

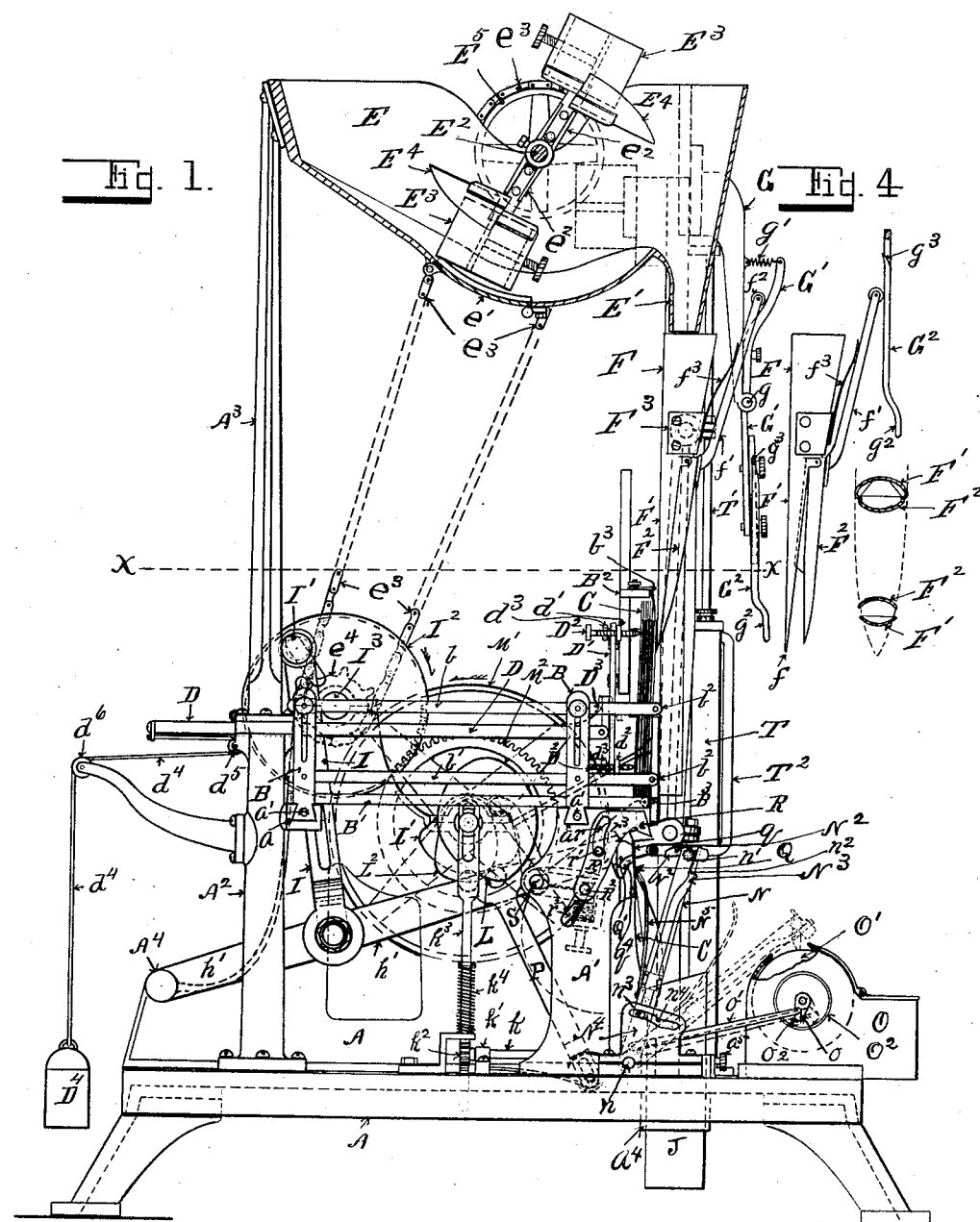
No. 896,952.

PATENTED AUG. 25, 1908.

J. C. & H. M. STURGEON.
BAG FILLING MACHINE.

APPLICATION FILED FEB. 15, 1907.

3 SHEETS—SHEET 1.



Witnesses.

G. J. Mead
Florence Stockert.

Inventors.

Inventors
John C. Sturgeon
Harold M. Sturgeon

No. 896,952.

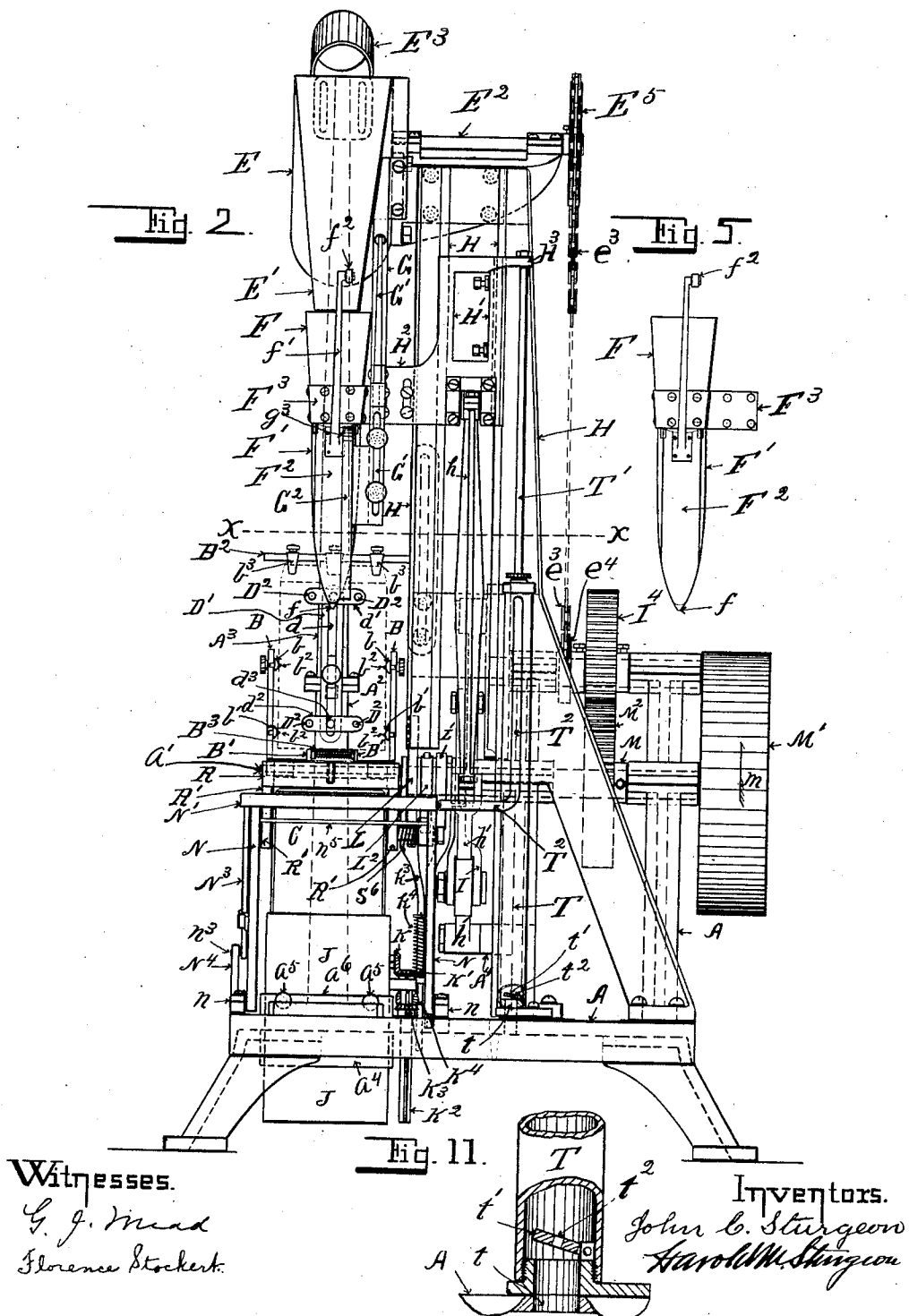
PATENTED AUG. 25, 1908.

J. C. & H. M. STURGEON.
BAG FILLING MACHINE.

BAG FILLING MACHINE.

APPLICATION FILED FEB. 15, 1907.

3 SHEETS—SHEET 2.



No. 896,952.

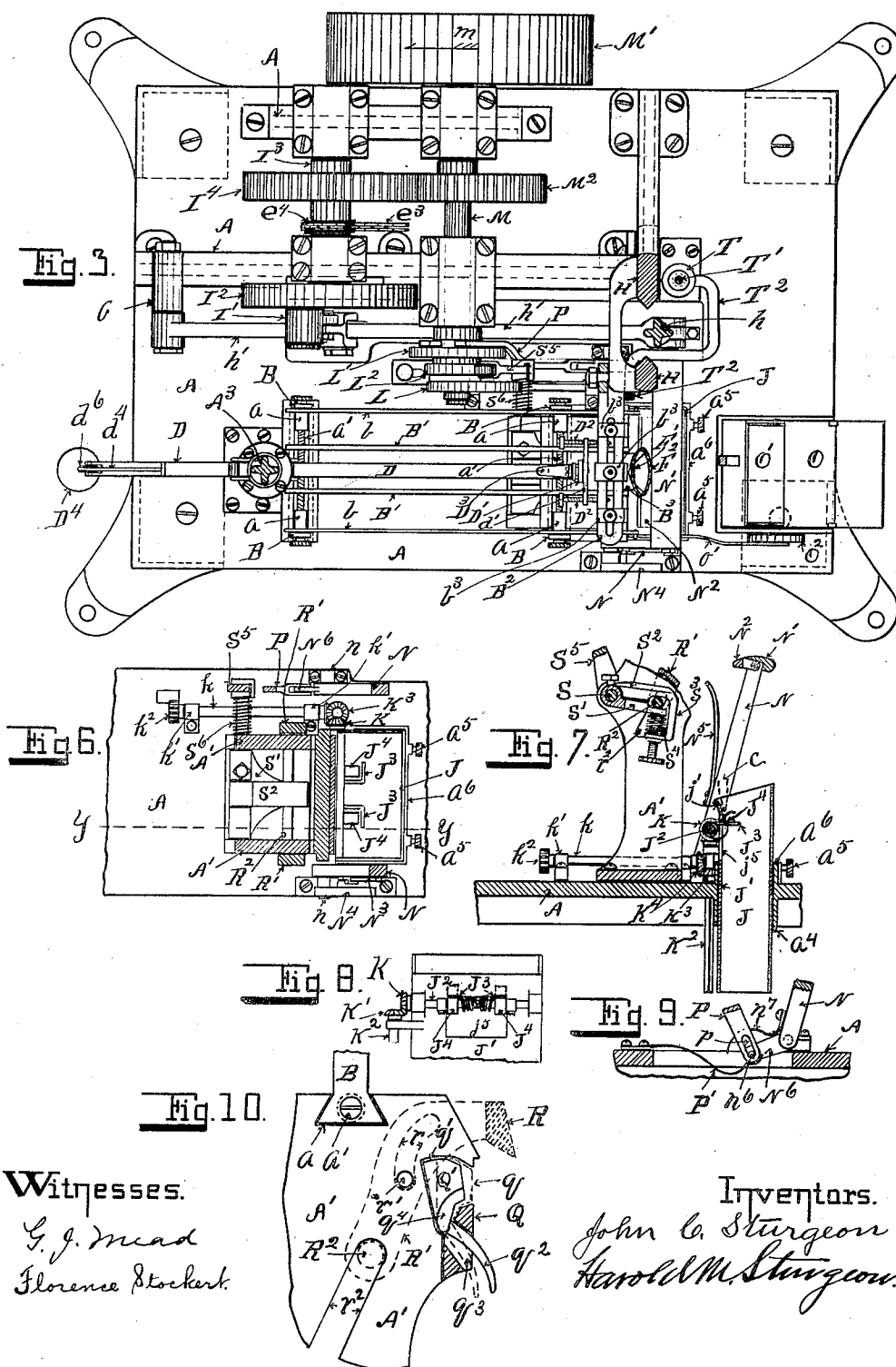
PATENTED AUG. 25, 1908.

J. C. & H. M. STURGEON.

BAG FILLING MACHINE.

APPLICATION FILED FEB. 15, 1907.

3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

JOHN C. STURGEON AND HAROLD M. STURGEON, OF ERIE, PENNSYLVANIA.

BAG-FILLING MACHINE.

No. 896,952.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed February 15, 1907. Serial No. 357,550.

To all whom it may concern:

Be it known that we, JOHN C. STURGEON and HAROLD M. STURGEON, citizens of the United States, residing at the city of Erie, in the county of Erie and State of Pennsylvania, have jointly invented certain new and useful Improvements in Bag-Filling Machines; and we 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

This invention relates to bag-filling machines, and consists substantially in improvements in the construction of machines for filling bags with measured quantities of material and gumming and sealing the bags after they are filled. To accomplish these results, we have constructed and combined in this machine, mechanism substantially comprising an adjustable bag-holder for holding flat paper bags in an upright position; a rotatable adjustable measuring device; a hollow, vertically reciprocating seed-carrier, adapted to enter the outermost bag in the bag-holder, remove it therefrom and carry it downward into a position to be gummed and sealed; mechanism for opening said seed-carrier preferably as it starts upward out of the bag; adjustable mechanism for actuating the seed-carrier adapted to vary the traverse thereof; vertically adjustable gripping mechanism to grip the lower end of the bag when it has been moved to its lowermost position, hold it while the seed-carrier is being withdrawn and while the bag is being gummed and sealed, and afterward release it; a gumming mechanism adapted to move the top of the bag against the sealing anvil and hold it there and gum it; a sealing jaw to turn the bag-flap over and seal it down upon the shorter ply of the bag; and an air-blast mechanism for blowing dust from the mouth of the bag while it is being gummed and sealed. These and other features of this invention are hereinafter set forth and explained, and illustrated in the accompanying drawings in which:

Figure 1 is a side view in elevation of our improved bag-filling machine, showing the mechanism thereof, with the seed-carrier traveling upward near its uppermost limit of travel, and with the seed-receptacle in sec-

tion. Fig. 2 is a front view of the same in elevation, with the gum tank left off. Fig. 3 is a horizontal section of the same on the line $x-x$ in Figs. 1 and 2, looking downward. Fig. 4 shows a detail view of the seed-carrier opened, and mechanism for opening the same. Fig. 5 shows a front view in elevation of the seed-carrier and its supporting arm. Fig. 6 shows a detail view of the sealing mechanism in section, and a top or plan view of the bag-gripping mechanism. Fig. 7 shows a vertical section of the same on the line $y-y$ in Fig. 6. Fig. 8 shows a detail view of the bag-gripping mechanism. Fig. 9 shows a detail view of a part of the paste-operating mechanism. Fig. 10 shows an enlarged detail view of the bag-sealing mechanism. Fig. 11 shows an enlarged detail view of the lower part of the air-pump.

In the construction of this bag-filling machine shown in the drawings, A is the frame of the machine. On uprights $A' A^2$ thereon is mounted a bag-holder, the side posts B B of which are mounted in grooves $a a$ in the tops of the standards $A' A^2$. Right and left-hand screws $a' a'$ (see Fig. 3) engage the lower ends of said side-posts B B, whereby they can be moved toward and away from each other to accommodate different widths of the bags C, and the upper parts of said side-posts B are slotted to permit of the vertical adjustment of the upper side bars $b b$ of the bag-holder to accommodate the same to different lengths of the bags C. The front ends of the side bars $b b$ and $b' b'$ are also provided with inwardly projecting studs $b^2 b^2$ (see Figs. 1 and 2) to engage the outermost of the bags C.

Above the front end of the bag-holder there is a slotted transverse bar B^2 upon which lip-holders b^3 are adjustably secured and adapted to engage the upwardly projecting flap of the outermost of the bags C in the bag-holder. This transverse bar B^2 is mounted on the machine frame so as to be vertically adjustable, whereby the lip-holders b^3 thereon may be adapted to engage the flaps of bags of different lengths placed in the bag holder.

Between the front ends of the base bars $B' B'$ of the bag-holder there is pivoted a spring-actuated flap B^3 , which, in its normal position, is on a horizontal plane with the tops of the base bars $B' B'$ of the bag-holder, and extends outward into the path of the vertical traverse of the seed-carrier hereinafter described, and operates to support the

lower end of the outermost of the bags C, until the seed-carrier has entered the bag and passed down into the bottom thereof, when the further downward traverse of the seed-carrier presses the flap B³ downward and out of its path, and as the seed-carrier travels on downward surrounded by the bag; said spring-flap B³ presses against the bag and prevents its dropping off of the seed-carrier, while it is being conveyed downward thereby.

In the upright A² supporting the rear end of the bag-holder is mounted a sliding bar D, and on the front end thereof is pivoted a vertically adjustable follower D'. In this follower D' there is a vertical slot *d* and on the follower D' there are horizontal arms *d'* *d*² vertically adjustable on the follower D', by means of set screws *d*³ passing through the slot *d*; and in the arms *d'* *d*² there are adjustable screws D² D² adapted to contact with the backs of the bags C and move them forward in the bag-holder against the studs *d*² and the lip-holders *b*³.

In order to make the follower D' press harder against the upper ends of the bags C than it does against the lower ends, a spring D³ is provided which acts between the sliding bar D and the follower D' to normally press the upper part of the follower D' forward, so as to constantly bring the more or less open upper end of the outermost bag C into the path of the downward travel of the lower end of the seed-carrier, hereinafter described.

The bar D and the follower D' are moved forward against the bags by means of a cord *d*⁴ attached to the rear end of the bar and passing over pulleys *d*⁵ and *d*⁶ to a weight D⁴ (as clearly shown in Fig. 1). From the above description it is obvious that the mechanism described is readily adjustable so as to operate to move different sized bags forward in the bag-holder.

Supported on a vertical extension A³ of the upright A², and upon the vertical guides hereinafter described, is a seed-receptacle E (clearly shown in Fig. 1). This receptacle is oblong, and a portion *e* of its bottom is transversely semi-circular and circular longitudinally, and is provided with a 'door *e*' by means of which the seed receptacle can be cleaned out. At the front end of the receptacle is a discharge nozzle E' through which measured quantities of seed or other material are discharged as hereinafter described.

At the upper part of the seed-receptacle E there is mounted a shaft E², having arms *e*² *e*² thereon, and upon these arms are removably mounted adjustable measuring cups E³ E³ having semi-circular lips E⁴ under the discharge ends thereof, whereby, as the cups E³ are rotated so as to discharge their contents, the lips E⁴ direct it into the discharge nozzle E'. This measuring mechanism is rotated by means of a sprocket wheel E⁵ on the shaft E², from which a sprocket chain *e*³ extends to

a sprocket *e*⁴ on the crank-shaft of the machine hereinafter described.

In operation the cups E³ are adjusted to dip up the proper quantity of seed, or if from the character of seed other sizes of cups *e* *e* necessary, they can be secured in place on the arms *e*² *e*², and adjusted to measure the desired quantity of seed, and as the machine operates, a measured quantity of seed is dipped up and discharged into the nozzle E', each time the seed-carrier, hereinafter described, reaches its uppermost point of traverse.

The seed-carrier of this machine consists of a hollow, somewhat conically-shaped, shell, the upper part F of which is open and adapted to pass up over the outside of the seed-receptacle nozzle E' as the seed-carrier nears its uppermost point of traverse. The lower part of the seed-carrier consists of two sections, one section, F', of which is integral and rigid with the upper part F, and tapers gradually to an obtuse point *f*, and the other section, F², is hinged at its upper end to the section F', and extends downward with substantially the same taper and contour as the section F', nearly to the point *f* thereof, so as to close upon the section F', and form a closed shell, and is adapted to open back from the section F', substantially as the bill of a bird opens. The features of this seed-carrier are clearly shown in Figs. 4 and 5. On the upper part of the section F² of the seed-carrier, there is an upwardly projecting arm *f*' provided on its upper end with a roller *f*², and between the arm *f*' and the part F of the seed-carrier there is a spring *f*³ which operates on the arm *f*' to keep the section F² normally closed against the section F', as shown in Figs. 1 and 5. On the downwardly projecting arm G, secured to the seed-receptacle there is mounted another arm G' centrally pivoted to the arm G, at *g*, and provided at its upper end with a retracting spring *g*', and at one side of the lower part of the arm G' there is adjustably secured thereto, a vertical cam-shaped bar G², so shaped and located that when the seed-carrier travels through its downward traverse, the roller *f*² on the arm *f*' passes behind the cam-shaped bar G² moving the lower end of it forward, the spring *f*³ meanwhile operating against the arm *f*' to keep the part F² of the seed-carrier closed upon the part F' thereof, during the downward traverse of the seed-carrier. As the seed-carrier nears the lowermost point of its traverse the roller *f*² passes off of the outside of the lower end of the cam-bar G², and the spring *g*' then restores the bar G² to its normal position, so that when the seed-carrier starts on its upper traverse the roller *f*² on the arm *f*' engages the inside of the curved lower end *g*² of the cam-bar G² and is thereby gradually moved inward so as to open the seed-carrier as it moves upward out of the

bag, retaining it open as shown in Fig. 4 until after it is withdrawn from the bag, thus allowing the seed in the seed-carrier to pass out of it into the bag as the seed-carrier moves upward; the seed-carrier is retained in this open position until the roller f^2 passes off of the upper end g^3 of the cam-bar G^2 , when the spring f^3 operates on the arm f' to close the seed-carrier, as illustrated in Fig. 1.

10 In operation, actuated as hereinafter described, the lower end f of the seed-carrier, when it arrives at the uppermost point of its traverse, is directly above the open end of the outermost of the bags C , the flap of which is slightly turned back by the lip-holders b^3 , and as the seed-carrier moves downward the point f thereof passes into the outermost bag between the upturned flap and the shorter ply thereof, and as it moves downward detaches the bag from the bag-holder, turns the flap B^3 , on which the lower end of the bag rests, downward, and carries the bag down to the position where it is to be gummed and sealed, and as it starts upward out of the bag, the seed-carrier is opened and discharges the seed therein into the bag. It is obvious from the foregoing description that so-called bag-openers are entirely dispensed with and not used in this structure, the same being
30 wholly unnecessary to the operation thereof.

The mechanism by means of which the seed-carrier is operated consists substantially of vertical guides H H suitably mounted on the machine frame between which there is a vertically sliding cross-head H' having thereon a laterally projecting arm H^2 , to which an arm F^3 on the seed-carrier is adjustably secured. From the lower end of the cross-head H' a pitman h extends downward to the end of an arm h' , the opposite end of which is pivoted on a stud A^4 at the rear of the machine frame.

The arm h' is reciprocated by means of a pitman I , pivoted thereto at an intermediate point, and extending to a wrist-pin adjustably secured in a crank-disk I^2 mounted on a shaft I^3 , suitably mounted in the machine frame, and actuated as hereinafter set forth. The pitman I is made longitudinally adjustable, and the wrist-pin I is also made adjustable in the crank-disk I^2 for conveniently varying the traverse of the seed-carrier when desired, as is necessary when bags of varying lengths are used.

55 To receive the lower end of the bag when it is carried down by the seed-carrier into position to be gummed and sealed, we provide a vertically adjustably gripping mechanism, preferably mounted on a vertically adjustable funnel J through which the filled and sealed bags are discharged from the machine. This funnel J extends down through an opening a^4 in the frame A , and set-screws a^5 passing through the ledge a^6 on the frame
65 hold it firmly at any elevation desired, as

clearly shown in Fig. 7. The upper end j of the rear wall J' of the funnel is preferably curved outward, and at the point j' is substantially in the line of the traverse of the lower end of the seed-carrier, hereinbefore 70 described. On the rear wall of this funnel J there is mounted a transverse rock-shaft J^2 provided with straight spring arms J^3 which when turned into the position shown in Fig. 7 form supports for the lower end of a bag. 75 The rock-shaft J^2 is also provided with curved spring-gripping arms J^4 which, when turned into the position shown in Fig. 7, serve to grip the lower end of a bag (shown in dotted lines c) resting on the supports J^3 , 80 between them and the rear wall J' at the point j' , as illustrated in Fig. 7. These supporting arms J^3 and the gripping arms J^4 operate through an opening j^5 in the rear wall J' of the funnel J and are adapted by 85 the rotation of the rock-shaft J^2 to be withdrawn through the opening j^5 in the rear wall of the funnel, so as to release the bag and allow it to pass down therethrough. The rock-shaft J^2 is preferably operated by 90 means of a bevel-gear K thereon which intermeshes with a like bevel-gear K' on the upper end of a shaft K^2 which is driven by means of a bevel gear K^3 and connected therewith by means of an ordinary spline 95 and groove, so that the shaft K^2 will slide vertically therein. The gear K^3 is driven by a bevel-gear K^4 on the end of a horizontal rock-shaft k mounted in bearings $k' k'$ on the machine frame A , and on the opposite end of 100 the shaft k there is a spur-gear k^2 which intermeshes with a vertically moving rack-bar k^3 , as clearly shown in Fig. 7, which rack-bar k^3 is actuated by a cam L on the end of the main driving shaft M of the machine as is 105 clearly shown in Fig. 1. This cam L is so shaped that it will operate the gripping mechanism to grip a bag while the seed-carrier is being withdrawn, and while the bag is being gummed and sealed, as hereinafter set forth, 110 and then the retracting spring k^4 on the rack-bar k^3 will operate said mechanism to release the bag. It will also be observed that the gripping mechanism being so mounted as to be vertically adjustable, can be adjusted to 115 grip the lower end of any length of bag when the flap of such bag is opposite the sealing anvil, hereinafter described, and in position to be turned down upon and sealed to the shorter ply of the bag. 120

The gumming mechanism of this machine consists substantially of a pair of arms N N joined together by a cross-piece N' at their upper ends, forming a gum-lever as clearly shown in Fig. 2. The lower ends of the arms 125 N N are provided with journals pivoted in bearings n n on the frame A . In the upper ends of the arms N N directly under the cross-piece N' there is pivoted a semi-rotatable gummer-blade N^2 (see Figs. 1 and 7) hav- 130

ing on the outer end of one of its journals a small spur-gear n' , and mounted on one of the arms N there is a sliding bar N^3 provided at its upper end with a rack-gear n^2 intermeshing with the spur-gear n' , and on the lower end of said sliding bar N^3 there is a stud n^3 which engages in a cam-slot n^4 in a plate N^4 secured to the frame. On the lower parts of the front edges of the arms N of the gum-lever, there is secured a U-shaped clamping spring N^5 , the transverse portion n^5 of which is adapted to contact with the lower portion of the sealing anvil hereinafter described. The paste-tank O is of the usual construction, and is provided with a paste-roller O' mounted and rotatable therein, and on the outer end of one of the journals thereof there is a clutch flange O^2 , and a clutch arm o which is actuated by a link o' , one end of which is connected with a jaw o^2 on the clutch arm o and the other end with the lower part of the gummer-arm N, so that the movement of the gummer-lever arms back and forth, operates through the link o' the clutch jaw o^2 , the clutch arm o and the clutch flange O^2 to rotate the paste-roller a short distance at each rearward movement of the gummer-lever.

For operating the gumming mechanism there is on the lower end of one of the arms N a laterally projecting arm N^6 with which the lower end of a connecting rod P is connected, as clearly shown in Fig. 9, which extends to and is actuated in one direction by a cam L' on the shaft M, and in the opposite direction by a spring P' (shown in Fig. 9). This yielding connection is preferably formed by making a slot p in the rod P, which operates on a stud-pin n^6 on the arm N^6 , a spring n^7 being provided which acts to retain the slot p and the stud n^6 in the normal position shown in Fig. 9.

In operation the gumming mechanism when in the position shown in dotted lines in Fig. 1, has the edge of the gumming-blade turned downward in contact with the gumming roller O' ; and at this time in the operation of the machine, the seed-carrier hereinafter described has carried a bag down to the proper position to be folded, and as in its further operation the seed-carrier is withdrawn from the bag, the action of the cam L on the gumming mechanism moves the gummer-lever forward until the spring clamp N^5 contacts with the bag and pushes the upper portion thereof against the sealing anvil; meanwhile during this forward movement of the gummer-lever, the gummer-blade N^2 by the action of the mechanism hereinbefore described, has been turned upward into the horizontal position shown in Figs. 1 and 7, and the further traverse of the gummer-lever brings the edge of the gummer-blade N^2 into contact with the shorter ply of the bag and presses it against the sealing anvil with a

yielding pressure thereby depositing a supply of gum on the shorter ply of the bag. In the further operation of the mechanism, from the shape of the cam L' , the gummer-lever is then immediately retracted by the action of the spring P' until it reaches substantially the position shown in Fig. 1, which leaves the spring clamp N^5 still holding the upper end of the bag against the sealing anvil, in which position the gummer-lever remains until the sealing jaw of the sealing mechanism hereinafter described, has turned the bag-flap down upon the gummed surface of the shorter ply of the bag and sealed it, at which time the shape of the cam L' permits the action of the spring P' to return the gummer-lever to its normal position, as shown in dotted lines in Fig. 1.

The sealing mechanism of this machine consists substantially of an upright anvil face Q on the upright A' as is clearly shown in Figs. 1 and 10. In this anvil face there is a transverse slot q into which the gummer-blade N^2 passes in case there is no bag in place to be gummed so as to prevent the deposit of gum on the face of the anvil Q. In a recess q' in the standard A' back of the anvil, there is an oblong block Q' which has its lower edge pivoted in the recess q' so that it can be oscillated to fill the slot q and complete the face of the anvil Q, and arms q^2 on the block Q' project outwardly and downwardly through slots q^3 in the anvil, and are adapted to be engaged by a bag pressed against the face of the anvil, and rock the block Q' so as to close the slot q during the action of the gummer-blade on the bag, as clearly shown in Fig. 10, and so long as the spring clamp on the gummer-lever holds the bag in contact with the anvil, the block Q' remains in this position.

For turning the bag-flap down upon the shorter ply of the bag and completing the sealing operation, the jaw R is rigidly secured on arms R' which pass down at each side of the standard A' . These arms R' are provided with slots r which engage studs r' on the standard A' , and the lower ends of the arms R' are connected together by means of a transverse rod R^2 operating in a slot r^2 in the standard A' (as shown by full and dotted lines in Figs. 1, 7 and 10), by means of which as the jaw structure travels downward it first moves vertically some distance, and finally diagonally toward the anvil until it meets the face thereof, and during this traverse the edges r^3 of the arms R' engage lugs q^4 on the ends of the block Q' and hold it firmly in position while the jaw R acts against the anvil face to seal the bag.

For operating the jaw R there is a rock-shaft S journaled in the upright A' , having an arm thereon formed preferably of two sections, one, S' , rigidly secured to the rock-shaft, and the other S^2 pivoted thereto, which sections of the arm embrace the rod R^2 be-

tween their ends. The section S^2 of the arm has a downwardly hooked extension S^3 which serves as a support for a spiral spring S^4 between it and the end of the section S^1 of the arm (see Fig. 7), so as to provide some yield to the pressure of the jaw R against the anvil face Q of the sealing anvil. The rock-shaft S is provided with a lever S^5 which engages a suitably shaped cam L^2 on the driving shaft M of the machine, the rotation of which cam operates the mechanism to bring the sealing jaw R against the face Q of the sealing anvil, and a spring S^6 on the rock-shaft S operates thereon to return the sealing jaw R to its normal upraised position; these parts being clearly shown in Figs. 6 and 7.

On the frame A at the side of the guides H there is secured an air-pump T of ordinary construction, having a piston rod T' connected to an arm H^3 on the cross-head H' . From the upper part of the air-pump, a pipe T^2 extends so that the open end thereof will direct the air discharged therefrom across the mouth of a bag when in position to be acted upon by the gumming mechanism hereinbefore described, and operate during the upward movement of the seed-carrier to blow away any dust or other matters thereabout which might be taken up by the gummer-blade and accumulate thereon so as to foul it.

In the lower end of the pump-barrel an inlet t is provided over which an ordinary flap valve t' operates to close the opening t during the downward traverse of the pump piston, and through the valve there is a small contracted opening t^2 through which the air in the pump-barrel, below the piston therein, slowly escapes during the downward movement of the pump-piston by which means the air-pump T also operates as a dash-pot to counterbalance the weight of the cross-head H' and its connected mechanism, during the downward traverse thereof.

The mechanism for operating the mechanism hereinbefore described preferably consists substantially in a driving-shaft M mounted on the machine frame and carrying on its inner end the cams L L' L^2 operating the gripping, pasting and sealing mechanisms as hereinbefore described. This shaft is provided with a band-wheel M' to which power from any suitable source can be applied so as to rotate it in the direction of the arrow m . On this shaft M there is also a gear-wheel M^2 which intermeshes with a like gear-wheel I^4 on the shaft I^3 , which carries the crank disk I^2 , operating the seed-carrier mechanism through intermediate mechanism as hereinbefore described. There is also a sprocket-wheel e^4 on the shaft I^3 , which, through the sprocket-chain e^3 , operates the measuring mechanism hereinbefore described.

In operation the several parts of the mechanism hereinbefore described, cooperate with

each other substantially in the following manner: A quantity of seed or other material being placed in the seed-receptacle E, the cups E^3 being properly adjusted to measure the desired quantity of seed, bags being placed in the bag-holder with their open ends up and the shorter plies thereof outward, and suitable paste or gum having been placed in the gum tank O, the mechanism is started by means of the driving wheel M' being rotated in the direction of the arrow. When the seed-carrier arrives at the uppermost point of its traverse, one of the measuring cups E, having dipped up a charge from the seed-receptacle, deposits it through the nozzle E' into the seed-carrier; the continued operation of the machine then moves the seed-carrier downward, and the lower end thereof enters the open end of the outermost bag on the bag-holder and moves downward within the bag until it has reached the bottom thereof, when its further movement turns the flap B^3 on the bag-holder downward, removes the bag from the bag-holder and carries it downward, the flap B^3 meanwhile pressing the bag between it and the seed-carrier and thus preventing the displacement of the bag thereon until it has completed its downward traverse; meanwhile the bag-supports J^3 , by the action of the gripper mechanism, having been raised into place with the lower end of the bag resting thereon, the further action of the gripping mechanism causes the grippers J^4 to grip the lower end of the bag against the side of the funnel J and hold it firmly; then the further action of the mechanism starts the seed-carrier on its upward traverse, and soon after it starts upward it is opened by the mechanism hereinbefore described, so that the seed therein passes out of it into the bag. As the seed-carrier, in its upward traverse, is passing out of the upper end of the bag, the cam L' operating the gummer lever raises it from its normal position where its gummer-blade is in contact with the past-roll O' , (as shown in dotted lines in Fig. 1) and moves it toward the bag, and the spring clamp N^5 thereon forces the upper part of the bag against the sealing anvil Q, which operates to turn the block Q' forward and close the slot q in the face of the anvil, the gummer-lever continuing its forward traverse then contacts with the shorter ply of the bag, depositing a supply of gum thereon, and then on account of the shape of the cam L' , the spring P' immediately retracts the gummer-lever to substantially the position shown in Figs. 1 and 7, where it remains with the spring clamp N^5 holding the upper part of the gummed bag against the face of the anvil, the cam L^2 , now acting to move the sealing bar downward, turns the flap of the bag down upon the gummed surface and clamps it firmly against the face of the seal-

ing anvil; as soon as this is accomplished, the cam L releases the bag-supporting and gripping mechanism, and the retracting spring k^4 operates on the mechanism to move them back out of the funnel J, and at the same time the cam L' releases the paster lever, which is then at once returned to its normal position with the pasting blade in contact with the paste-roll O'. As soon as the spring clamp N⁶ moves back from the bag, the cam L² immediately releases the sealing jaw R, and the retracting spring S⁶ operating upon the mechanism moves the sealing bar R up to its normal position, and the filled and sealed bag is thereby released and falls down through the funnel J. Meanwhile the seed-carrier has returned to its uppermost position again, ready to operate as hereinbefore described.

We have thus described our invention so as to enable others to construct and operate the same, but it is obvious to those skilled in the art, that many parts thereof may be considerably modified in their construction and arrangement without departing from the spirit of our invention; therefore we do not desire to restrict our invention to the exact construction and arrangement of mechanism shown and described herein, as

What we claim and desire to secure by Letters-Patent of the United States is:

1. In a bag-filling machine, a seed-carrier consisting of a hollow body, the lower portion of which tapers substantially to a point at its lower end and consists substantially of a section rigid with the body, and a hinged section adapted to close against the rigid section, substantially as set forth.

2. In a bag-filling machine, the combination of a reciprocating seed-carrier consisting of a hollow body, the lower portion of which tapers substantially to a point at its lower end and consists of a section rigid with the body and a hinged section adapted to close against the rigid section, means for retaining the hinged section in contact with the rigid section during the downward traverse of the seed carrier, and means for vertically reciprocating the seed-carrier, substantially as set forth.

3. In a bag-filling machine, the combination of a seed-carrier consisting of a hollow body, the lower portion of which tapers substantially to a point at its lower end and consists of a section rigid with the body and a hinged section adapted to close against the rigid section, means for retaining the hinged section in contact with the rigid section during the traverse of the seed-carrier in one direction, means for moving the hinged section away from the rigid section during the traverse of the seed-carrier in the opposite direction, and means for reciprocating the seed-carrier, substantially as set forth.

4. The combination in a bag-filling ma-

chine, of means to present a bag to be filled, with a hollow seed-carrier comprising a hollow shell open at its upper end and tapering to a point at its lower end and having its lower portion made in two sections one rigid and the other hinged thereto so as to close upon the rigid section, means for vertically reciprocating said seed-carrier, means for retaining the hinged lower section thereon closed upon the rigid lower section thereof during the downward traverse of the seed-carrier while entering and traveling down into the bag to be filled, and means for opening the hinged section away from the rigid section, during its upward traverse, substantially as set forth.

5. In a bag-filling machine, a guide-box to hold a series of bags, a spring actuated flap at the front end of the bottom of the guide-box, a lip-holder above the front end of the guide-box, a hollow seed-carrier, the lower portion of which is made in two sections, one section thereof rigid with the body of the seed-carrier and tapering to a point, and the other section of like shape hinged thereto so as to close upon the rigid section, and means to operate the seed-carrier to enter and pass down into the endmost bag at the front end of the guide-box, substantially as set forth.

6. In a bag-filling machine the combination, of a guide box to hold a series of bags, a spring actuated flap pivoted in the front end of the bottom of said guide-box, a follower in the guide-box, and a lip-holder above the front end of the guide-box, substantially as set forth.

7. In a bag-filling machine, a guide-box to contain a series of bags, a follower in said guide-box comprising substantially, a horizontally sliding bar operating in a support at the rear end of the guide-box, means for actuating said bar, a vertical bar pivotally connected with the front end of said sliding bar, and a spring acting between said horizontal and vertical bars, to normally force the upper end of said vertical bar forward, substantially as set forth.

8. In a bag-filling machine a guide-box adapted to hold a series of bags, vertical sides on said guide-box adjustable toward and away from each other, a spring-actuated flap pivoted at the front end of the bottom of said guide-box and projecting outward therefrom, inwardly projecting studs in the front ends of the sides of said guide-box, a vertically adjustable lip-holder above the front end of said guide-box, a standard at the rear end of the guide-box, an adjustable follower in said guide-box supported on said standard, and means to actuate it, substantially as set forth.

9. In a bag-filling machine, a guide-box to contain a series of bags, a follower in said guide-box comprising substantially a horizontally sliding bar operating in a support at

the rear end of the guide-box, means for actuating said bar, a vertical slotted bar pivotally connected with and vertically adjustable on said sliding bar, a spring acting
 5 between said horizontal and vertical bars to normally force the upper end of said vertical bar forward, cross arms adjustably secured to the upper and lower parts of said vertical bar, and adjustable contact screws in said
 10 arms to contact with the backs of the bags in the bag-holder, substantially as set forth.

10. The combination in a bag-filling machine, of a bag presenting mechanism, a spring actuated flap pivoted in the front end
 15 of the bottom thereof, a seed-receptacle, a rotatable measuring device therein, a hollow seed-carrier open at its upper end to receive material from the measuring device, a tapering lower portion on said seed-carrier di-
 20 vided into a rigid and a hinged section, means for reciprocating said seed-carrier to cause the tapering lower end thereof to enter the mouth of a bag on the bag presenting mechanism and be withdrawn there-
 25 from, substantially as set forth.

11. The combination in a bag-filling machine, of a hollow seed-carrier open at its upper end and tapering to a point at its lower end consisting of a rigid section and a
 30 hinged section closing upon the rigid section, a guide-box to contain a series of bags, a lip-holder above the front end of the bag-holder in proximity to the path of travel of the point of the seed-carrier to engage the
 35 upturned lip of the outermost bag in the guide-box, a spring actuated flap in the bottom of the front end of the guide-box extending outward into the path of travel of the point of the seed-carrier, and means for ver-
 40 tically reciprocating the seed-carrier to move the point thereof into the endmost bag in the guide-box between the upturned lip and the shorter ply thereof and downward therein until it contacts with and turns the flap on
 45 the guide-box downward, so as to remove the bag from the guide-box, substantially as set forth.

12. In a bag-filling machine, a bag presenting mechanism, a vertically reciprocating seed-carrier, a bag-supporting and grip-
 50 ping mechanism mounted substantially in the line of vertical travel of the seed-carrier, a support for said bag supporting and gripping mechanism, and mechanism vertically
 55 adjustable to a fixed position for intermittently rotating the bag-supports and gripping mechanism to support and grip the lower end of a bag, substantially as set forth.

60 13. In a bag-filling machine, a bag-presenting mechanism, a vertically reciprocating seed-carrier, a vertically adjustable funnel the rear side whereof is substantially in the line of traverse of the point of the
 65 seed-carrier, a bag-supporting and gripping

mechanism mounted on the upper portion of the rear side of said funnel for supporting and gripping the lower end of a bag brought down thereto by the seed-carrier, and means for intermittently actuating said bag-sup- 70
 porting and gripping mechanism, substantially as set forth.

14. In a bag-filling machine, a rock-shaft, bag-supports and bag-grippers thereon, a support for said rock-shaft vertically ad- 75
 justable to a fixed position, and actuating means for intermittently operating said rock-shaft to rotate the bag-supports and grippers thereon so as to support and grip the lower end of a bag, and afterward turn 80
 them downward and backward so as to release it, substantially as set forth.

15. In a bag-filling machine, a guide-box for presenting bags to be filled, a hollow seed-carrier the lower portion of which tapers 85
 to a point and is bifurcated so as to be opened and closed, means for reciprocating the seed-carrier vertically past the front end of the guide-box so that during its downward
 90 traverse it will enter the endmost bag therein and carry it down below the bottom of the guide-box, a vertically adjustable bag-supporting and gripping mechanism for receiving and gripping the lower end of a bag
 95 when it is carried to its downmost point of traverse, and hold it during the upward traverse of the seed-carrier, substantially as set forth.

16. In a bag-filling machine, a guide-box to contain a series of bags, a movable arm, a 100
 hollow seed-carrier carried thereby up and down adjacent to the front end of the guide-box a bifurcated lower portion on said seed-carrier, said bifurcated portions of the seed-carrier tapering to a point when closed to- 105
 gether, and adapted to enter and pass down into the endmost bag in the guide-box, a spring actuated flap pivoted in the front end of the bottom of the guide-box and extending outward into the path of traverse of the 110
 seed-carrier, means to retain the bifurcated portions of the seed-carrier closed upon each other during its downward traverse, gripping mechanism adapted to grip the lower end of the bag as the seed-carrier reaches its lower- 115
 most point of traverse, and hold it while the seed-carrier is being withdrawn therefrom, and means for operating the bifurcated portions of the seed-carrier as it starts on its up-
 120 ward traverse to discharge its contents into the bag, substantially as set forth.

17. In a bag-filling machine, a guide-box for presenting bags to be filled, a seed-carrier to enter a bag therein, remove it from the guide-box and carry it down into position to 125
 be gummed and sealed, with an air-blast mechanism to blow a current of air across the mouth of the bag prior to the gumming and sealing of the same, substantially as set forth.

18. In a bag-filling machine, an air-blast 130

mechanism means for supporting a bag to be filled, means for gumming and sealing the same adapted to blow a current of air across the mouth of a bag prior to the gumming and sealing of the same, and means for operating said air-blast mechanism, substantially as set forth.

19. In a bag-filling machine, the combination of a guide-box for holding bags to be filled, mechanism for removing a bag therefrom and depositing a measured quantity of material therein, mechanism for actuating the bag-removing and seed-depositing mechanism, an air-blast mechanism to blow a blast of air across the mouth of the bag, and means for operating said air-blast mechanism, substantially as set forth.

20. In a bag-filling machine, a guide-box for holding bags to be filled, a seed-carrier for removing a bag therefrom, carrying it to a position to be gummed and sealed and depositing its contents therein, an air-pump adapted to blow a blast of air across the mouth of said bag before it is sealed, mechanism for reciprocating said seed-carrier, and means connecting the air-pump with the actuating mechanism of the seed-carrier, substantially as set forth.

21. In a bag-filling machine, a guide-box for holding bags to be filled, a hollow tapering seed-carrier bifurcated at its lower end so as to be opened and closed together, for removing a bag from the guide-box, conveying it downward to a position to be gummed and sealed and depositing its contents therein, an air-pump to blow a blast of air across the mouth of the bag before it is gummed and sealed, mechanism for reciprocating said seed-carrier, and means connecting the air-pump with the seed-carrier operating mechanism so as to blow a blast of air during the upward traverse of the seed-carrier, substantially as set forth.

22. In a bag-filling machine, a bag-holder to present bags to be filled, a vertically reciprocating seed-carrier adapted to enter the mouth of the outermost bag in the bag-holder during its downward traverse, an arm on said seed-carrier, a cross-head adjustably connected with said seed-carrier, vertical guides for said cross-head, a reciprocating air-pump, an arm on said cross-head connected with the piston-rod of said pump, a piston in said pump adapted to pump air as it is raised upward in the pump-barrel, a pipe leading from the upper end of the pump-barrel to a point adjacent to the mouth of the bag when in position to be gummed and sealed, a check-valve having a contracted opening therethrough, in the base of the pump-barrel, and means for operating said cross-head and the mechanism connected therewith, substantially as set forth.

23. In a bag-filling machine, the combination of a bag-holder to present bags to be

filled, a seed-carrier for removing bags therefrom, carrying them to a position to be gummed and sealed, and filling them, a gumming mechanism, a sealing mechanism, means for actuating said carrier, gummer, and sealer, and an air-blast mechanism for blowing a current of air across the mouth of the bag before it is gummed and sealed, substantially as set forth.

24. In a bag-filling machine, a bag-holder, a gum-tank, an intermittently rotating gum-roll therein, a stationary sealing-anvil under the delivery end of the bag-holder of the machine, means for sealing a gummed bag against said sealing-anvil, a reciprocating gummer-lever carrying a gummer-blade, and coöperating with the gum-roll at one end of the traverse of the gummer-lever and with the stationary sealing-anvil at the other end of its traverse, and means for operating the gummer-lever, substantially as set forth.

25. In a bag-filling machine, a reciprocating gummer lever, a gum tank, an intermittently operating gum-roll therein, a sealing anvil, a spring clamp for bringing the upper end of a bag against the anvil, a gummer-blade on the gummer-lever for contacting with the upper end of the shorter ply of the bag when in contact with the sealing anvil, and means for intermittently operating the gummer-lever and spring clamp, substantially as set forth.

26. In a bag-filling machine, a gum-tank, an intermittently rotating gum-roll mounted therein, a sealing-anvil below the delivery end of the bag-holder of the machine, a gummer lever reciprocating between the gum-roll and the anvil, an oscillating gummer-blade mounted on the gummer-lever, a spring clamp mounted on the gummer-lever and adapted to contact with the lower part of the anvil as the gummer-blade approaches it, lever and cam mechanism for intermittently operating the gummer-lever, and means for oscillating the gummer-blade on the gummer-lever to bring the edge of the gummer-blade into contact with the gum-roll at one end of the traverse of the gummer-lever and into contact with the shorter ply of a bag against the anvil at the opposite end of the traverse of the gummer-lever, substantially as set forth.

27. In a bag-filling machine, a stationary sealing anvil having a transverse slot in the face thereof, and a rocking block in said anvil adapted to be turned forward to close the slot therein, substantially as set forth.

28. In a bag-filling machine, a stationary sealing anvil having a transverse slot in the face thereof, a rocking block mounted in said anvil so as to be turned forward and close the slot therein, an arm on said block adapted to be engaged by a bag when brought into contact with the face of the anvil and turn the rocking block forward to fill

the slot in the anvil, substantially as set forth.

29. In a bag-filling machine, a stationary sealing anvil having a transverse slot in the face thereof, a rocking-block mounted in said anvil so as to be turned forward to fill the slot in said anvil, lugs on the end of said block, a sealing bar to close against the face of the anvil, arms thereon passing down at each end of the anvil and contacting with the lugs on said block as the sealing bar approaches the face of the anvil, and means for operating the sealing bar, substantially as set forth.

30. In a bag-filling machine, a stationary anvil, a sealing bar adapted to be brought against the face thereof, arms on said sealing bar at each end of the anvil, studs in the ends of the anvil engaging slots in the arms of the sealing bar, standards supporting the anvil having slots therein, a transverse rod connecting the lower ends of said arms through said slots, a rock-shaft mounted in bearings on the anvil-supports, a yielding arm connecting said rock-shaft with the rod passing through the lower ends of the sealing-bar arms, lever, cam, and spring mechanism for operating said rock-shaft and the sealing bar connected therewith, substantially as set forth.

31. In a bag-filling machine, a vibrating sealing anvil, a sealing bar adapted to be first moved bodily downward in front of the anvil and then moved backward toward the face of the anvil to fold a bag-flap down on the shorter ply of the bag and press it against the face of the anvil, and mechanism to operate said sealing-bar, substantially as set forth.

32. In a bag-filling machine, a sealing anvil, a gummer mechanism to deposit gum on the shorter ply of a bag when the upper portion of said bag is in contact with the face of the sealing anvil, a sealing bar adapted to turn the flap of a bag down upon the gummed shorter ply thereof after the gummer mechanism has moved backward therefrom, and press the flap and gummed shorter ply of the bag together between it and the face of the sealing anvil, and mechanism for operating said sealing and gumming mechanism in proper time with each other, substantially as set forth.

33. In a bag-filling machine, a bag-holder to present bags to be filled, a seed-carrier to enter and remove the endmost bag from the bag-holder and carry it downward into position to be gummed and sealed, a gripper mechanism to grip the bottom of the bag when it reaches its downmost point of traverse, means for reciprocating said seed-carrier, a sealing anvil, a reciprocating clamping and gumming mechanism to move the upper end of the bag against the face of the anvil and gum the shorter ply thereof when the seed-carrier has passed upward out of the

bag, a sealing bar to turn down the bag-flap and clamp it on the shorter ply of the bag against the face of the anvil after the gummer mechanism has been retracted therefrom, and means for timing the operation of the seed-carrier, gripping mechanism, clamping and gumming mechanism, and said sealing mechanism each in proper time with the others, substantially as set forth.

34. In a bag-filling machine, a gripper mechanism to grip and hold the lower end of a bag, a rock-shaft, grippers thereon, a vertically adjustable support therefor, cam mechanism and intermeshing gear mechanism for operating said rock-shaft in one direction, and a retracting spring to actuate said gear mechanism to release the gripper mechanism, substantially as set forth.

35. In a bag-filling machine, a paster lever, a pasting blade pivoted therein, a pinion on the axis of the paster-blade a rack-bar mounted on one arm of the paster-lever engaging said pinion, and a cam engaging the rack-bar, a cam to intermittently actuate said paster-lever in one direction, and a spring to actuate said lever in the opposite direction, substantially as set forth.

36. In a bag-filling machine, a sealing anvil, a sealing bar, a rock-shaft, an arm thereon connecting the sealing bar with said rock-shaft, a cam, an arm on the rock-shaft communicating with said cam for moving the sealing bar first downward in front of and then rearward toward the face of the sealing anvil and spring mechanism for moving the sealing bar in the opposite direction, substantially as set forth.

37. In a bag-filling machine, vertical guides on the machine frame, a cross-head operating in said guides, adjustable crank, lever, and pitman mechanism for operating said cross-head, a hollow seed-carrier open at its upper end and tapering to a bifurcated point at its lower end, one section of which bifurcated point is rigid and the other section hinged thereto, an arm on said seed-carrier adjustably and removably secured to an arm on the cross-head, means for retaining the bifurcated portions of the seed-carrier closed during its downward traverse, and means for operating the hinged portion thereof during its upward traverse, substantially as set forth.

38. In a sealing mechanism for bag-filling machines, the combination of an anvil having a slot in the face thereof, a sealing block in said slot, arms on said block adapted to contact with a bag to be sealed and be depressed thereby so as to rock said block forward, shoulders on the ends of said block a sealing bar, arms on said bar embracing said anvil and adapted to contact with the shoulders on the ends of the sealing block and press the same forward when the sealing bar is operated, and mechanism adapted to operate said

sealing bar, substantially as and for the purpose set forth.

39. The combination in a gripping mechanism for bag-filling machines, of a vertically adjustable funnel, a horizontal rock-shaft mounted thereon, gripping fingers mounted on and operated by said shaft, a vertically adjustable rock-shaft mounted on said funnel, bevel gears between said horizontal and vertical rock-shafts, and mechanism adapted to operate said vertical rock-shaft, substantially as and for the purpose set forth.

40. In a bag-filling machine, the combination of a bag-holder adapted to hold a series of bags to be filled, a seed-receptacle adapted to contain seed, a measuring mechanism adapted to dip a measured quantity of seed from the seed-receptacle, a seed-carrier adapted to receive seed from the measuring mechanism, to enter the endmost bag in the bag-holder, to remove said bag therefrom and carry it to a gripping mechanism, deposit the seed in said bag and afterward withdraw therefrom, gripping mechanism adapted to grip the bag, gum supplying mechanism, gumming mechanism adapted to take gum from the gum supplying mechanism, press the upper end of the bag against the sealing anvil and then to place the gum on the shorter ply thereof, means to retain the bag against said anvil while the gummer partially withdraws therefrom, sealing mech-

anism adapted to fold the longer flap of said bag down upon the gummed shorter ply thereof and seal it thereto, mechanism adapted to operate said measuring mechanism to dump its contents into the seed-carrier when it is at its highest point of traverse, mechanism to cause said seed-carrier to reciprocate, mechanism to cause said gripping mechanism to grip the bag when the seed-carrier reaches its lowest point of traverse, mechanism to cause the seed-carrier to open when it starts on its upward traverse, mechanism to cause the gummer mechanism to operate after the seed-carrier has withdrawn out of the bag, mechanism to cause the sealing mechanism to operate after the gummer has retreated from the bag, mechanism to cause the gripper mechanism to release its hold upon the bag after the sealing mechanism has sealed the bag-flap down upon the gummed shorter ply of the bag, and mechanism to cause the sealing mechanism to release the bag as the seed-carrier moves downward, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures, in presence of two witnesses.

JOHN C. STURGEON

HAROLD M. STURGEON.

Witnesses:

FLORENCE STOCKERT,
G. J. MEAD.