

(No Model.)

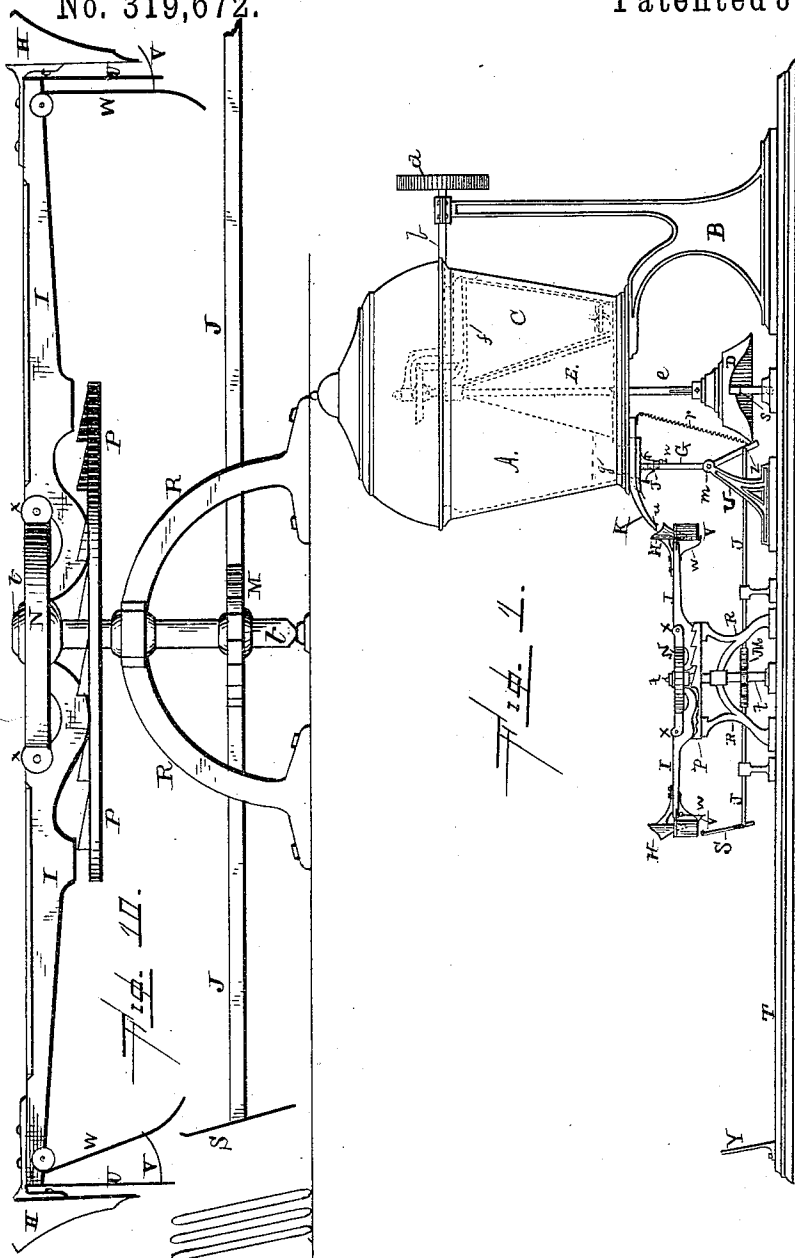
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J. C. BROWN.

APPARATUS FOR MIXING, MEASURING, AND PACKAGING
POWDERED MATERIAL.

No. 319,672.

Patented June 9, 1885.



Witnesses:

George D. Stiles
Louis M. D. Smith

Inventor:

Joseph C. Brown
per Charles E. Allen
Att'y.

(No Model.)

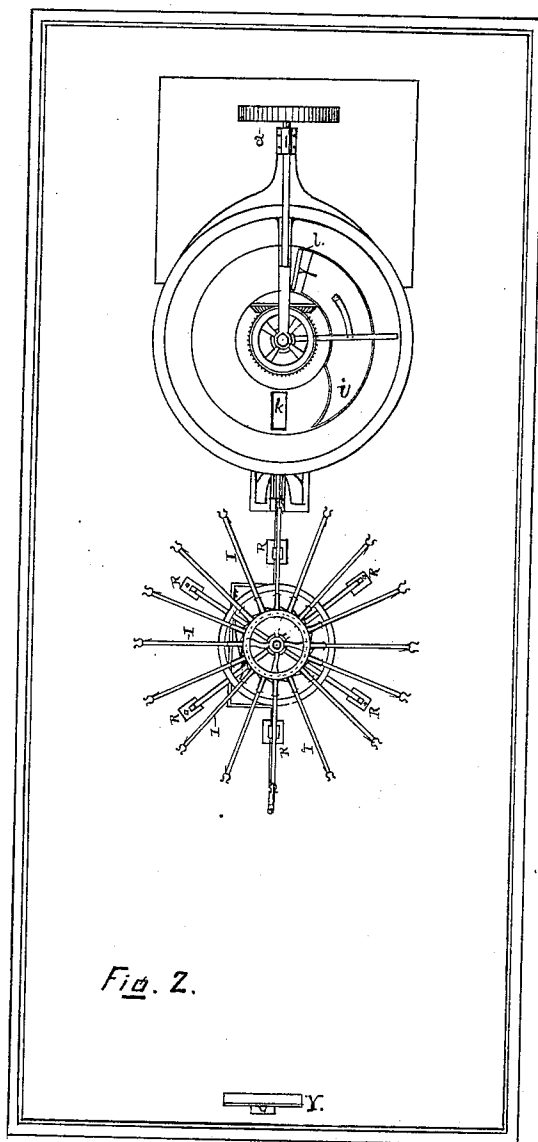
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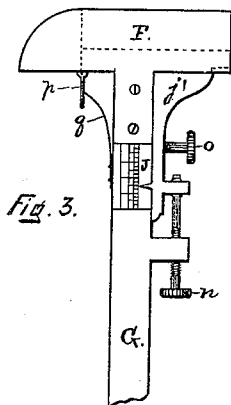


Fig. 6

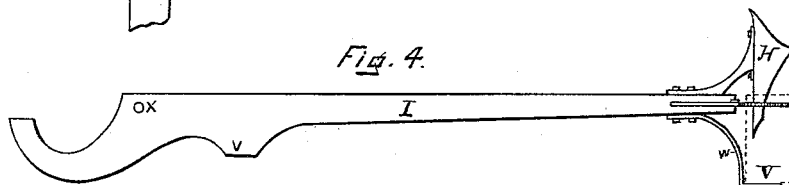
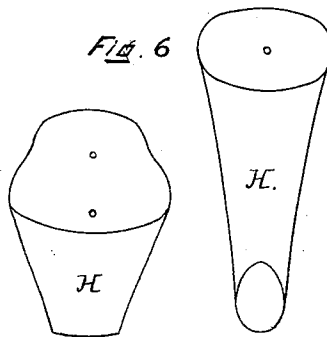
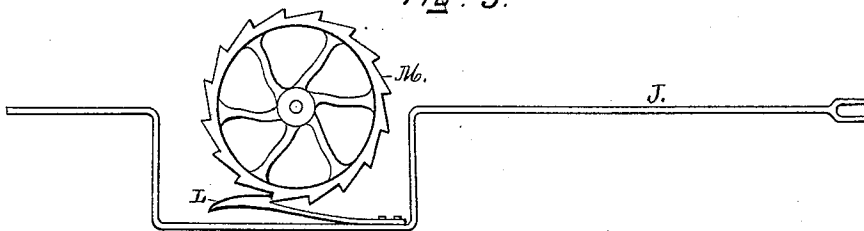


Fig. 5.



Witnesses:

George W. Stiles
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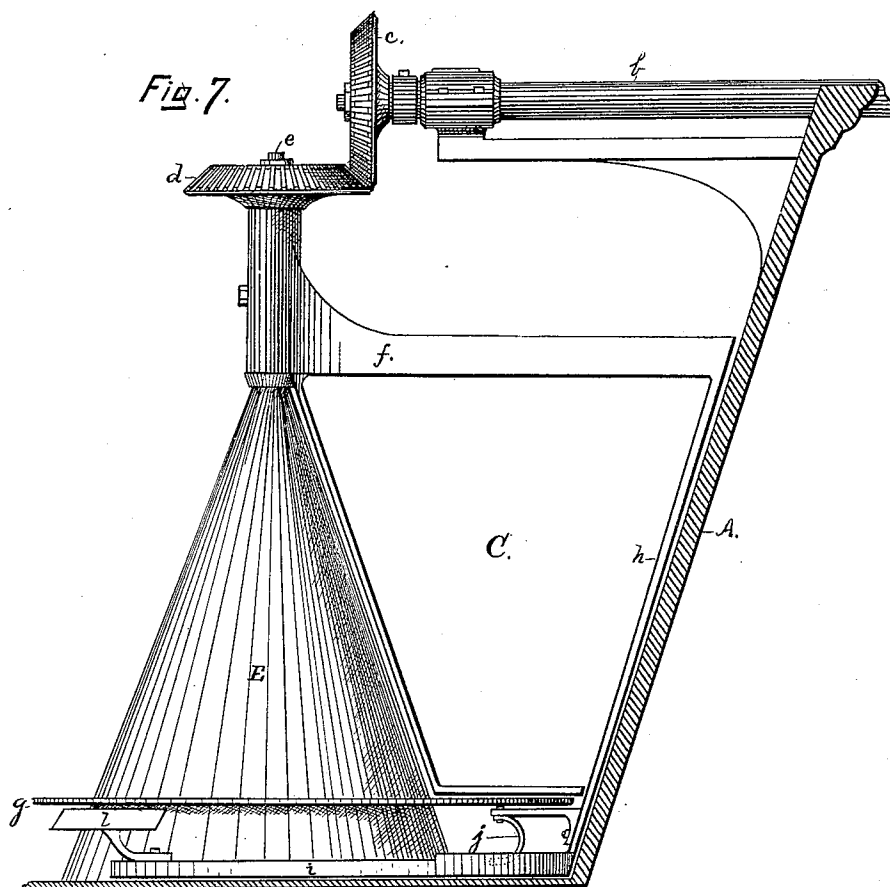
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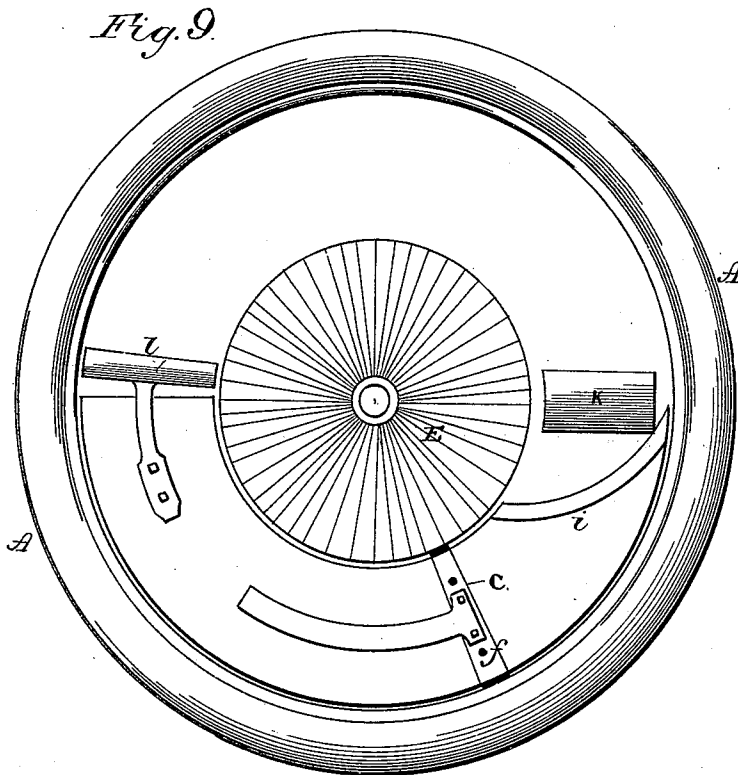
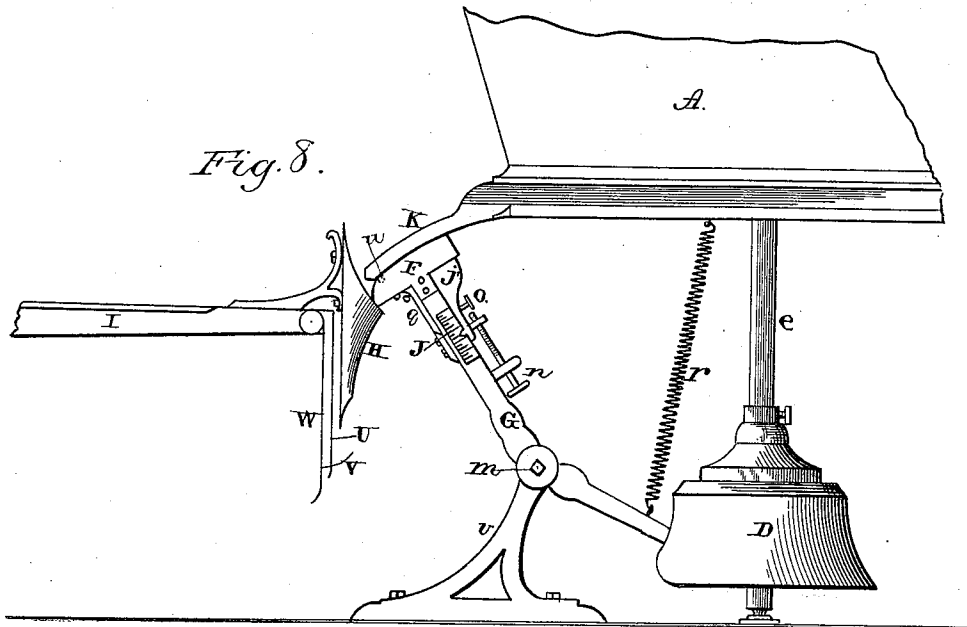
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WITNESSES:

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per C. E. Allen,
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH C. BROWN, OF BURLINGTON, VERMONT.

APPARATUS FOR MIXING, MEASURING, AND PACKAGING POWDERED MATERIAL.

SPECIFICATION forming part of Letters Patent No. 319,672, dated June 9, 1885.

Application filed May 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. BROWN, a citizen of the United States, residing at the city of Burlington, in the county of Chittenden and State of Vermont, have invented certain new and useful Improvements in an Apparatus for Automatically Mixing, Measuring, and Delivering Powdered Material into Packages, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in an apparatus for automatically mixing, measuring, and delivering into suitable envelopes or packages powdered material of any character; and the objects of my improvements are, first, to provide an air-tight receptacle to contain the powder, where it can be properly agitated, thoroughly mixed, and then delivered into the measuring device without exposure to the operator or to inconvenience or loss of the material from air-currents; second, to facilitate a rapid and reliable measurement of the quantity of powder desired to be put up in suitable packages while properly protected from the air; third, to deposit the material thus measured and guarded from air-currents into envelopes or other suitable packages prepared to receive it; and, fourth, to automatically deliver the packages for filling, and thence carry them to a place where they can be properly closed and arranged for commercial purposes. I attain these objects by the mechanism illustrated in the accompanying drawings; in which -

Figure 1 is an elevation of my apparatus, the dotted lines in the interior of the receiver indicating the form and position of the mixer, scraper, and the application of the motive power. Fig. 2 is a plan view showing the relative positions of the motive power, receiver, and the turn-table to which the packages are attached. Fig. 3 is a side elevation of the measuring device. Fig. 4 is a side view of one of the arms designed to retain and subsequently deposit the powder-packages when ready to be sealed. Fig. 5 is a plan view of the application of the motive power to the turn-table. Fig. 6 are elevations of the tunnels which are employed to direct the powder into the packages, the form of their lower ex-

tremities varying according to the quantity or character of the material to be passed through them. Fig. 7 is a detached view in perspective of a portion of the interior of the receiver, showing the revolving diaphragm or scraper, its attendant trowel, and the motive power. Fig. 8 is an enlarged detail view showing the scale in a different position from what it is in Fig. 1. Fig. 9 is an enlarged view of the bottom of the receiver. Fig. 10 is an enlarged detail view.

Similar letters indicate similar parts throughout the several views.

A is a circular receiver, preferably made of metal and surmounted by a cover for the purpose of protecting its interior from air-currents. It is intended to contain the powder to be mixed, measured, and then conveyed to the envelopes or other packages designed to receive it. It is sustained at a suitable height above the floor or table by the metallic bracket B, which also forms the base of the stand-ard which supports the lying shaft *b*, by which power is transmitted from the pulley *a* through the miter or bevel wheels *c d* to the central or upright shaft, *e*, which passes down through the receiver and rotates both the diaphragm or scraper C and the revolving disk or cam D beneath the receiver.

E is a metallic cone, which is located in the center of the receiver and extends from the bottom of the receiver, to which it is attached, to the revolving arm *f* of the diaphragm C.

Attached to the exterior surface or circumference of the cone E, about two inches above its base or the bottom of the receiver, is a flange or horizontal projection, *g*, which extends outward from the cone nearly to the sides of the receiver, so that only a narrow open space is left between the outside edge of the flange and the sides of the receiver A. Its purpose is to sustain the weight of the powder contained in the receiver above it, and allow free movement to the semi-disk, which rotates on the bottom of the receiver below it, and thus prevent the powder from pressing down too heavily into the opening *k* in the bottom of the receiver, thereby securing a uniform delivery of the powder into the measuring-box F, into which the aperture *k* opens. The diaphragm or scraper C stands vertically,

and is of such shape as to fill the space within the receiver above the flange *g*, as it revolves on the shaft *e*. Its lower part being turned somewhat backward from the line of its upper arm, *f*, it exerts a continuous and drawing force upon the powder deposited upon the flange, thereby crowding it continually toward the outer edge of the flange, and thence into the open space between the flange and the side of the receiver. Through this space its exterior arm, *h*, passes for the purpose of sustaining the revolving semi-disk *i*, which is made to press closely upon the bottom of the receiver by the force of the spring *j*, and extends from the base of the cone *E* to the side of the receiver. The front edge of the half-disk *i* is concaved and turned slightly upward, so as to carry forward and crowd the powder which falls onto the bottom of the receiver through the open space between the edge of the flange *g* and the side of the receiver into the opening *k*, Fig. 2, in the bottom of the receiver, from whence it passes into the measuring device *F*.

At the rear end of the traveling disk *i* is a trowel, *l*, which extends upward from the disk, for the purpose of preventing the powder from clinging to the under side of the flange *g* and on the sides of the receiver.

The measuring device *F*, Fig. 3, consists of a box or vessel having two sides and rear end closed and immovable. It is rigidly attached to the top of a reciprocating lever or rod, *G*, which is pivoted to the standard *W* at *m*. Its bottom being connected with the slide *j'*, which has a vertical movement on the lever *G*, controlled by the adjusting-screw *n*, can be set at any position indicated on the scale *J*, and there held by the set-screw *o*. By this arrangement the box *F* can be made of any depth desired, and its capacity correspondingly regulated according to the quantity designed to be deposited in each envelope or package. The front end of the box is so hinged at its bottom that it can be readily dropped forward by pressing back the bar *p*, which is connected with it, and projects below the bottom of the box sufficiently far to hold the end in a vertical position, and thus close the box by the force of the spring *q*. The rod or lever *G* has a reciprocating motion caused by its extension below its pivotal point at such an angle that it shall always impinge upon the periphery of the cam *D* by reason of the contracting force of the spring *r*, which connects it with the receiver. During the time that the lever *G* presses against the regular circular part of the cam the box *F* remains in an upright horizontal position, ready to receive the powder which is being crowded into it by the semi-disk *i* through the opening *k* in the bottom of the receiver.

K is a semicircular projecting guard or cover attached to the bottom of the receiver *A*. It is designed to cover the box *F* as it moves from the opening *k* in the bottom of the re-

ceiver to the tunnel *H*, so as to protect the contents of the box from air-currents and form a guide to direct it into the tunnel.

u is a stationary pin, which is rigidly attached to one of the under edges of the guard *K* and near its lower extremity. It is angular in form and extends back toward the receiver so as to come in contact with and push back the spring-bar *p*, which is attached to and projects below the outer or hinged end of the box *F*, as the box is tipped forward by reason of the pressure of the lower end of the lever *G* against the recessed portion of the periphery of the cam *D*, and thus by causing the hinged end of the box *F* to lie in the same plane with the bottom of the box allow the contents of the box to readily pass into one of the tunnels *H* as soon as it is reached by the box *F*.

The measuring by the box *F* is performed as follows: The depth of the box has first to be adjusted according to the quantity of the powder desired to be deposited in the envelope, for the disk *i* will crowd into the opening *k* all that the box will hold. The depth of the box *F* is regulated by moving its bottom up or down on the slide *j'*, which has a vertical movement on the lever *G*, and which bottom is fastened in place by a set-screw, *n*. As soon as the box *F* is filled it is moved toward the tunnel and envelope which is to be filled. On the scale *J* are marks indicating the weight of the powder in the box according to the position of the bottom of the box. No matter what the position of the bottom may be, the disk *i* will force enough powder through the opening *k* to fill the box, and then the disk covers over the opening *k*, so that no more powder can pass out. While the disk is still covering the opening the box is moved so as to discharge its contents, and then returns to position again, ready to be again filled. These tunnels are attached to the outer extremities of the radial arms *I*, which, by a simultaneous movement, hereinafter described, are brought to a position in front of the guard *K* at the same moment that the box *F* is tipped forward to discharge its contents into the tunnel and thence into the envelope or package which has been previously placed upon the package-support *V* of the perpendicular spring *w*, which is attached to the arm *I*. This package-support projects forward in nearly a horizontal direction, and is firmly attached to the vertical spring *w* and sufficiently below the lower extremity of the tunnel *H* to permit the package or envelope, which it is designed to sustain during the act of filling, to be placed upon it in such a position that the lower extremity may readily enter it. The package is held upright by the face-plate *U*, which projects downward from the end of the arm *I*, to which it is firmly attached. Near its bottom is an opening to allow the package-support *V* to pass through, the object being to sustain the package on this support until the spring *w* is forced back by being brought into con-

tact with the upright bar S at the end of the reciprocating rod Q as the arm I is carried around the standard R, in the manner herein-after described. By the withdrawal of the support V through the face-plate U, by the pressure of the bar S against the spring w, the package, being deprived of its support, at once drops to the table T below, whence it can be removed at pleasure. When the box F reaches the tunnel H, the lower end of the lever G, which has been pressing against the regular circular periphery of the cam D during its rotation, reaches the square notch s in the recessed portion of the cam. The sudden dropping of the lever G into the notch s has the effect to produce a sharp striking motion on the lever, and therefore to the box F on its upper extremity sufficient to entirely empty the box of whatever might otherwise be retained. As the cam D continues to rotate, the contracting force of the spring r keeps the lower end of the lever impinging upon its edge, gradually returning it again to the circular regular portion of its periphery. The effect is to press this end of the lever G forward and the upper end of the lever correspondingly backward, until the box F is again brought into its former horizontal position beneath the opening k in the bottom of the receiver A ready to be again filled with the material, which during this time has been conveyed to the opening k by another revolution of the diaphragm C, and the consequent rotation of the disk i within the receiver. At the same time another opportunity is given to the operator to place another envelope or package upon the spring-support of the next arm I, which is meanwhile approaching the delivery-point, ready to be filled from the next tipping forward and emptying of the box F, as before described.

J is a horizontal rod pivoted to the reciprocating lever G at z. It is sustained by suitable bearings, and has a horizontal reciprocating motion by reason of its connection with the lever G, and is designed, by means of the spring-pallet L, Fig. 5, to act upon and give an intermittent rotation to the wheel M, which has as many ratchets in its periphery as there are arms I.

t is a vertical shaft of the pinion M, to which it is attached, designed to convey to the top plate, N, a motion corresponding with that of the wheel M. To this plate N the radial tunnel-arms I are pivoted at x. Directly below the plate N is a circular stationary plate, P, supported by the frame R, through the center of which passes the shaft t. The upper surface of the front half of the plate P is dentated, so that as the tunnel end of the pivoted arms I are carried over it by the rotation of the plate N the shoulders, which rest upon the stationary plate P, pass over the dentations and successively drop into each interdental space, thereby causing the interior extremity of the arm I to strike the under side of the

plate N, and thus cause an abrupt forcible jar to the whole arm, which thoroughly shakes and empties each tunnel into the package beneath it, from the moment the tunnel is filled from the receiver until the package is removed by the upright bar S, which is placed on the outer extremity of the rod Q in such a position that as the rod is carried back toward the receiver by the entrance of the lever G into the recessed portion of the cam D it pushes back the spring w and with it the support V which sustains the package. The package or envelope being thus deprived of its support at once drops upon the table or platform T below it, whence it can be readily removed by the operator to the movable slide Y as fast as it is deposited. As there is no occasion for jarring the arms I after the removal of the packages and until they are again replaced to be filled, the upper surface of the rear half of the plate P is smooth. Thus constructed, the entire apparatus after the material has been placed in the receiver A causes the powder or material to be thoroughly mixed in the receiver, and then to be reliably measured, according to the quantity desired to be put up, and then deposits that quantity into an envelope or other package without any effort or care of the operator, except to keep the receiver A supplied with the material to be mixed and put up, and the packages or envelopes removed from the table T, and new ones supplied to the arms as fast as it becomes necessary, and at the same time the person of the operator is effectually protected from all inconvenience or injury resulting from any flying dust from the powder, as no air-currents can affect or reach the powder after the top of the receiver is closed.

The several movements of the different portions of the entire apparatus are automatic and uniform on account of the peculiar construction and mutual interdependent arrangement of its parts.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of a receiver for the powdered or other material, a revolving shaft extending into it, a revolving semi-disk which forces the material through an opening in the bottom of the receiver and then covers or closes the opening to prevent the escape of the material after the box is filled, and the movable box which receives the material and delivers it to the package which is to be filled, substantially as shown.

2. The combination of the receiver, the revolving shaft, revolving cone carrying a disk or device for filling the box and then closing the opening in the bottom of the receiver, the movable box which receives the material from the receiver and then empties it into the package which is to be filled, and a mechanism for both moving the box to discharge its contents and to move a fresh package into position, substantially as described.

3. A circular receiver having a central

cone and suitable outlet, in combination with a rotating diaphragm, C, and semi-disk *i*, provided with the trowel *l*, the same being actuated by a central revolving shaft, *e*, and suitable motive power, by means of which the contents of the receiver are mixed and subsequently deposited into a measuring device, F, substantially as shown and described.

4. The box F, having an adjustable bottom and hinged front operated by the spring *q*, through the bar *p*, in combination with the reciprocating lever G, having the slide *j'*, held by the set-screw *o* at any point on the scale J, the recessed cam D, shaft *e*, and guard K, substantially as described, and for the purpose set forth.

5. The plate N, having radial pivoted arms I, which rotate on the dentated stationary plate P, supported by a suitable frame, R, and rotated through the vertical shaft *t* by the horizontal reciprocating-rod J, ratchet-pinion M, and spring-pallet L, all arranged as and for the purpose set forth.

6. In combination with the plate N and

dentated plate P, the rotating pivoted arms I, having on their outer extremities the tunnels H, and spring package-supporter *u*, substantially as described, and for the purpose set forth.

7. The reciprocating-rod J, having the bar S on its outer extremity, in combination with the reciprocating lever G, to which it is pivoted, and the cam D, rotated on the shaft *e*, substantially as described.

8. In a measuring and delivering device, the reciprocating lever G, having the measuring device attached to its upper extremity, pivoted to the standard W at *m*, in combination with the spring *r* and recessed cam D, rotated on the shaft *e*, substantially as described.

In testimony whereof I do affix my signature in presence of two witnesses.

JOSEPH C. BROWN.

Witnesses:

CHARLES E. ALLEN,
L. F. WILBUR.