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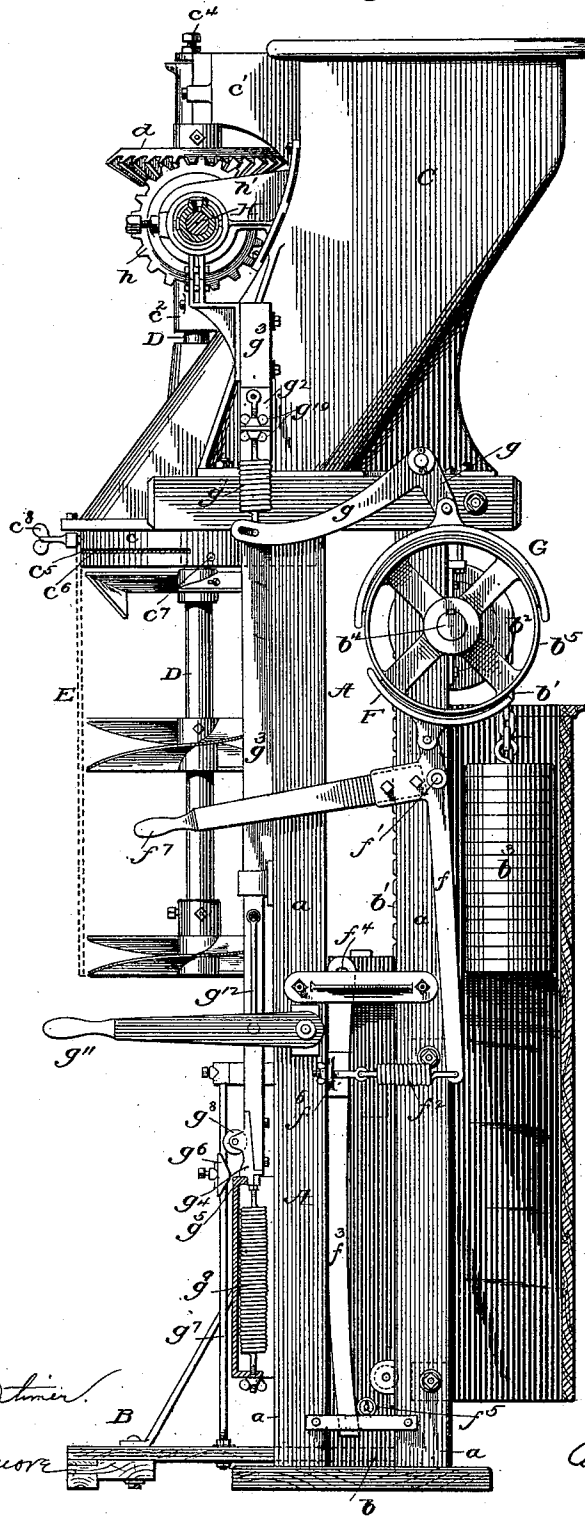
3 Sheets—Sheet 1.

W. D. GRAY.
FLOUR PACKER.

No. 465,473.

Patented Dec. 22, 1891.

Fig. 1.



Witnesses:

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F. Stanley Elmore

Inventor:

W. D. Gray
By *P. T. Dodge*
Att'y.

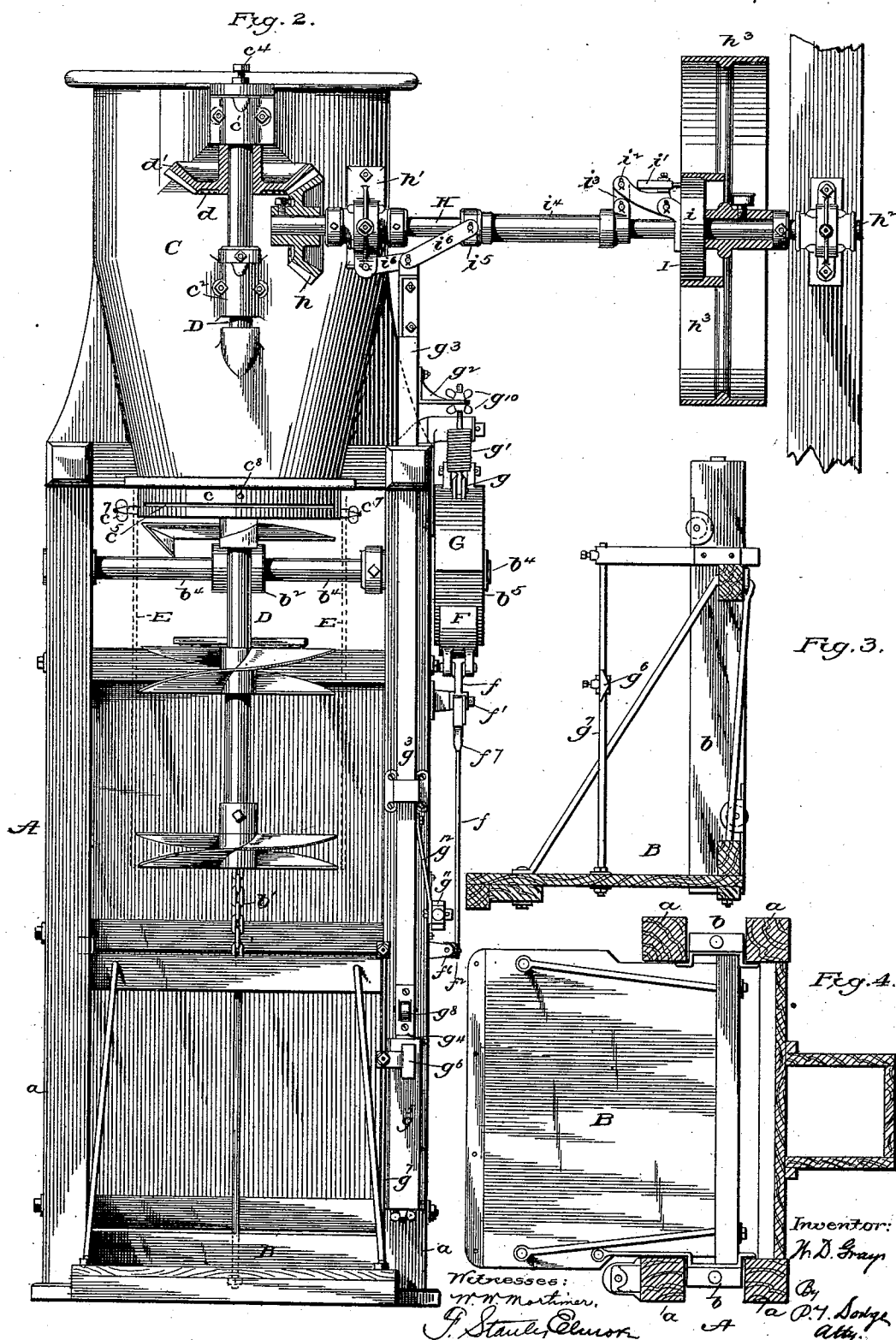
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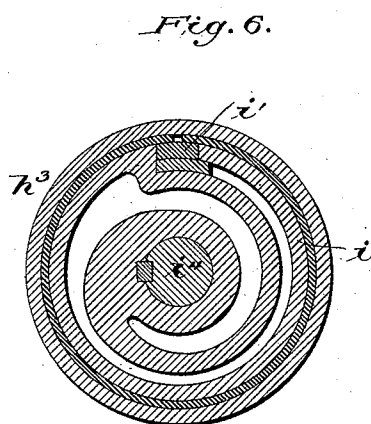
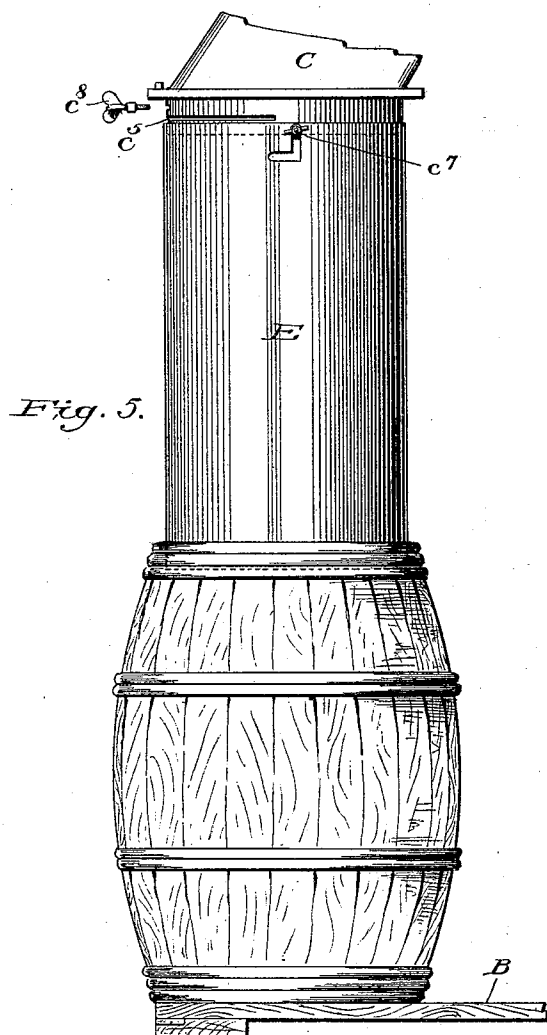
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3 Sheets—Sheet 3.

W. D. GRAY.
FLOUR PACKER.

No. 465,473.

Patented Dec. 22, 1891.



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Inventor:

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UNITED STATES PATENT OFFICE.

WILLIAM D. GRAY, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE EDWARD
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FLOUR-PACKER.

SPECIFICATION forming part of Letters Patent No. 465,473, dated December 22, 1891.

Application filed March 1, 1890. Serial No. 342,251. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. GRAY, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain Improvements in Flour-Packers, of which the following is a specification.

This invention relates to that class of flour-packing machines in which the flour to be delivered into a stationary hopper passes downward into a stationary tube affixed to its lower end and a surrounding tube containing a vertical shaft provided with augers or packing-blades by which the flour is forced downward into the barrel or other receptacle carried by a vertically-movable platform, which sinks as the filling operation progresses, automatic devices being employed to trip the auger-driving gear out of action when the barrel is properly filled.

The invention relates, mainly, to an improved construction of the metal hopper by which it is adapted to sustain the driving-shafts; to an improved arrangement of parts for gradually increasing the resistance to the descent of the platform as the weight of the flour in the barrel increases in order to secure a uniformity in the packing-pressure; in improved mechanism for holding the driving devices in action and for throwing the same automatically out of action at the proper time; to improved means by which the operator is enabled quickly to lower the barrel away from the packing auger and tube at the close of the filling operation.

It also relates to a valve for cutting off the delivery of flour to the augers and to means for preventing the leakage of flour through the slit which receives the valve.

It also consists in various other details, which will be hereinafter explained.

In the accompanying drawings, Figure 1 is a side elevation of the machine with the parts in operative position, the tube which surrounds the augers being omitted and the box which receives the counter-weight shown in section. Fig. 2 represents a front elevation of the machine, the driving-pulley being shown in vertical section. Fig. 3 is a side elevation of the barrel-supporting platform. Fig. 4 is a top plan view of the same, the adjacent parts of the main frame being shown

in horizontal section. Fig. 5 is a detail view illustrating the manner of removing the packing-tube. Fig. 6 is a detail view of the driving-clutch.

Referring to the drawings, A represents a rigid main frame; B, a rising and falling platform to sustain the barrel or other receptacle while being filled; C, a hopper or spout bolted to the top of the main frame to deliver the flour into the barrel; D, the packing-auger, and E a tube fixed to the lower end of the hopper and surrounding the auger to conduct the flour into the barrel. The platform B is provided with upright side bars b , which slide freely between the standards $a a$ of the main frame, and is sustained by a chain b' , carried over a pulley b^2 and provided with a weight b^3 sufficient to elevate the platform and empty barrel. The chain-wheel b^2 is fixed on a horizontal shaft b^4 , seated in bearings in the main frame and carrying a friction-pulley b^5 , acted upon by two brake-shoes F and G, which control the descent of the platform.

In order to secure a uniform pressure of the packing-auger upon the flour, notwithstanding the increasing weight in the barrel, means are provided for automatically increasing the resistance to the descent of the platform as it sinks. To this end the lower brake F is attached to a lever f , pivoted to the frame at f' , and connected at its lower end by a spring f^2 to a lever f^3 , which is pivoted at f^4 to a standard on the frame, and extended thence downward in position to be acted upon by a roller or stud f^5 , projecting from the side of the platform-frame. The lever is shaped and arranged in such manner that as the platform descends the roller f^5 , traveling along against the lever, causes it to force the brake F with increased pressure against the friction-pulley b^5 . Thus it is that the descending platform is subjected to a resistance varying in due relation to the weight of its load. The spring f^2 is connected to the lever f^3 by an eyebolt and thumb-screw f^6 , so that its tension and the frictional effect of the brake may be varied to adapt the machine for filling large or small barrels. The brake-carrying lever f is provided with a rigid handle f^7 , by means of which the operator may throw the brake out of action and release the plat-

form at will, for the purposes hereinafter explained.

While I prefer to employ the peculiar arrangement of levers herein shown between the platform and the brake, it is to be understood, that these details may be modified within the range of mechanical skill, provided the mode of action such as above described is retained. The essence of my invention in this regard lies in operating a brake to retard the descent of the platform by a lever on which the descending platform acts. The second brake G is employed to assist in giving the required frictional resistance during the filling of the barrel. It is combined with automatic devices by which it is thrown out of action when the filling is completed, in order that the platform may be left for the time being under the control of the lower brake only.

The automatic action of the upper brake is secured by attaching it to one end of an elbow-lever g , which is pivoted to the main frame and connected at its opposite end by a spring g' to a bracket g^2 , fixed rigidly to a vertically-movable bar g^3 , mounted in suitable guides on the main frame and provided at the lower end with a metal catch or shoulder g^4 , adapted to engage, when the bar is raised to apply the brake, upon a plate g^5 , fixed to the main frame, as shown in Fig. 1. When the bar g^3 is thus lifted and locked in position, the upper brake is held with a spring-pressure upon the pulley b^5 .

The release of the bar and brake is effected by an inclined trip-plate g^6 , adjustably secured to a rod g^7 on the platform-frame and arranged to act against a roller g^8 on the bar g^3 . At the instant that the barrel is filled to the proper point the descending platform causes the trip-plate g^6 to force the catch g^4 out of engagement with the plate g^5 , whereupon the bar g^3 descends, throwing the upper brake out of action. To insure this result, a spring g^9 is secured to a fixed support and to the lower end of the bar g^3 to compel the descent of the latter. The spring g' between the bar g^3 and the brake-lever is adjustable by means of thumb-screws g^{10} in order that the operative pressure of the brake G may be varied. The hand-lever g^{11} , pivoted to the frame and connected to the bar g^3 by a link g^{12} , serves as a means of lifting the bar to its locked position, and thereby applying the upper brake. When the upper brake has been tripped out of action by the descending platform, the platform remains for the time being under the control of the lower brake. The operator, depressing the handle f^7 , releases the lower brake and permits the platform to descend until the upper end of the barrel is clear of the packing devices, so that it may be removed from the machine. As the spring is entirely under his control, the operator is enabled to permit this final descent of the platform and barrel with a smooth and easy action. After the barrel is removed and replaced by an empty barrel

the operator again releases the lower brake by means of the handle f^7 , whereupon the platform and barrel are elevated by the weight. After this has been done he operates the handle g^{11} , thereby throwing the upper brake into action and at the same time throwing into action the auger-driving gear now to be described.

The hopper C is cast complete in one piece and bolted rigidly to the top of the main frame. It is inclined forward from the upper toward the lower end and is gradually changed from a rectangular form at the top to a circular form at the bottom, where it terminates in an annular flange c , intended to receive the upper end of the packing-tube E. The auger-shaft extends upward through the shaft of the hopper and through its front wall, and, emerging therefrom at its upper end, is sustained in bearings c' and c^2 , cast integral with the hopper and provided with the usual half boxes or caps to keep the shaft in place. The shaft also receives support in the bearing through which it passes from the inside to the outside of the hopper, and is further sustained at the upper end by a vertical screw c^4 , seated in a lug in the upper bearing to receive the vertical thrust.

The auger-shaft is provided at its upper end with a fixed beveled driving-pinion d' , which receives motion from a pinion h , fixed on the end of the horizontal driving-shaft H, which latter is seated at one end in a bearing h' , bolted to the hopper, and at the opposite end in a bearing h^2 , fixed on any suitable support.

The driving-shaft H is provided with a loose driving-pulley h^3 and with a clutch I to lock the pulley thereto. This clutch may be of any approved form; but I have shown in the drawings and recommend for general use the peculiar form of friction-clutch represented in Letters Patent granted to W. D. Gray, No. 408,011, dated July 30, 1889. The clutch consists of an expanding hub i , fixed to the shaft, provided with an expanding-wedge i' , operated by an elbow-lever i^2 , connected by link i^3 to a sleeve i^4 , mounted loosely on the driving-shaft to play endwise thereon. This sleeve at the opposite end is grooved circumferentially to receive a collar i^5 , connected by a toggle i^6 to the shaft-bearing h' . The toggle is jointed at its middle to the upper end of the brake-controlling bar g^3 . When, therefore, this bar is raised by the hand-lever g^{11} to apply the upper brake, it at the same time throws into action the auger-driving mechanism, and when the descending platform trips the bar g^{11} out of engagement, so as to release the upper brake, it at the same time throws out of action the driving mechanism.

It is necessary from time to time to remove the tube E. In order to prevent the flour contained in the hopper from escaping during this change, the tube-sustaining flange c is provided with a horizontal slit c^5 to admit a cut-off plate or valve c^6 , which is inserted therein from one side. In order to permit the

introduction of this plate or valve before the tube is wholly removed, the construction shown in Figs. 1 and 2 is adopted. The flange *c* is provided with three screws *c*⁷ *c*⁸, passed through the upper end of the tube. The screw *c*⁸ is inserted through a round hole in the tube; but the screws *c*⁷ are inserted through L-shaped slots in the tube. To remove the tube, the screw *c*⁸ is first removed and the tube then given a slight rotation, so as to bring the vertical portions of the slots over the screws *c*⁷. This permits the tube to be dropped sufficiently to expose the slot and permit the introduction of the valve, after which the remaining screws are removed and the tube detached.

Referring again to the hopper of my machine, it is to be noted that it is adapted to be and is bolted upon the top of the frame and that it alone sustains the auger and shaft-bearings above the frame. This construction not only avoids the usual upward extension of the wooden frame and the fitting of the various bearings thereto, but it holds the bearings immovably in their proper relations, and thus avoids the annoyances which attend the springing and twisting of frames of the ordinary forms.

The operation of the machine is as follows:
 30 The platform being at its lowest point and the upper brake and auger-driving mechanism being out of action, an empty barrel is placed upon the platform. The operator then depresses the handle *f*⁷, thereby loosening the lower brake *F* and permitting the weight to lift the platform and barrel. When they have reached their highest elevation, he releases the hand-lever, allowing the lower brake to act upon the barrel, after which he lifts the hand-lever *g*¹¹, thereby elevating the bar *g*³ until it is locked by the devices at its lower end, thereby throwing into action the auger-driving mechanism and the upper brake. As the auger acting upon the accumulating flour forces the barrel and platform downward the resistance is gradually increased by the platform-roller *f*³ acting on the brake-controlling lever *f*³. At the instant that the barrel is properly filled the trip *g*⁶ releases the bar *g*³, which, descending, throws the auger-driving mechanism out of gear and at the same time releases the upper brake *G*. The top of the barrel remains at this time over the mouth of the tube, so that the escape of flour is prevented and the attendant permitted to insert the cut-off plate, if desired. The operator now depresses the handle *f*⁷, and, releasing the lower brake, permits the platform to descend until the barrel is clear of the auger and packing-tube, the barrel being then removed and another inserted. The barrel is lifted by depressing lever *f*⁷ and the packing operation again incorporated by lifting hand-lever *g*¹¹.

Having thus described my invention, what I claim is—

1. In a flour-packing machine, the hopper having the slotted flange to receive the cut-

off plate, in combination with the removable packing-tube having the angular slots, and the screws to hold the tube, whereby the tube is enabled to close the slit when in its normal position and to expose the slit while still attached to the hopper, so that the slide may be inserted and the leakage of flour prevented.

2. In a flour-packing machine, the hopper having the slit to admit a cut-off plate, in combination with a removable tube which covers and closes the slit to prevent leakage of the flour.

3. In a flour-packing machine, the combination, with the packing mechanism, of a vertically-movable platform to sustain the barrel, a brake mechanism to resist the descent of the platform, and a brake-controlling lever directly and positively operated by the platform to increase the resistance as the platform descends.

4. In a flour-packing machine, the combination of the vertically-movable platform, its counter-weight, and the friction-pulley geared to the platform with the brake-strap and its actuating-lever arranged to be positively operated by the descending platform to increase the resistance of the brake, whereby the increase in the weight of the load is automatically compensated for.

5. In a flour-packing machine, the vertically-movable platform and a counter-weight to elevate the same, in combination with the friction-pulley to control the descent of the platform, the brake *F*, the brake-carrying lever, the second lever pivoted to the frame and connected to the first by a spring, and a roller or projection on the platform to operate the second lever, and thereby increase the action of the brake as the platform descends.

6. In a flour-packing machine, the combination of the vertically-movable platform, a counter-weight to elevate the same, a pulley through which the vertical movement of the platform is controlled, a brake *F*, acting on said pulley, a brake-operating lever *f*³, arranged to be positively operated by the descending platform to increase the pressure of the brake, and adjustable connecting devices located between said lever and brake and adapted to be operated at will to momentarily release the brake while the lever *f*³ is held by the platform, whereby the operator may momentarily release the brake to permit the sinking of the platform beyond the point at which it automatically stops.

7. In a flour-packing machine, the combination of an auger, an auger-driving clutch, a vertically-movable platform, a pulley and brake to resist the descent of the platform, a locking device common to the brake and the clutch to hold them in action, and a trip carried by the platform to trip the locking devices, whereby the auger and the brake are both thrown out of action automatically when the filling of the barrel is completed.

8. In a flour-packing machine and in combination with a packing-auger, a vertically-

movable platform, a pulley to control its descent, two brakes controlling said pulley, locking devices to hold one of said brakes in action, a trip to cause the automatic release of
5 said brake when the platform completes its descent, automatic devices to increase the pressure of the second brake as the platform descends, a manual device for releasing the second brake at will, and a counter-weight to
10 elevate the platform when the second brake is thus released.

9. In a flour-packing machine, the vertically-movable platform, the counter-weight to elevate the same, the pulley and brake to re-
15 sist the descent of the platform, the bar g^3 ,

and the devices for locking and automatically releasing the same, and an adjustable spring connection between said bar and the brake, whereby the brake may be applied with more or less pressure, as required, and automatically
20 released at the completion of the filling operation.

In testimony whereof I hereunto set my hand, this 18th day of February, 1890, in the presence of two attesting witnesses.

WILLIAM D. GRAY.

Witnesses:

WM. BANNEN,
RICHARD HOPPIN.