J. C. THOM.

MACHINE FOR PACKING PULVERULENT MATERIAL.

APPLICATION FILED APR. 26, 1913.

1,092,232.

Patented Apr. 7, 1914.

3 SHEETS—SHEET 1.

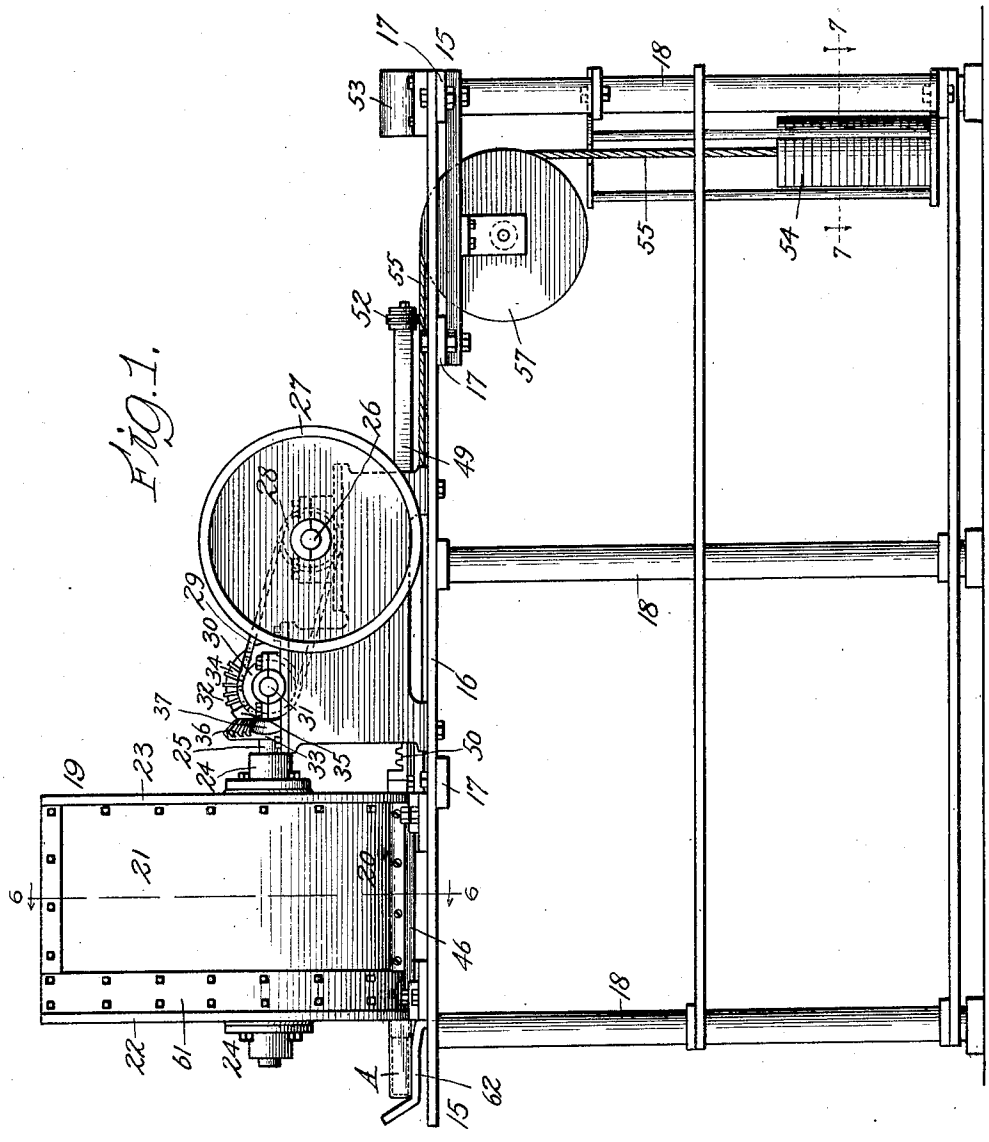


FIG. 1.

Witnesses:
G. W. Bomarus Jr.
R. Bauerle

Inventor:
James C. Thom.
By. Meyers, Cushman & Rea
Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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3 SHEETS—SHEET 2.

Fig. 2.

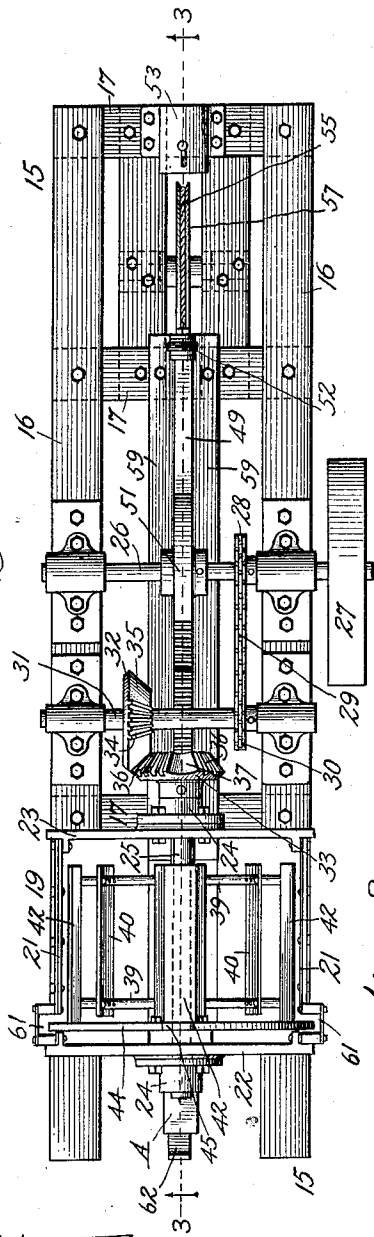


Fig. 5.

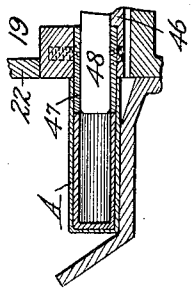


Fig. 4.

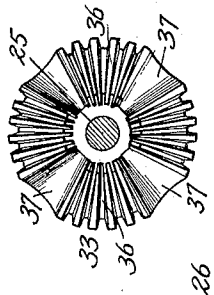


Fig. 3.

Witnesses:

G. W. Bomarus Jr.

R. Bauerle

Inventor:

James C. Thom,

By: Meyers, Cushman & Rea

Attys

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3 SHEETS—SHEET 3.

Fig. 6.

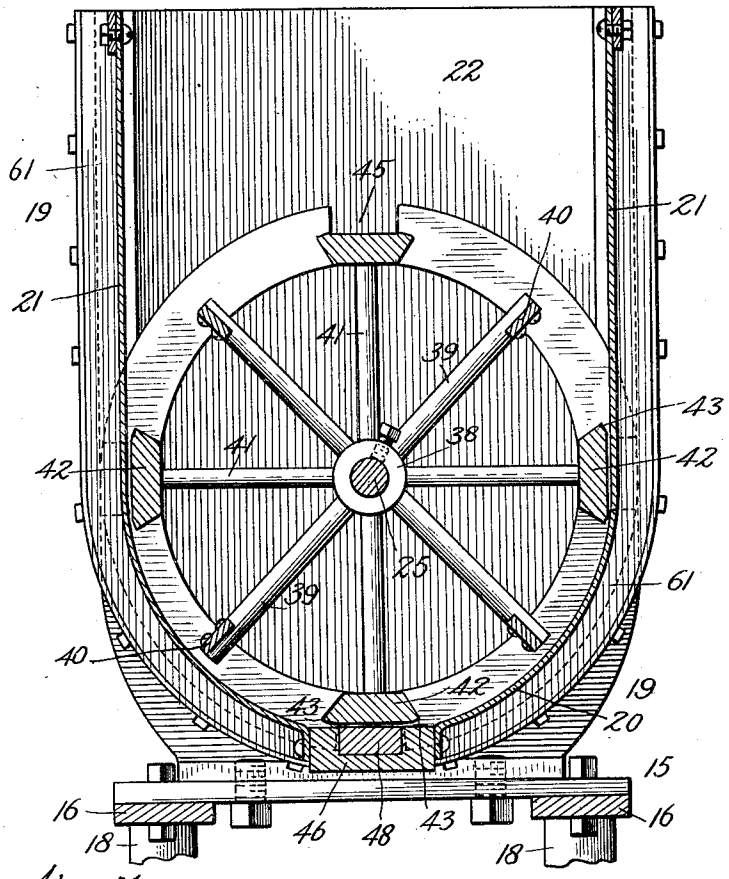


Fig. 7.

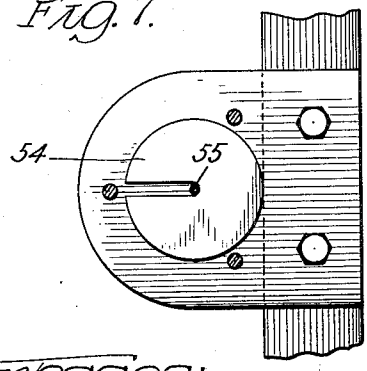
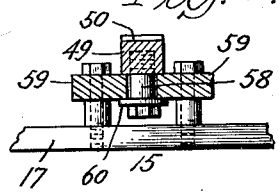


Fig. 8.



Witnesses:
G. W. Bowers Jr.
R. Bauerle

Inventor:
James C. Thom,
By: Meyers, Cushman & Rea
Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES C. THOM, OF CHICAGO, ILLINOIS, ASSIGNOR TO WEYMAN-BRUTON COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

MACHINE FOR PACKING PULVERULENT MATERIAL.

1,092,232. Specification of Letters Patent. Patented Apr. 7, 1914.

Application filed April 26, 1913. Serial No. 763,757.

To all whom it may concern:

Be it known that I, JAMES C. THOM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Machines for Packing Pulverulent Material, of which the following is a specification.

This invention relates to a packing machine, particularly to a machine for packing pulverulent or powdered material, such as snuff, in paper containers, and has for its object to provide a machine of this type which will rapidly and accurately fill the containers with the proper weight of material, this being necessary when the material is a tobacco product because the U. S. revenue laws require each of such packages to be sealed with a stamp indicating the exact quantity of such product inclosed.

The machine comprises a hopper in which the pulverulent material, snuff in the present instance, is placed and is prevented from packing therein by an agitator, rotating intermittently in the hopper above a loading channel into which the snuff falls and from which it is expelled by a reciprocating plunger movable in the channel. From the channel the snuff passes into an open ended container made of paper supported in line with the channel and packed thereon by the plunger. Each container is removed after receiving a charge and the open end closed by folding in the sides thereof and applying a revenue stamp.

With the above as the principal object in view, the invention consists of the novel construction, combination and arrangement of parts hereinafter described and set out in the claims, reference being had to the accompanying drawings in which:—

Figure 1 is a side elevation of the complete machine. Fig. 2 is a plan view of the same. Fig. 3 is a vertical longitudinal sectional view on the line 3—3 of Fig. 2. Fig. 4 is an enlarged detail view of the mutilated bevel-gear for intermittently rotating the agitator shaft. Fig. 5 is an enlarged sectional detail view showing the container in position and the plunger for filling the same in a position just ready to recede. Fig. 6 is an enlarged sectional view on the line 6—6 of Figs. 1 and 3, showing the hopper and agitator. Fig. 7 is a sectional view on the line 7—7 of Fig. 1. Fig. 8 is a detail sectional view on the line 8—8 of Fig. 3, showing the sliding rack for operating the filling plunger and its guides.

In the drawings, 15 indicates a rectangular frame made in the present instance of two parallel longitudinal side bars 16 connected by a plurality of spaced transverse bars 17 bolted firmly to the side bars. This frame may be of cast metal or made in any other manner suitable for the purpose intended. The frame 15 is carried on the upper ends of legs 18 that rest upon the floor and are suitably braced to secure rigidity.

Supported upon the top of frame 15 near one end, here shown as at the left end, is a hopper or receptacle 19 within which is placed the pulverulent material to be measured and packed in containers. The hopper or receptacle 19 has a semi-circular bottom 20, parallel vertical sides 21 and parallel ends 22 and 23, said ends being provided with bearings 24 in the axial line of the semi-circular bottom to support an intermittently revoluble shaft 25 that carries an agitator to stir the pulverulent material, the details of which will be described later.

Rotatable in bearings secured to the frame 15 about midway its length is a shaft 26 extending transversely of said frame and having on its outer end a band pulley 27 by means of which said shaft is continuously rotated. Between the bearings is a sprocket wheel 28 also fixed on said shaft and driving a sprocket chain 29, which passes around a second sprocket wheel 30 of the same diameter as the sprocket wheel 28 and secured on a second shaft 31 also rotatable in bearings fixed to the frame 15 nearer the hopper or receptacle 19. On the shaft 31 is a mutilated miter gear 32 adapted to engage at intervals with a second mutilated miter gear 33 on the inner projecting end of the agitator shaft 25, whereby said shaft and the agitator carried thereby are given a series of intermittent rotary movements. The miter gear 32 is provided with a few teeth 34, the remainder of the gear wheel being smooth as at 35, while on the miter gear 33 are a plurality of series of teeth 36 between which are smooth spaces 37. As shown in the drawing the teeth on the miter gear 33

are divided into four groups equally spaced so that at every rotation of the shaft 31 the agitator is given a quarter revolution.

The agitator comprises a plurality of hubs 38 from which project in a radial direction a number of spokes 39 on the outer end of which are secured blades 40 which as they rotate travel somewhat close to the inner surface of the bottom of the hopper. Other spokes 41 also project radially from the hubs 38 intermediate the spokes 39, and support on their outer ends longitudinal bars 42 having knife edges 43 at each side, and a flat outer surface tapered toward said knife edges. Fastened to the outer ends of the bars 42 is an annular head 44 concentric with the axis of the agitator shaft, and projecting beyond the outer faces of the bars 42. Opposite each bar 42 the annular head is cut away to form a notch 45 of rectangular form, the use of which will be set forth later.

At the bottom of the hopper below the shaft 25 is a longitudinal measuring channel 46 that extends from one end of the hopper or receptacle to the other and passes through the heads 22 and 23, said channel being open at the top to receive the pulverulent material from the receptacle 19. The outer end of the channel is provided with a nozzle 47 over which the paper containers A are placed to be filled.

Slidable longitudinally in the measuring channel 46 is a plunger 48 adapted to travel longitudinally from one end of the channel to the other for the purpose of ejecting material collected therein into the container A. The inner end of the plunger 48 is secured on one end of a bar 49 provided on its upper face with a rack 50 with which a mutilated gear 51 is adapted to engage and intermittently move said bar and the attached plunger in one direction, the return movement of said parts being effected by a weight 54 hung from a cord 55 attached to a lug 56 from the under side of the bar 49, said cord passing over a pulley 57. Extending downwardly from the bottom of the bar 49 are a number of pins 58 which pass between guide bars 59, said pins having washers 60 on their lower ends held against the under side of the guide bars 59 by means of nuts whereby the rod 49 is adapted to move freely in a longitudinal direction, but is prevented from being raised out of position by the washers 60.

The position of the annular head 44 is such that as it rotates it will close the outer end of the filling channel 46 and only when the agitator comes to a pause will the notches 45 in said head be brought into alinement with the channel. By this means the blades 40 and the bars 42 acting on the material within the hopper or receptacle not only stir it in order to keep the same from packing, but force said material to enter the channel 46 where it is measured. Attention is called to the fact that the blades 40 after delivering more or less material into the channel are each followed by a bar 42, which pushes the material before it and completes the filling of the channel should the blades 40 fail to do so. The bars 42, scrape the material from the top of the channel as they pass thereover and finally come to a momentary rest immediately upon the same forming a temporary closure therefor, to prevent the material from being forced from the channel as the plunger advances and carries the material into the container. The annular head 44 projects beyond the periphery of the agitator blades 40 and bars 42 to provide for this enlargement. The hopper 19 is formed adjacent the head 22, with a channel 61 as shown in Figs. 2 and 6, to receive the outer edge of said head.

The operation of the machine is as follows: Pulverulent material, such as snuff, being poured into the hopper 19, and power being applied to the belt pulley 27, the shaft 26 rotates continuously driving through the sprocket chain 29 the shaft 31. With each rotation of the shaft 26 the segment of teeth on the mutilated gear 51 engage the teeth 50 on the bar 49 and move said bar toward the hopper, thereby pushing the plunger 48 through the hopper and the material in the channel into the container A, the outer end of which is supported by a bracket 62. As soon as the plunger forces the material into the container the teeth on the mutilated gear 51 are disconnected from the teeth on the rack 50, and the weight 54 being unsupported immediately falls, pulling the bar 49 and plunger with it. A piston 52 on the end of the bar 49 enters a cylinder 53 at the end of the return movement of said bar and cushions the shock, which otherwise would result in a return of the weight. While the plunger 48 is advancing for the purpose of expelling the material the smooth surface 35 of the miter gear 32 is in contact with the smooth surface 37 of the miter gear 33, thus holding the latter miter gear fixed against rotation, and one of the bars 42 over the channel 46 and its associated notch 45 in line with said channel. But as soon as the plunger 48 has been withdrawn from the channel the teeth 34 on the miter gear 32 engage one of the groups of teeth 36 on the miter gear 33 and turns the same through a quarter revolution, thus advancing another blade 40, and another bar 42 toward the channel for the purpose of refilling the same and measuring the material therein as is done by the bar 42 as it passes over the top of said channel and removes therefrom all surplus material, the channel being made of such size as to hold the exact quantity necessary to fill each container. During the return movement of the

plunger and the intermittent movement of the agitator the filled container is withdrawn from the machine and a new container substituted in place thereof ready to be filled at the next advance of the plunger.

What I claim is:—

1. A machine for packing pulverulent material in containers, comprising a receptacle or hopper for said material, a measuring channel opening through said receptacle and provided with means for holding a container, an intermittently movable agitator in said receptacle for stirring the material, means carried by the agitator for separating a determined quantity of material in the channel from the bulk within the receptacle, and means for expelling the measured charge of material from the channel into the container.

2. A machine for packing pulverulent material in containers, comprising a receptacle for said material, a measuring channel opening through said receptacle and provided with means for holding a container, an intermittently movable agitator in said receptacle for stirring the material, means carried by the agitator for closing the outer end of said channel during the filling thereof, and means for expelling the measured charge of the material from the channel into the container.

3. A machine for packing pulverulent material in containers, comprising a receptacle or hopper for said material, a measuring channel opening through said receptacle and provided with means for holding a container, an intermittently movable agitator in said receptacle for stirring the material, means carried by the agitator for separating a predetermined quantity of material in the channel from the bulk within the receptacle, other means carried by the agitator for closing the outer end of said channel during the filling thereof, and means for expelling the measured charge of material from the channel into the container.

4. A machine for packing pulverulent material in containers, comprising a receptacle for said material, a measuring channel opening through said receptacle and provided with means for holding a container, an agitator movable within said receptacle having periodical movements of rest, means carried by said agitator for directing material into said channel, other means on the agitator following the first named means for completing the filling of the channel and forming a top closure therefor during intervals of rest, and means for expelling the measured charge of material from the channel into the container.

5. A machine for packing pulverulent material in containers, comprising a receptacle for said material, a measuring channel opening through said receptacle and provided with means for holding a container, an agitator movable within said receptacle having periodical movements of rest, means carried by said agitator for directing material into said channel, other means on the agitator following the first named means for completing the filling of the channel and forming a top closure therefor during intervals of rest, means also carried on the outer end of the agitator for closing the delivery exit of said channel during the movement of the agitator, said closing means having openings therein which register with said channel during its period of rest, and means for expelling the measured charge of material from the channel into the container.

6. A machine for packing pulverulent material in containers, comprising a receptacle for said material, a measuring channel opening through said receptacle and provided with means for holding a container, an intermittently rotating agitator within said receptacle, blades carried by said agitator for stirring the material and directing the same into said channel, arms also carried by said agitator disposed between said blades and following them to complete the filling of said channel, said arms also constituting closures for the top of the channel during the periods of rest of the agitator, and a plunger within said channel for expelling the measured charge of material from the channel into the container.

7. A machine for packing pulverulent material in containers, comprising a receptacle for said material, a measuring channel opening through said receptacle and provided with means for holding a container, an intermittently rotating agitator within said receptacle, an annular member carried by said agitator for closing the delivery end of said channel while the agitator is moving and provided with openings which register with the channel when the agitator is at rest, arms carried by said agitator which move across said channel and successively form temporary closures for the top of the same, said arms being radially in line with the openings in the annular member and parallel to the agitator shaft, and a plunger in said channel for expelling the charge of material into the container.

8. A machine for packing pulverulent material in containers comprising a receptacle or hopper for said material having a semicircular bottom, a measuring channel projecting below said bottom and opening at its top into said receptacle, an intermittently rotatable agitator provided with blades for feeding said material to said channel and arms for removing surplus material from above the channel and for closing the same at each period of rest, an expelling plunger for the material in said channel, and a nozzle continuous with said channel and exte-

rior of the receptacle by which said containers are supported.

9. In a machine for packing pulverulent material the combination of a receptacle or hopper, an agitator therein, a measuring channel at the bottom of said receptacle or hopper and opening thereinto, a container support projecting from the channel at one end of said hopper, an expelling plunger slidable in said channel through its opposite end, rotating means adapted to intermittently engage said plunger and force the same through said channel, other means for withdrawing said plunger from the channel, and means for rotating the agitator intermittently.

10. In a machine for packing pulverulent material in containers, the combination of a receptacle or hopper for said material, said receptacle having a semi-circular bottom, an intermittently rotating agitator mounted in said receptacle and having blades projecting therefrom which travel close to the bottom of the receptacle, a measuring channel exterior of the bottom of the receptacle and communicating therewith, an annular head carried by the agitator for closing the outer end of said channel as the agitator rotates, said head having notches formed therein to register with the channel when said agitator comes to rest, arms parallel with said blades and extending between the same for closing the top of said channel during the pauses in the movement of the agitator, and a plunger for expelling the material from said channel.

11. A machine for packing pulverulent material in containers, comprising a hopper for said material having a measuring channel in the bottom thereof opening into said hopper, to receive a charge of material therefrom, means within the hoppper for agitating the pulverulent material to cause it to enter the measuring channel, movable means for closing the outer end of the channel during the filling thereof, and means for expelling the measured charge of material from the channel into a container.

12. A machine for packing pulverulent material in containers, comprising a hopper or receptacle for said material having a charge measuring channel therein one side of which opens into the hopper, a plunger movable within the channel for forcing the charge of material therefrom and into a container supported outside the hopper, and means for covering the open side of the channel while the plunger is moving forward therein.

13. A machine for packing pulverulent material in containers, comprising a hopper or receptacle for said material, a measuring channel in the bottom of said hopper having one side open to receive a measured charge of the material from the hopper, means for expelling the measured charge of material from the channel into a container, and a movable closure operating to close the said open side of the channel when the charge of material is being expelled therefrom.

14. In a machine for packing pulverulent material in containers, the combination of a hopper or receptacle for said material, an agitator therein, a measuring channel in the bottom of said receptacle open on one side thereof and through the ends thereof, means on one open end to receive and support a container, an ejecting plunger extending through the other open end and slidable in said channel, a rack connected to said plunger, a mutilated gear wheel intermittently engaging and operating said rack to drive the plunger through the channel and eject the charge therein, and means other than said gear for withdrawing the plunger.

15. In a machine for packing pulverulent material in containers, the combination of a hopper or receptacle for said material, an agitator therein, a measuring channel in the bottom of said receptacle open on one side thereof and through the ends thereof, means on one open end to receive and support a container, an ejecting plunger extending through the other open end and slidable in said channel, a rack connected to said plunger, a continuously rotating mutilated gear wheel intermittently engaging and operating said rack to drive the plunger through the channel and eject the charge therein, and a cord and weight connected to said rack for quickly returning the plunger after the disengagement of said gear wheel from the rack.

16. In a machine for packing pulverulent material in containers, the combination of a hopper or receptacle for said material, an agitator therein, a measuring channel in the bottom of said receptacle open on one side thereof and through the ends thereof, means on the open end to receive and support a container, an ejecting plunger extending through the other open end and slidable in said channel, a rack connected to said plunger, a continuously rotating mutilated gear wheel intermittently engaging and operating said rack to drive the plunger through the channel and eject the charge therein, a cord and weight connection to said rack for quickly returning the plunger after the disengagement of said gear wheel from the rack, and a dash pot or equivalent means for cushioning the return of the plunger.

17. In a machine for packing pulverulent material in containers, the combination of a hopper or receptacle for said material, an intermittently rotating agitator therein, a measuring channel in the bottom of said receptacle open on one side and through the ends thereof, means on one open end to re-

ceive and support a container, an ejecting plunger extending through the other open end and slidable in said channel, intermittently actuating means for driving the plunger through the channel to eject the charge therein, separate means for withdrawing said plunger, and connections between the plunger actuating mechanism and the agitator for moving the latter when the plunger is at rest and holding it immovable while the plunger is reciprocating.

18. In a machine for packing pulverulent material in containers, the combination of a hopper or receptacle for said material, an intermittently rotating agitator therein, a measuring channel in the bottom of said receptacle open on one side and through the ends thereof, means on one open end to receive and support a container, an ejecting plunger extending through the other open end and slidable in said channel, a rack on the plunger, a mutilated gear wheel to operate said rack and move the plunger in one direction, independent means for returning the rack, locking mutilated gear wheels for intermittently rotating the agitator, and driving connections between said gear mechanisms for causing the alternate movement of the agitator and the plunger.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES C. THOM.

Witnesses:
JOHN M. DE VOE,
ELWOOD M. SKINNER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."