2 Sheets—Sheet 1.

A. W. STRAUB.
Flour-Packer.

No. 225,028. **Patented Mar. 2, 1880.**

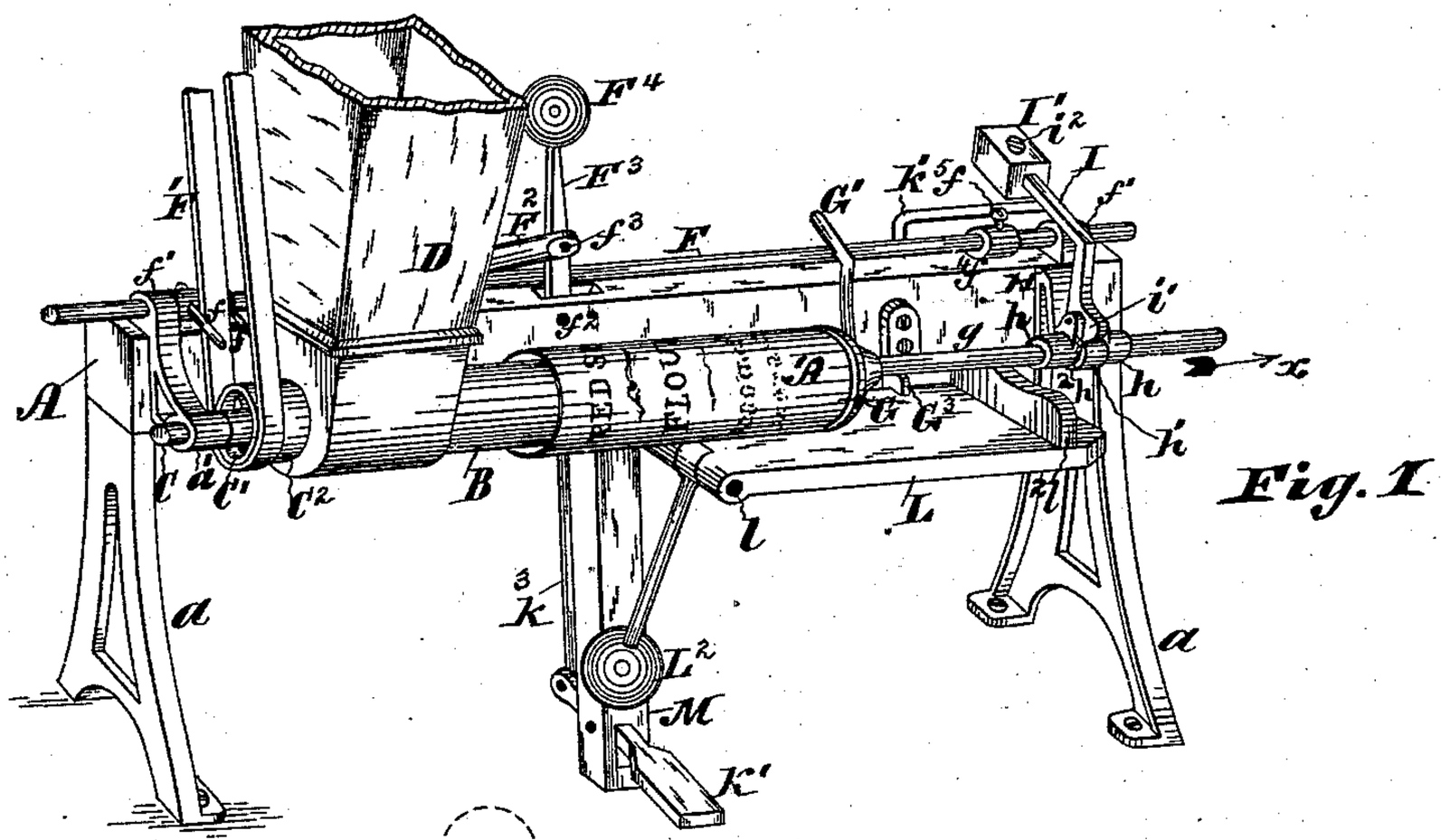

Fig. 1

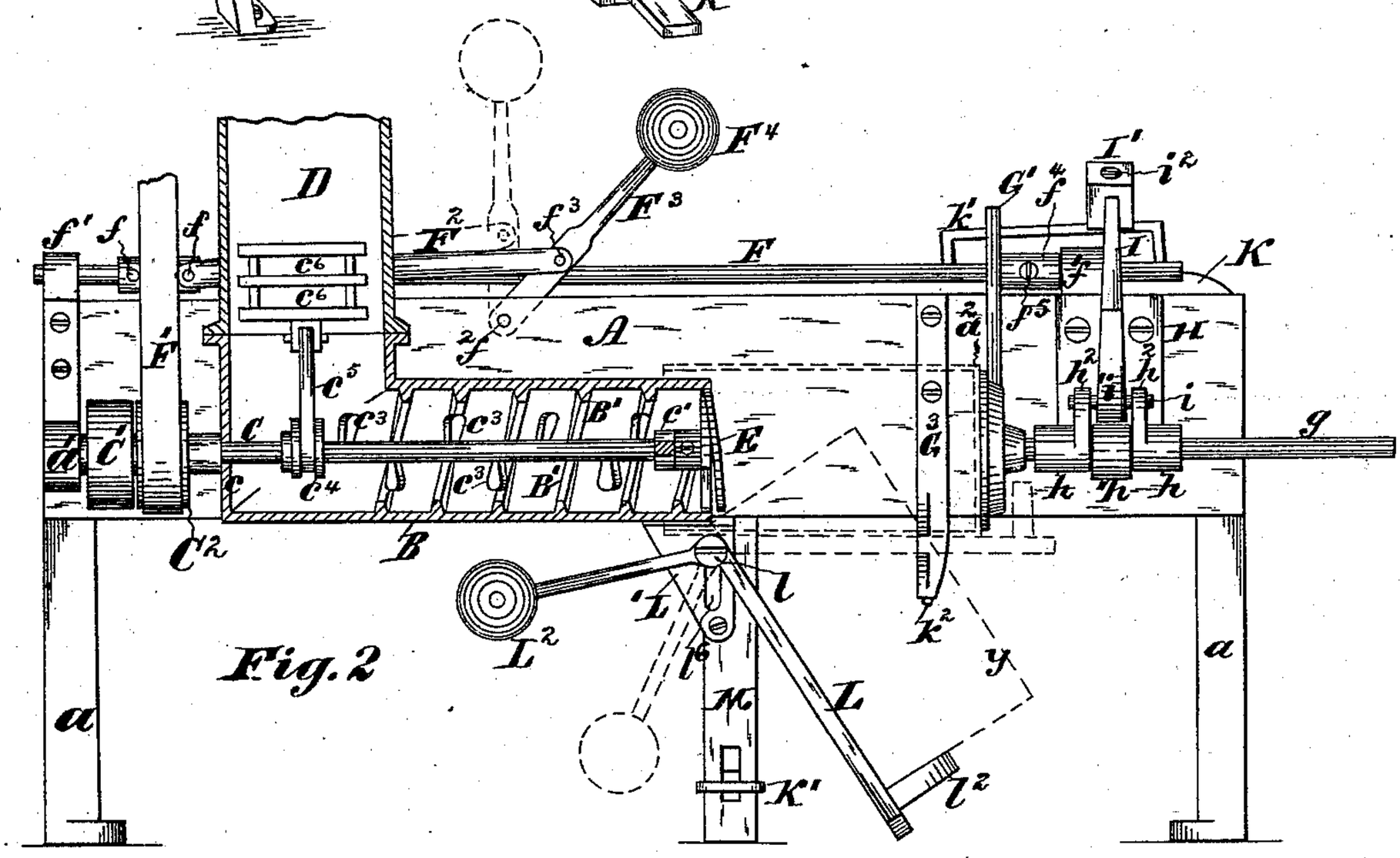

Fig. 2

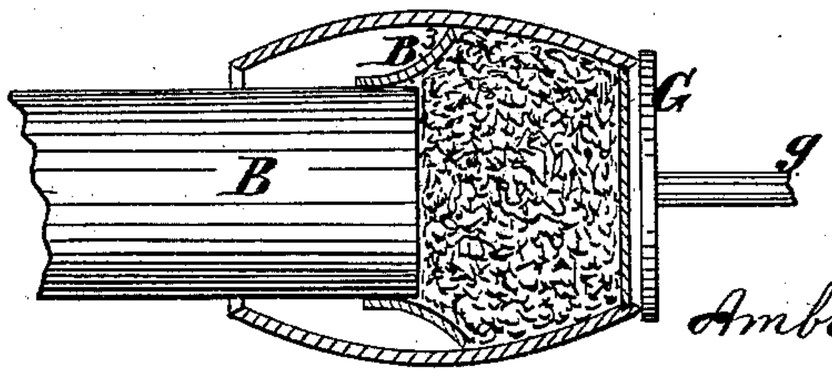

Fig. 11

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H. C. Claire

INVENTOR.
Ambrose W Straub

2 Sheets—Sheet 2.

A. W. STRAUB.
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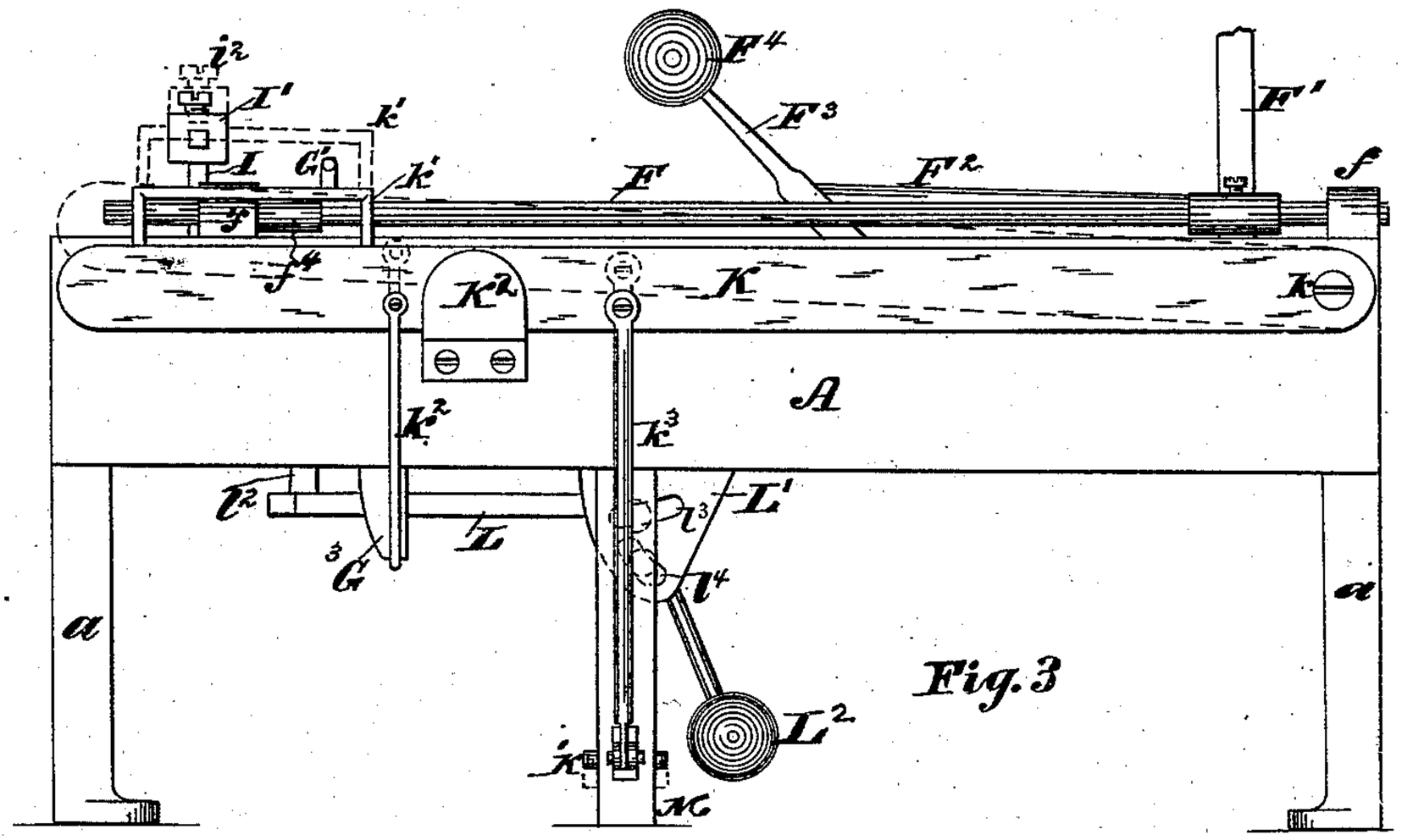

Fig. 3

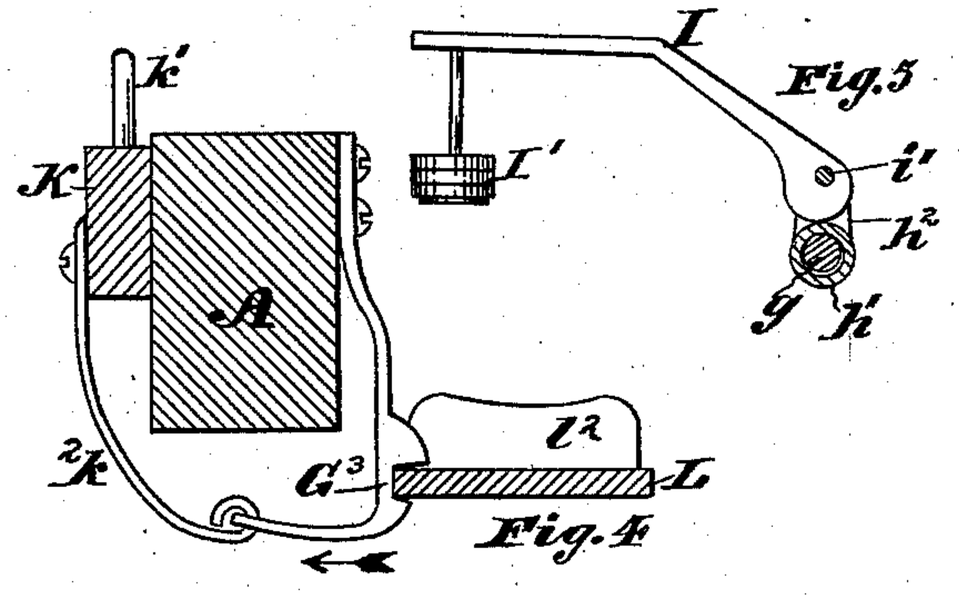

Fig. 4

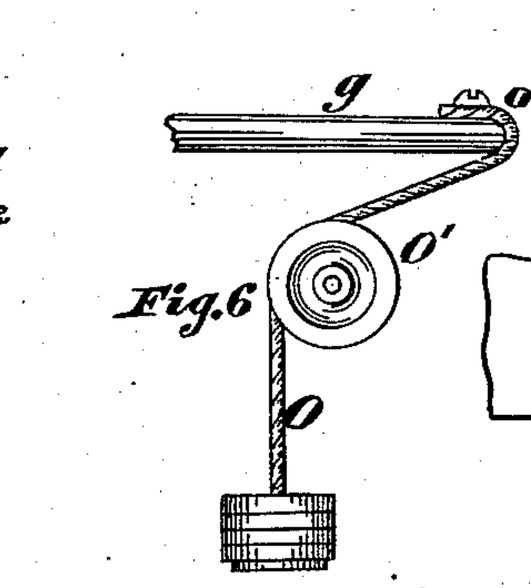

Fig. 6

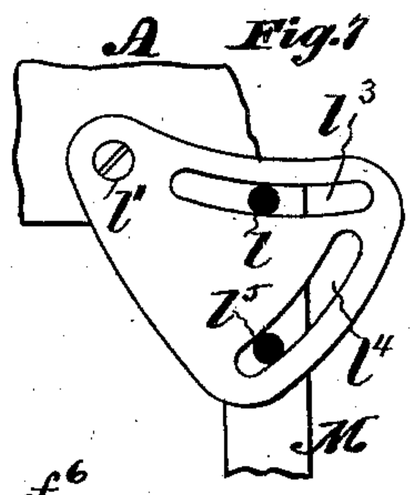

Fig. 7

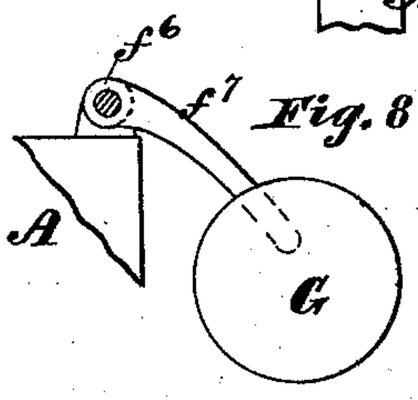

Fig. 8

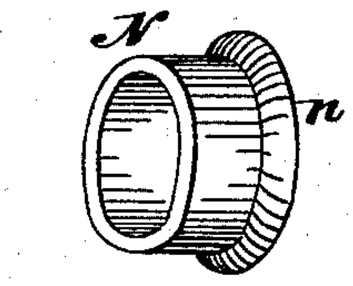

Fig. 10

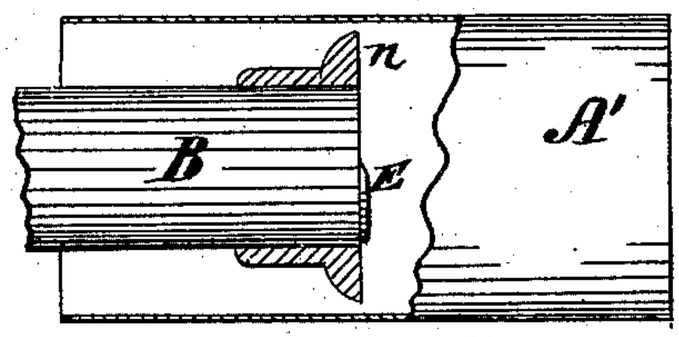

Fig. 9

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UNITED STATES PATENT OFFICE.

AMBROSE W. STRAUB, OF PHILADELPHIA, PENNSYLVANIA.

FLOUR-PACKER.

SPECIFICATION forming part of Letters Patent No. 225,028, dated March 2, 1880.

Application filed November 1, 1879.

To all whom it may concern:

Be it known that I, AMBROSE W. STRAUB, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Flour-Packers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specication, in which—

Figure 1 is a perspective of my invention. Fig. 2 is a longitudinal vertical section of the feeding devices and an elevation of the remaining parts of my invention. Fig. 3 is a rear elevation of the same. Fig. 4 is a transverse section of the spring-catch mechanism for the tilting table; Fig. 5, a like view of the frictional devices for the receding piston; Fig. 6, an elevation of a modification of the same; Fig. 7, detail elevation of the adjustable bracket for the tilting table; Fig. 8, detail modification. Fig. 9 is a detail elevation of the auger-tube and re-enforce ring. Fig. 10 is a perspective of said re-enforce ring; and Fig. 11 is a detail view showing the manner of filling barrels.

My invention has for its object to provide a machine for automatically filling and packing paper, muslin, or jute bags with a predetermined quantity or weight of flour, sugar, grain, or other similar commodity, said machine being so arranged that when the bag is filled and packed it automatically stops feeding. The operator then, by a treadle-motion, moves a tilting table upon which the filled bag rests, whereby said bag is released from the filling apparatus and has its position changed to catch all the spill or loose flour falling from the end of the auger or filling device.

My invention accordingly consists, first, in the provision of a horizontal conveying or auger tube having a centrally-supported shaft, upon which is spirally secured a series of radially-arranged spurs or blades, forming conveyers for moving the flour forward to the auger, placed on the extreme end of the said shaft, the latter having at its opposite end and outside of the auger case or tube a fast and a loose pulley, or other driving mechanism; second, in combination with said auger-tube, a series of re-enforce rings, detachably placed on the end of said tube, whereby different sizes of bags may be filled without changing or altering the size of the auger and tube; third, in the provision of a weighted belt-shifting device, whereby when the belt is automatically shifted to stop the feeding devices of the machine said belt is instantly and effectually removed from the fast to the loose pulley and the feeding of the flour immediately ceases when the required amount of such material is packed; fourth, in the provision of a receding piston supporting the end of the bag, and, in combination therewith, of an adjustable friction or weighted device engaging with the shaft of the piston, whereby a greater or less pressure is exerted thereon to cause said piston to recede at different rates of speed to obtain the proper resistance against the end of the bag being filled, in order that the required amount of flour shall be packed in said bag; fifth, in the provision of a tilting or turning table upon which the bag is supported during the operation of filling, and when filled is tilted or let down to change the position of the bag for the reception of the spill or loose flour falling from the auger; sixth, in the provision of means whereby, when the bag is filled, the friction or weight on the piston-shaft is removed and the tilting table operated to change the position of the bag from a filling position to one to receive the spill, the change in position of the bag effecting a release of its open end from the auger-tube without tearing the edges of the same; seventh, in the provision of means for preventing the flour from bridging in the hopper and from revolving with the shaft and conveyers in the auger-tube; eighth, in the provision of means whereby the turning table is adjusted to accommodate itself to and operate with different sizes of bags or receptacles; ninth, in the general combination, construction, and arrangement of parts, as hereinafter more fully described.

Referring to the accompanying drawings, A represents the bed of the machine, supported on legs *a a*, or other suitable mediums. B is the auger or conveying tube, to which the hopper D is secured. C is a shaft placed centrally within tube B, having its bearings in one end, *c*, and in a bridge, *c'*, secured a short

distance from the remaining end of said tube B.

c^3 c^3 are series of spirally-arranged radial spurs or blades secured to the shaft C, and revolving therewith to push the flour or other material forward through the tube B to the auger E, secured on the extreme end of shaft C. At the opposite extremity of said shaft, and outside of the tube B, are affixed a loose and a fast pulley, C′ C^2, respectively, the end of said shaft having its bearing in a hanger or bracket, a', projecting from or secured to the bed A. Within the auger-tube B, and affixed to or formed integrally with its internal walls, is a screw, B′, having a pitch the reverse of that of the blades c^3 c^3 on shaft C, so that if the flour as it is moving forward in said tube B should at any time become so tightly packed therein as to assume a tendency to revolve with the shaft C, said reverse-screw B′ will prevent such movement of the flour and cause it to be fed to the auger E.

c^4 is an eccentric secured to the shaft C about midway over the entrance of the hopper, and from which proceeds a rod, c^5, having affixed thereto one or more bars or lattice, c^6, whereby the revolution of the eccentric c^4 on shaft C will operate the rod c^5 to shake the lattice c^6 in the hopper-tube, to prevent any bridging of flour therein.

F is a rod having arms f f, for embracing the belt F′, and has its bearings in guides f' f', secured to the bed A.

F^2 is a supplemental rod secured or pivoted to one of the arms f of the rod F, as shown in Fig. 2, or it may be pivotally secured directly to the rod F.

F^3 is a lever pivoted at f^2 to the bed A, and at f^3 to the rod F^2, and is provided with a weight, F^4, so arranged that when the rod F is reciprocated to shift the belt said motion will be communicated to the supplemental rod F^2, to move the lever F^3 on its pivotal point f^2, thereby causing the weight F^4 to fall, and in so doing causes said rods F F^2 to move quickly to completely and instantly shift the belt from the fast to the loose pulley, to at once stop the feeding of the flour or other material operated upon.

G is the receding piston, provided with a shaft, g, having bearings in boxes h h, formed on or secured to the hanger H, which is bolted to the bed A. Said boxes h h are separated from each other by an intervening space, in which is placed a loose sleeve, h', surrounding the piston-shaft g. Said sleeve is slightly larger in diameter than the shaft g, as shown in Fig. 5, so as to have a slight play thereon.

I is a lever pivoted at i in the lugs h^2 h^2 on the hanger H, and is formed with a cam, i', which rests upon said sleeve h' on the shaft g. I′ is an adjustable weight placed upon said lever I, and is secured in any desired position by the screw i^2.

The object of said arm and weight is as follows: In packing the flour the closed end of the bag must move from the auger-tube against pressure; otherwise the necessary amount of flour could not be packed in a given-size bag. To effect such pressure upon the piston-head G, and thence upon the end of the bag, I employ the weight I′ to depress arm I, thereby causing its cam i' to impinge upon loose sleeve h', which in turn binds against the piston-shaft g, producing friction thereon equal to the amount of weight I′ employed. The greater the weight the greater the friction and more slow will be the movement of the piston, and the larger the weight of flour packed in the bag as the same is being filled; or the amount of said friction may be increased or decreased by adjusting the weight I′ to and from the pivotal connection of the arm I.

G′ is an arm secured to the piston-head to prevent the latter from revolving under influence from the auger, and projects upwardly and over the bed A, and rests and moves upon the shifting-rod F as the piston G reciprocates to and fro. f^4 is an adjustable stop-collar firmly secured in the desired position on the rod F by the set-screw f^5, against which the arm G′ of piston-head G comes in contact as said piston recedes during the filling operation, thereby moving said rods F and F^2 in the direction of arrow x, to shift the belt from the fast to the loose pulley C^2, to stop the machine, as the collar f^4 is so adjusted on the rod F in reference to the arm G′ that when the latter impinges against said collar the bag is nearly filled. When the contact of said arm and collar takes place the pressure upon the piston is not sufficient to enable the arm G′ to move the rods F F^2 the required distance to effectually shift the belt from the fast to the loose pulley, but only so far that said belt will be partly on the fast and partly on the loose pulleys, in which position it slips thereon and still continues to operate the shaft C to feed flour to the bag. To obviate this defect I employ the falling weight F^4; and as the rods F F^2 are moved by the arm G′ striking against the collar f^4, the lever is moved out of its perpendicular, and the weight F^4 falling gives additional momentum to said rods F and F^2 to effectually and instantly change the belt F′ completely to the loose pulley C^2, and the flour ceases to be fed to the bag.

If desired, instead of employing the arm G′ to strike the collar f^4 to shift the belt, said arm may alone be used to prevent the piston from turning on its shaft, and the collar f^4 may be formed with a projecting arm, f^7, as shown in Fig. 8, against which the middle of the piston-head will impinge, and thereby slide the rods F F^2 to shift the belt, the advantage of the latter construction being that the impingement of said parts will be centrally and more directly on the line of the piston-shaft, so as not to produce any sidewise motion or binding of said shaft in its bearings h h.

K is a lever pivoted to the bed A at k, and held in position by the bracket K^2, secured to bed A, as shown. Said lever is provided with

a treadle mechanism, K′, pivoted in the standard M, and also with a raised rod or ledge, k', and a rod, k^2, which connects with a spring-catch mechanism, G^3, secured to the bed A, as shown.

L is what I denominate a "tilting board or table," pivoted or hinged at l to a bracket, L′, adjustably secured to the bed A by the screw l'. Said table is provided with a counter-balance, L^2, operating to always return and keep said table in a horizontal or its normal position, to form a support for the bag as it is filled, as shown in Figs. 1 and 2. Said table is held in its horizontal position under the weight of the filled bag by means of the spring-catch G^3.

The operation is as follows: All of said parts being arranged as shown in Fig. 1, the bag A′ is placed on the auger-tube B, the piston G being pushed up to the closed end of said bag and the lever I arranged to project over the ledge k' of the lever K, and having its weight I′ properly adjusted to obtain the required amount of friction upon the piston-shaft g to cause said piston to recede at such a velocity as to enable the auger E to fill said bag with the desired amount and weight of flour. The turn-ball F^4 is then raised to a perpendicular position, thereby shifting the belt to the fast pulley C′ and starting the machine. The revolution of the shaft C causes the spurs c^3 c^3 thereon to feed the flour forward in tube B to the auger E, and thence to the bag. As the latter is filled it passes off the auger-tube, causing the piston G to recede, but only at a speed allowable by the pressure or friction resulting from the impingement of cam i' and sleeve h' upon its shaft g. Said piston recedes until the arm G′, secured thereto, strikes against the stop-collar f^4 on rod F, moving the latter and its supplemental rod F^2 until the turn-ball F^4 falls, whereby said rods are farther moved to instantly change the belt to the loose pulley C^2, when the feeding ceases, the bag being then filled and supported by the piston G and table L, with its open end about three to six inches on the auger-tube. The operator now places his foot upon the treadle K′, depressing the same to elevate lever K by means of the connecting-rod k^3, and thereby operating said lever to instantaneously perform two functions, to wit: The ledge k' of said lever, as it rises, strikes the weighted friction-lever I, raising the same and removing the cam i' from the sleeve h', as shown in Figs. 2 and 3, thereby taking all pressure from off said sleeve and avoiding all friction upon the piston-rod g. As said lever rises it also actuates the connecting-rod k^2 to release the catch G^3 from the tilting table L. The weight of the bag then depresses said table, and as it descends the arc of the circle described by the upper end or edge, a^2, of the bag readily pushes the piston G backwardly still farther, as it is relieved of all pressure, and allows the opposite end of the bag to be removed from the auger-tube, said removal being gradually and automatically effected as the table descends until it reaches the position shown in Fig. 2, the changed position of the bag being shown by dotted lines y in said figure, in which position said bag is held by the ledge l^2 on table L to catch the spill or loose flour falling from the auger, when the bag is then removed from the table, which is immediately returned to its normal position by its weight L^2. A new bag is then passed over the auger-tube, the piston slid up to its closed end, and the belt is shifted to resume operations.

During the feeding and in the intervals thereof the flour in the hopper is prevented from bridging by the shaking of the lattice c^6, by the revolution of the eccentric c^4 on the shaft C, and if at any time the flour should become packed in the tube B, to assume a tendency to revolve with the feed-shaft C, such movement will be prevented by the reverse screw-thread B′ of the auger-tube, and said flour will be thereby advanced toward the auger, so that in all cases a continuous flow will be provided for, and no break in its continuity and no clogging of the same can under any imaginable circumstances occur.

It will be observed that the auger-tube is constructed of a uniform diameter and is made for only one size of bags or other receptacles.

To pack bags of a larger size than said tube-diameter, I employ a series of re-enforce rings, N N, which are made or formed with collars n n, nearly of a size of the bag to be packed and filled, and over which the latter is passed. These rings are slipped over the end of the auger-tube, as shown in Fig. 9, and held thereon by friction, or they may have a set-screw for that purpose. When said rings are employed the table L must be lowered so as to still assume a horizontal position for the reception of the increased-sized bag. To effect this the bracket L′ is pivoted at l' to the bed A, as shown in Figs. 3 and 7, and is formed with two slots, l^3 and l^4. Through the slot l^3 passes a set-screw or hinge, l, for securing the table L to said bracket and adjusting it in said slot, and through the slot l^4 passes a set-screw, l^5, which is screwed into the standard M, and serves to hold the bracket and turn-table in their adjusted positions. By the adjustment of said set-screws in said slots the bracket and table can always be so arranged that said table is lowered or raised to different horizontal heights to accommodate itself to variations in the sizes of the bags and re-enforce rings.

In lieu of the two described curved slots a straight perpendicular slot, l^6, formed in said bracket, may be employed, as shown in Fig. 2, in which case the bracket is immovably secured to bed A, and the pivotal connection of the table is raised and lowered in said slot, and the table thereby vertically adjusted for the purpose described.

It is obvious that the foregoing-described

apparatus may be used to fill barrels equally as well as the bag or sack, and when so used the end of the auger-tube or the re-enforce ring is provided with a circular shield of leather, B^3, or equivalent flexible material, so that in filling the bulge or middle of the barrel the flour will not be worked backwardly and pass out of its open end. The shield will in such cases be distended against the sides of the barrel, as shown in Fig. 11, thereby preventing such reverse movement of the flour.

In lieu of the friction device described for the piston-shaft, a rope or chain, O, may be employed, as shown in Fig. 6, one end, *o*, of which will be attached to the end of said shaft *g*, and the other passing over a pulley, O′, secured to the bed A, and provided with a series of weights, by means of which the friction on the shaft *g* is increased or decreased by adding to or removing from the amount of weight on said rope or chain. So, too, instead of a belt and loose pulley, a gear-connection may be used, which is provided with a clutch mechanism operated by the rods F F^2 and weighted lever F^3, to cause said clutch to engage with and disengage from said gear to start and stop the machine.

The advantages of the foregoing are obvious. The flour can never bridge in the hopper, and no break occur in its continuity of flow or feed. The bag is automatically filled, and when so done it operates mechanism in like manner to stop the machine and cause the feeding to cease. The pressure is then simultaneously removed from the end of the bag, and the latter is changed in position to receive the spill, and during said change it releases itself from the auger-tube. No skilled labor is required for its operation, and when the bags are filled the pressure or friction devices on the piston-shaft can be and are so accurately regulated and determined that the bags will require no after weighing to ascertain if they contain the necessary weight of flour, while the re-enforce rings enable the machine to be used for various-sized bags, barrels, or other receptacles without employing two or more sizes of auger-tubes and augers, thereby saving their expense, and avoiding the trouble and annoyance of changing said augers and tubes in passing from the filling of different sizes of bags.

The machine can be used, if desired, to pack sugar, grain, or other similar commodities.

What I claim as my invention is—

1. In a flour packer or mixer, the combination of a horizontal auger-tube and feeding device, a receding piston, and an intervening table or support for the bag or receptacle to be filled, substantially as shown and described.

2. The combination of the horizontal auger-tube and feeding device, a receding piston, and interposed table or platform for the support of the bag or receptacle to be filled, said table being so arranged as to tilt or drop the bag from a filling to a position to receive the spill or loose flour falling from the auger-tube, substantially as shown and set forth.

3. In an organized machine for packing flour, the combination of a horizontal auger-tube and feeding device, a tilting table, a receding piston, and a belt-shifting mechanism operated to automatically shift the belt when the bag is filled, substantially as shown and described.

4. In a flour packer or mixer, the combination of a horizontal auger-tube and feeding device, a tilting table, a receding piston, a belt-shifting mechanism, and devices interposed between said piston and shifting mechanism whereby the latter is automatically operated to stop the feeding devices, substantially as shown and described.

5. In a flour-packer, the combination of a feeding device, a turn-table, a receding piston, and frictional or weighted devices applied to said piston, substantially as shown, and for the purpose set forth.

6. In a flour-packer, the combination of a horizontal auger-tube and feeding devices with a receding piston moving against a predetermined resistance or pressure, for controlling and regulating the amount of flour to be placed or packed in the bag operated upon, substantially as shown and described.

7. In a flour-packer, the combination of means, substantially as described, whereby the bag or receptacle is first filled and then operated upon to change its position to catch the spill-flour or other commodity, substantially as shown and described.

8. In a flour-packer, the combination of means, substantially as described, whereby the bag or receptacle is first filled and then operated upon to change its position to catch the spill-flour and release its open end from the feeding devices, substantially as set forth.

9. The combination of an auger-tube, feeding devices, a tilting table, a receding piston and frictional appliances, a weighted shifting device and interposed mechanism, whereby, when the bag is filled, the friction will automatically be relieved from the piston and the turn-table tilted, substantially as shown and set forth.

10. In a flour-packer, a weighted belt-shifting device so arranged that when the belt is partially shifted said weight will operate to complete the shifting, substantially as shown and described.

11. In a flour-packer, a tilting table which supports the bag or receptacle as it is filled and changes its position to receive the spill-flour from the feeding devices, substantially as shown and described.

12. In a flour-packer, an adjustable tilting table and bracket so arranged that said table may be adjusted to different positions to support various sizes of receptacles to be filled, substantially as shown and described.

13. In a flour-packer, re-enforce rings adapted to various-sized bags or receptacles, where-

by said bags or receptacles may be filled by one auger-tube, and feeding devices, substantially as shown and described.

14. In a flour-packer, the combination, with the feeding device, of re-enforce rings adapted to be applied to said feeding devices, substantially as shown and described.

15. In a flour-packer, the combination of a horizontal auger-tube, feeding-shaft, and mechanism, substantially as shown and described, for preventing the flour from becoming packed in said auger-tube, to revolve with said shaft to stop the continuity of its flow, substantially as shown and described.

16. In a flour-packer, the combination, with a horizontal auger-tube, feeding-shaft, and supply-hopper, of means interposed between said shaft and hopper, and actuated by said shaft to prevent bridging of the flour within the hopper, substantially as shown and described.

17. The combination of auger-tube B, shaft C, spirally-arranged blades or spurs c^3 c^3, auger E, and screw B′, the pitch of the latter being reversely that of the blades c^3 c^3, substantially as shown and described.

18. The combination of auger-tube B, shaft C, fast and loose pulleys C′ C², rods F F², lever F³, and weight F⁴, substantially as shown and described.

19. The combination of auger-tube B, shaft C, pulleys C′ C², rods F F², provided with stop-collar f^4, weighted lever F³, and receding piston G, provided with arm G′, substantially as shown and described.

20. The combination of auger-tube B, shaft C, eccentric c^4, rod c^5, and bars or lattice c^6, substantially as shown and described.

21. The combination of piston G, shaft g, hanger H, sleeve h', lever I, and weight I′, substantially as shown and described.

22. In a flour-packer, the counterpoised tilting table L, substantially as shown, and for the purpose set forth.

23. The combination of tilting table L and bracket L′, constructed substantially as shown and described, whereby said table is adjustable upon said bracket to be raised or lowered to varying horizontal heights to support different sizes of receptacles placed thereon, substantially as shown.

24. The combination of lever K, pivoted at k, and provided with ledge k', connecting-rods k^2 k^3, and treadle K′, substantially as set forth.

25. The combination of lever K, piston G, friction-lever I, tilting table L, and interposed mechanism between said parts, whereby, when said lever K is operated, the frictional lever I will be removed from the piston and the tilting table changed in position, substantially as shown and described.

26. The combination of lever K, treadle K′, connecting-rods k^3 k^2, spring-catch G³, and tilting table L, substantially as set forth.

27. The re-enforcing-rings N, provided with collars n, substantially as shown, and for the purpose set forth.

28. In combination with auger-tube B, the re-enforcing rings N, having collars n, adapted to different sizes of bags or receptacles, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of October, 1879.

AMBROSE W. STRAUB.

Witnesses:
CHAS. E. BARBER,
WM. H. KEY.