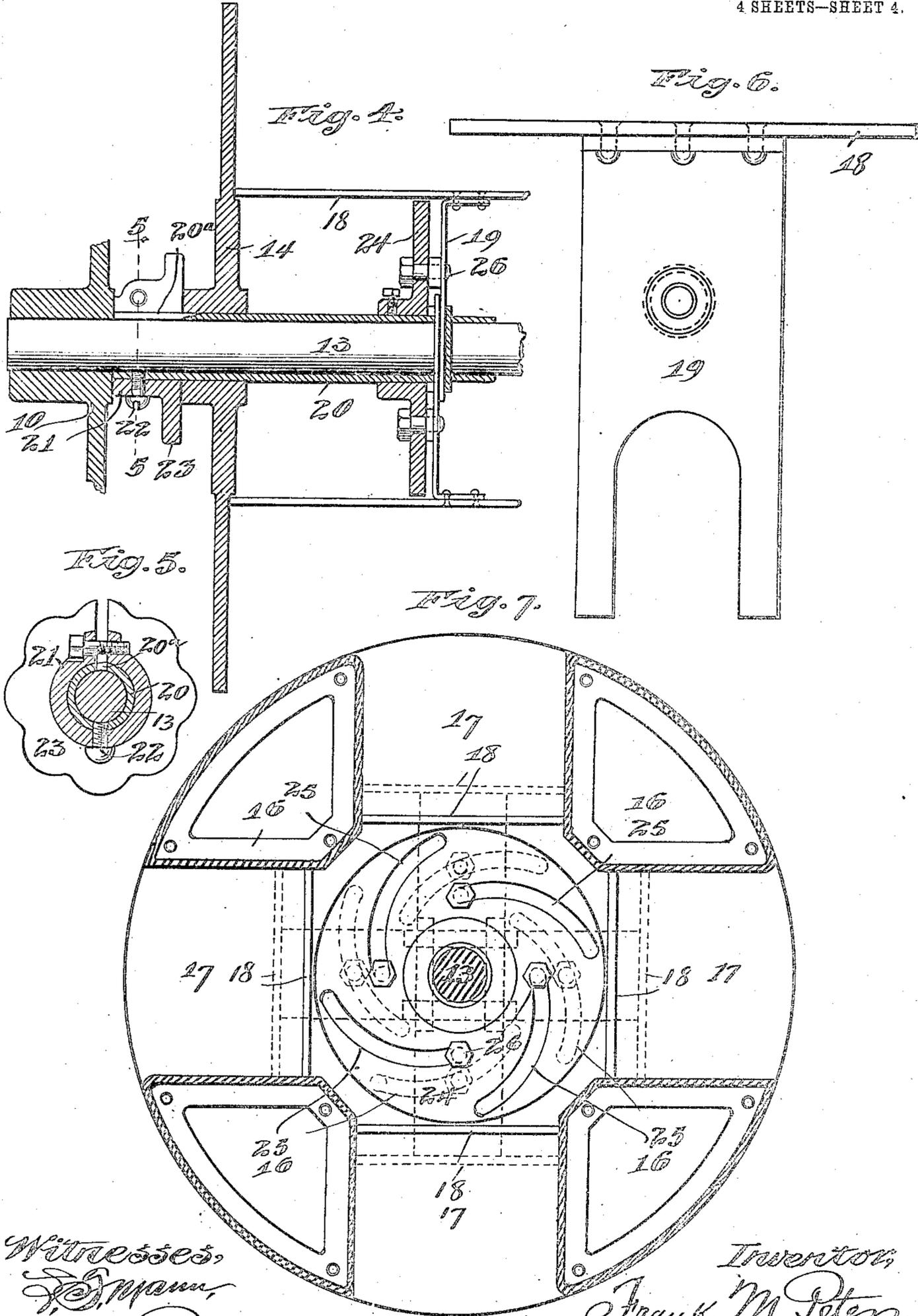
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

FRANK M. PETERS, OF CHICAGO, ILLINOIS.

## FILLING-MACHINE.

No. 821,186.

Specification of Letters Patent.

Patented May 22, 1906.

Application filed September 25, 1903. Serial No. 174,804.

To all whom it may concern:

Be it known that I, FRANK M. PETERS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Filling-Machines, of which the following is a specification.

This invention relates to new and useful improvements in filling or packaging machines, the same being designed for use more particularly in connection with the filling of boxes or packages with manufactured food products, such as bakery goods and similar articles, which are usually put up in paste-board cartons or similar receptacles.

More particularly, the invention relates to a filling-machine of that type designed to handle material and introduce the same to the carton in a loose condition as distinguished from that type of packaging-machines wherein the shape of the carton is made to conform to the outline shape of the goods and the latter are disposed in a regular arrangement or order within the carton.

The present invention has been designed more especially to operate upon bakery goods and similar products of small and finer sizes and more or less irregular shape, such as "oyster-crackers" and the like, in which the goods are loosely and freely deposited *en masse* in predetermined quantities, and the principal object of the invention is to facilitate the filling of the boxes or receptacles with this class of goods in measured quantities and in an even, uniform, and practically continuous manner and with capacity and despatch.

Another important object of the invention is to adapt the machine by an easily-effected adjustment thereof to the delivery of varying quantities.

Still other objects of the invention will appear later in the detailed description thereof.

To these ends my invention resides in a new and improved machine for the purposes stated and in various combined and cooperating elements thereof, substantially as hereinafter described, and pointed out in the appended claims.

A machine illustrating the present invention in the best mechanical form in which I have as yet embodied the same is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of the com-

plete machine. Fig. 2 is a side elevational view from the opposite side on an enlarged scale and with the lower portion of the supporting-frame omitted. Fig. 3 is a front elevational view of the parts shown in Fig. 2 with the drum containing the measuring-receptacles and the discharge-chute shown in section. Fig. 4 is an enlarged detail sectional view in the plane of the axis of the drum, more particularly illustrating the means for adjusting the bottoms of the receptacles to vary the capacity of the latter. Fig. 5 is a cross-sectional detail on the line 5 5 of Fig. 4. Fig. 6 is an isolated detail of one of the adjustable receptacle-bottoms and its stem, and Fig. 7 is an enlarged cross-sectional view of the receptacle-carrying drum with the adjustable receptacle-bottoms in elevation and more particularly illustrating the hollow formation of the quadrant-partitions between said receptacles.

In the drawings, 10 designates each of a pair of skeleton uprights constituting the main side members of the supporting-frame, said members being united by tie-bars 11. The upper ends of said members support a receiving-hopper 12, and in and between said upper ends of the side frame members beneath and to one side of the lower end of the hopper is journaled a shaft 13, on which is mounted a drum containing a series of measuring-receptacles and constructed as follows: 14 and 15 designate a pair of end plates or heads of the drum, the plate 15 being splined or otherwise secured on the shaft. These plates are tied together in parallel relation by a quartet of quadrant-shaped partition-blocks 16, which for the sake of lightness are made of hollow formation, as shown in Fig. 7. These quadrant-partitions furnish the side walls of a series of radial measuring-receptacles 17, whereof the opposite inner faces of the disks 14 and 15 furnish the end walls, while the bottoms are constituted by a series of plates 18 of dimensions such as to slidingly fit between the side and end walls of the receptacles, each of said plates being provided with a pair of stems 19, the inner ends of which are bifurcated, as shown in Fig. 6, and straddle the drum-shaft 13. 20 designates a sleeve loosely fitting the shaft 13 and extending from the inner face of the drumhead 15 to the journal-bearing of the shaft at its opposite end and longitudinally split at its outer end, as

shown at 20<sup>a</sup>, to receive a split collar 21, by tightening which latter the sleeve is normally clamped to the shaft, so as to rotate with the latter. On the sleeve 20 just inwardly of the split collar 21 is loosely mounted the head-plate 14 of the drum, and the sleeve and collar are united to turn together by a set-screw 22. The split collar 21 has formed integral therewith a peripherally milled or corrugated hand-wheel 23, for a purpose hereinafter explained.

Keyed on the sleeve 20 just inside the end plates 14 and 15 of the drum are a pair of disks 24, each of which is provided with four eccentric slots 25, Fig. 7, and through these slots are loosely passed pins 26, which pins respectively project from the opposed faces of the stems 19 of the bottom plates 18 of the receptacles.

That side of the hopper 12 which is adjacent to the drum has a rectangular opening 27 of considerable size formed there-through, and from the margins of said opening there project walls or flanges leading to and substantially in loose contact with the periphery of that quadrant of the drum which is nearest the hopper, the top wall or flange being shown at 28, the bottom wall at 29, Fig. 2, and the side walls at 30, these walls thus constituting a discharge-chute leading from the hopper proper to the periphery of the drum.

31 designates a discharge-chute directly underlying the drum, which discharge-chute may conveniently be supported on a transverse brace or bar 32 of the frame, the inner or rear wall of the hopper preferably extending up around the periphery of the drum to a point where it joins the lower margin of the bottom wall 29 of the opening or chute 27, leading from the hopper 12. The lower end of the discharge-chute 31 has a contracted discharge-orifice 33 of a form and dimensions well adapted to the discharge of the goods into the open end of a box or carton 34, represented in Fig. 2 as supported directly therebeneath.

35 designates a shield or cover curved to conform to the curvature of the surface of the drum and hinged at its lower end to a transverse brace or bar 36 of the frame with its lower edge substantially coincident with the upper forward edge of the discharge-chute 31. The shield 35 extends upwardly over the surface of the drum nearly to the top thereof and is adapted to be maintained in covering relation to the periphery of the drum by a hook 37, pivoted to one of the side frame members of the machine and engaging a laterally-projecting pin 38 on the side margin of the shield.

39 designates a cylindrical-shaped brush rotatably mounted on and between the upper ends of the main side frame members in such a position as to peripherally engage and

sweep over the top periphery of the drum at a point substantially coincident with the upper margin of the shield 35.

Any suitable driving mechanism for actuating the rotatable elements in proper relation may be employed within the invention, a simple and convenient mechanism for this purpose being as follows: 40 designates the main driving-shaft journaled in the upper portion of the frame beneath the hopper 12 and carrying a driving-pulley 41, equipped with any suitable clutch mechanism (indicated at 42) for making the same fast or loose on the shaft, as desired. Fast on the shaft 40 inside the main side frame members is a pinion 43, which meshes with a pinion 44, mounted on a stub-shaft 45, this latter pinion meshing with a large gear 46, fast on the drum-shaft 13. On the opposite end of the main driving-shaft 40 is a sprocket-wheel 47, which is connected with and drives a sprocket-wheel 48 on the brush-shaft by means of a sprocket-chain 49. It will be seen that the above-described driving connections effect the rotation of the brush and the drum in the same direction, whereby the contacting portions of their peripheries are caused to move in opposite directions. By reason of the fact that the brush is subjected to considerable wear which constantly reduces its diameter it is desirable to so mount the brush that it can be readily adjusted toward the periphery of the drum. For this purpose the ends of the drum-shaft are journaled in the outer ends of a pair of plates 50, which have a pin-and-slot connection, as shown at 51 52, Fig. 2, with the side members of the main frame, the inner faces of the latter being grooved, as shown at 53, Fig. 3, to provide ways for the plates 50. As the brush wears down the pins 51 are loosened, the plates set inwardly to a sufficient extent to bring the periphery of the brush into engagement with the periphery of the drum, and the pins again tightened. To take up for the slack in the sprocket-chain 49 thus occasioned, I provide a solid-metal or other idler pulley 54, mounted on the free end of an arm 55, bolted at 56 to the side frame member, said pulley bearing directly upon the upper section of the chain.

Any suitable support to hold the box or carton 34 in proper receiving position beneath the chute 31 may be employed; but a simple support which prevents the accumulation of dust and dirt on the machine is herein shown and consists of the following. 57 designates each of a pair of horizontally-disposed angle-irons secured to the inner faces of the main side frame members, resting upon and across which is another angle-iron 58, so disposed beneath the discharging-orifice 33 of the chute 31 as to form a guide and stop for the carton in a manner plainly shown in Fig. 2. In order to support the outer edge of the base of the carton, where the latter is of

greater width than the base of the angle-iron 58, an auxiliary support in the form of a flat bar 59 may be employed. By reason of this style of support practically all the dust and fine particles discharged from the machine and not caught by the box drop to the floor, where they are readily swept up, thus leaving the carton-support always free and unobstructed.

The operation of the machine may be briefly described as follows: The rotation of the main shaft 40 sets up a rotation of the drum and of the brush through the described driving connections in the respective directions indicated by the arrows. As the open outer end of each receptacle passes through that arc of its travel wherein it registers with the discharge-opening 27 of the hopper 12, it receives by gravity a charge of the crackers or other material, being completely filled thereby. As it passes out of engagement with the hopper it meets the brush which sweeps over the top of the contents of the receptacle, thus evening off the latter, after which the open end of the receptacle immediately passes by the shield 35, whereby the contents are retained therein until having traveled past the shield and emerged into the discharge-chute 31 the crackers or other material fall into and through the latter, being discharged thence directly into the carton 34, which is at once removed to be closed and sealed making place for the next empty carton. The empty receptacle then travels upwardly through a quarter-circle, which brings it again into gradual registration with the discharge-opening of the receiving-hopper, from which it takes its next charge. In this way the several radial receptacles of the drum are successively charged and emptied one after the other, the speed with which the filling operation is carried on depending, of course, upon the speed of rotation imparted to the drum.

A leading advantage of the machine resides in its capacity, when properly adjusted, to serve cartons or boxes of widely-varying capacity. This advantage it possesses by reason of the presence of the adjustable bottoms 18 of the several charging-receptacles. In the drawings these receptacles are shown (by the full lines) as adjusted to their maximum capacity. When it is desired to employ them for charging cartons of less capacity, the collar 21 is loosened and turned by the hand-wheel 23, which effects a partial turning of the sleeve 20 and of the slotted disks 24, which latter by reason of their cam-slot engagement with the pins 26 serve to simultaneously and equally move the bottoms 18 outwardly, as indicated by the dotted lines in Fig. 7. When the bottoms have thus been moved outwardly to the desired extent, the collar 21 is tightened up, again clamping the sleeve 20 to the shaft 13, and the machine is then ready for the charging of

cartons of a capacity equal to the capacity of the modified charging-receptacles.

It will be observed that the periphery of the drum is solid for considerable distance between adjacent measuring-receptacles. An important advantage flowing from this construction resides in the fact that it is not necessary to employ an intermittent movement, stopping the drum to permit the complete discharge from the lowermost receptacle before advancing to another step, thus enabling the drum to be continuously rotated. Where the charging-receptacles are separated merely by a radial partition-plate, it becomes necessary to employ an intermittent or step-by-step movement of the drum to secure a sufficient interval between successive discharges to enable the filled carton to be removed and an empty carton to be inserted in its place. Furthermore, such a construction requires an intermittent movement in order to effect the measuring function, since otherwise there would be a more or less continuous discharge simultaneously from two or more adjacent measuring-receptacles.

From the foregoing it will be seen that my invention provides a machine adapted to charge boxes or cartons in a rapid, neat, and accurate manner and with a minimum of waste and breakage. It also dispenses with the necessity of providing separate machines or even separate charging-drums for the accommodation of cartons of different capacities.

It is evident that the machine as described might be considerably varied in respect to constructional details without departing from the spirit of the invention, and it is also obvious that the machine is adapted for use in the filling of cartons, boxes, packages, or any receptacles of uniform capacity with any kind or class of material which will pass through the machine. Hence I do not limit the invention, except to the extent indicated in specific claims, to such constructional details or to its employment with any particular class of material.

I claim—

1. In a filling-machine, the combination of a receiving-hopper having a discharge-opening, a rotatable drum having a plurality of radially-disposed measuring-compartments separated by solid peripheral portions, a chute connecting said discharge-opening with the periphery of said drum, and a rotatable brush mounted to form one wall of said chute and to sweep the periphery of the drum to even off the contents of the measuring-compartments as they pass thereunder, substantially as described.

2. In a filling-machine, the combination of a receiving-hopper having a discharge-opening, a rotatable drum beneath said hopper having a plurality of radially-disposed measuring-compartments separated by solid pe-

ripheral portions, a chute connecting said discharge-opening with the periphery of said drum, a rotatable brush mounted to form one wall of said chute and to sweep the periphery of the drum to even off the contents of the measuring-compartments as they pass thereunder, and means to rotate said drum and brush in the same direction, substantially as described.

3. In a filling-machine the combination of a receiving-hopper having a discharge-opening formed in and through the lower portion of one of its inclined walls, a continuously-rotatable drum having a plurality of radially-disposed measuring-compartments separated by solid peripheral portions mounted beneath said hopper, a chute connecting said discharge-opening with one side of the periphery of said drum, a shield engaging the opposite side of said periphery, a rotary brush forming the upper wall of said chute and sweepingly contacting the top of said periphery, means to rotate said drum and brush in the same direction, and a discharge-chute covering the lower portion of said periphery, substantially as described.

4. In a filling-machine, the combination with a receiving-hopper having a discharge-opening; of a rotating drum having a plurality of radially-disposed measuring-compartments mounted to rotate across and in regis-

ter with the discharge-opening of the hopper, each of said compartments having a bottom movable inwardly and outwardly of the compartment to vary the capacity thereof, and cam means rotatable with said drum for simultaneously adjusting the positions of said bottoms, substantially as described.

5. In a filling-machine, the combination with a receiving-hopper having a discharge-opening, of a continuously-rotatable drum having a plurality of radially-disposed measuring-compartments mounted to rotate across and in register with the discharge-opening of the hopper, each of said compartments having a bottom movable inwardly and outwardly of the compartment to vary the capacity thereof, a shaft on which said drum is axially mounted, a series of forked stems secured to the inner sides of said movable bottoms and straddling said shaft, a disk adjustably mounted on said shaft and having a series of eccentric slots, and pins projecting from the faces of said stems and engaging said slots, whereby the rotary adjustment of said disk effects the inward and outward movement of said bottoms, substantially as described.

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