No. 649,449. Patented May 15, 1900.

W. L. HARDY.

PACKING MACHINE.

(Application filed Oct. 9, 1899.)

(No Model.) 3 Sheets—Sheet 1.

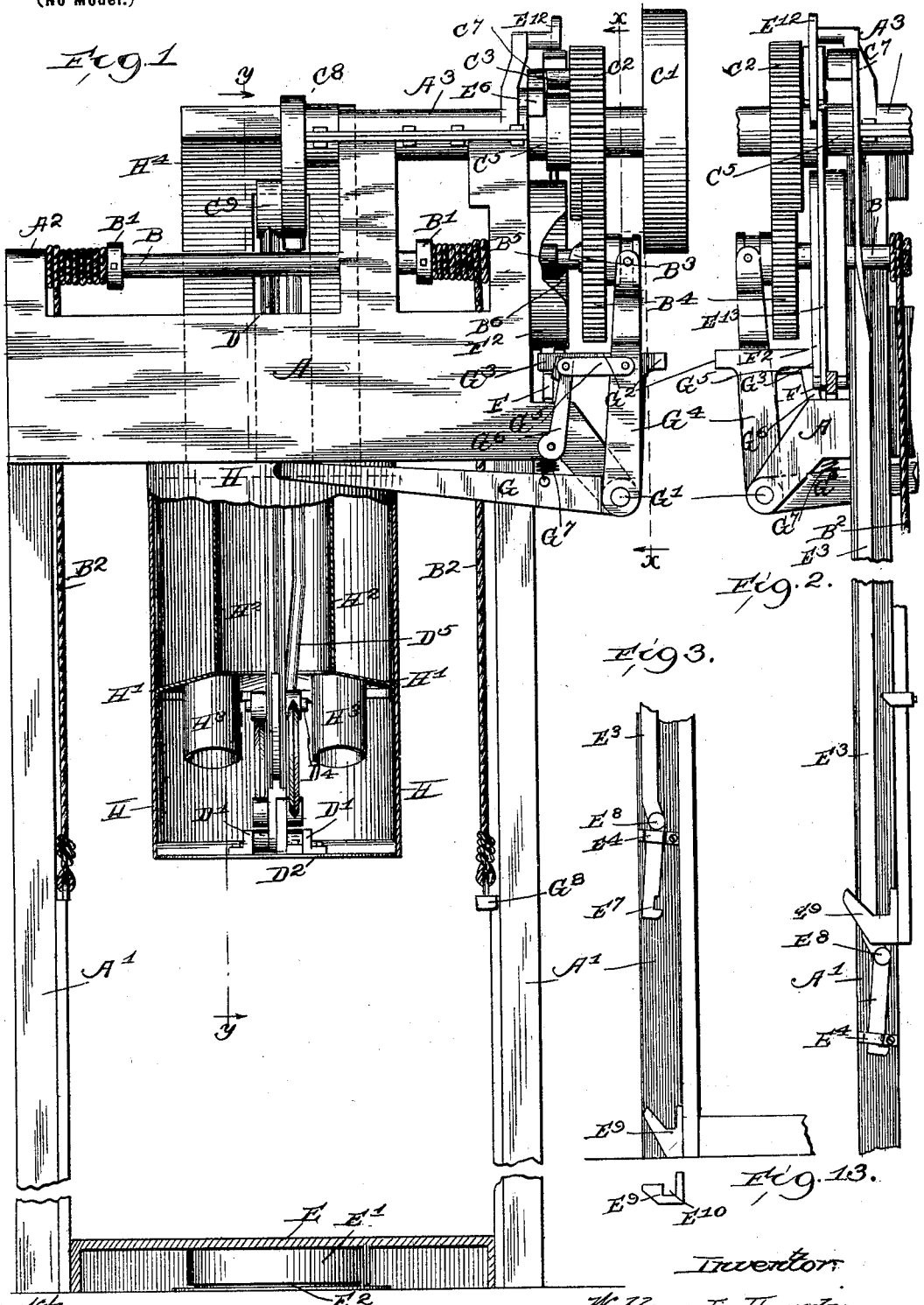

Fig. 1.

Fig. 2.

Fig. 3.

Witnesses:
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(Application filed Oct. 9, 1899.)

(No Model.) 3 Sheets—Sheet 2.

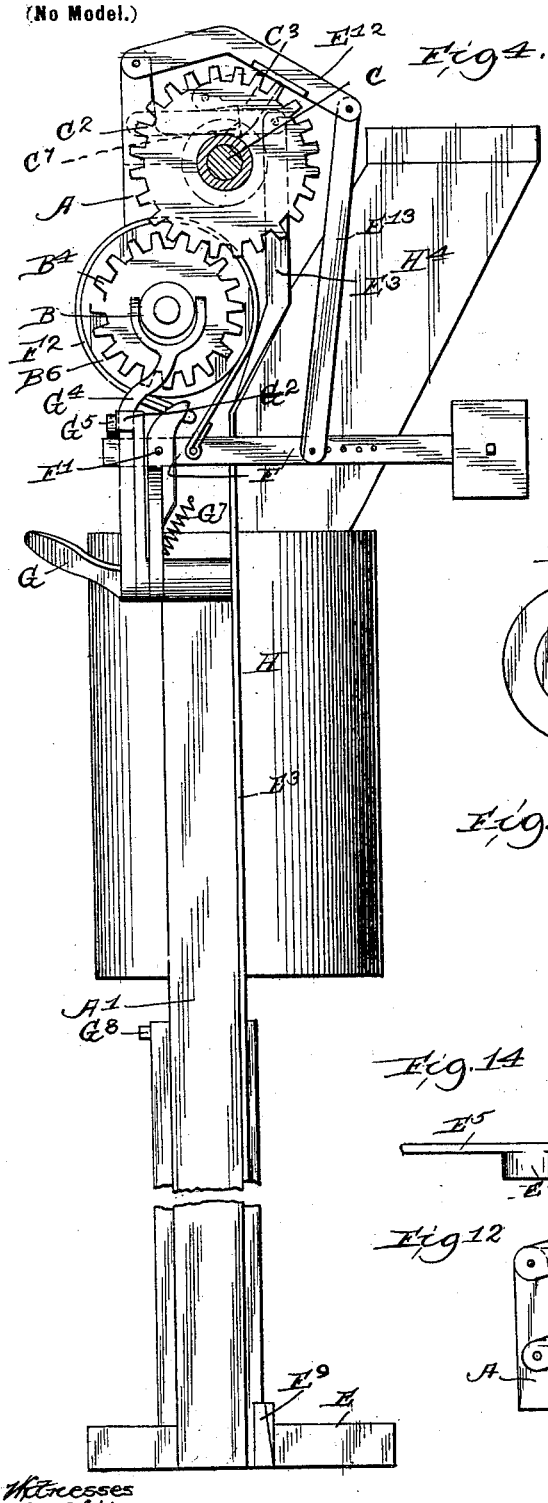

Fig. 4.

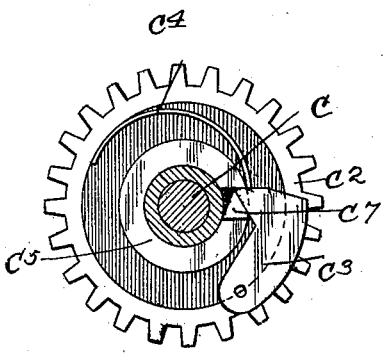

Fig. 8

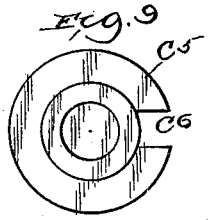

Fig. 9

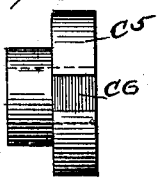

Fig. 10

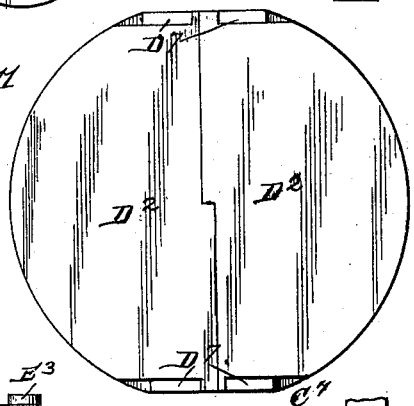

Fig. 11

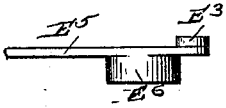

Fig. 14

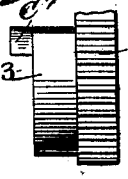

Fig. 15

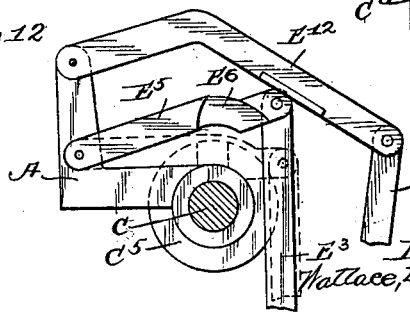

Fig. 12

Witnesses
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No. 649,449. Patented May 15, 1900.

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PACKING MACHINE.

(Application filed Oct. 9, 1899.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 5.

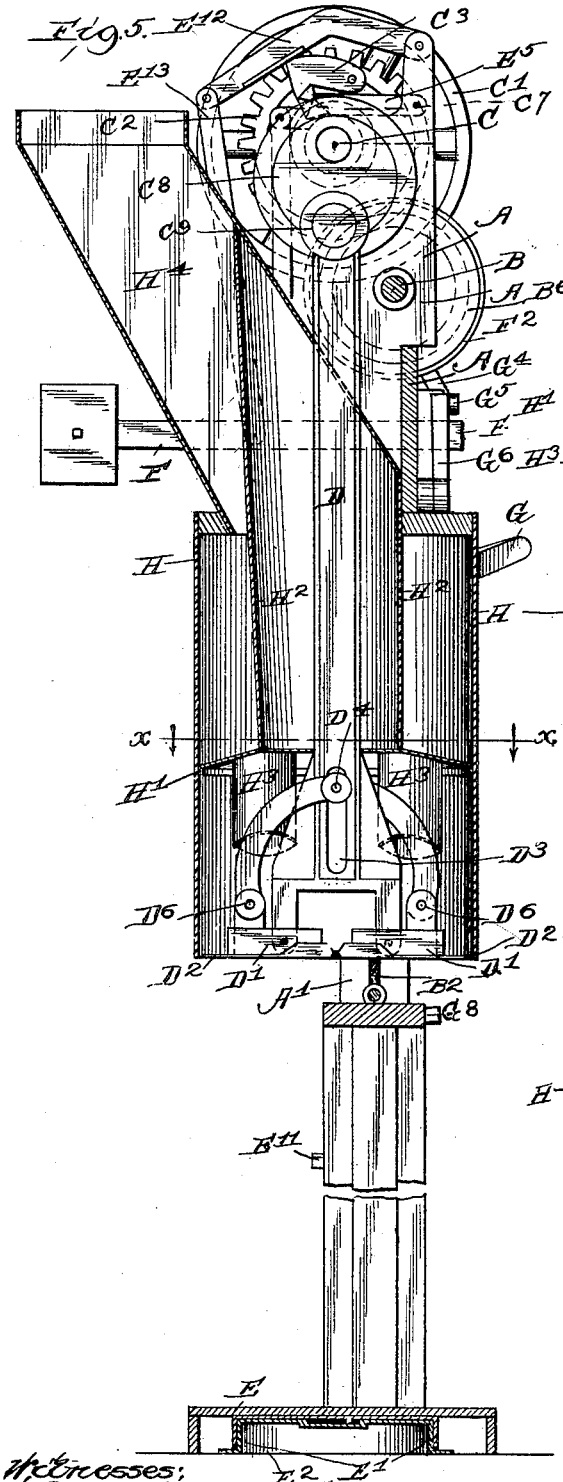


Fig. 7.

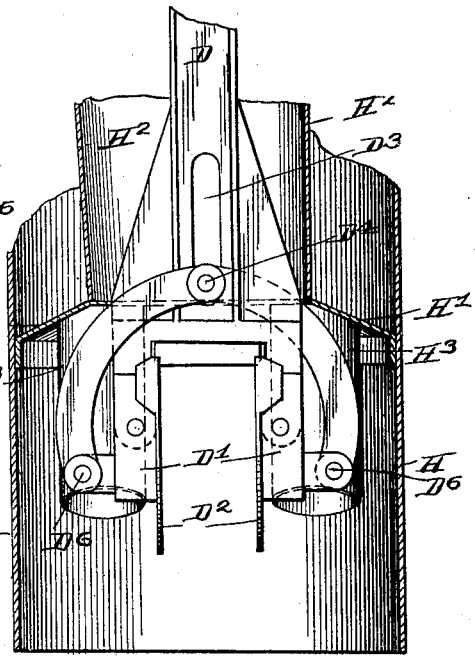
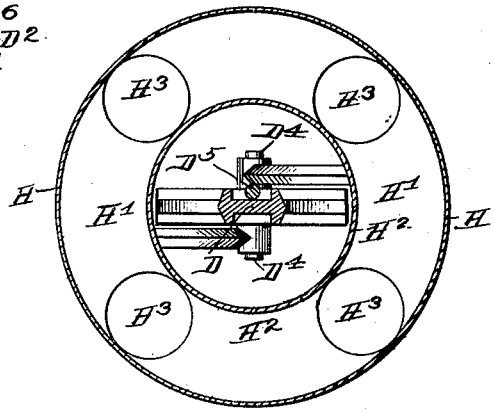


Fig. 6.



Witnesses:
Harry R. White.
R. White.

Inventor:
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UNITED STATES PATENT OFFICE.

WALLACE L. HARDY, OF JOLIET, ILLINOIS.

PACKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 649,449, dated May 15, 1900.

Application filed October 9, 1899. Serial No. 733,055. (No model.)

To all whom it may concern:

Be it known that I, WALLACE L. HARDY, a citizen of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Packing-Machines, of which the following is a specification.

The object of this invention is the production of a packing-machine for packing any pulverulent material, but especially for that class of materials as oatmeal, bran, &c., which for various reasons cannot be packed successfully with a revolving screw or auger, such as is commonly used for packing flour.

In the accompanying drawings, Figure 1 is a front elevation of this packing-machine, showing some of the parts in section. Fig. 2 is an elevation of the clutch mechanism viewed from the rear side of the machine. Fig. 3 shows the lower end of the tripping-rod illustrated in Fig. 2 in its down position. Fig. 4 is a transverse vertical sectional view of the mechanism, taken on dotted line $x\ x$ of Fig. 1. Fig. 5 is a transverse vertical section of the mechanism on dotted line $y\ y$ of Fig. 1. Fig. 6 is a horizontal section through the packing-drum on dotted line $x\ x$ of Fig. 5. Fig. 7 is a side elevation of the plunger mechanism, showing the packing-plates in a vertical position. Fig. 8 is an enlarged inner face view of the upper driving gear-wheel, showing its clutch mechanism in detail. Fig. 9 is a face view of the clutch-collar shown in Fig. 8. Fig. 10 is a side view of said clutch-collar. Fig. 11 is a plan view of the pivoted plates of the packing-plunger. Fig. 12 is a view of the clutch and brake operating arms. Fig. 13 is a plan view of the projecting finger shown in Fig. 3. Fig. 14 is a fragmental view showing the free end of the lever, hereinafter designated by the character E^5. Fig. 15 is a like view showing a plan of the pivoted pawl C^3.

Like letters of reference indicate corresponding parts throughout the several views.

In the accomplishment of the object hereinbefore set forth I have provided a supporting-framework, in which is mounted a movable platform for raising the barrel or other receptacle to the packing device. Two shafts have been journaled in the upper portion of the supporting-frame, both of which shafts are operated by clutches and only one of which shafts can be rotated at a given time. One of these shafts serves to raise the movable platform, and the clutch which operates it is caused to engage upon starting the machine in operation. The other shaft is automatically made to rotate by the rising of the platform to a certain predetermined height, and the rotation of the last-mentioned shaft causes the packing-plates to rise and fall and during their rising movement to turn up edgewise to permit the passage of more material into the lower part of the packing-drum under said plates. The movable platform, being suspended by the friction of a band upon a brake or friction wheel, is pushed downward with the receptacle as the material is forced by the packing-plunger into the latter. As before stated, the rising of the movable platform to a certain height automatically throws out the clutch engaging the elevating mechanism and throws in the clutch which causes the vertical reciprocation of the packing-plunger. When the movable platform has descended to a predetermined position, the clutch actuating the plunger mechanism is released and the movement of that mechanism ceases. The releasing of the clutch, as last mentioned, relieves the friction of the band upon the friction-wheel and permits the movable platform and the packed receptacle to fall, a dash-pot on the under side of the platform providing an air-cushion for taking up the shock of the fall. In the construction of the mechanism thus outlined I have provided a supporting-frame A, having the vertical guide-beams A′ and the journal-bearings A^2 and A^3, in which the two shafts B and C, respectively, are mounted. The shaft B has to do entirely with the hoisting of the movable platform and has the winding-spools B′ fixed thereon to receive the hoisting-cables B^2. The shaft B is driven only when the clutch member B^3 of the gear-wheel B^4 is thrown into engagement with the corresponding clutch member B^5 of the friction-wheel B^6, the gear-wheel B^4 being loosely mounted upon the shaft B. The friction-wheel B^6 is fixed on the shaft B, its purpose being to yieldingly support the movable platform during the packing operation.

The shaft C is the drive-shaft and has

loosely mounted thereon the drive-pulley C′ and the gear-wheel C^2, which pulley and gear-wheel are secured together. The gear-wheel C^2 bears upon its side the pivotal pawl C^3, held inward toward the supporting-shaft C by the spring C^4, and the collar C^5, fixed upon the shaft C, having a notch C^6 to receive the said pawl C^3. A wedging-block C^7 is formed integral with said pawl C^3 on the side thereof. The opposite end of the shaft carries an eccentric C^8, and from the face of the eccentric a wrist-pin C^9 projects. A crank-rod D extends downward from the wrist-pin C^9 and dividing in a yoke at its lower end pivotally engages the ears D′, rising from the semicircular plunger-plates D^2. The crank-rod D also has an elongated opening D^3 near its lower end, in which a cross-head D^4 of the eccentric or cam rod D^5 is free to reciprocate. The cam-rod D^5 has the usual connection with its wrist-pin C. This cross-head D^4 has a pivotal link connection with the ears D^6, also rising from the upper faces of the semicircular plunger-plates D^2. As the throw of the crank is double that of the eccentric or cam, the plunger-plates are bodily raised through a vertical distance equal to the length of the throw of the eccentric and also are tilted upon their edges, their adjacent edges being uppermost, these adjacent edges overlapping when the plates are in a horizontal position. These plates are also provided on their curving peripheries and near their meeting edges with upwardly-turned flanges D^7 to guide them in the drum and prevent excessive wear of the latter.

A movable platform E is mounted between the vertical supports A′ and is suitably connected with the hoisting-cables B^2. An air-tight cylinder E′, fixed underneath the movable platform E, with its corresponding piston E^2 fixed to the floor, provides an air-cushion for receiving the falling platform. A vertically-movable rod E^3, mounted in the bracket E^4, extends upward beside one of the supports A′ and is pivotally connected at its upper end with the pivoted arm E^5, which arm carries intermediate its ends a wedging-block E^6, similar in form to the wedging-block C^7 on the pawl C^3 and intended to lie in the path of said block C^7 and raise the pawl C^3 from its engagement with the notch C^6. The meeting faces of said blocks C^7 and E^6 are made wedging, so that they shall not foul when meeting. When the hoisting mechanism of the apparatus is in operation, the wedging-block E^6 prevents the pawl C^3 from engaging with the notch C^6 of the collar C^5; but when the packing-plungers are being reciprocated the wedging-block E^6 rides over the block C^7, said block E^6 being held elevated.

The lower end of the vertical rod E^3 is bent outward and has near its lower extremity the notch E^7, Fig. 3, the upper shoulder of which notch is adapted to engage the bracket E^4. Said rod E^3 also is provided with the roller E^8 a little distance from the said notch E^7. The movable platform E carries a hooked projection E^9, which engages said roller E^8, raising the rod E^3 at a certain point in the upward movement of the platform E, and moving the rod transversely causes the notch E^7 to engage the bracket E^4. An opening E^{10} in said projection permits the passage of the projection over and beyond the roller E^8, leaving the rod E^3 resting on the bracket E^4 as the platform ascends. The upward movement of the vertical rod E^3 just described causes the wedging-block E^6 to be withdrawn from the path of the block C^7, permitting the entrance of the pawl C^3 into the notch C^6, whereby the shaft C is caused to rotate with the gear-wheel and the plunger mechanism to reciprocate. When the movable platform has descended to a certain predetermined position, a projection E^{11} thereon engages the roller E^8, whereby the rod E^3 is pushed from its support in the bracket E^4 and falls of its own weight, moving the pivoted arm E^5, interposing the wedging-block E^6 into the path of the block C^7, raising the pawl C^3 from its engagement with the notch C^6, and stopping the rotation of the shaft C. When the pawl C^3 is thus excluded from the notch C^6 and is caused to ride over the said block E^6, it engages the lever E^{12} and through said lever E^{12} and the connecting-link E^{13} lifts the weight-lever F, releases the supporting power of the friction-band on the friction-wheel B^6, and permits the movable platform to fall upon its air-cushion in the cylinder E′. F is said weight-lever, pivoted on the main frame A at F′, having the friction-band F^2 attached thereto and arranged in the usual manner to engage the face of the friction-wheel B^6.

G is the starting-lever for the mechanism, mounted on the pivot G′ on the main frame A and extending forward lies within reach of the operator. It is provided with the two side projections G^2 and with a forwardly-extending integral member G^3, which member G^3 lies over the rear end of the weight-lever F for raising said lever and releasing the engagement of the friction-band F^2 and the friction-wheel B^6.

A clutch-operating arm G^4, engaging the hub of the gear-wheel B^4, is mounted upon the pivot G′ and lies between the projections G^2 on the lever G, which arm G^4 is connected by a pivotal link G^5 with a pivoted retaining-hook G^6 for holding the weight-lever elevated, and consequently holding the friction-band in a released position free from the friction-wheel B^6. A coil-spring G^7 counterbalances the weight of the forward end of the lever G. A projection G^8, secured to the movable platform E, is adapted to engage the lever G when said platform has risen to a certain predetermined height and raising the said lever moves the clutch member B^3 of the gear-wheel B^4 out of engagement and stops the rotation of the shaft B.

The plunger mechanism is surrounded by a

drum H, within which drum is fixed the transverse diaphragm H′, situated at a point within said drum as low as the upward movement of the plates D^2 will permit. An inner tube H^2 protects the connecting-rod D^5 and eccentric-rod D, and the four feeder-pipes H^3 deliver the material to the plunger-plates D^2, the length of said feeder-pipes being also limited by the upward movement of the plunger and its plates within the packing-drum H. A main supply-pipe H^4 conveys the material to the upper part of the packing-drum H.

The operation of the machine is as follows: An empty receptacle, as a barrel, is placed upon the movable platform E and the lever G depressed. The depression of the lever G throws the gear-wheel B^4 lengthwise of the shaft B, engaging the clutch members B^3 and B^5, and causing the rotation of the shaft B raises the movable platform E. As the movable platform E nears the upper limit of its movement the projection E^9 engages the roller E^8 on the vertical rod E^3, and as the upward movement of the platform E continues the rod E^3 is carried upward and its lower end inward until the notch E^7 in said rod E^3 rests upon the bracket E^4, the roller E^8 then passing through a recess E^{10} in the inner face of the inclined projection E^9. Coincidently with this action the projection G^8 comes in contact with the lever G, carrying it upward until one of the projections G^2 moves the clutch-operating arm G^4 outward on the shaft B to disengage the clutch members B^3 and B^5 and also moves the retaining-hook G^6 from its engagement with the rear end of the weight-lever F. These events must occur at the same instant in order to prevent any drop of the platform E. The raising of the rod E^3 just described also moves the wedging-block E^6 from in front of the notch C^6 and permits the pawl C^3 to engage said notch and to transmit the rotary motion of the gear-wheel B^4 to the shaft C. The rotation of the shaft C vertically reciprocates the plunger-plates D^2 within the drum H and forces the material to be packed into the barrel or other receptacle, the platform E being forced downward against the sustaining frictional engagement between the friction-wheel B^6 and the friction-band F^2 thereon. When a certain predetermined point has been reached by the platform E in its downward movement, the projection E^{11} engages the roller E^8 of the vertical rod E^3, pushing said rod to one side, so that its notch E^7 no longer engages the bracket E^4, permitting said rod to fall of its own weight. This movement of the rod E^3 drops the wedging-block E^6 into the path of the pawl C^3 and causes the latter to withdraw from the notch C^6 and immediately after engage the lever E^{12}, which it lifts at each subsequent revolution of the shaft C. Said lever E^{12} lifts the weight-lever F, releasing the frictional contact between the friction-band F^2 and the friction-wheel B^6, permitting the platform to fall upon the air-cushion in the cylinder E′. The barrel is then removed from the platform and another put in its place for a repetition of the operation.

The clutch-collar C^5 is fixed to the shaft C with such relation to the crank C^9 that the plunger-plates D^2 always stop at the lowest point of their stroke.

I claim as my invention—

1. In a packing-machine, in combination, a main frame; a movable platform; a hoisting-shaft therefor; a clutch for said hoisting-shaft; a friction-wheel; a friction-band therefor; a weight-lever for giving tension to said friction-band; a packing device; a rotatable shaft for said packing device; a clutch for said last-mentioned shaft; and means actuated by the movement of the platform, for causing the engagement of the last-mentioned clutch.

2. In a packing-machine, in combination, a main frame; a movable platform; a hoisting-shaft therefor; a clutch for said hoisting-shaft; a lever for operating said clutch; a projection on the movable platform, for moving said lever; a packing device; a shaft for said packing device; a clutch for said last-mentioned shaft; an arm for operating said clutch; and a projection on the movable platform, for moving said arm.

3. In a packing-machine, in combination, a main frame; a movable platform; a hoisting-shaft therefor; a clutch for said hoisting-shaft; a lever for operating said clutch; a projection on the movable platform, for engaging said lever; a packing device; a shaft for said packing device; a collar on said shaft, having a notch therein; a pawl for engaging said notch; a wedging-block for preventing the entrance of said pawl into said notch; a rod for moving said wedging-block; a projection on the movable platform, for moving said rod; and means for rotating the shaft last mentioned.

4. In a packing-machine, in combination, a main frame; a packing device; a shaft for actuating said packing device; a clutch for said shaft, consisting of a collar on the shaft having a notch in said collar, and a pawl adapted to engage said notch; a movable platform; a hoisting-shaft for the platform; a friction-wheel; a friction-band; a weight-lever for giving tension to said friction-band; and a friction releasing-lever adapted to be acted upon by said pawl when it is out of engagement with said notch.

5. In a packing-machine, in combination, a main frame; a shaft journaled thereon, having an eccentric and a crank; an eccentric-rod and a crank-rod for said eccentric and for said crank, respectively; and a plunger-plate having a pivotal connection with said eccentric-rod and with said crank-rod.

6. In a packing-machine, in combination, a main frame; a shaft journaled thereon, having an eccentric and a crank; an eccentric-rod and a crank-rod for said eccentric and for said crank, respectively; and two plunger-

plates, each having a pivotal connection with said eccentric-rod and with said crank-rod.

7. In a packing-machine, in combination, a main frame; a movable platform; a hoisting-shaft; a shaft having an eccentric and a crank; a clutch for said shaft; an eccentric-rod and a crank-rod; and two pivoted plunger-plates, which plates have a pivotal connection with said eccentric-rod and with said crank-rod.

8. In a packing-machine, in combination, a main frame; a movable platform; a hoisting-shaft; a clutch for said hoisting-shaft; a shaft having an eccentric and a crank; a clutch for said last-mentioned shaft; means actuated by the movement of the platform for causing the engagement of said last-mentioned clutch; an eccentric-rod; a crank-rod; two pivoted plunger-plates, each having a pivotal connection with said eccentric-rod and with said crank-rod; and means for rotating the last-mentioned shaft.

9. In a packing-machine, in combination, a main frame; an eccentric; an eccentric-rod; a crank; a crank-rod; two plunger-plates having a pivotal link connection with said eccentric-rod, and having a pivotal connection with the lower end of said crank-rod; and means for reciprocating the eccentric-rod and the crank-rod.

10. In a packing-machine, in combination, a main frame; a pivoted packing-plate; a packing-drum; a partition in said drum, provided with an opening therein; and means for reciprocating said plate and moving it upon its pivot.

11. In a packing-machine, in combination, a main frame; a plunger comprising two pivoted plates; a packing-drum; a partition in said drum, having an opening therein; and means for reciprocating said plunger and moving said plates upon their pivots.

12. In a packing-machine, in combination, a main frame; a plunger comprising two pivoted plates; a packing-drum; a partition in said drum, having an opening therein; a feeder-pipe communicating with said opening; and means for reciprocating said plunger and moving said plates upon their pivots.

13. In a packing-machine, in combination, a main frame; a plunger comprising two pivoted plates; a packing-drum; a partition in said drum, having a plurality of openings therein; a feeder-pipe for each of said openings, extending below said partition; and means for reciprocating said plunger and moving said plates upon their pivots.

14. In a packing-machine, in combination, a main frame; a packing device; a movable platform; a shifting device comprising a vertically-movable rod having a notch and a stud; a projection on the platform, for engaging the stud and raising the rod automatically to actuate the shifting device by the movement of the platform; and a bracket on the main frame, for engaging said notch on the movable rod.

15. In a packing-machine, in combination, a main frame; a packing device; a movable platform; a shifting device comprising a vertically-movable rod bent at its lower end, and having a notch therein, and a stud; a projection on the platform, adapted to engage the stud, lift the rod, and automatically actuate the shifting device; and a bracket on the main frame, for receiving the notch in said rod; said projection having an opening therein, adapted to permit the passage of said stud when the bracket engages the notch in the rod.

16. In a packing-machine, in combination, a main frame; a packing device; a movable platform; a shifting device comprising a clutch for the packing device and a vertically-movable rod having a notch and a stud; a projection on the platform, for engaging said stud and raising the rod automatically to engage said clutch and start the packing mechanism by the upward movement of the platform; and a bracket on the main frame, for engaging said notch in the movable rod.

17. In a packing-machine, in combination, a main frame; a packing device; a movable platform; a shifting device comprising a clutch for the packing device and a vertically-movable rod bent at its lower end and having a notch therein and a stud; a projection on the platform, adapted to engage the stud, lift the rod, and automatically actuate the shifting device to engage said clutch and start the packing mechanism by the upward movement of the platform; and a bracket on the main frame, for receiving the notch in said rod; the projection on the platform having an opening therein, adapted to permit the passage of said stud when the bracket engages the notch in the rod.

18. In a packing-machine, in combination, a main frame; a packing device; a shaft; a wheel loosely mounted on said shaft; a collar fixed on said shaft, having a notch therein; a pawl on said wheel; a lever having a wedging-block thereon; adapted to engage said pawl to prevent the latter from entering the notch in said collar; and means for rotating said shaft.

19. In a packing-machine, in combination, a main frame; a movable platform; a hoisting-shaft therefor; a clutch on said hoisting-shaft; a shaft having an eccentric and a crank; a clutch on said last-mentioned shaft; means actuated by the movement of the movable platform, for causing the engagement of said last-mentioned clutch; an eccentric-rod; a crank-rod; two pivoted plunger-plates having a pivotal connection with said eccentric-rod and said crank-rod; and means for rotating the shaft last mentioned.

20. In a packing-machine, in combination, a main frame; a movable platform; a hoist-

ing-shaft therefor; a clutch on said hoisting-shaft; a friction-wheel; a friction-band therefor; a weighted lever for giving tension to said friction-band; a shaft having an eccentric and a crank; a clutch on said last-mentioned shaft; means actuated by the movement of the movable platform, for causing the engagement of said last-mentioned clutch; an eccentric-rod; a crank-rod; two pivoted plunger-plates having a pivotal connection with said eccentric-rod and said crank-rod; and means for rotating the shaft last mentioned.

21. In a packing-machine, in combination, a main frame; a movable platform; a hoisting-shaft therefor; a clutch on said hoisting-shaft; a lever for operating said clutch; a projection on the movable platform, for moving said lever; a shaft having an eccentric and a crank; a clutch on said last-mentioned shaft; an arm for operating said clutch; a projection on the movable platform, for moving said arm; an eccentric-rod; a crank-rod; two pivotal plunger-plates, each having a pivotal connection with said crank-rod and a pivotal link connection with said eccentric-rod; and means for rotating the shaft last mentioned.

22. In a packing-machine, in combination, a main frame; a movable platform; a hoisting-shaft therefor; a clutch on said hoisting-shaft; a lever for operating said clutch; a projection on the movable platform, for engaging said lever; a shaft having an eccentric and a crank; a collar on said shaft, having a notch therein; a pawl for engaging said notch; a wedging-block for preventing the entrance of said pawl into said notch; a rod for moving said wedging-block; a projection on the movable platform, for moving said rod; an eccentric-rod; a crank-rod; two pivoted plunger-plates, each of which plates has a pivotal connection with said crank-rod and a pivotal link connection with the eccentric-rod; and means for rotating the shaft last mentioned.

23. In a packing-machine, in combination, a main frame; a shaft journaled thereon; an eccentric and a crank on said shaft; an eccentric-rod and a crank-rod; two inwardly-overlapping plunger-plates, each of which plates has a pivotal connection with said crank-rod, and a pivotal link connection with said eccentric-rod; and means for rotating said shaft.

24. In a packing-machine, in combination, a main frame; a shaft journaled thereon; an eccentric and a crank on said shaft; a notched collar rigidly mounted on said shaft; a drive-wheel loosely mounted on said shaft; a pawl pivotally mounted on said wheel, and adapted to engage the notch of said notched collar; an eccentric-rod and a crank-rod; and two inwardly-overlapping plunger-plates, each having a pivotal connection with said crank-rod, and having a pivotal link connection with said eccentric-rod.

25. In a packing-machine, in combination, a main frame; a shaft journaled thereon; an eccentric and a crank on said shaft; a notched collar rigidly mounted on said shaft; a drive-wheel loosely mounted on said shaft; a pawl pivoted to said wheel, adapted to engage the notch of said notched collar; a pivoted arm having a wedging-block; means for moving said pivoted arm; an eccentric-rod and a crank-rod; and two inwardly-overlapping plunger-plates, each of which has a pivotal connection with the crank-rod, and a pivotal link connection with the eccentric-rod.

WALLACE L. HARDY.

Witnesses:
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