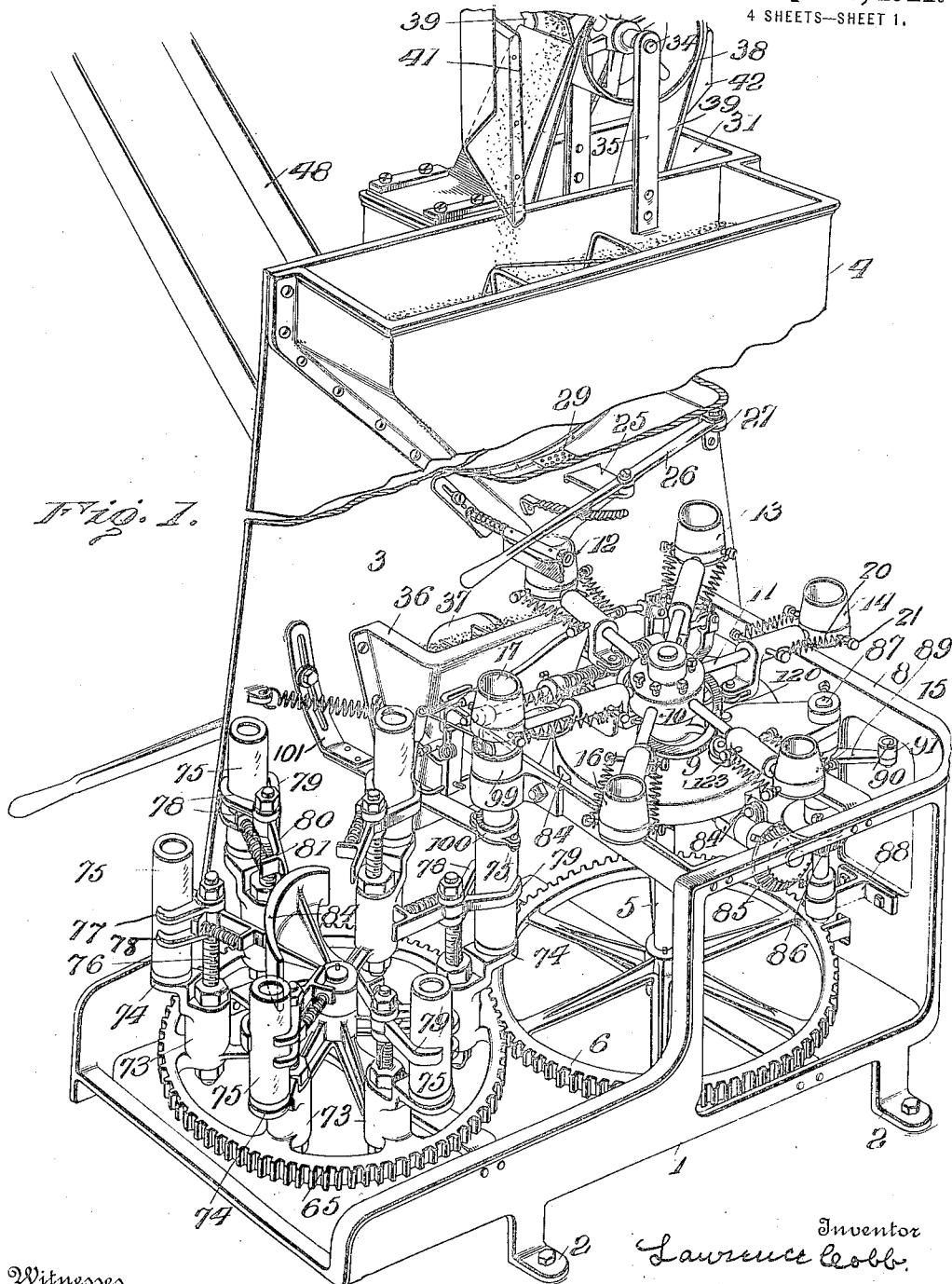


L. COBB,
FILLING MACHINE.
APPLICATION FILED AUG. 9, 1918.

1,375,674.

Patented Apr. 26, 1921.

4 SHEETS—SHEET 1.



Witnesses

W. A. Williams.

C. P. Wright, Jr.

Inventor

Lawrence Cobb.

By

S. H. Grand

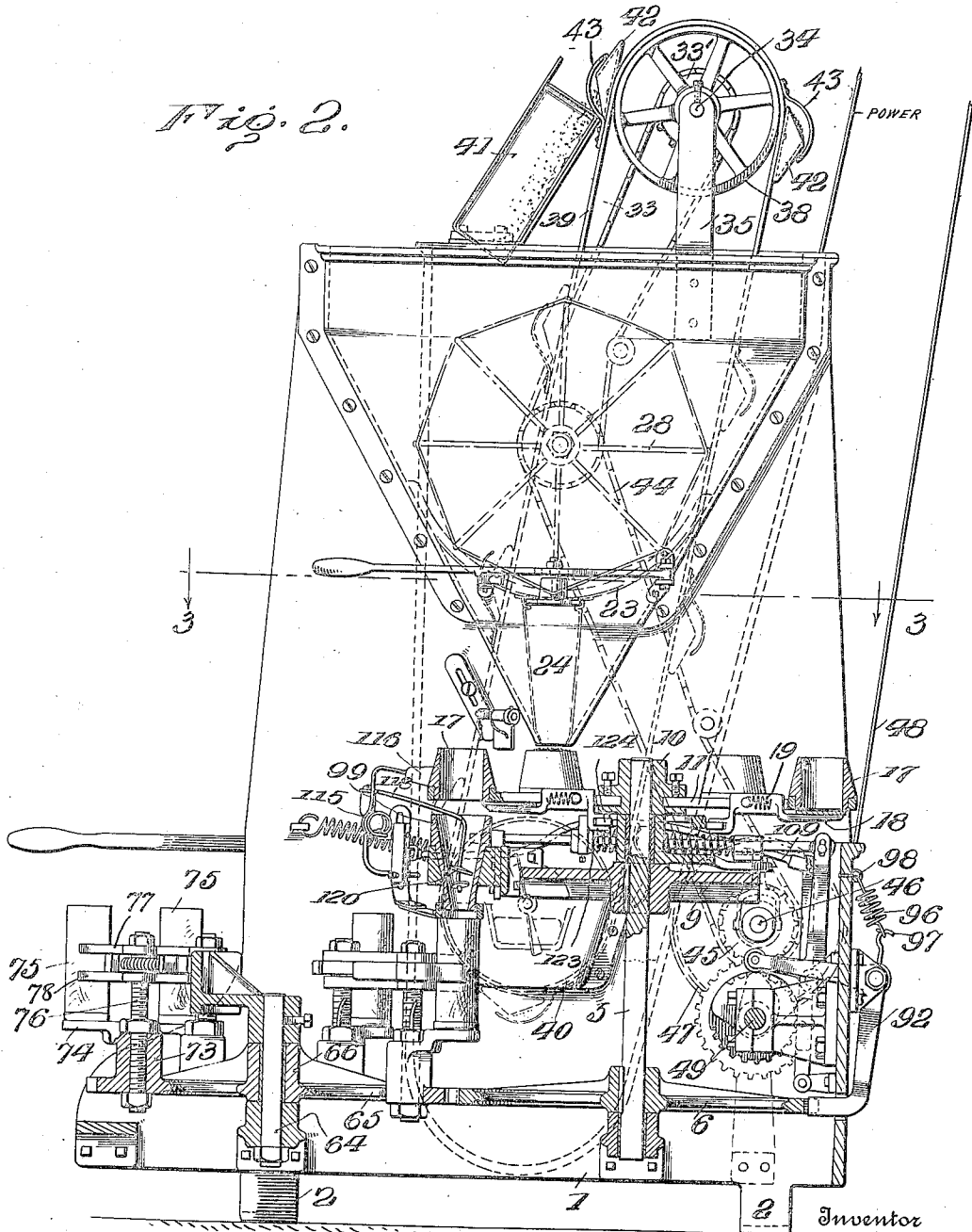
Attorney

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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

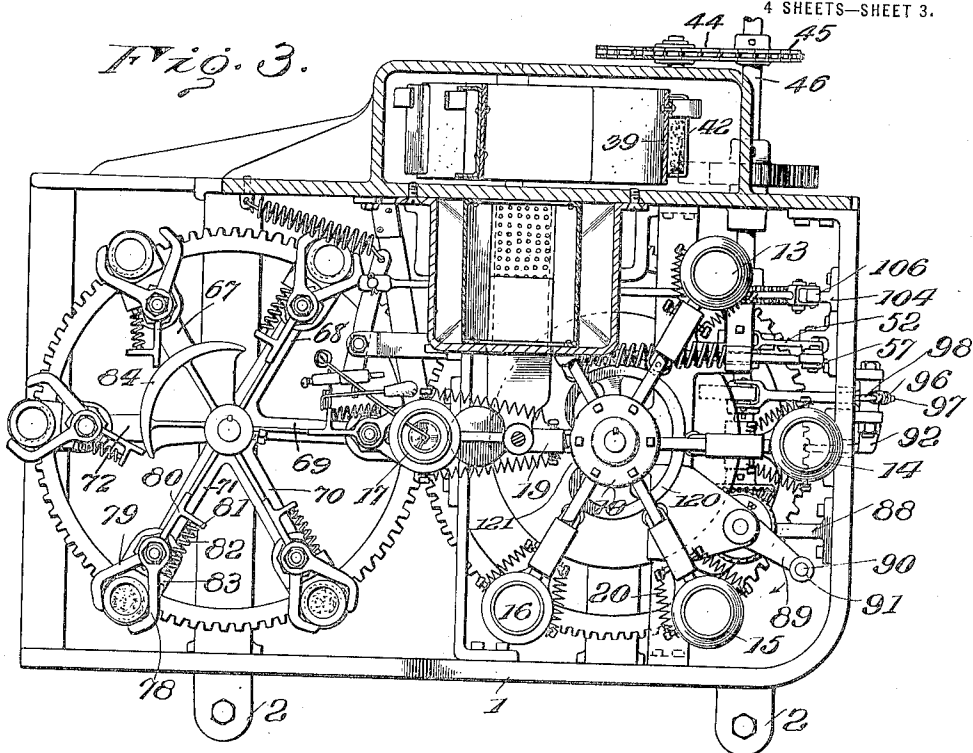


Fig. 4.

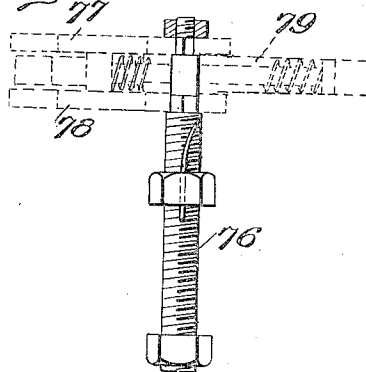
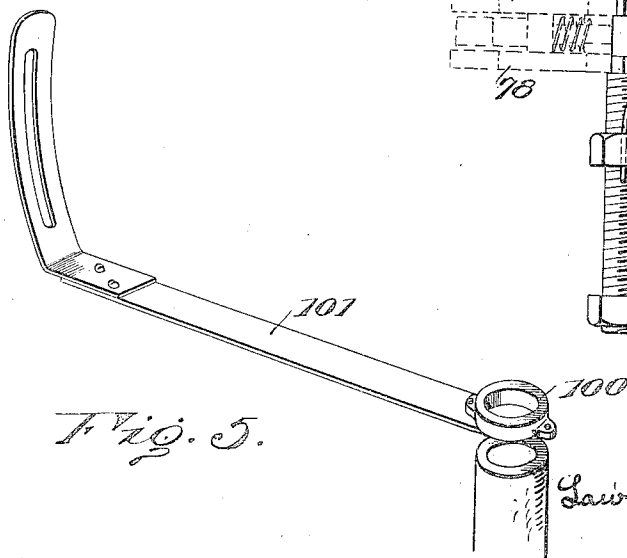


Fig. 5.



Witnesses

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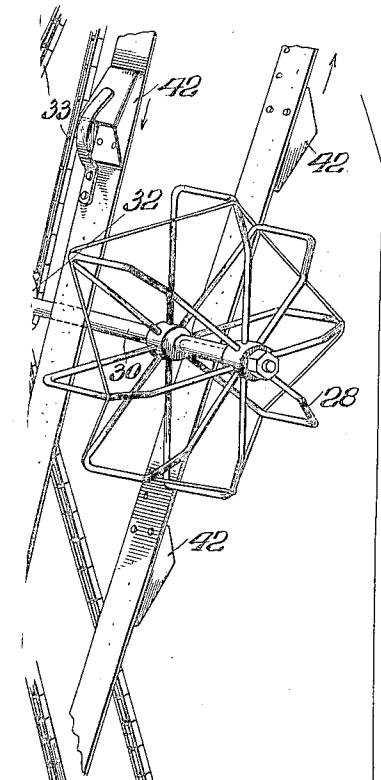


Fig. 6.

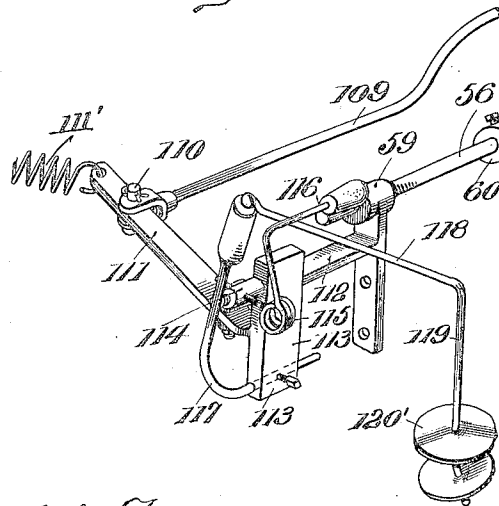
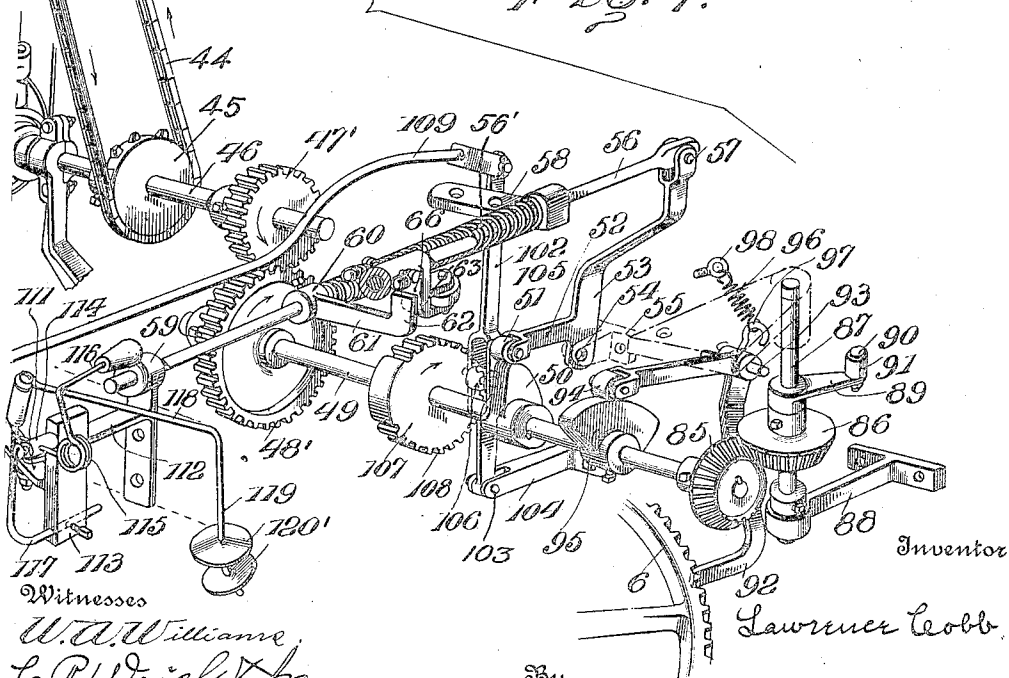


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

LAWRENCE COBB, OF RICHMOND, VIRGINIA.

FILLING-MACHINE.

1,375,674.

Specification of Letters Patent. Patented Apr. 26, 1921.

Application filed August 9, 1918. Serial No. 249,196.

To all whom it may concern:

Be it known that I, LAWRENCE COBB, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Filling-Machines, of which the following is a specification.

My invention relates to improvements in filling machines, and pertains particularly to the filling of cans, bottles, or the like, with granular material.

The object of my invention is to provide a machine of this character, in which the cans, bottles, or the like, can be more readily filled automatically, and in which the granular material cannot pack and will be properly fed to the cans, and in which the waste from the filling of the can is carried back to the feed hopper.

Another object of my invention is to provide means whereby the cans, or the like, are automatically stopped and held still during the filling operation, and in which the surplus granular material is scraped off of the top of the can.

A still further object of my invention is to provide a filling machine in which it is only necessary to place and remove by hand the cans, or the like, in the machine, the remainder of the operation being automatic and having certain details of structure and operation hereinafter more fully set forth.

In the accompanying drawings:

Figure 1 is a perspective view of my improved filling machine;

Fig. 2 is a front view, partly in section, of Fig. 1;

Fig. 3 is a horizontal sectional view taken on the line 3—3, Fig. 2;

Fig. 4 is an enlarged side elevation of the can-holding means carried by the revolving can carrying table;

Fig. 5 is an enlarged perspective view of the means for scraping the surplus granular material off of the upper end of the can, or the like;

Fig. 6 is a detached perspective of the agitator and beater for causing the proper feeding of the granular material to the can; and

Fig. 7 is a perspective view of the stopping mechanism for holding the can carrying table still while being filled, and also

showing the agitator and beater operating mechanism.

My improved machine is designed to fill cans or cartons with powdered bluing, and, while I will so describe the same, it will be understood that the same can be used for any other granular material, such as flour, sugar or meal, without any modifications or changes, and, therefore, I use the broad term of filling machine.

Referring now to the drawings, 1 represents a base which, as shown, is preferably provided with feet 2, whereby it is secured to the floor, or elsewhere, as is desired, and thus rigidly holding the same against movement. The rear end of the base 1 is provided with a rigid vertical wall 3, the upper end of which supports on its front face the feed hopper 4, which is adapted to feed the bluing to the cups and afterward discharge it in the cans or the like. Mounted within said base is a vertical shaft 5, which has keyed thereon at its lower end a gear 6. On the upper end of the shaft is mounted a bushing supported by any suitable stationary means. The frame 8 and base 1 are shown of a single casting, but this could be readily varied, as the specific form and means of supporting the mechanism forms no part of my invention.

The shaft 5 adjacent its upper end is provided with a circular table-like member 9, which is keyed upon the shaft, and by means of which the shaft is rotated, as will be hereinafter more fully described.

The shaft 5 is provided with an enlarged hub 10, which has rigidly secured therein the radially extending rods 11, which may be of any desired number, but I have shown six. The outer end of each of these arms is provided with conical shaped members having cylindrical bores, which I have designated by the reference numerals 12, 13, 14, 15, 16 and 17, for the purpose of convenience in the operation of the machine, as will be hereinafter more fully described.

These cylindrical members carried by the rods 11 have their lower ends open and are closed by the disks 18. These disks 18, as shown, are supported by sleeves 19, slidably mounted upon the rods 11, and are normally held in their outward positions, below the cylindrical members, by means of the springs 20. The springs 20, as shown, are

of the coil form and have their outer ends secured by means of a screw or bolt 21 to the sides of the conical members and their inner ends connected to the sleeves 19 by means of bolts 22. There are two springs 20 for each sleeve and it will be seen that the sleeves, by means of the springs, are normally held in their outward position so that the disks 18 carried thereby are normally held in their outward position below the cylinders.

The feed hopper, in which the powdered bluing is placed, is supported by the vertical wall 3 of the base and terminates at a point above a horizontal plane in which lie the upper ends of the cylindrical members 12 to 17, and in such a position that said members travel below the hopper and receive their charge of bluing. The hopper, as shown, is provided with a circular bottom 23 some distance above its lower end and is provided with a chute 24 through which the bluing passes to the cylinders. The upper end of the chute 24 is controlled by a slide 25, which has pivotally connected to its outer end the hand lever 26 which is pivoted to the hopper and whereby the feed of the bluing from the hopper to the chute 24 is controlled.

Mounted within the hopper is a rotary agitator 28 which extends down and just misses the circular bottom 23 of the hopper, which causes a continuous feed of the bluing through the chute. The opening between the hopper and the chute is covered with a screen which prevents any lumps of bluing from being fed to the cans, as will be readily understood. The agitator 28 is mounted upon a shaft 30, which extends through the wall 3 and also through the hopper 31 carried by the rear face of the wall 3. The said shaft beyond the hopper 31 is provided with a sprocket 32, over which the chain 33 passes, the said chain passing upwardly and over a sprocket 33' carried by the rear end of the shaft 34 mounted upon the bracket 35 carried by the upper end of the hopper 4.

The hopper 31, as shown, extends down to the base 1, and the wall 3 is provided with a hopper 36, which is below the hopper 4, to receive any waste of the bluing which may occur during the filling of the conical shaped members. The wall 3 is provided with an opening 37, whereby the waste bluing passes from the hopper 36 to the hopper 31, to be again conveyed to the hopper 4, as I will now describe.

The shaft 34 is provided with a large wheel 38, over which passes the endless conveyer 39, which also passes over the wheel 40 mounted in the hopper 31 adjacent its lower end. The wheel 40, as shown, is some distance above the lower end of the hopper 31, which prevents the packing of

the waste bluing in the hopper 31. The upper end of the hopper 31 is provided with a chute 41, which extends obliquely and discharges into the hopper 4, whereby the waste is conveyed back to be later used. The endless conveyer 39 is of the bucket form with the buckets 42 arranged thereon at the proper intervals and having curved springs 43 extending across the same which are adapted to engage the chute 41 and shake the same for causing the bluing to travel downwardly and discharge into the hopper 4.

The shaft 30 is driven by a chain 44 which passes over the sprocket wheel 45 carried by the shaft 46. This shaft 46, as shown, extends across the base 1 and is driven by means of a pulley 47, through the medium of the belt 48, whereby the shaft is continuously driven. The belt 48 derives its power from a motor of any desired character.

The shaft 46 at its inner end is provided with a gear 47', which meshes with a gear 48' keyed upon the shaft 49, whereby the said shaft 49 is continuously rotated. The shaft 49 is provided with a cam 50, which engages the roller 51 carried by the arm 52 of the lever 53. The lever 53 is pivoted at 54 to the bracket 55 carried by the frame 8 and is bent laterally so that it is brought into alinement with the rod 56 to which it is pivoted at 57. This rod 56 is slidably mounted in a bearing 58, carried by the frame 8, and extends across the upper face of the table and has its outer free end slidably mounted in a bracket 59, also carried by the frame 8.

The rod 56 is provided with a sleeve 60, which is provided with an outwardly extending arm 61, having an upwardly turned end 62 which extends opposite the downwardly extending portion 63 of the sleeve 19, whereby the outward movement of the rod 56 forces the sleeve 19 inwardly and withdraws the disk 18 from below the cylinder to discharge the contents thereof, as will be hereinafter more fully described. The rod 56 has a coiled spring 56' surrounding the same and having one end engaging the bearing 58 and its opposite end engaging the sleeve 60 whereby the rod is normally held in an inward position. The cam 50 is so timed with the movement of the cylinders that the disk 18 is moved inwardly from below the cylinder when the cylinder is at rest.

The base 1 is provided with a vertical shaft 64, the lower end of which has keyed thereon a gear 65, which meshes with the gear 6 and is driven thereby, and whereby the shafts 5 and 64 are simultaneously driven in opposite directions. The upper end of the said shaft 64 is provided with a hub 66 having radially extending integral arms 67, 68, 69, 70, 71 and 72, which corre-

spond in numbers to the conical shaped members 12, 13, 14, 15, 16 and 17, the outer end of each arm being provided with an enlarged portion 73, having an outwardly extending shelf 74 upon which the cans or cartons 75 are supported. The enlarged portions 73 are provided with vertical shafts 76, which have their upper ends provided with two rigid arms or jaws 77 and 78 which have curved outer ends extending above the can support 74. Loosely mounted upon the shaft 76 between the rigid arms 77 and 78 is a movable jaw 79 having at its inner end an extension 80. This extension 80 is provided with an ear 81 against which a spring 82 bears and normally holds the extension in an inward position parallel with the arms supporting the same. The opposite ends of the springs 82 bear against the extensions 83 carried by the rigid arms 77 and 78. By this structure it will be seen that the movable arm 79 is normally forced inwardly toward the stationary arms 77 and 78, whereby the can or carton 75 is firmly held upon the support 74.

The upper end of the shaft 64 is provided with a hub locked upon the shaft and provided with a cam 84, which is adapted to simultaneously engage the extensions 80 of two of the movable arms and force them from the stationary arms to release the filled cans or cartons so that they may be removed and empty ones placed therein. When the arm carrying the same has passed the cam the jaws are forced together and the can again gripped and held to be filled.

The gear 6 is not driven, but is fast to the shaft 5, and when the shaft 5 is rotated, as hereinafter more fully described, the gear 65 is driven in unison and one of the supports 74 with its can or carton is stopped directly below one of the members 12 to 17 from which the disk 18 has been withdrawn and the contents of the cylinder is discharged into the can or carton.

The table-like member 9 is keyed to the shaft 5 and is provided in its lower face with radial grooves 84' starting from the edge thereof and by means of which the same is intermittently moved a certain distance or a sufficient distance to bring another cylinder below the hopper and at the same time bring another cylinder into discharging position and the table stopped while the cylinder is being filled and the other cylinder is discharged, which I will now proceed to describe.

The shaft 49 at its outer end has keyed thereon a bevel gear 85 which meshes with a beveled gear 86 keyed upon the vertical shaft 87, which is mounted in a bracket 88 carried by the frame 8, by means of which said vertical shaft is continuously rotated. The said shaft above the gear 86 is provided with a rigid arm 89, the outer end of which

has an upwardly extending stud 90 upon which is rotatably mounted the roller 91. The shaft 87 and arm 89 are so located in respect to the table 9 that, during each rotation of the shaft 87, the roller of the arm 89 enters a semicircular groove 84 in the lower face of the table and causes it to move a distance so as to bring another cylinder below the hopper to be filled.

In order that the movement of the table will not continue after the roller 91 of the arm has passed out of the groove 84, I provide a lock 92 for the gear 6. This lock 92 is adapted to enter the teeth of the gear, the said gear being keyed upon the shaft 5 the same as the table 9, and it will be seen that the table 9 is stopped upon the stopping of the gear. This lock 92 is in the form of an L-lever pivoted at 93 to the frame 8 and having a roller 94 which engages the cam 95 mounted upon the shaft 49. This cam is so timed with the cam 50 that the table 9 is locked when the rod is forced outwardly, as shown in Fig. 7, and when in this position the cylinder 17 is discharging and the cylinder 12 is receiving another charge. The cam 50 is so arranged that, immediately upon the starting of the table to the left after the conical shaped members 17 has passed the disk 18, it is rapidly forced out. The lever or lock 92 is held against the cam by the spring 96, which has one end connected at 97 to the lever and the opposite end connected at 98 to the frame 8.

The frame 8 is provided with a slightly conical-shaped member 99, which is adapted to receive the bluing from the conical shaped members 17 and convey it to the cans or cartons and is rigidly supported by the frame. Surrounding the lower end of the conical-shaped member 99 is a ring 100, which is supported by the spring arm 101 which is arranged at an angle and adjustably supported by the wall 3 of the frame. This ring 100 is normally held down so that it projects some distance below the bottom of the conical-shaped member 99 and as the cans or cartons come around into filling position they engage the slanting arm and force the same upwardly, whereby the ring tightly engages the upper end of the carton and prevents any waste of the bluing from the member 99 as the bluing passes there-through.

In filling cans with bluing some difficulty has been found, in that the bluing cakes and does not freely pass from the conical shaped member 17, nor does it freely pass through the conical-shaped member 99, and I have provided an agitator and a beater to prevent such caking and cause the free passage and discharge thereof to the cans or cartons.

The agitating means consists of a lever 102 pivoted at its lower end at 103 to the

arm 104, which is rightly secured to the frame 8. The said lever intermediate its end is of a double form, as indicated at 105, and is provided with a roller 106. The lever 102 is located adjacent the shaft 49, the said shaft being provided with a wheel 107 having teeth 108 on part of its periphery which are adapted to engage the roller 106, whereby the lever 102 is vibrated during a part of each revolution of the wheel 107 and is at rest during the remainder of its revolution.

Connected to the upper end of the lever 102 is a rod 109. This rod is pivotally connected to the lever 102 and extends forwardly and is pivotally connected at 110 to the lever 111. This lever is pivotally mounted upon a bracket 112 supported by the frame 8. Secured to the end of the lever 111 is a spring 111' which normally holds the lever in the position shown in Fig. 6. The inner end of the lever 111 carries a vertically disposed member 113 which is provided at its upper end with an outwardly extending stud 114 to which is attached a spring member 115, having at its upper end the horizontally arranged portion 116, to which is attached a beater which engages the discharging conical shaped member and causes the bluing to pass therefrom when the disk 18 has been withdrawn from below the same.

The lower end of the member 113 is provided with an outwardly and upwardly extending member 117, which is provided at its upper end with a horizontal portion 118 which extends below the cylinders and has a downwardly turned portion 119 entering the conical-shaped member 49. The lower end of said portion 119 is provided with disks 120' which are of a diameter less than that of the conical-shaped member. The member 117 through the lever 111, rod 109 and lever 102 is given an oscillating movement which causes the feed of the bluing through the conical-shaped member and thus insures the full discharge therefrom.

The operation of the machine is as follows:

The belt 48 is set in motion by the motor, which in turn starts the endless conveyer in operation to carry the waste bluing back to the hopper 4. The shaft 49, through the gears 47' and 48', is likewise set into operation and continues to revolve. In order to stop the shaft 46 without stopping the belt, a clutch or other means may be provided, whereby the drive pulley carried by the end of the shaft 46 is disconnected from the shaft and the whole machine is stopped. This is necessary in order that the machine may be readily stopped should any of the parts become inoperative and thus prevent the breaking of the machine. The shaft, when in operation, rotates the vertical shaft

87 through the bevel gears 85 and 86 and the arm 89 is caused to revolve. The roller 91 enters one of the grooves 84 in the table 9 and causes the same to revolve and the conical shaped members 12, 13, 14, 15, 16 and 17 being carried thereby are moved below the chute 24 of the hopper 4 and receive the charge of bluing. Any waste bluing passes downwardly into the hopper 36 and is carried back to the hopper 4, as heretofore described. The movement of the table caused by the arm 89 is sufficient to move the cylinder 12 around to the position of the conical shaped member 17. When the conical shaped member has reached the position at 17 the arm 52 has ridden up upon the cam 50, causing the rod 56 to force the sleeve 19 toward the center of the table and withdrawing the disk 18 from below the same. Just previous to this operation the cam 95 has raised the upper end of the lever and forced the lower end 92 into the teeth of the gear 6 and stopped the same. It is understood that the gear 6 is driven through the shaft 5 from the table 9 and this lever is only to stop the momentum of the table caused by the movement imparted by the arm 89, as heretofore described.

When the rod 56 has withdrawn the disk 18 from below the conical shaped member 17 the teeth 108 of the wheel 107 have engaged the roller carried by the lever 102 and through the medium of the rod 109 the beater 116 and the agitator are set in operation to cause all of the bluing to be discharged from the conical shaped member and the conical-shaped member 99 to the can.

The can supporting arms, as heretofore described, are carried by the hub and timed with the gear 65, so that when the disk 18 is drawn outwardly a can is directly below the same and is properly filled. After the can is filled and the table 9 is set in operation, the filled can is carried around when the cam 84 engages the inner end of the extension 80 and releases the can when it is removed and another empty can placed thereon, and after the cam has been passed the can is again grasped and held while it is being filled.

In order to insure the positive outward movement of the disk 18, I provide the sleeve above the table 9 with a cam 120, which also has a cut-away portion 121. The sliding sleeve 19 is provided with downwardly extending arms 63, heretofore described, the said arms being provided with inwardly turned ends bifurcated at 123. Within these bifurcated ends are rollers 124, which are adapted to engage the cam 120. When the cut-away portion of the cam comes opposite the roller, the sleeve 19 is forced inwardly and the disk 18 is withdrawn from under the member 17 and the

bluing is discharged. This cam works in conjunction with the cam operated member for operating the arm 61 for forcing the sleeve 19 inward.

5 Having thus fully described my invention what I claim is:

1. A can filling machine, comprising a hopper having a circular bottom spaced from the lower end thereof, a chute extending from an opening in the circular bottom to the lower end of the hopper, a slide controlling said opening, an agitator within the hopper, a can filling mechanism below the hopper and receiving the discharge from the hopper, a second hopper below the can filling mechanism, an endless conveyer having its lower end extending into the second mentioned hopper a distance above its lower end, and conveying the waste from the filling machine upwardly, an inclined chute receiving the discharge from the endless conveyer and discharging it into the first mentioned hopper, and means carried by the endless conveyer for rocking the chute to cause the waste to travel downwardly therein.

2. A can filling machine, comprising a hopper, a rotatable table below the hopper, radially extending arms carried by the table, charge receiving cylinders carried by the outer ends of the arms and adapted to pass below the hopper, sleeves carried by the said arms and having disks closing the lower ends of the cylinders, springs normally holding the sleeves in an outward position with the disks from below the cylinders, means for intermittently rotating the table, a cam timed with the table rotating means and operating a lever for successively operating the sleeves for withdrawing the disks from below the cylinders, a rotary can supporting means below the table and driven by the table and adapted to receive the discharge from the charge receiving cylinders.

3. A filling machine, comprising a hopper, a vertically disposed shaft below the hopper, a table supported by the upper end of the shaft, charge receiving cylinders carried by the table and adapted to travel below the hopper, disks horizontally movable and closing the lower ends of the cylinders, a gear carried by the lower end of the shaft, a rotating can supporting member below the table, a gear carried thereby and meshing with the gear carried by the shaft, automatically operated can clamping jaws carried by the can supporting member, means for intermittently driving the table, means for locking the gear carried by the table shaft when the table is at rest, and means timed with the table operating means for moving one of the disks inwardly for discharging the contents of the cylinder to the can directly below the same.

4. A filling machine, comprising a hopper, a rotary table below the hopper, charge receiving cylinders carried by the table and adapted to travel beneath the hopper, means for intermittently rotating the table, a can supporting member below the table and operated by the table, a conical-shaped member between the upper ends of the cans supported by the can supporting member and the cylinders, a vertically movable sleeve surrounding the lower end of the conical-shaped member and operated by the can to snugly fit the upper end thereof, an agitator within the conical-shaped member and timed with the table, means for intermittently rotating the table, means timed with the table rotating means for locking the table against movement when at rest, and means operated by the table operating means for opening the lower end of the cylinder above the conical-shaped member when the table is at rest.

5. A filling machine, comprising a hopper, a rotary table having radial grooves in the lower face thereof below the hopper, charge receiving cylinders carried by the table and adapted to travel beneath the hopper, horizontally movable disks closing the lower ends of the cylinders, a continuously driven shaft below the table, a vertically disposed shaft gearing connecting the said shafts for driving the second named shaft, an arm carried by the said second shaft and entering said radial grooves in the lower face of the table for intermittently rotating the same, a cam carried by the continuously driven shaft and timed with the table operating means for locking the table when the operating means has stopped, a second cam carried by the continuously operated shaft and timed with the table operating means for moving the disk of one of the cylinders inwardly and from beneath the cylinder, a can supporting rotating member below the table and driven by the table, and automatic means carried by the can supporting members for gripping the cans while they are being filled.

6. A filling machine, comprising a hopper, a rotatable table below the hopper, charge receiving cylinders carried by the table and adapted to travel beneath the hopper, means for intermittently driving the table, means for discharging the charge receiving cylinders, a gear carried by the table, a second gear driven thereby, can supporting members carried by said gear and adapted to travel beneath the charge receiving cylinders, rigid jaws carried by the can supporting members, pivoted jaws carried by the can supporting members and having their inner ends extending inwardly beyond their pivots, springs for normally holding the pivoted jaws inwardly toward the stationary jaws, and a rigidly sup-

ported cam adapted to engage the inner ends of the spring pressed pivoted jaws and move the pivoted jaws from the stationary jaws, whereby the cans can be removed.

5 7. A filling machine comprising a hopper, a rotary table, cylindrical members carried by the table and adapted to pass below the hopper, means for intermittently driving the table, horizontally movable disks closing the cylindrical members, and a cam
10 above the table for engaging the disks and forcing the same outwardly.

8. A filling machine, comprising a hopper, a rotary table, a series of cylinders
15 carried by the table and passing below the hopper, means for intermittently revolving the table, a stationary cam above the table,

horizontally movable disks engaged by the cam and forcing the disks outwardly below the cylindrical members.

9. A filling machine, comprising a hopper, a rotary table, cylindrical members carried by the table and adapted to pass below the hopper, horizontally movable disks normally held outwardly below the cylindrical
25 members, springs for normally holding the disks outwardly, means for forcing the disks inwardly against the tension of the springs, and a cam for forcing the disks outwardly, substantially as shown and de-
30 scribed.

In testimony whereof I affix my signature.

LAWRENCE COBB.