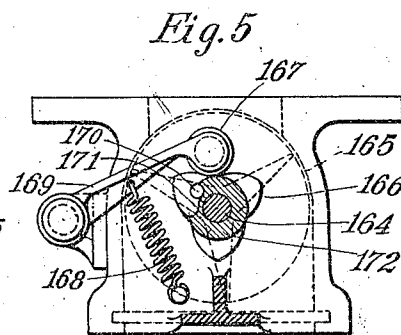
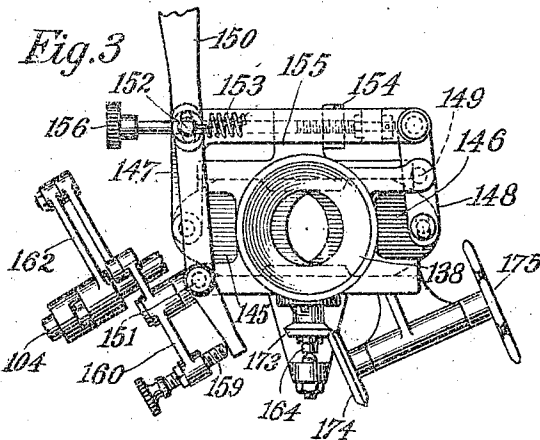
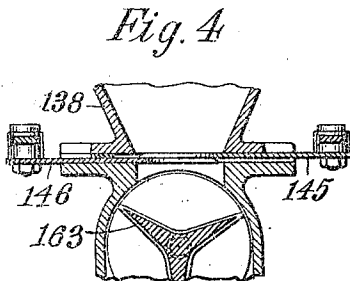
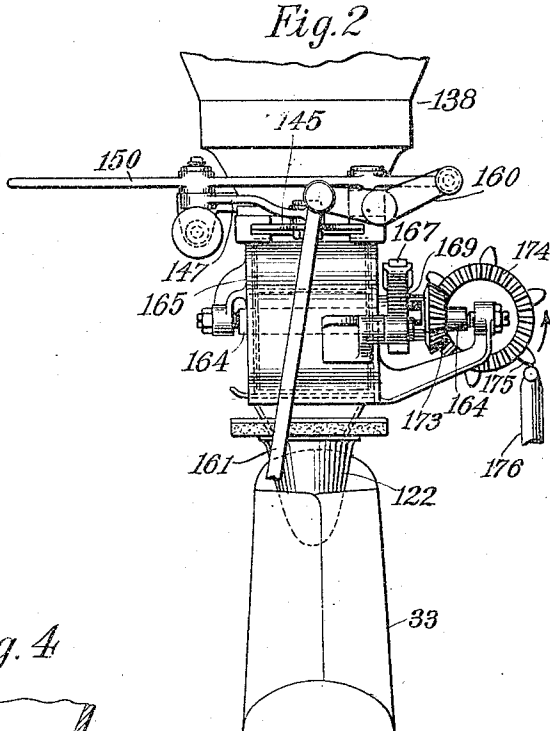
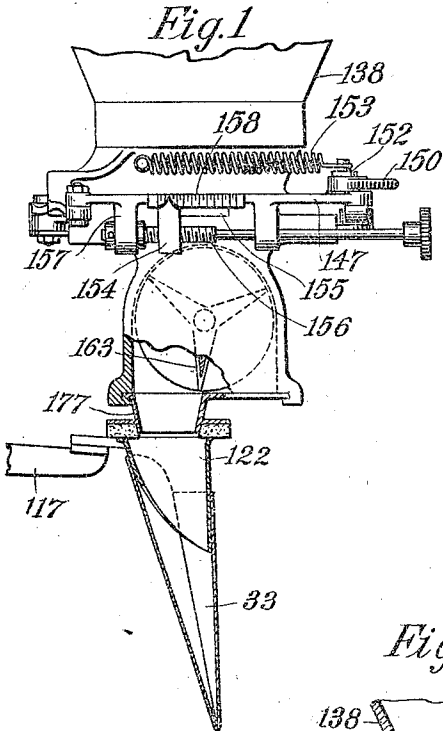


G. L. HOYT.
 FEED REGULATOR FOR FINE MATERIAL.
 APPLICATION FILED AUG. 8, 1910.

1,014,003.

Patented Jan. 9, 1912.



Witnesses:
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UNITED STATES PATENT OFFICE.

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FEED-REGULATOR FOR FINE MATERIAL.

1,014,003.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Original application filed November 12, 1909, Serial No. 527,724. Divided and this application filed August 8, 1910. Serial No. 576,112.

To all whom it may concern:

Be it known that I, GUY L. HOYT, a citizen of the United States, residing in the borough of Brooklyn, New York city, in the county of Kings and State of New York, have invented certain new and useful Improvements in Feed-Regulators for Fine Material, of which the following is a specification.

This invention relates to means for feeding charges of pulverulent substances, seeds, or other fine material, and its object is to provide improved means for obtaining detached or segregated charges of measured bulk or volume. Mechanism of this character is adapted to be used in connection with other machines, such for example as the bag-filling machine described in my Patent No. 977,632, dated December 6, 1910, of the application for which, Serial No. 527,724, filed November 12, 1909, this application is a division.

Of the accompanying drawings, Figure 1 represents a side elevation, partly in section, showing a feeding mechanism constructed according to my invention, together with one of the funnels of a bag-filling machine on which is positioned an empty bag. Fig. 2 represents a front elevation of said mechanism. Fig. 3 represents a top plan view. Fig. 4 represents an intermediate vertical sectional view. Fig. 5 represents a view in side elevation and section showing the means for controlling the feeder valve.

In the drawings, 33 represents a flat paper bag or envelop which the feeding mechanism is adapted to charge with fine material, said bag surrounding the mouth of a funnel 122 mounted on an arm 117, which funnel may be one of a revolving series, or turret, which presents the funnels successively underneath the discharge opening of this feeder mechanism.

138 is the hopper adapted to contain the material and having at its lower or discharge mouth an iris feed-regulating or measuring diaphragm composed of a pair of slides 145, 146, supported in suitable guides on a frame or casing 165 as seen in Fig. 2, and forming a variable feed opening between them, this feed opening being adjustable to regulate the rate of discharge of the material in conformity with the rate of recurrence or progression of the funnels or of

the other mechanism with which the feeder may be combined. That is to say, if the funnels or other receptacles for the material are presented and the segregating valve (hereinafter described) is operated, for example, seventy-five times per minute, the quantity of material in each charge would with any given opening of the diaphragm, be less than if the recurrence were at the rate of sixty times per minute; but the adjustability of the slides enables the feed opening to be coordinated with any particular speed so as to obtain the desired quantity in each charge. Slide 145 is attached to a rectilinearly-movable L-shaped slide bar 147 which connects with the slide 146 by a lever 148 pivoted at a fixed point 149 on the frame so that the slides have equal opposite movements and present a central discharge opening.

150 is a hand lever for opening and closing the slides, said lever being fulcrumed at a fixed point 151 on the frame and having a slotted connection with a stud 152 on the slide bar 147, 153 being a spring attached to this stud and to a fixed pin on the hopper as seen in Fig. 1, and normally tending to close the slides. The size of the opening between the slides is determined by a gage nut 154 abutting against a fixed stop 155 and having its position with relation to the slide bar 147 varied by means of an adjusting screw 156, the latter being swiveled in an ear 157 on the slide bar. The upper end of nut 154 constitutes a pointer cooperating with an index 158 on the slide bar, which shows the amount of opening between the slides.

159 is a stop screw mounted on a lever 160 and normally located in the path of the heel of hand lever 150 which is held against said stop screw by the spring 153. Link 161 connects the lever 160 with an arm 162 on a shaft 104 which may form part of an automatic stop motion for the bag-filling or other machine.

163 is a three-vaned rotary valve for segregating the individual charges and (in this instance) assisting in their downward propulsion. This valve is mounted to rotate on a horizontal shaft 164 in a casing 165 below the mouth of hopper 138, shaft 164 having fixed on it a three-pointed cam 166 against which a roller 167 is held by a spring 168

attached to the pivoted arm 169 carrying the roller. Cam 166 carries a pin 170 working in a segmental depression 171 in the hub 172 of a bevel gear wheel 173 loose on the feeder shaft 164, whereby a lost-motion connection is formed between the valve and the bevel gear. Gear 173 meshes with a second bevel gear 174 having double the number of teeth of gear 173 and carrying a six-pointed star wheel 175 which may be engaged by any suitable tripping device. 176 (Fig. 2) is a stud for this purpose which may be one of a series whose progress in a horizontal circle in co-action with the wheel 175 causes the valve 163 to be intermittently turned, through one-third of a rotation at each step. The first part of its movement from the position of rest shown in Figs. 1, 4, and 5, will be uniform, allowing the material to fall from the hopper into the spaces on either side of the uppermost vane, but during the last part of the movement one of the points of cam 166 rides under the roller 167 and the lost motion of pin 170 permits said roller to accelerate the valve and effect a sharp cut-off of the material, followed by a rest during which the material between two of the valve vanes is dropped by gravity through a discharge opening 177 in the casing 165 at the proper moment. This accelerated movement or kick of the vaned feeder valve facilitates the discharge of the material, especially when the latter is a powder. It is to be understood however that I do not wholly limit myself to the use of a rotary or other material-propelling valve-mechanism since the stream of material whose volume is determined or measured by the adjustable diaphragm may be segregated into individual charges by any other suitable means.

I am aware that it has heretofore been proposed to measure the volume of a stream or of segregated charges of material by means of a multiple valve-member having a longitudinal series of pockets each designed to be filled to its full capacity, together with a corresponding series of independently-movable gates adapted to be wholly opened or wholly closed so as to place a greater or less number of pockets in operation at each charge-delivery. Such devices however are complicated, difficult to adjust, and ill-adapted for caking or powdery substances.

It will be noted that each space or compartment of the segregating valve 163 shown in my drawings has a capacity in excess of the maximum bulk of the charge which the machine is designed to deliver, and is commanded by a single diaphragm mechanism (the slides 145, 146) adjustable to various predetermined degrees of opening for the purpose of regulating the volume of flow into said space or compartment, whereby I avoid the aforesaid objections.

As before stated, the volume of material

in the stream flowing from the hopper is determined by the adjustment of the slides, but the bulk of material in each of the charges delivered by the multiple segregating valve 163 depends upon the relation between the amount of opening of said slides and the rate of progression of said valve. It will be further noted that when valve 163 is stationary in its intercepting position, as seen in Fig. 4, the opening between the slides is substantially central with the receptacle formed by said vanes and the walls of the valve-casing, and this opening remains central at all adjustments. Thus the charge intercepted by the valve is always deposited squarely upon said valve and is largely kept away from the stationary walls of the casing, this being of particular advantage when handling powders which have a tendency to cake.

I claim,—

1. In a machine for feeding variable volumes of fine material, the combination of a hopper, a valve casing below said hopper, a valve device in said casing having vanes which form with the casing a charge-receptacle of constant volume, means for intermittently operating said device to intercept and discharge the material in separate charges whose bulk depends upon the relation between the rate of flow of the material from the hopper and the rate of operation of said valve device, a diaphragm device controlling the outlet from the hopper and composed of slides adapted to preserve a variable opening substantially central with said valve-device when the latter is in its intercepting position, and means for coincidentally adjusting said slides to various predetermined degrees of opening.

2. In a machine for feeding fine material, the combination of a hopper for the material, a diaphragm below said hopper composed of adjustable slides forming a measuring aperture to regulate the feed of the material, means for yieldingly drawing said slides together to contract said aperture, mechanism for spreading the slides, and an adjustable stop for said slides, which determines the maximum opening between them.

3. In a machine for measuring separate charges of fine material by volume, the combination of a rotary valve in the path of the material to be fed, rotating means therefor constructed to provide for movement of the valve independent of such means, mechanism for automatically and intermittently accelerating and then interrupting the rotation of said valve, and adjustable means for feeding a regulated stream of material to said valve.

4. In a machine for feeding fine material, the combination of a valve-driving member, a multiple valve mounted to rotate vertically in the path of the material being fed and

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5 having a lost-motion connection with said member, a multiple-pointed cam attached to the valve, a spring presser coöperating with said cam for intermittently accelerating the valve as the latter is carried around by said member, and means for discharging material into the path of movement of said

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses, this 5th day of Aug., 1910.

GUY L. HOYT.

Witnesses:

W. J. DUDLEY,

JOHN A. RABENSTEIN, Jr.