

No. 767,590.

PATENTED AUG. 16, 1904.

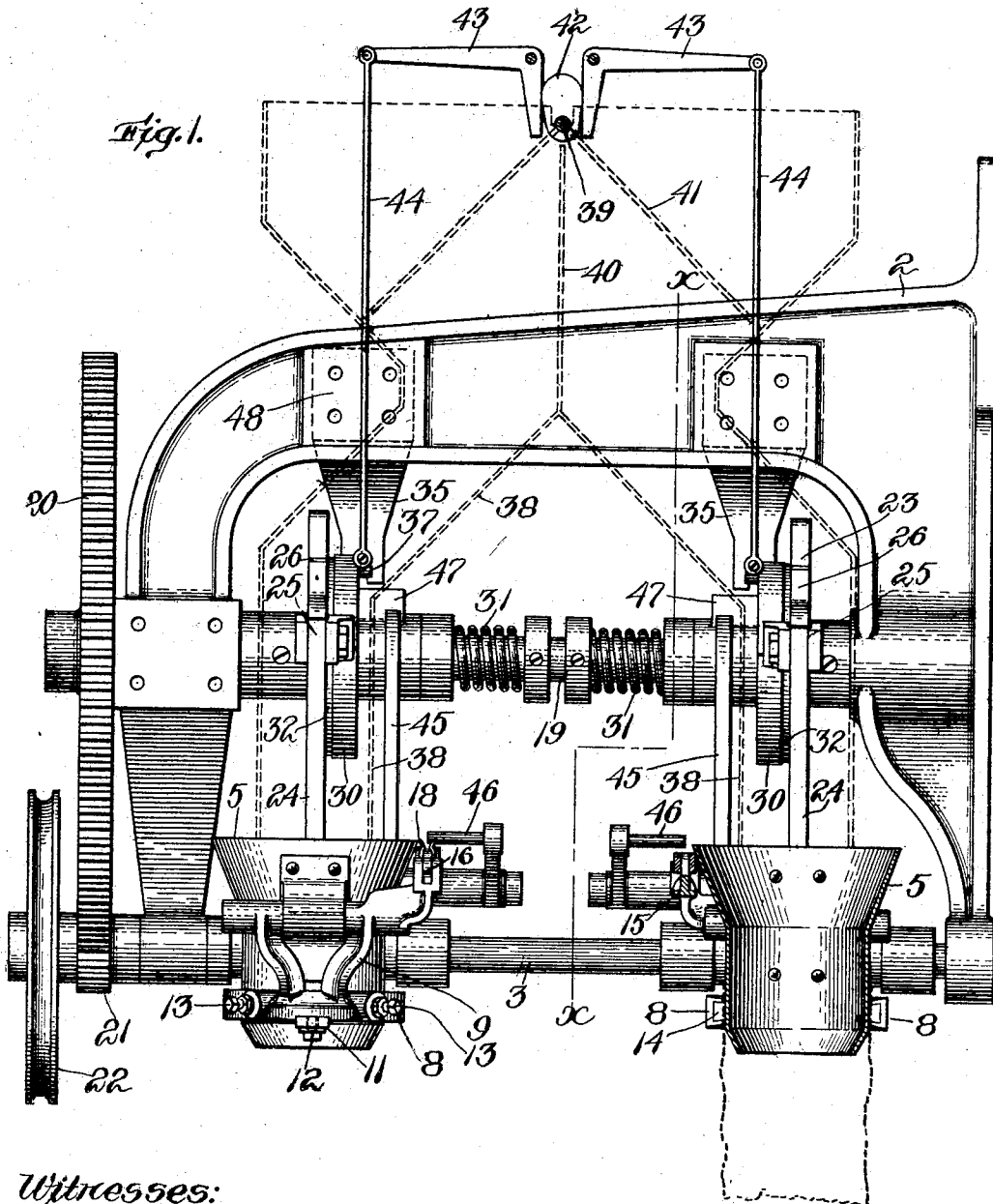
W. E. NICKERSON.

MACHINE FOR SETTLING MATERIAL IN BAGS OR THE LIKE.

APPLICATION FILED JUNE 28, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

Joseph T. Branson
Margaret A. Danaher

Inventor:

Wm E. Nickerson,

by

E. D. Shadwick,
Attorney.

No. 767,590.

PATENTED AUG. 16, 1904.

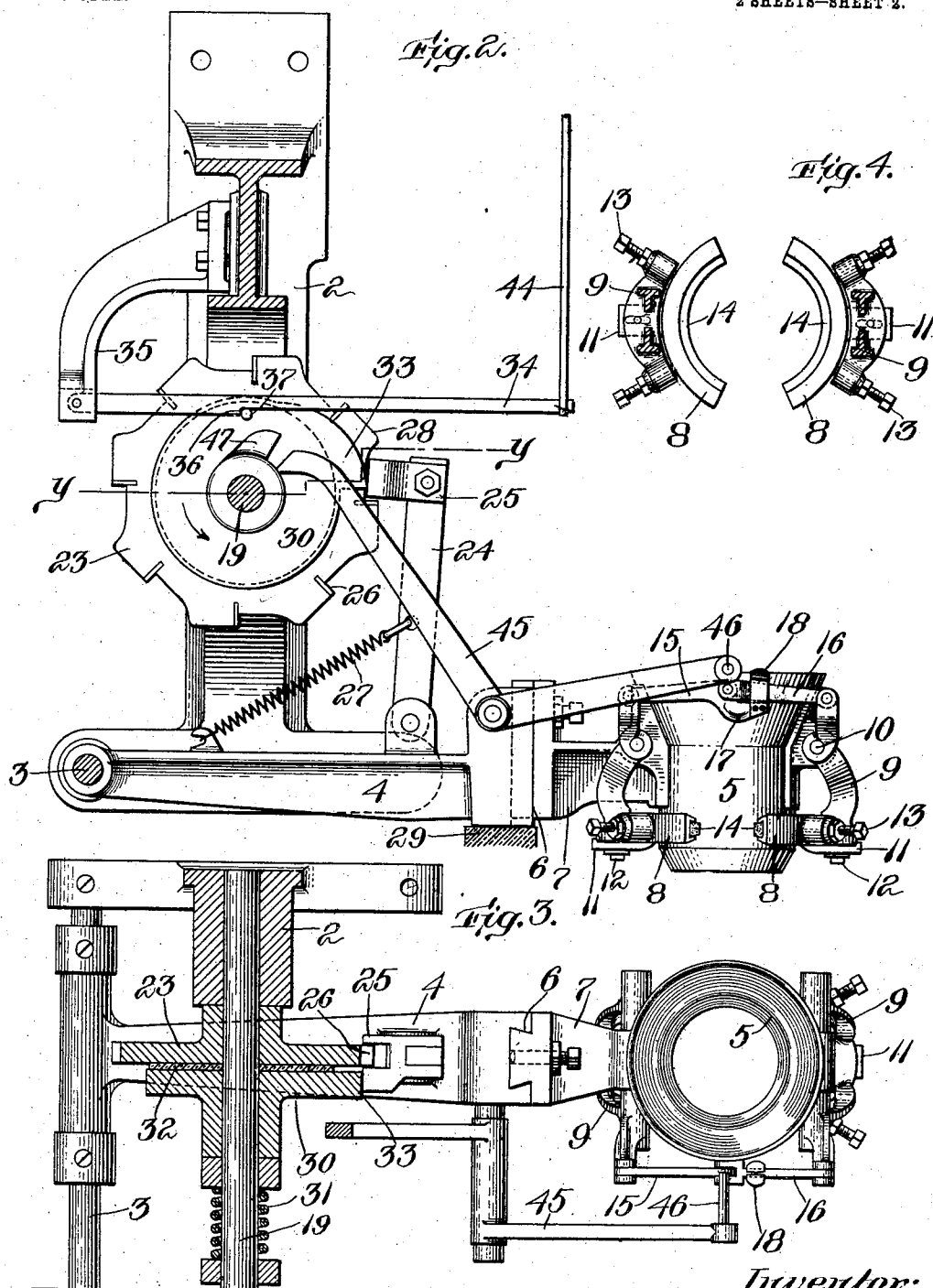
W. E. NICKERSON.

MACHINE FOR SETTLING MATERIAL IN BAGS OR THE LIKE.

APPLICATION FILED JUNE 28, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:

Joseph T. Brennan,
Margaret A. Daniker.

by

Inventor:
Wm E. Nickerson,
E. S. Chadwick,
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM EMERY NICKERSON, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO AUTOMATIC WEIGHING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MACHINE FOR SETTLING MATERIAL IN BAGS OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 767,590, dated August 16, 1904.

Application filed June 28, 1902. Serial No. 113,559. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EMERY NICKERSON, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Settling Material in Bags or the Like, of which the following is a specification.

10 This invention relates to apparatus for shaking down or settling finely-divided substances in bags or other receptacles, and is intended to provide an apparatus of the character referred to which may be used in connection
15 with automatic weighing or measuring machines and will effectively settle the successive loads of material as fast as they can be delivered by such a machine and will also require the services of but one attendant.

20 To this end a main feature of my invention consists in the provision of two independently-operated receptacle-agitators combined with mechanism whereby the successive loads of material are supplied to said agitators alternately, each load being settled thereby while the next load is being made up and the receptacle therefor is being placed in position to receive it.

30 Other features of my invention relating to the details of construction of certain parts of my apparatus will be set forth at length hereinafter.

My invention is intended more particularly to be used for shaking down salt and similar
35 materials in the bags in which such materials are commonly put up and sold, and an apparatus for this purpose containing my improvements in their preferred form is illustrated in the accompanying drawings, in which—

40 Figure 1 is a side elevation of the complete apparatus at rest, showing a funnel in vertical section. Fig. 2 is a transverse section taken on the line *x x* in Fig. 1. Fig. 3 is a horizontal section taken on the line *y y* in Fig. 2, and
45 Fig. 4 is a plan view of bag-clamping devices hereinafter described.

In the drawings, 2 represents the supporting framework of my apparatus, which may

conveniently have the form, roughly speaking, of an inverted U and is adapted to be 50 bolted at one end to the wall of a room or other suitable fixed support directly beneath the machine which delivers the successive loads of material.

A horizontal rod 3 is secured to the lower 55 ends of the frame 2, and on said rod are journaled two arms 4, which extend horizontally in the same direction and are adapted to carry on their outer ends the bags which receive the material. As these two arms are or may be 60 precisely alike, it will be necessary to describe but one of them in detail. Referring to Figs. 2 and 3, in which one of these arms 4 is shown in side elevation and top plan view, 5 indicates a funnel which is attached to the free 65 end of said arm and by preference is detachably secured thereto, as shown at 6, in order that funnels of different sizes, corresponding with the various bags employed, may be used with the same machine. The lower end of the 70 funnel 5 extends far enough below the arm 7, which carries it, to enable the neck of a bag to be slipped up over said lower end and to be firmly secured thereto by suitable means. My preferred form of clamp for this purpose 75 consists of two similar segments 8, formed to fit the outside of the funnel 5 and each secured to the lower end of a hanger 9, which is pivoted to the side of the funnel, as at 10. Each segment 8 is detachably connected to 80 its hanger 9 by means of a slotted projection 11, secured to said segment and clamped against the bottom of the hanger by means of a bolt 12 passing through the slot in said projection, the adjustment of the segment being 85 determined by bolts 13 passing through the lower portion of the hanger and bearing against the outer edge of said segment. On its inner face each of the segments 8 is preferably provided with a cushion 14, of rubber 90 or other compressible material. After the neck of a bag has been drawn over the lower end of the funnel 5 the segments 8 are pressed inward against said bag and funnel by means such as links 15 and 16, pivoted to each other 95 and to the upper ends of the hangers 9, thus

forming a toggle, the segments 8 being so adjusted that they are caused to exert the requisite clamping pressure when the toggle-links 15 and 16 pass their dead-center. According to the arrangement shown this pressure is applied by an upward movement of the toggle-links, said upward movement being arrested immediately after passing the dead-center by means of a stop 17, secured to one of the links and arranged to engage the other link at that point. In order to provide against the accidental downward movement of the toggle-links 15 and 16, the stops 17 may be provided with spring-jaws 18, arranged to embrace the link 16, and thus hold said links in the position shown in Fig. 2. A shaft 19 is journaled horizontally in the framework 2 and is driven continuously by suitable means, such as intermeshing gears 20 and 21 and a belt-pulley 22, said shaft being provided with means for alternately raising and dropping each arm 4. To this end I prefer to employ a toothed wheel 23, rigidly secured to the shaft 19 above each arm 4, an arm 24 being pivoted at its lower end to each arm 4 and provided at its upper end with a head 25, so formed as to be engaged by the teeth 26 of the corresponding wheel 23 when drawn into the proper position by means of a spring 27. Thus whenever said head 25 is in position to be engaged by the teeth 26 it and the arm 4 will be lifted until said head is pushed out of engagement with the tooth which raises it by the projecting lower corner 28, formed on said tooth, whereupon the arm 4 will drop until its motion is arrested by a buffer or other fixed support 29. The bags which receive the material are not supported from below, but are suspended by their necks by being clamped to the funnels 5, as above described, and hence so long as the engagement of either of the heads 25 with the teeth 26 is permitted the corresponding arm 4 will alternately lift and drop the bag which it carries, thus settling the material contained therein.

According to the construction shown the shaft 19 is caused to operate the arm 4 in the manner just described during one revolution, whereupon such operation is discontinued until another charge of material has been delivered through the corresponding funnel 5, the number of vibrations given to said arm 4 at each operation thereof thus being equal to the number of teeth 26 on the wheel 23. For stopping these vibrations automatically at the proper time I provide in connection with each wheel 23 a friction-clutch, preferably consisting of a collar 30, mounted loosely on the shaft 19 and pressed against said wheel 23 by a spring 31. A disk of leather 32 is usually interposed between said collar and wheel for the purpose of increasing the friction. On the collar 30 is formed a cam-shaped projection 33, which when it is brought opposite the head 25 by the rotation of the shaft 19 operates to

push said head away from the wheel 23 and out of engagement with its teeth 26, thereby stopping the vibration of the corresponding arm 4. At this point the rotation of the collar 30 is stopped by means such as a latch-arm 34, pivoted at one end to a hanger 35, secured to the framework 2 and provided with a notch 36, which receives a pin 37, carried by the collar 30. The rotation of said collar being thus arrested while the head 25 is out of engagement with the teeth 26, no further vibration of the arm 4 can occur until the latch-arm 34 is lifted.

The loads of material to be settled are conveyed to the funnels 5 through suitable chutes 38, these chutes being shown in dotted lines in Fig. 1 in order not to obscure the illustration of the parts behind them. The arrangement of chutes shown in Fig. 1 is suited for use in connection with an automatic weighing-machine of the twin-bucket type, which itself has two delivery-chutes and delivers the successive loads of material through said chutes alternately, such a machine being shown in Letters Patent of the United States, No. 555,393, granted to me on the 25th day of February, 1896. It will be understood, however, that my present invention is equally well adapted for use in connection with two alternately-operating weighing or measuring machines or with weighing or measuring machines which discharge the material through a single chute only, in which latter case the successive loads will be diverted into the funnels 5 alternately by means which are well known in the art and which it is not necessary here to describe in detail. According to the arrangement shown in Fig. 1 a rod 39 is journaled above the central partition 40, which separates the chutes 38, and said rod 39 is rotated alternately in opposite directions through a small angle by means of flaps 41, which are secured thereto and are located in the path of the descending loads of material, so that the weight of each load will serve to operate the rod 39 in one direction or the other. To said rod 39 is secured a cam 42, arranged to bear against the lower end of each of two bell-crank levers 43, which are journaled on opposite sides of said cam 42 and connected, respectively, by links 44 to the free ends of the latch-arms 34.

As thus constructed the operation of my apparatus is as follows: It will be understood that the delivery-chutes of the twin-bucket weighing-machine above referred to are located, respectively, above the flaps 41 and discharge into the top of the chutes 38. Upon the discharge of a load from either bucket of the weighing-machine the corresponding flap 41 is depressed by the weight of the descending material and rocks the shaft 39, thus causing the cam 42 to operate the corresponding lever 43 and raise the latch-arm 34, to which it is connected. The corresponding collar 30

is thereby released and immediately begins to rotate with the shaft 19, and after it has so rotated through an angle which depends upon the shape of the cam 33 the arm 24 and head 25 are drawn toward the wheel 23 by the spring 27, whereupon the corresponding arm 4 is vibrated, as above described, until said head 25 is thrown out of engagement with the teeth 26 by the cam 33 at the end of one rotation of the shaft 19. At this point the rotation of the collar 30 is arrested by the latch-arm 34, as above described, and the arm 4 then remains at rest until another charge of material is delivered to the corresponding chute 38. The shape of the cam 33 is preferably such that a part or all of each load of material will have time to fall past the flap 41 and through the chute 38 and funnel 5 into the bag which is attached to said funnel before the vibrations of the arm 4 commence. As soon as a load of material has been delivered through one of the funnels 5 and shaken down in the bag which is attached thereto said bag is released by opening the clamping-segments 8 and thus permitting the bag to drop from the funnel by its own weight. I prefer to effect the releasing of the bags automatically, and to this end I provide a lever 45, which is pivotally secured to the arm 4 and extends at one end to a point just above the connected ends of the toggle-links 15 and 16, at which point it is provided with a pin 46, which extends laterally over said links. The other end of said lever 45 is carried to a position adjacent to the hub of the collar 30, which is provided with a cam-shaped projection 47, so located that simultaneously with or just after the disengagement of the head 25 from the wheel 23 the lever 45 will be tilted by the cam 47. The pin 46 is thus caused to engage the connected ends of the links 15 and 16 and force them downward, thereby opening the clamping-segments 8 and releasing the bag, which may fall into or upon any suitable device for carrying it away. While one bag is being filled and shaken down the operator draws the neck of another empty bag over the funnel 5 and secures it thereto by raising the connected ends of the toggle-links 15 and 16 into the position shown in Fig. 1, whereupon the bag thus attached is ready to receive the next load of material. The successive loads of the material are thus delivered alternately through the two funnels 5, and the only attendance required is that involved in attaching the empty bags to said funnels alternately, as above described.

I consider the arrangement according to which the mechanism which vibrates the arms 4 is positively connected to and operated by the shaft 19, while the friction-clutch is relied upon merely to disconnect said arms and shaft, to be an important feature of my invention, as I am thereby enabled to operate

upon heavy loads of material without depending upon friction for the proper operation of the apparatus. It will be understood, however, that the apparatus described may be variously modified without departing from my invention, since, so far as I am aware, I am the first to devise a duplex apparatus composed of two similar settling mechanisms which operate alternately, and thus enable the attendant to attach an empty receptacle simultaneously with the filling of the one previously attached, thereby making the operation of the apparatus practically continuous.

It will be noticed that the framework 2, as shown in the drawings, has both of its sides made alike, and this is my preferred construction, since I am thus enabled to locate the funnels 5 on either side of said framework, according to the requirements of the space in which the apparatus is to be located. To effect a reversal of the position of the parts, the hangers 35 are removed and bolted to the opposite side of the framework at 48, the rod 3, with the arms 4 and funnels 5 attached, is turned end for end and transferred to the opposite ends of the laterally-extending lower ends of the framework 2, and the shaft 19 is also turned end for end, first removing the gear 20 and finally replacing the same.

I claim as my invention—

1. In an apparatus of the character described, the combination of two receptacle-agitators, located adjacent to each other, means for supplying successive loads of material thereto alternately, and means for operating each of said agitators for a predetermined interval independently of the other.

2. In an apparatus of the character described, the combination of two vibrating receptacle-agitators, means for supplying loads of material thereto alternately, and means for operating each of said agitators while the other is at rest.

3. In an apparatus of the character described, the combination of two vibrating receptacle-agitators, means for supplying loads of material thereto alternately, a shaft and means for driving the same continuously, and means operated by said shaft for actuating said agitators independently of each other.

4. In an apparatus of the character described, the combination of two vibrating receptacle-agitators, means for supplying loads of material thereto alternately, means for operating each of said agitators independently of the other and means for stopping such operation after a predetermined interval.

5. In an apparatus of the character described, the combination of an arm, means for detachably securing a receptacle thereto, a shaft and means for driving the same continuously, a toothed wheel secured to said shaft, a head connected to said arm and adapted to be engaged, lifted and dropped by said

teeth successively, and means for throwing said head into and out of engagement with said teeth.

6. In an apparatus of the character described, the combination of an arm, means for detachably securing a receptacle thereto, a shaft and means for driving the same continuously, a toothed wheel rigidly secured to said shaft, a head connected to said arm and arranged to be engaged, lifted and dropped by said teeth successively, a frictionally-driven collar carried by said shaft, a stop for the same, and means carried by said collar for throwing said head out of engagement with said teeth.

7. In an apparatus of the character described, the combination with an arm and means for vibrating the same, of a funnel carried by said arm, and means for detachably clamping the neck of a bag to said funnel, comprising pivoted hangers, clamping-segments secured thereto, and toggle-links pivoted to said hangers and forming a locking-brace therefor, substantially as described.

8. In an apparatus of the character described, the combination with an arm and means for vibrating the same, of a funnel carried by said arm, and means for detachably clamping the neck of a bag to said funnel, comprising pivoted hangers each provided with a clamping-segment having a compressible clamping-face, and toggle-links pivoted to said hangers and forming a locking-brace therefor, substantially as described.

9. In an apparatus of the character described, the combination of a pivoted arm carrying a funnel at its free end and means for detachably clamping a bag thereto, a shaft and means for driving the same continuously, a toothed wheel rigidly secured to said shaft, a spring-actuated head carried by said pivoted arm and adapted to be engaged, lifted and dropped by said teeth successively, a frictionally-driven collar carried by said shaft and provided with a cam arranged to disengage said head from said teeth, and a latch-arm arranged to arrest said collar in that position in which its cam has effected such disengagement.

10. In an apparatus of the character described, the combination of an arm carrying a funnel and means for detachably clamping a bag thereto, said clamping means comprising pivoted hangers provided with clamping-segments and actuated by toggle-links forming a locking-brace therefor, a shaft and means for driving the same continuously, means carried by said shaft for vibrating said arm, and means for automatically releasing a bag from said funnel, comprising a pivoted arm adapted to engage and collapse said toggle-links, and a cam carried by said shaft and arranged to operate said arm.

11. In an apparatus of the character described, the combination of a pivoted arm car-

rying a funnel at its free end and means for detachably clamping a bag thereto, a shaft and means for driving the same continuously, means operated by said shaft for vibrating said arm, a frictionally-driven collar carried by said shaft, a latch for arresting the same at a predetermined point, and means carried by said collar for stopping the vibration of said arm and releasing a bag from said funnel.

12. In an apparatus of the character described, the combination of two vibrating arms each carrying a funnel and means for detachably clamping a bag thereto, means for supplying successive loads of material to said funnels alternately, and means for vibrating each of said arms independently of the other.

13. In an apparatus of the character described, the combination of two vibrating arms each carrying a funnel and means for detachably clamping a bag thereto, a shaft and means for driving the same continuously, means operated by said shaft for vibrating said arms, and means for arresting the vibration of either arm independently of the other.

14. In an apparatus of the character described, the combination of two vibrating arms each carrying a funnel and means for detachably clamping a bag thereto, means for vibrating each of said arms independently of the other, and means for stopping such vibration after a predetermined interval.

15. In an apparatus of the character described, the combination of two vibrating arms each carrying a funnel and means for detachably clamping a bag thereto, means for delivering successive loads of material to said funnels alternately, means for vibrating each of said arms independently of the other, and means for automatically stopping the vibration of either arm after a predetermined interval.

16. In an apparatus of the character described, the combination of two arms each provided with a funnel and means for detachably clamping a bag thereto, means for vibrating said arms independently of each other, means for arresting the vibration of each arm after a predetermined interval, two chutes delivering into said funnels respectively, and means operated by the delivery of a load of material into either of said chutes for starting the vibration of the corresponding arm.

17. In an apparatus of the character described, the combination of two arms each provided with a funnel and means for detachably clamping a bag thereto, a shaft and means for driving the same continuously, two toothed wheels rigidly secured to said shaft, two heads connected to said arms respectively and arranged to be engaged, lifted and dropped by the successive teeth on the corresponding toothed wheel, two frictionally-driven collars carried by said shaft and provided respectively with cams arranged to disengage said heads from the respective toothed wheels, two

latches for stopping said collars after such disengagements, two chutes delivering respectively into said funnels, and means operated by the passage of a load of material through either
5 of said chutes for releasing the corresponding latch.

10 18. In an apparatus of the character described, a framework adapted to be attached at one end to a vertical support, said framework being symmetrical with respect to its two sides, a reversible rod secured to said framework and

provided with receptacle-carrying arms, a reversible shaft journaled in said framework and provided with means for operating said arms, and means for driving said shaft.

In testimony whereof I have hereunto subscribed my name this 9th day of June, 1902.

WILLIAM EMERY NICKERSON.

Witnesses:

E. D. CHADWICK,
JOSEPH T. BRENNAN.