

J. N. CROWLEY.
MACHINE FOR FILLING AND CLOSING BAGS.
APPLICATION FILED APR. 19, 1906.

949,675.

Patented Feb. 15, 1910.

7 SHEETS—SHEET 1.

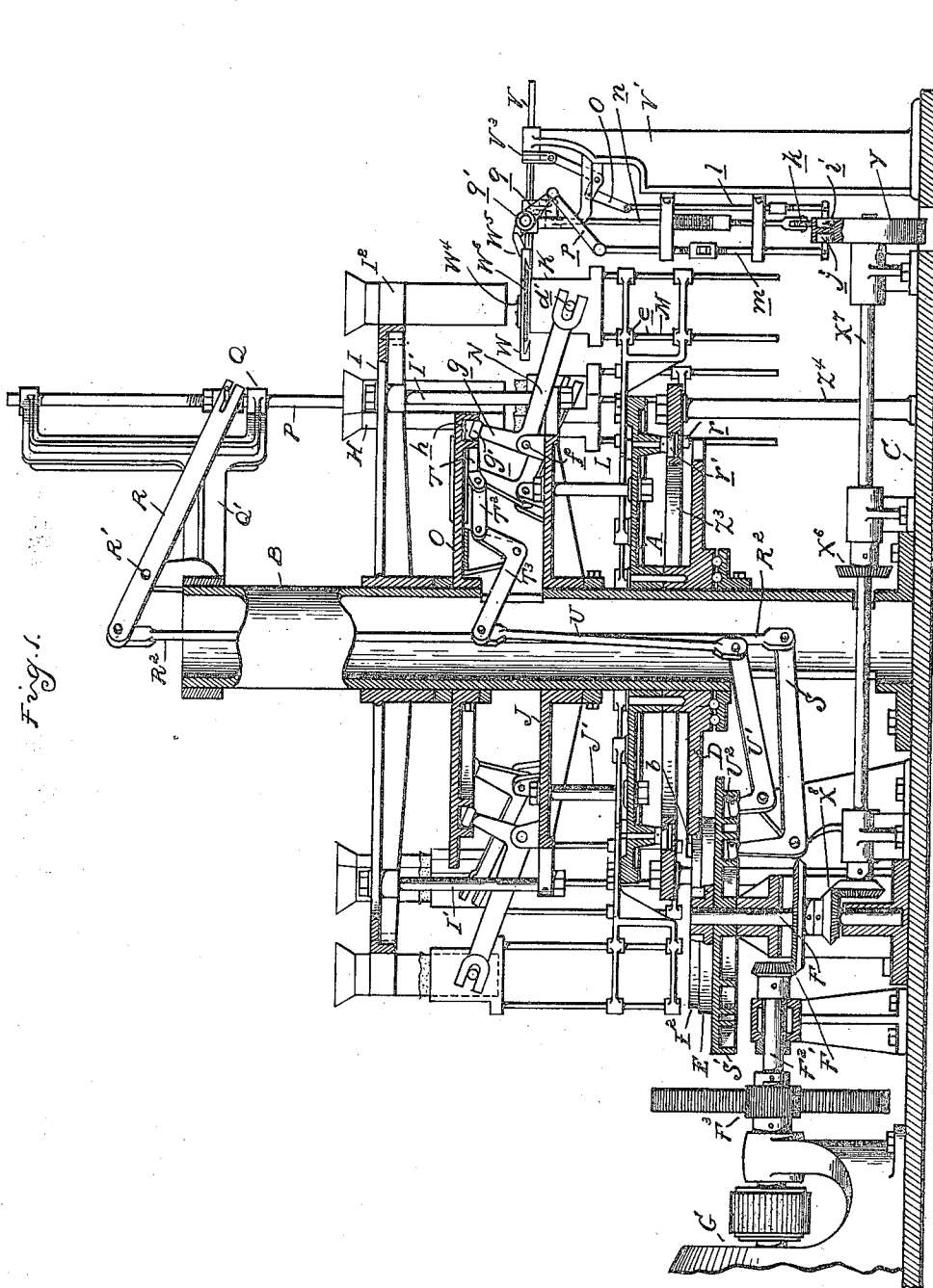


Fig. 1.

Witnesses
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Geo. H. Gause

By

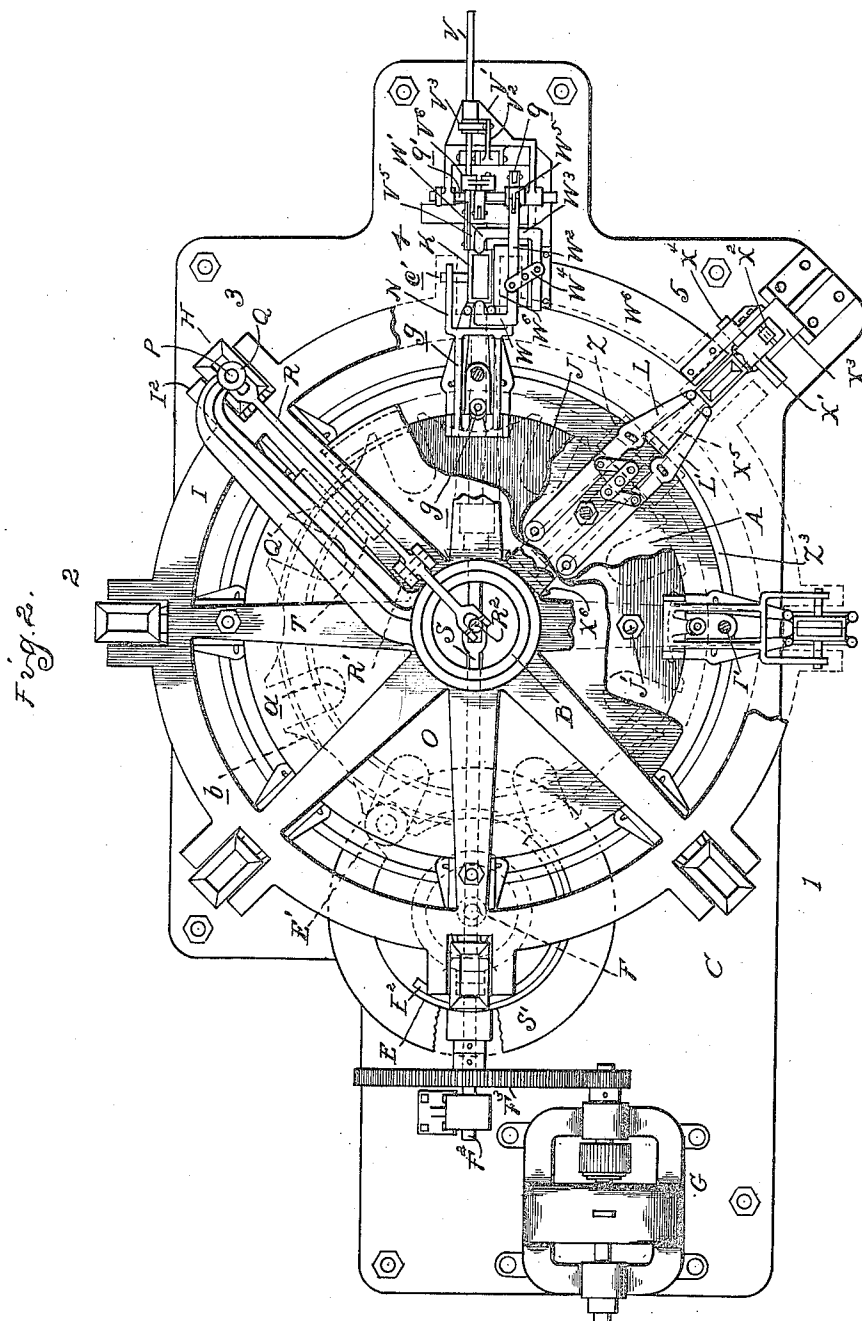
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7 SHEETS—SHEET 3.

Fig. 3.

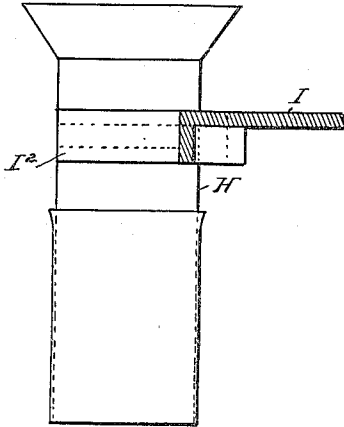


Fig. 4.

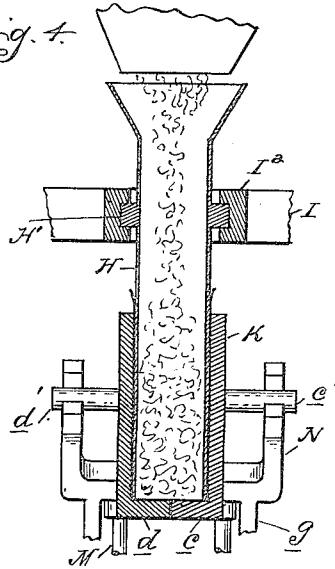


Fig. 5.

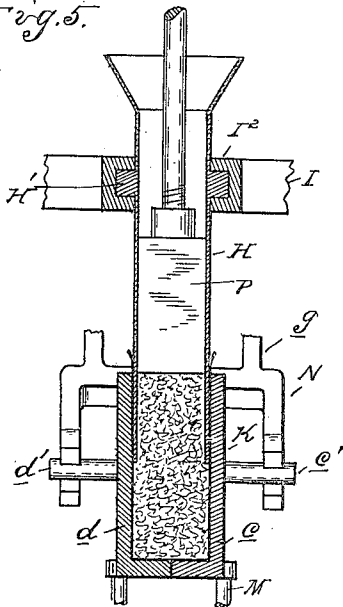
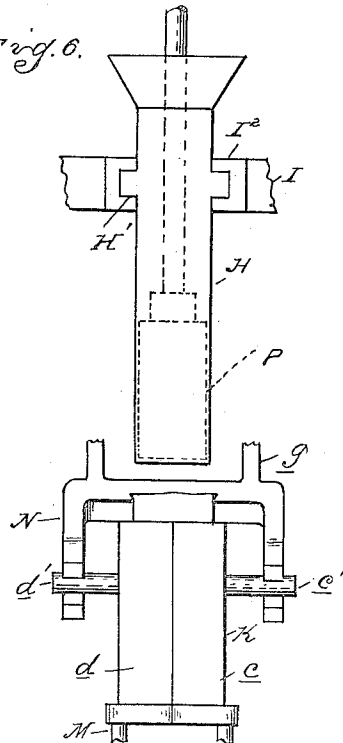


Fig. 6.



Witnesses
A. L. Hobby
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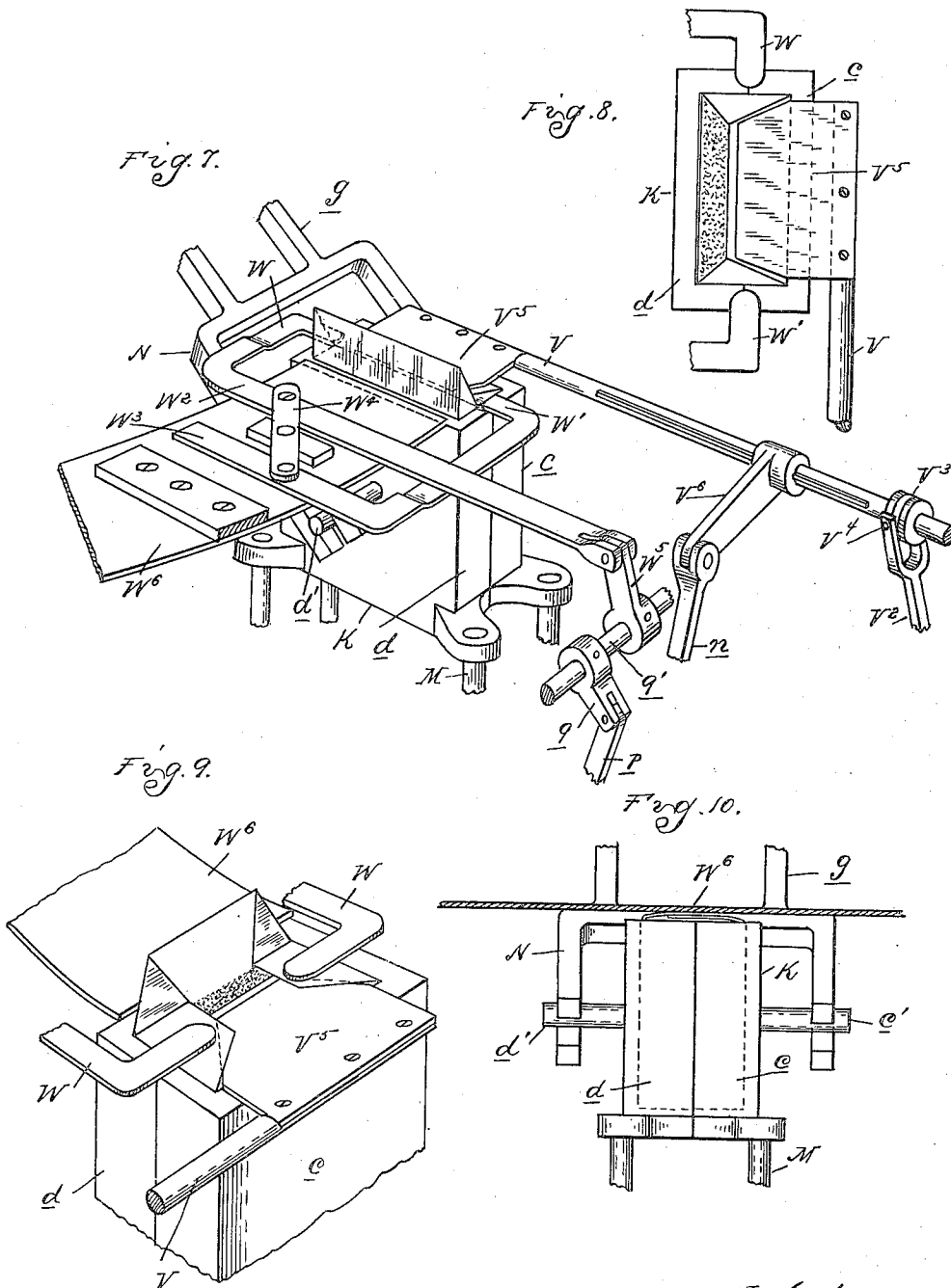
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7 SHEETS—SHEET 4.



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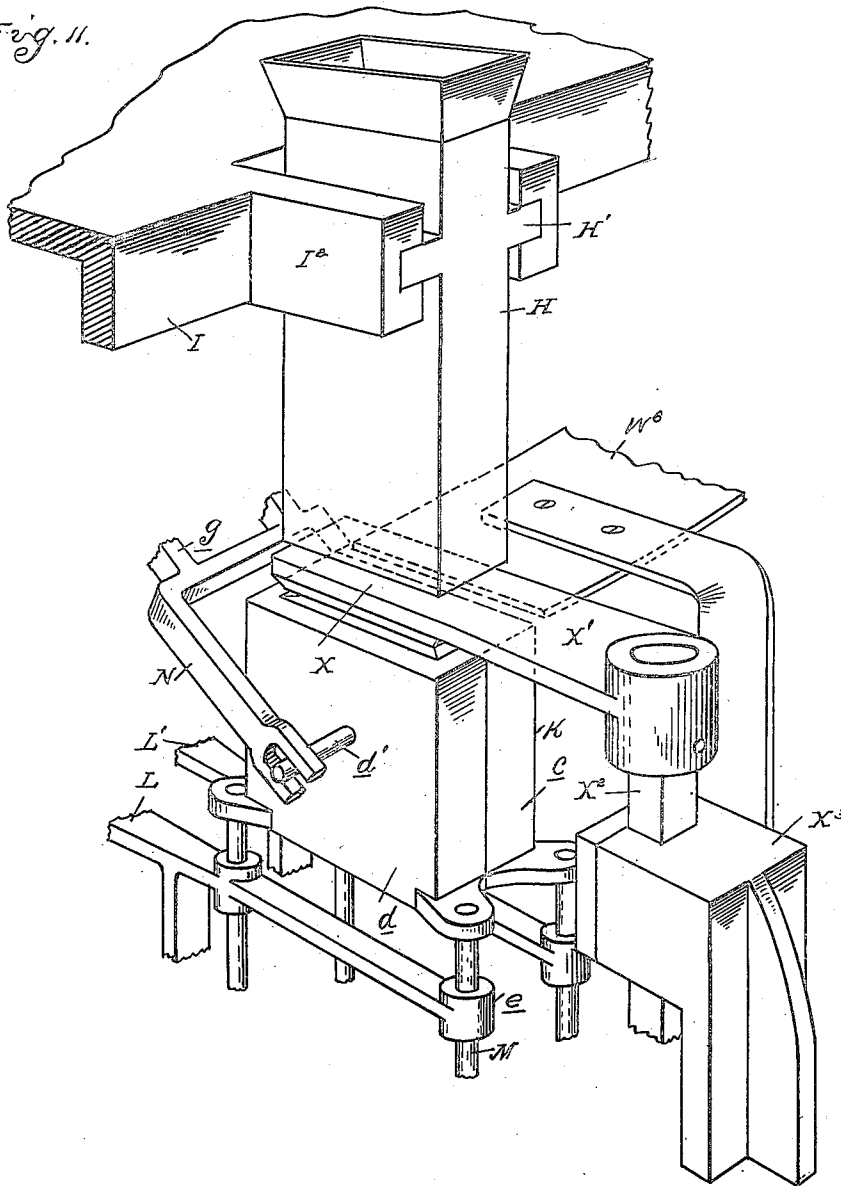
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7 SHEETS—SHEET 5.

Fig. 11.



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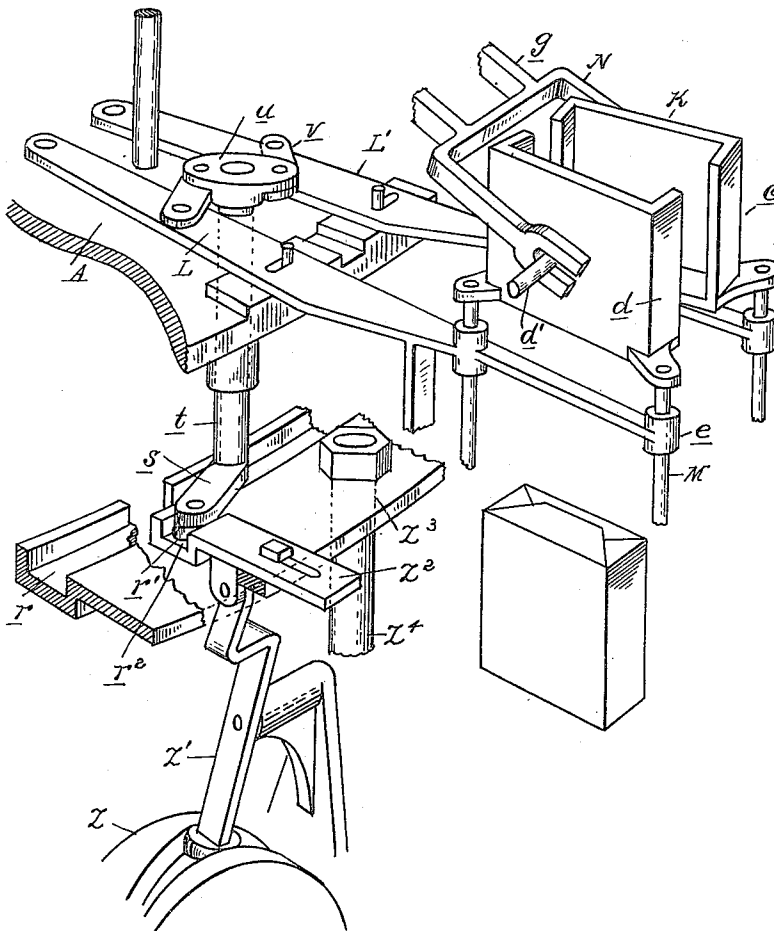
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7 SHEETS—SHEET 6.

Fig. 12.



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7 SHEETS—SHEET 7.

Fig. 13.

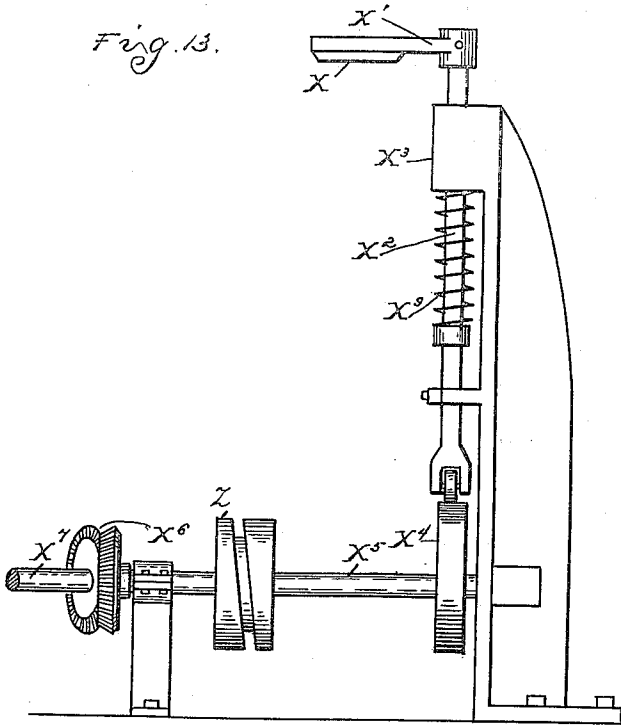
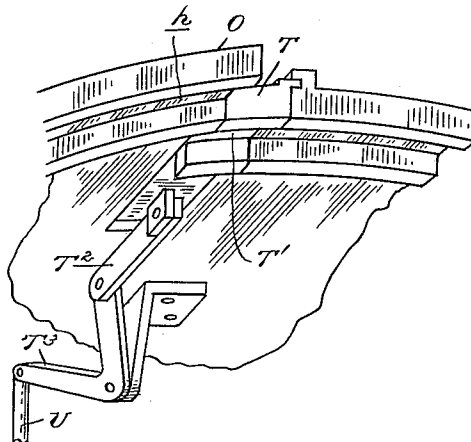


Fig. 14.



Witnesses
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UNITED STATES PATENT OFFICE.

JOSEPH N. CROWLEY, OF TOLEDO, OHIO.

MACHINE FOR FILLING AND CLOSING BAGS.

949,675.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed April 19, 1905. Serial No. 256,480.

To all whom it may concern:

Be it known that I, JOSEPH N. CROWLEY, residing at Toledo, in the county of Lucas and State of Ohio, a citizen of the United States, have invented certain new and useful Improvements in Machines for Filling and Closing Bags, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to machines for filling and closing bags, and is more particularly designed for use in the filling of bags with tobacco.

In the preparation of certain grades of chewing tobacco, the cut leaves are mixed with a molasses or syrup, resulting in a sticky mass which is difficult to handle. Heretofore, tobacco of this character has usually been placed in bags by hand operation and it is the object of the present invention to provide automatic mechanism for accomplishing this purpose. The difficulties encountered are first due to the sticky nature of the substance and second, to the fact that any pressure upon the substance will tend to compact it and destroy its value. These difficulties have been overcome by the present construction of machine as hereinafter set forth.

In the drawings, Figure 1 is a longitudinal section, partly in elevation of the machine; Fig. 2 is a sectional plan view thereof; Fig. 3 is an elevation of the bag filler; Figs. 4 and 5 are longitudinal sections thereof, illustrating the operation of the filling mechanism; Fig. 6 is an elevation of the mechanism for the completion of the filling operation; Fig. 7 is a perspective view of the bag closing mechanism, illustrating the first of its operations; Fig. 8 is a plan view thereof; Fig. 9 is a perspective view showing the second operation; Fig. 10 is a sectional elevation illustrating the third operation; Fig. 11 is a perspective view, showing the final operation of closing the bag; Fig. 12 is a perspective view illustrating the mechanism for dropping the filled bag from the machine; Fig. 13 is an elevation of the crimping mechanism; Fig. 14 is a perspective view of the actuating mechanism for lowering the bag holder.

In general construction, the machine comprises a series of bag filling devices and a revoluble carrier upon which said filling de-

vices are mounted and by which they are carried into operative relation to the cooperating mechanism. There is also associated with the carrier, mechanism for closing the bags when filled and for ejecting them when closed, as will be hereinafter described.

In the construction preferably employed, the revoluble member A is in the form of a circular table, which is journaled upon a post or column B mounted upon a suitable base C. The table A is intermittently driven through partial rotations by means of the star wheel D, which is provided with open-ended radial slots *a* and intervening concave segments *b*.

E is a rotary head carrying a roll E' for engaging with the slots *a* and with a segmental flange E² for engaging with the concave *b* during the interval in which the roll is disengaged from the slots and thereby locking the star wheel from movement. The head E is mounted upon a vertical shaft F, which is driven through the bevel gear wheels F', shaft F² and gears F³ from a motor G or other source of power.

The material to be placed in the bags is separated into quantities of proper weight preferably by hand or by mechanism forming no part of the present invention, which relates to the filling and bag closing devices. The filling mechanism comprises a series of filler tubes H, each of which is of a size to fit within the bags and is flared at its upper end to form a receiver. These tubes are preferably detachably secured to a revoluble carrier frame I, which is mounted upon the post B and is connected through the medium of the posts I', head J and post J' with the table A, so as to revolve therewith and all together forming a revoluble carrier. The engagement between the tubes H and the frame I is illustrated in Fig. 4, in which I² are grooved ways projecting from the periphery of the frame I and H' are flanges upon the tubes H, which are adapted for engagement, with said ways. Thus, the tubes may be quickly removed from or engaged with the frame I, and while disengaged the bags to be filled are sleeved upon the tubes.

In vertical alinement with each of the tubes H is a bag holder K, which is mounted for vertical reciprocation upon the table A. This holder is formed preferably of two separable sections *c* and *d*, which are ar-

ranged to be moved laterally in relation to each other to open or close the holder. To permit of this combined vertical and lateral movement of the holders K, they are preferably secured to the table A through the medium of levers L and L' fulcrumed upon the table and extending outward beyond the periphery thereof. Each of these levers is provided with bearings *e*, in which are vertically slidably secured the rods M having mounted on their upper ends the sections *c*, *d*.

N is a bifurcated lever embracing the sections *c*, *d*, of the holder K and engaging pins *c'*, *d'* thereon, said lever being fulcrumed at *f* upon the head J of the carrier. These levers N are preferably in the form of bell cranks and carry on their short arms *g*, anti-friction rolls *g'* which engage with a cam groove *h*, formed in a stationary head O mounted on the post B. The arrangement is such that in the rotation of the carrier, the rolls *g'* will travel around the cam groove *h*, which is so fashioned as to cause a movement of the bell cranks N and a consequent vertical movement of the holders K and rods M.

The function of the bag holders above described is first to hold the bag in position upon the filler tube H, and second, to move the bag downward during the operation of transferring the material from the filler tube into the bag, so as to prevent compacting. There is a further function of holding the filled bag during the operation of the closing mechanism, and the final ejection of the filled and closed bag by the separation of the sections of the holder. These functions are successively performed during one revolution of the carrier, so that by the time the holders have completed their revolution they have gone through the entire cycle of movements and are ready to repeat the same. These successive movements will now be described in detail, in connection with the co-operating mechanism.

The bags are placed on the detached filler tubes by the operator who then places a tube with the bag thereon in engagement with the ways I² on the frame I of the carrier, preferably at the point indicated by the numeral 1 (Fig. 2) in the drawings. During the succeeding movement of the carrier, the roll *g'*, in traveling around the cam groove *h* will actuate its corresponding bell-crank lever N, so as to raise the bag holder K and slip the same over the filler tube H and the bag thereon. By the time the filler tube has reached the point indicated by the numeral 2 (Fig. 2), the bag holder has been completely raised, and at this position the material to be filled into the bag is placed in the hopper of the filler tube. At the next stopping point of the carrier, indicated

by the numeral 3 (Fig. 2), is arranged a plunger P, the shank of which is vertically slidably mounted in bearings Q on the bracket arm Q' secured to the upper end of the post or column B. The plunger is actuated by a lever R, which is fulcrumed at R' and at its inner end is connected by the rod R², passing downward through the hollow column B with a bell crank lever S actuated by a revoluble cam S'. This cam is mounted upon the shaft F, before described, and during the continuous rotation of said shaft, the cam is revolved and at certain points in its rotation, will impart movement to the bell crank S to cause a corresponding movement of the plunger P.

The plunger P is of a form to exactly fit within the filler tube H and during the interval when said tube is arranged at point 3, the plunger will be depressed, thereby forcing the material within the tube downward. Simultaneous with this operation, the bag holder K is depressed and at the same rate of movement, so that the material ejected from the lower end of the filler tube will be placed in the bag without compression. Inasmuch as the depression of the bag holder occurs during the interval of rest of the carrier, it is obvious that the stationary cam *h* cannot be utilized to impart the necessary movement to the bell crank N. A separate actuating device is therefore provided, comprising a slide T engaging a radial channel in the head O. This slide is provided with a recess T' which is initially in registration with the cam groove *h*, through which the roll *g'* travels during the movement of the filler tube H to station point 3. Thus, in the final movement of the carrier, the roll *g'* passes out from the cam groove *h* into the recess T' of the slide T. This slide is connected by a link T² and bell crank lever T³ with a rod U, passing downward through the hollow column, and connected at its lower end with a bell crank lever U', one end of which is provided with a roll engaging a second cam groove U² in the cam wheel S'. This cam groove is so fashioned that during the period of rest of the carrier, the slide T will be moved outward in the radial slot and will thereby actuate the bell crank lever N to depress the bag holder K, as has been before described. After this movement of the slide, the roll *g'* will be held in a position in registration with a portion *h'* of the cam groove *h*, so that the succeeding movement of the carrier will reengage the roll with this cam and groove.

In the next succeeding movement of the carrier, the bag holder having the filled bag therein is transferred to station point 4 (Fig. 2) where the top of the bag is folded to close the same by mechanism of the following construction:—V is a rock shaft jour-

naled in bearings in a vertical standard V' on the bed C and extending in a horizontal plane radially in relation to the table A. This shaft is longitudinally slidable as well as revoluble in its bearings and is reciprocated longitudinally by a lever V² having a bifurcated upper end embracing a grooved collar V³ on the shaft and engaging the same by pins V⁴. At the inner end of the shaft V is a folding plate V⁵, which in normal position extends upward, but which may be turned by a partial rotation of the shaft into a horizontal plane. This rocking of the shaft is effected by a rock arm V⁶ feathered upon the shaft V.

In normal position of parts, the rock shaft V which is in a plane slightly above the bag holder in its lowered position is withdrawn outward, so as to clear the path of the bag in the holder during its movement from station 3 to station 4. When at the latter point, the shaft V is first moved inward by the operation of the lever V², after which the actuation of the rock arm V⁶ will cause a rocking of the shaft and the turning of the plate V⁵, as indicated in Fig. 7, so as to fold downward one side of the bag projecting above the holder. The ends of the bag are then folded by oppositely moving fingers W and W'. These are secured to parallelly arranged rods W² and W³, which are connected by a lever W⁴ which causes them to move oppositely in relation to each other. One of these rods is connected to a rock arm W⁵ adapted at the proper time to reciprocate the rod to cause the operation of the folding finger attached thereto and through the medium of the lever W⁴ simultaneously actuate the opposed finger. The rods W², W³ are supported upon a table W⁶ upon which is also fulcrumed the lever W⁴. This table is arranged just above the upper end of the bag holder and is in the path of the bag as it is moved by the carrier from station point 4 to station point 5. Thus, after one side and the ends of the bag have been folded by the mechanism described, the movement of the bag holder will carry the bag beneath the table W⁶ which will fold down the remaining side.

After the bag has been folded in the manner described, it is prevented from again opening by a crimping mechanism arranged at station point 5. This, as illustrated in Fig. 11, comprises a plate X of a size to fit the top of the closed bag, said plate being carried by a laterally extending arm X' secured to the vertically movable rod X² which is slidably secured in bearings X³. The lower end of this rod extends in proximity to a cam X⁴ upon a shaft X⁵ which is driven through the medium of bevel gear wheels X⁶ from a shaft X⁷ and the latter is driven through the medium of bevel gear

wheels X⁸ from the shaft F. The cam X⁴ is so fashioned as to gradually raise the rod X² and plate X and at the time the folded bag reaches station point 5, an abrupt operation of the cam permits the rod and plate to fall, thereby pressing downward the folded portion of the bag. The downward movement of the plate is accelerated by a spring X⁹ on the rod X², the effect being to strike a sharp blow upon the bag and cause the creasing or bending of the paper, so as to give a permanent set or crimp.

The shaft X⁷ upon which the bevel gear wheel X⁸ is mounted extends outward and has secured thereto a cam wheel Y for operating the folder mechanism. The actuating connections between this cam and the folder comprise two anti-friction rolls *i* and *j* respectively engaging cam grooves upon opposite sides of the wheel and an anti-friction roll *k* engaging the periphery of the wheel. These rolls are respectively connected to vertically slidable rods *l*, *m*, *n*. The rod *l* is connected by a link *o* with the lever V² which is in the form of a bell crank. The rod *m* is connected by a link *p* with a rock arm *q* on a rock shaft *q'* upon which the rock arm W⁵ is secured. The rod *n* is connected to the rock arm V⁶. Thus, the single cam wheel Y is used to actuate all of the parts of the folder mechanism.

As soon as the crimping of the bag has been effected, the sections *c*, *d* of the holder are separated to permit of the disengagement of the bag therefrom, this being effected by the following mechanism: Z is a cam upon the shaft X⁵ which engages a lever Z' for actuating a slide Z² arranged radially of an annular head Z³ mounted on posts Z⁴ on the bed. This annular head Z³ is provided with an annular channel *r* with which a roll *r'* on a rock arm *s* engages. The rock arm *s* is secured to a vertical rock shaft *t* journaled in bearings upon the carrier A and provided at its upper end with oppositely extending rock arms *u* connected by links *v* with the levers L and L'. The slide Z² is arranged to extend across the path of the channel *r* and is provided with a recess *r*², which is normally in registration with said channel *r* and forms a complementary portion thereof. The channel *r* is concentric with the axis of the revoluble carrier A, and as a consequence during the movement of the carrier the roll *r'* will travel around this channel without imparting any rocking movement to the shaft *t*. Thus, the levers L and L' will remain stationary and in a position where the sections *c* and *d* of the bag holder are closed. When, however, the roll *r'* engages with the recess *r*² of the slide Z² at station point 5, movement is imparted to said slide from the cam Z through the medium of the lever

Z', and this will cause a rocking movement of the arm *s* and rock shaft *t* which in turn actuates the rock arm *u* and links *v* to separate the levers L and L' and the sections *c, d* carried thereby. When thus separated, the filled and closed bag will drop out as indicated in Fig. 12.

In the above description only one set of levers L and L' and bell crank lever N have been described but it will be understood that each of the bag holders K is provided with a set of levers which are successively operated during the movement of the carrier in the manner described.

15 What I claim as my invention is:—

1. In a bag filling machine, the combination with an open-ended filler tube adapted for the sleeving of a bag on the lower end thereof, a reciprocating plunger for entering the upper end of said tube and ejecting the material therein from the lower end thereof, a bag holder embracing the bag sleeved upon said tube, and means for lowering said bag holder simultaneously and correspondingly with the movement of said plunger, whereby the bag is filled without compacting the material.

2. A bag filling machine, comprising an open-ended filler tube adapted for the sleeving of the bag on its lower end, a bag holder embracing said bag upon said tube, a plunger, means for reciprocating said plunger to enter the upper end of said tube and eject the material therein from the lower end thereof, mechanism simultaneously and correspondingly actuated for lowering said bag holder, and means for subsequently disengaging the filled bag from said holder.

3. In a bag filling machine, the combination with a revoluble carrier, of an open-ended filler tube and a bag holder mounted upon said carrier and in vertical alinement, means for reciprocating said bag holder vertically in relation to said filler tube, a plunger arranged to register with the upper end of said filler tube during the interval of rest of said carrier, means for reciprocating said plunger to eject the material from said tube simultaneously and correspondingly with the lowering of said bag holder.

4. In a bag filling machine, a revoluble carrier, means for intermittently actuating said carrier, a series of filler tubes mounted thereon, a plunger arranged to register with said tubes during successive intervals of rest of the carrier, mechanism for actuating said plunger to eject the material from the lower end of the registering filler tube, a bag holder for each filler tube, and means for lowering said bag holder simultaneously and correspondingly with the downward movement of said plunger, whereby the material is placed in the bags without compression.

5. In a bag filling machine, the combina-

tion with a revoluble carrier and means for intermittently actuating said carrier, of a filler tube adapted for the sleeving of a bag thereon detachably engaging said carrier, a bag holder mounted on said carrier in alinement with said filler tube, means operating during the travel of said carrier for raising said bag holder to embrace the bag on said filler tube, a plunger arranged to register with said filler tube during an interval of rest of said carrier, and means for correspondingly and simultaneously depressing said plunger and said bag holder, for the purpose described.

6. In a bag machine, a revoluble carrier, means for intermittently actuating said carrier, a series of radially extending ways at the periphery of said carrier, filler tubes adapted for the sleeving of a bag thereon and for detachable engagement with said ways, a bag holder in alinement with each filler tube when in engagement with said ways and mounted for vertical reciprocation upon said carrier, a plunger for ejecting the material from said filler tubes and means for simultaneously depressing the corresponding bag holder, for the purpose described.

7. In a bag filling and closing machine, the combination with a revoluble carrier, of a filler tube mounted thereon, a bag holder in alinement with said filler tube, means for transferring the material from said filler tube to the bag in said holder and folding mechanism with which said bag holder registers during the movement of said carrier for closing the top of the bag, and mechanism for crimping the closed top to prevent the re-opening of the bag.

8. In a bag filling and closing machine, the combination with a revoluble carrier, of a bag holder mounted thereon, means for filling the bag, mechanism subsequently operating for folding the top of said bag to close the same, and a crimping device consisting of a plate registering with the top of the bag holder, and means for depressing said plate to crease the open edges of the paper to prevent the re-opening of the bag.

9. In a bag filling machine, a revoluble carrier, a series of filler tubes mounted thereon, a corresponding series of bag holders in alinement with said filler tubes and each formed of separable sections, means for vertically reciprocating said holders to engage or disengage the same from said filler tubes, and means for laterally moving the sections of said holder to separate the same.

10. A bag filling machine comprising a revoluble carrier, a filler tube mounted in the upper portion of said carrier, a bag holder in vertical alinement therewith formed in separable sections, laterally movable levers with which the respective sections of said holder have a vertically sliding

engagement, means for raising and lowering said holder in relation to said filler tube, and means for operating said levers to separate the sections of said holder.

- 5 11. A bag filling machine comprising a vertical column, a revoluble carrier journaled upon said column, a filler tube mounted on said carrier, a bag holder in alinement with said filler tube mounted for vertical
10 movement upon the lower portion of said carrier, a lever for raising and lowering

said bag holder, and a stationary cam mounted on said column engaging with said lever to actuate the same during the movement of the carrier.

In testimony whereof I affix my signature in presence of two witnesses.

15

JOSEPH N. CROWLEY.

Witnesses:

M. B. McCARTHY,
M. C. NOLAN.