E. L. BRACY.

TOBACCO PACKAGING MACHINE.

APPLICATION FILED DEC. 11, 1911.

1,125,802.

Patented Jan. 19, 1915.

8 SHEETS—SHEET 1.

Fig. 15

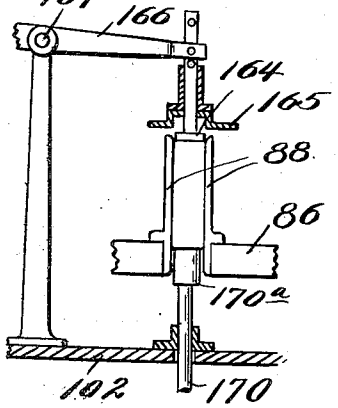


Fig. 1.

Witnesses

C. A. Kesler

C. A. Bateman.

Inventor

Edward L. Bracy

By James L. Norris Jr.

Attorney

E. L. BRACY.

TOBACCO PACKAGING MACHINE.

APPLICATION FILED DEC. 11, 1911.

1,125,802.

Patented Jan. 19, 1915.

8 SHEETS—SHEET 2.

Fig. 16.

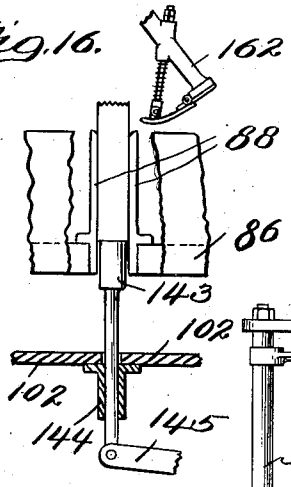


Fig. 2.

Witnesses

C. A. Bateman

Inventor

Edward L. Bracy

By James L. Norris

Attorney

E. L. BRACY.

TOBACCO PACKAGING MACHINE.

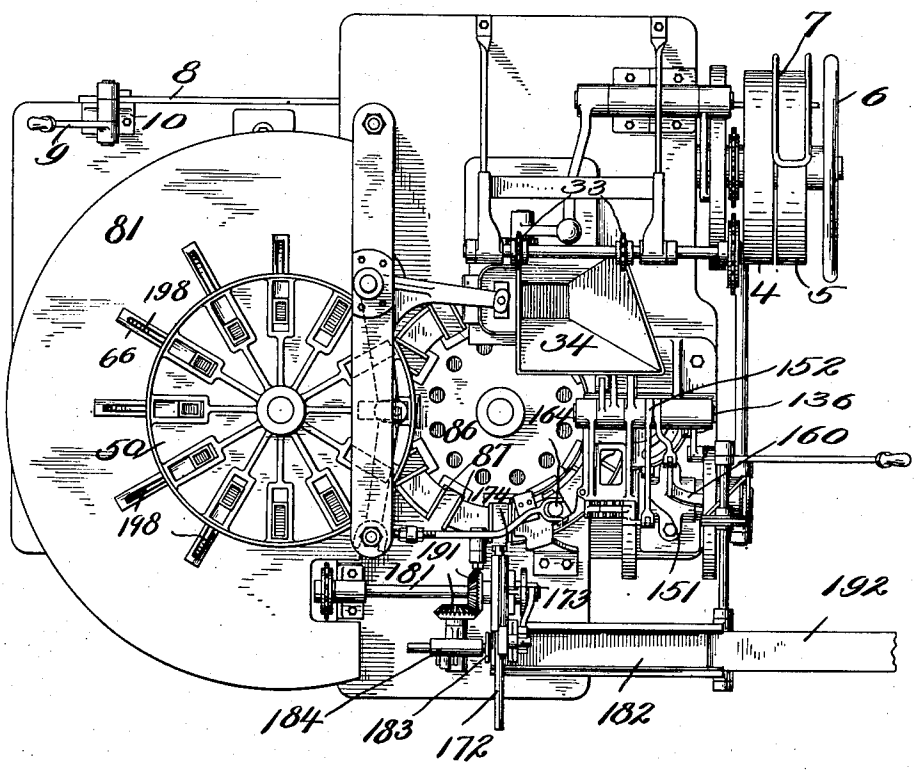
APPLICATION FILED DEC. 11, 1911.

1,125,802.

Patented Jan. 19, 1915.

8 SHEETS—SHEET 3.

Fig. 3.



Witnesses

C. A. Bateman

Inventor

Edward L. Bracy

By James L. Norris Jr.

Attorney

E. L. BRACY.

TOBACCO PACKAGING MACHINE.

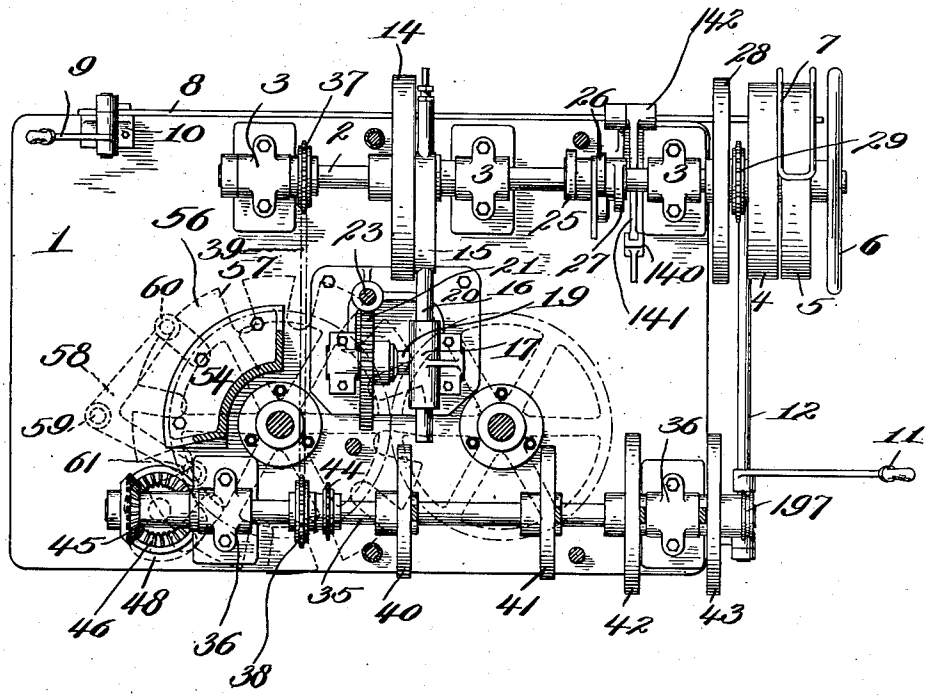
APPLICATION FILED DEC. 11, 1911.

1,125,802.

Patented Jan. 19, 1915.

8 SHEETS—SHEET 4.

Fig. 4.



Witnesses

C. A. Bateman.

Inventor

Edward L. Bracy

By James L. Norris

Attorney

E. L. BRACY.

TOBACCO PACKAGING MACHINE.

APPLICATION FILED DEC. 11, 1911.

1,125,802.

Patented Jan. 19, 1915.

8 SHEETS—SHEET 5.

Fig. 6.

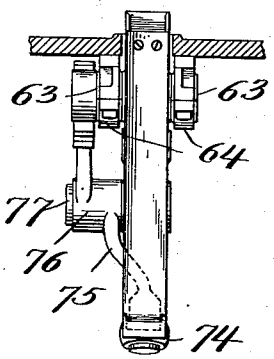
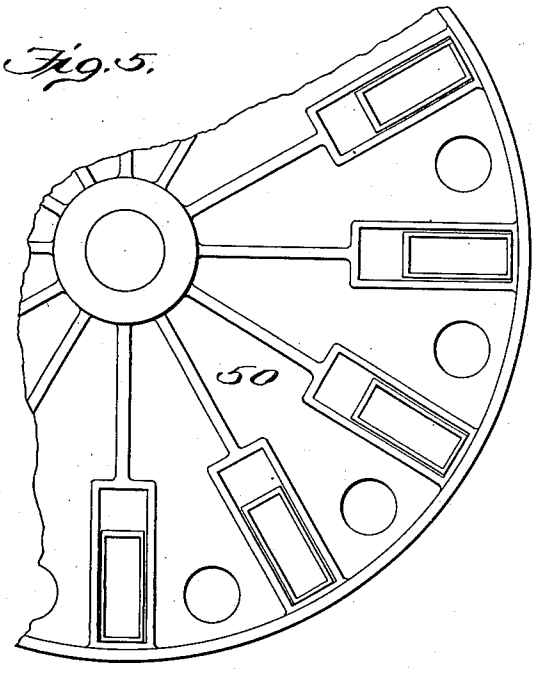


Fig. 5.



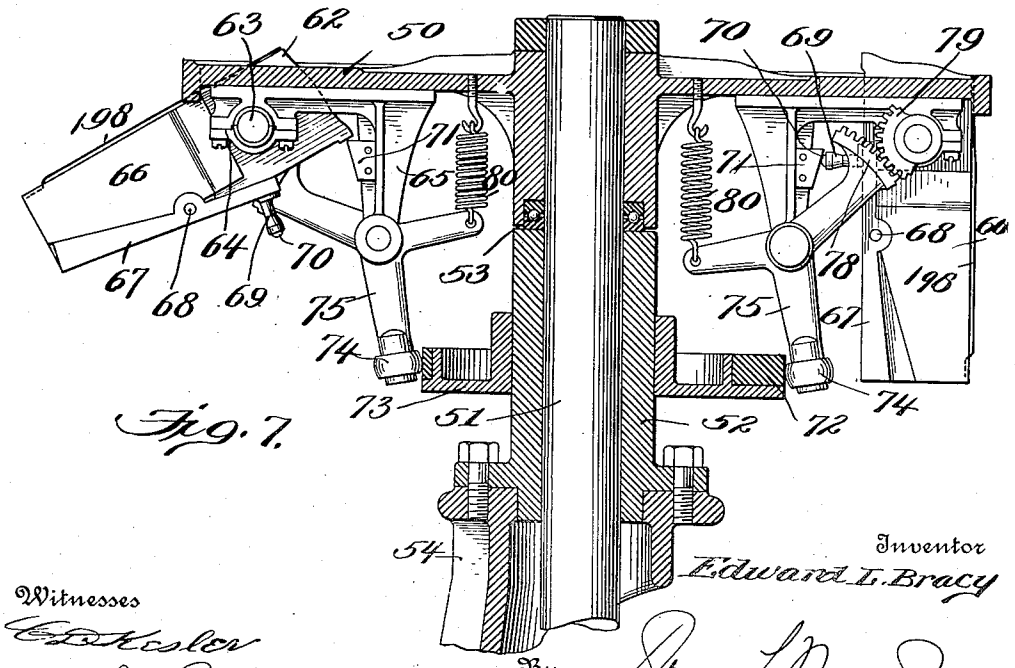


Fig. 7.

Witnesses

C. A. Bateman

Inventor

Edward L. Bracy

By James L. Norris Jr.

Attorney

E. L. BRACY.

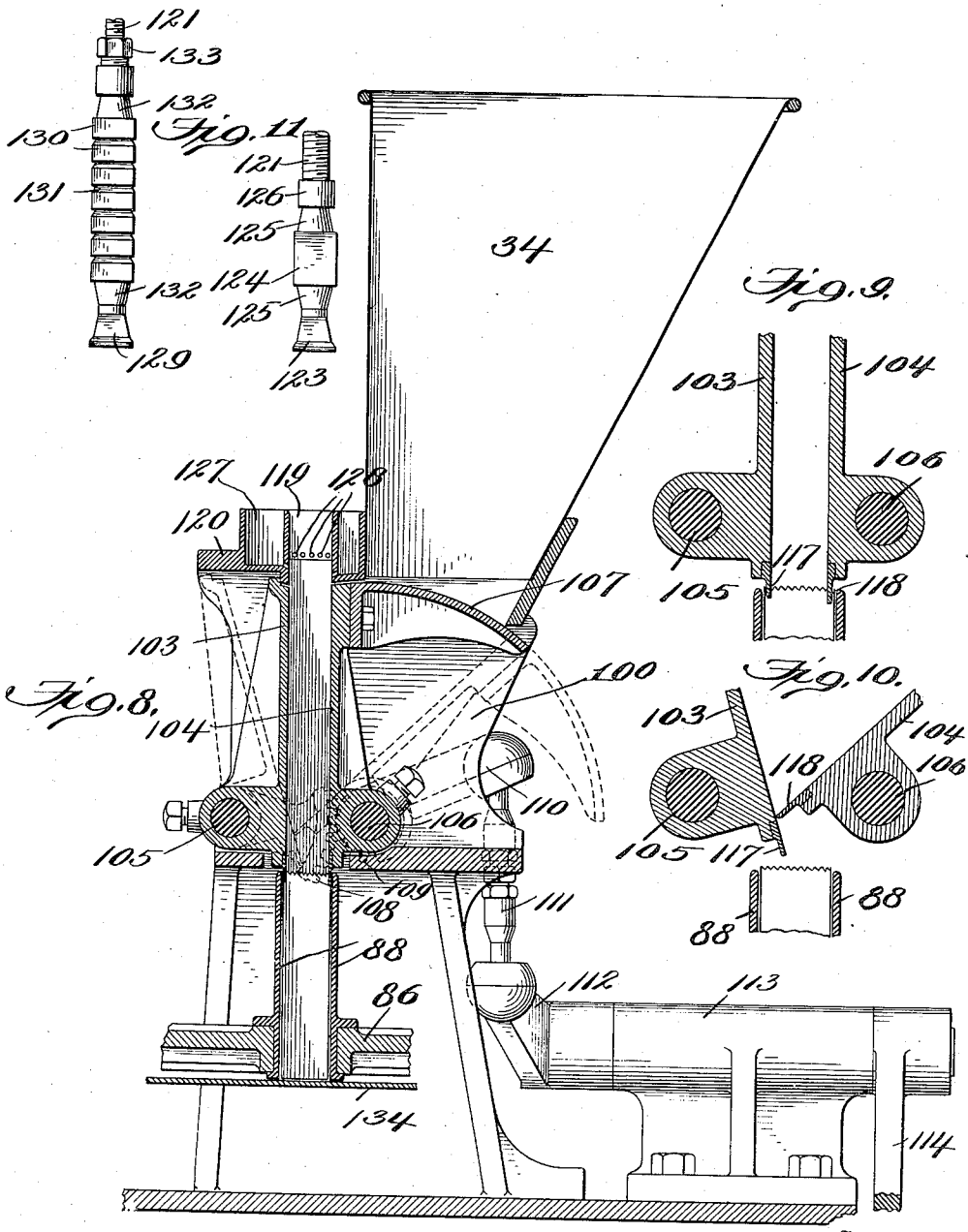
TOBACCO PACKAGING MACHINE.

APPLICATION FILED DEC. 11, 1911.

1,125,802.

Patented Jan. 19, 1915.

8 SHEETS—SHEET 6.



Witnesses

C. A. Kesler

C. A. Bateman

Inventor

Edward L. Bracy

By Amos L. Norris Jr.

Attorney

E. L. BRACY.

TOBACCO PACKAGING MACHINE.

APPLICATION FILED DEC. 11, 1911.

1,125,802.

Patented Jan. 19, 1915.

8 SHEETS—SHEET 7.

Fig. 12.

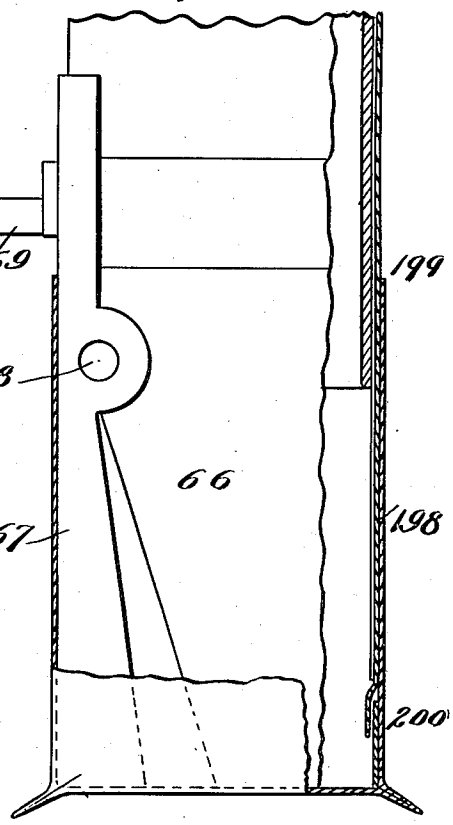


Fig. 13.

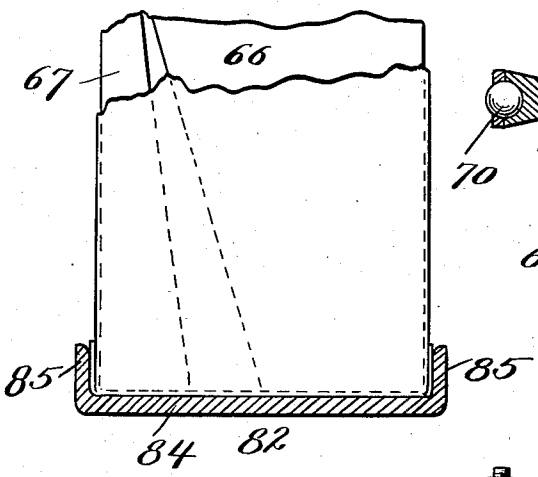
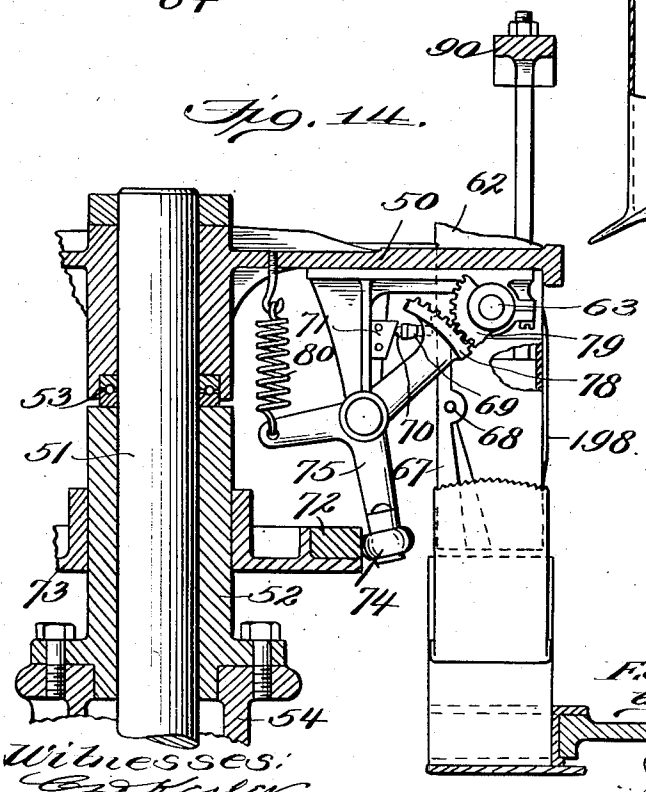


Fig. 14.



Witnesses:
C. A. Bateman

Inventor
Edward L. Bracy
by
James L. Norris Jr.
Atty

E. L. BRACY.

TOBACCO PACKAGING MACHINE.

APPLICATION FILED DEC. 11, 1911.

1,125,802.

Patented Jan. 19, 1915.

8 SHEETS—SHEET 8.

Fig. 17.

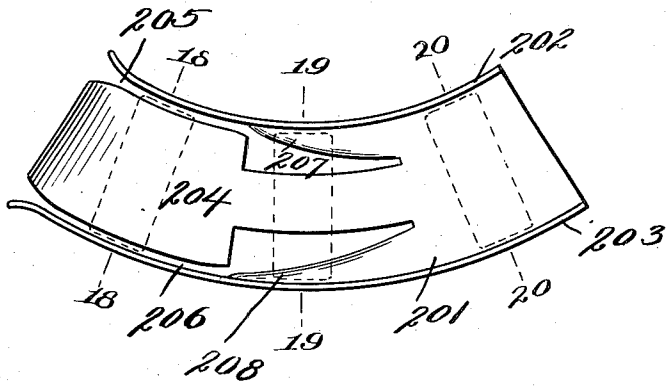


Fig. 18.

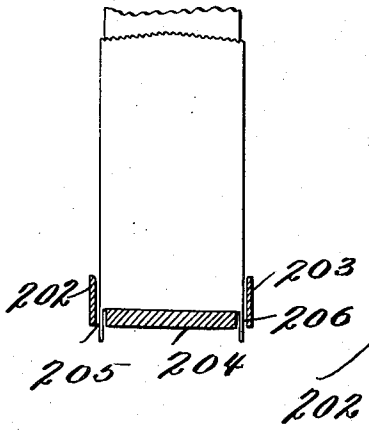


Fig. 19.

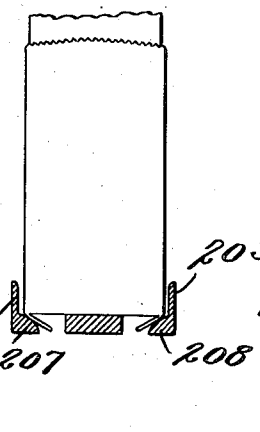
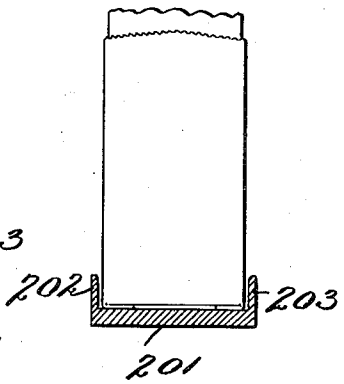


Fig. 20.



Witnesses

C. A. Bateman

Inventor

Edward L. Bracy

By James L. Norris Jr.

Attorney

UNITED STATES PATENT OFFICE.

EDWARD L. BRACY, OF SCOTLAND NECK, NORTH CAROLINA, ASSIGNOR TO RICHARD H. WRIGHT, OF DURHAM, NORTH CAROLINA.

TOBACCO-PACKAGING MACHINE.

1,125,802. Specification of Letters Patent. Patented Jan. 19, 1915.

Application filed December 11, 1911. Serial No. 665,077.

To all whom it may concern:

Be it known that I, EDWARD L. BRACY, a citizen of the United States, residing at Scotland Neck, in the county of Halifax and State of North Carolina, have invented new and useful Improvements in Tobacco-Packaging Machines, of which the following is a specification.

My present invention relates to improvements in packaging machines and more especially to such machines of the class adapted to fill and pack tobacco in bags or other suitable receptacles, and the primary object of the invention is to provide an improved machine of this character embodying in combination a carrier bearing formers to which the empty bags may be readily and conveniently applied, means for transferring the formed bags from said formers on said carrier to molds on a second carrier, mechanism for automatically introducing uniformly packed charges of material into the respective bags contained in said molds, and means for removing the filled bags from the molds to suitable receiving means after the filled bags have been closed, whereby the operation of the machine is greatly facilitated, the filled bags will possess the proper shape, and the charges will be uniformly distributed and packed within the bags.

Another object of this invention is to provide improved means for receiving and properly forming or shaping the bags or receptacles, such means in its preferred form comprising a movable carrier bearing a plurality of formers, such formers being pivoted whereby they may swing bodily into a position which will enable the operator to conveniently apply the bags thereto, and means is provided for subsequently swinging the formers with the bags thereon to a position whereby such bags are transferred to the molds of a second carrier, the formers being relatively collapsible to enable the bags to be easily and quickly applied to them, and means is provided for subsequently expanding the formers to properly shape the bags and to retain them thereon until the bags are transferred to the molds of a coöperating carrier.

A further object of this feature of the invention is to provide the formers with means whereby they may compensate for variations in the size of the bags, thereby insuring proper shaping of bags that are slightly larger or smaller than the intended size, preventing breakage of undersized bags and preventing the larger bags from dropping from the formers.

Another object of the invention is to provide in a machine of this class, a pair of coöperative carriers, one supporting a set of formers to receive and shape the bags, and the other carrier bearing a set of molds adapted to receive the shaped bags from the former, a plunger being provided which is operative through each former of the first carrier and transfers the shaped bag from the former to the mold, the carriers and plunger being operated at proper intervals to bring a former and mold in alinement with the plunger.

Another object of the invention is to provide means for uniformly packing the charges of material and for introducing these packed charges in evenly distributed condition within the bags, such means comprising in the preferred embodiment of the invention coöperative pivoted compression members which when in one position receive a charge of material between them and when shifted to a reverse position uniformly compress the charge, one of the compression members being also preferably constructed to serve as a valve which controls the supply of material to the compression space between the members. These compression members are also provided with means to engage the edges of the bag adjacent to the opening thereof and when the compression members are operated to compress the charge, the edges of the bag are opened and are clamped against coöperating walls of the mold whereby the bag is held securely and in open condition while the charge is being introduced therein, displacement of the bag and loss of material being thereby avoided.

Further objects of the invention are to provide mechanism for indenting the upper closed end of the bag or package together with means for shifting the bag or package into coöperative relation with the indenting mechanism, and to provide means for removing the filled and closed bags from the molds and for feeding the filled and closed bags along a runway where labels and revenue stamps when used may be conveniently applied.

To these and other ends, the invention consists in certain improvements, and com-

binations and arrangements of parts, all as will be hereinafter more fully described, the novel features being pointed out particularly in the claims at the end of the specification.

In the accompanying drawings:—Figure 1 is a front elevation of a packaging machine constructed in accordance with the present invention; Fig. 2 is a side elevation of the machine as viewed from the right in Fig. 1; Fig. 3 is a top plan view of the machine; Fig. 4 represents a horizontal section through the machine below the plane of the former and mold carriers, and showing the operating mechanism; Fig. 5 is a top plan view of a portion of the former carrier; Fig. 6 is a detail view of one of the formers; Fig. 7 represents a diametrical section through the former carrier and showing one of the formers in position to receive a bag and another former in position to transfer the bag to a corresponding mold on the mold carrier; Fig. 8 represents a vertical section through the supply hopper for the material, the packer, and one of the molds, the packer being in position to compress or pack the material and the bag being shown in the mold and held in position by the grippers on the compression members of the packer; Figs. 9 and 10 are fragmentary sectional views of the coöperative parts of the compression members and the mold and showing respectively the manner in which the bag is gripped and held in open condition and the way in which the compression members close the bottom of the space between them to form a pocket for the reception of the material; Fig. 11 shows in detail two different forms of plunger for the packer; Fig. 12 is a detail view of one of the bag holders or formers and illustrating diagrammatically the manner in which the holder or former compensates for bags of different sizes; Fig. 13 is a detail sectional view showing the folding device for turning up the lower corners of the bag; Fig. 14 shows diagrammatically a bag holder or former in alinement with a mold and the plunger in position to transfer the bag from the holder or former to the mold; Figs. 15 and 16 are detail sectional views showing the plungers for lifting the packages into coöperative relation with the indenting and folding devices; Fig. 17 is a detail plan view of a folder which is adapted to turn the ears under the package; and Figs. 18, 19 and 20 represent sections on the lines 18—18, 19—19 and 20—20 respectively of Fig. 17.

Similar parts are designated by the same reference characters in the several views.

Packaging machines constructed in accordance with the present invention are capable of use generally in filling bags and similar receptacles with materials of different kinds. The invention is particularly applicable to machines for packaging tobacco, and in the accompanying drawings, I have shown a machine adapted for this purpose. It will be understood, however, that the invention is not limited to the particular construction shown, as modifications and changes may be made in the detail construction and relative arrangement of the parts in order that the invention may be applied to the best advantage and to meet the requirements of each particular case. It is to be understood that packaging machines embodying the present invention are applicable generally to the filling of receptacles of various kinds, the term "bag" being used merely in a generic sense.

In the present instance, the machine embodies a suitable base 1 which serves to support the various mechanisms of the machine. The main or power shaft 2 is mounted in bearings 3 secured to the upper side of the base, this shaft being provided with tight and loose pulleys 4 and 5 which coöperate with a suitable driving belt, and a hand wheel 6 is also shown on the power shaft whereby the machine may be rotated manually when desirable or necessary. The belt guide 7 serves to shift the driving belt with respect to the pulleys 4 and 5 and this guide is connected to a shifting bar 8, the latter being operable either by a handle 9 which is pivoted to the bracket 10 on the base or by the handle 11 which is fixed to a shaft 12, the latter being connected to the shifting bar 8 by the arm 13. A cam 14 is fixed on the power shaft 2 and coöperates with a horizontally reciprocatory member 15, the latter straddling and coöperating with the power shaft as a guide, and the inner end of this member is provided with a rack bar 16 which reciprocates horizontally in a guide or bearing 17, the teeth of the rack 16 coöperating with a pinion 18 which is fixed on the shaft 19, this shaft being journaled in suitable bearings on a bracket 20, and a gear 21 is fixed to the shaft 19 and coöperates with the rack teeth 22 formed on the lower end of a vertically reciprocatory rod 23, the lower end of this rod 23 operating in a guiding sleeve 24 which is preferably formed as a part of the bracket 20. The shaft 2 also has a set of three cams 25, 26 and 27 fixed thereon, these cams serving for a purpose to be hereinafter described, and a cam 28 is also fixed to the power shaft 2, this latter cam serving to operate the press as will be hereinafter described. A sprocket wheel 29 is fixed to the shaft 2, this sprocket wheel cooperating with a chain 30, and this chain cooperates with a sprocket wheel 31 mounted on a shaft 32, the shaft 32 bearing sprocket wheels 33 which drive a conveyer which conducts the tobacco or other material to the supply hopper 34.

A secondary shaft 35 is also journaled in bearings 36 on the upper side of the base 1,

and this secondary shaft is driven by suitable means from the main or power shaft 2, sprocket wheels 37 and 38 being used in the present instance which are secured to the shafts 2 and 35 respectively, and a chain 39 coöperates with these sprocket wheels and forms a driving connection between them. A set of cams 40, 41, 42 and 43 are fixed in predetermined relation on the shaft 35 and the purposes of these cams will be hereinafter described. A sprocket wheel 44 is also fixed on the shaft 35 and this sprocket wheel serves to operate the mechanism for ejecting the filled bags or packages from the molds and to feed the bags or packages along the runway. The shaft 35 also has a bevel gear 45 fixed thereto and this bevel gear coöperates with a similar gear 46 the shaft of which extends through a bearing 47 supported by the base 1, and the lower end of this shaft has a cam 48 fixed thereto and this cam bears an operating pin or projection 49.

The machine shown in the present instance is adapted to receive previously made bags and the bag-receiving and forming mechanism comprises a carrier 50 which in the present instance is in substantially the form of a wheel and is rotatable with a vertical shaft 51 to which such carrier is fixed. The upper end of the shaft 51 extends through a bearing 52 and an anti-friction thrust bearing 53 is preferably interposed between the hub of the carrier 50 and the upper end of the bearing 52 to sustain the weight of the carrier, the shaft and the mechanisms supported by these parts. The bearing 52 is supported on a rigid standard 54 which rests upon and is secured to the top of the base 1, and the lower end of the shaft 51 extends through a bearing 55 on the base 1 and is provided below said base with a toothed wheel 56. The tooth spaces 57 in the wheel 56 are adapted to receive successively the operating pin or projection 49 on the cam 48 whereby continuous rotation of the cam 48 will impart a step-by-step movement to the wheel 56 and to the carrier 50 which is driven by said wheel. The carrier 50 is successively locked in the different operative positions adapted to be occupied thereby, by a locking device which embodies in the present instance a bell-crank lever 58 which is pivoted at the under side of the base on the axis 59, one arm of the lever bearing a roller or projection 60 which is adapted to enter each tooth space 57 in the wheel 56, and the other arm of the lever bears a roller or projection 61 which coöperates with the periphery of the cam 48. The cam 48 revolves continuously, it operating at each revolution to withdraw the roller 60 from a tooth space in the wheel 56, the projection 49 will enter another tooth space in the wheel 56 and thereby advance the wheel 56 one step, and the roller 60 will enter the next tooth space in the wheel 56 and thereby lock said wheel in its advanced position, the wheel 56 being thereby rotated step-by-step and is locked from movement during the intervening intervals.

The step-by-step movement of the wheel 56 is transmitted to the carrier 50 which bears bag holders or formers of a number corresponding to the number of tooth spaces in the wheel 56, each movement of the wheel 56 bringing a former into position whereby the bag thereon may be transferred to a mold arranged to receive it. The bag-receiving and forming mechanism of the present invention enables the bags to be applied conveniently, and after each bag has been applied, it is expanded into the proper shape. In the present construction, the carrier 50 is provided with a set of circumferentially spaced bag holders and formers each of which is pivoted whereby it may swing bodily into a position which will facilitate the application of a bag thereto, and after the holder and former has received a bag, it is swung bodily and automatically into an upright position preparatory to the transfer of the bag to the mold which is carried by a coöperative carrier, and the swinging movement of the bag holder and former is utilized in the present instance to effect expansion of the bag holder and former whereby the bag will be opened into the proper shape and will be firmly held. To accomplish these results, each bag holder and former embodies a supporting shell 62 having alined trunnions 63 on its opposite sides which coöperate with bearings 64, these bearings in the present instance being part of a bracket 65. The bag-receiving portion of the holder and former comprises complemental sections 66 and 67, the section 66 being fixed to the supporting sleeve 62 while the section 67 is mounted on a pivot 68 whereby the major part of the section 67 may swing toward the stationary section 66 and thereby reduce the size of the bag-receiving end of the holder and former, the latter then having a tapered form as shown at the left in Fig. 7 which will enable the operator to quickly and easily apply a bag thereto, and when the section 67 is swung in a reverse direction about its pivot 68, the bag holder will assume the shape that is to be given the bag and at the same time the holder will be expanded and, hence, the bag holder will be fully opened and given the proper shape. In order to expand the bag holder and thereby open and form the bag, a stud 69 is secured to the section 67 at a point above its pivot 68, and this stud has a ball 70 in its end which coöperates with a cam 71, the cam being fixed to the bracket 65 and is engaged by the ball 70 when the

bag holder is swung into upright position about its trunnions 63 as an axis. After the bag has been transferred from the holder to the mold, the holder is turned to an inclined position whereby the ball 70 disengages from the cam 71 and the weight of the stud 69 may serve to swing the collapsible section 67 in collapsed position preparatory to the reception of another bag. Tilting of the bag holders from an inclined to an upright position and vice versa is effected automatically and at properly timed intervals by a suitably shaped cam 72 which is supported in fixed position by a bracket 73 which surrounds and is secured to the bearing 52, this cam coöperating with the rollers 74 for the different bag holders. Each of these rollers is carried by an arm 75 fixed to a hub 76, the hub being journaled on a pivot 77 which is supported by the bracket 65, and this hub 76 has a gear segment 78 fixed thereto, the gear segment coöperating with a segmental pinion 79 which is fixed to one of the trunnions 63 of each bag holder. Springs 80 serve to hold the rollers 74 in coöperative relation with the cam 72. To facilitate the operation of placing the bags on the bag holders and formers, a segmental table 81 is preferably provided, this table being supported, for example, by the standard 54.

In using ordinary flat bags, ears are formed at the lower corners of the bag when the same is applied to a holder of substantially rectangular form, and in order to prevent these ears from being filled with tobacco or material when the bag is charged, means is provided for turning these ears up against the narrow sides of the bag after the latter has been applied to the holders and formers. Such means embodies a folding cam 82 which is supported rigidly in stationary position by standards 83, and this folding cam is of segmental form and is curved to coincide with the path of movement of the lower ends of the bag holders as the latter approach the point where the bag is to be transferred to the mold. This folding cam has a bottom section 84 which bears against the bottom of the bag as the latter is carried over the folding cam by its respective holder, and a pair of parallel curved flanges 85 are provided the forward ends of which are inclined as shown, these flanges coöperating with the out-turned ears on the bag and causing the same to be folded upwardly and against the narrow sides of the bag. The folding of these arms is obviously effected automatically and while the bags are being brought to the transfer point.

After the bags have been properly opened and shaped by the holders as described, they are transferred to molds borne by a second carrier. This second carrier 86 rotates in a plane parallel to and below the plane of operation of the bag holders, this carrier being provided with a set of circumferentially spaced molds 87 of a number corresponding to the number of bag holders on the carrier 50, and in the present instance, each mold comprises a pair of parallel opposed side members 88 and the space between these members is open at both ends and at the top and bottom. The carriers 50 and 86 are so constructed and mounted that the bag holders on the carrier 50 are successively brought into alinement with the molds on the carrier 86, and while each bag holder is in alinement with a bag-receiving mold, the bag on the holder is transferred to the mold. The means of transferring the bags to the molds embodies in the present instance a vertically reciprocatory plunger 89 which is operative vertically through the hollow bag holder and former and coöperates with the bag to push the bag downwardly off the holder and between the side members 88 of the mold. This plunger is connected to a vertically movable cross head 90, the latter being guided by a vertical guide rod 91 which is fixed to the base, and the cross head is operated by the vertically movable bar 23 to which the cross head is secured. The rod 91 and the operating bar 23 are maintained in proper position by a cross member 92, the latter having a bearing 93 through which the bar 23 passes, and this cross member is supported by the rod 91 and by a rod 94. The mold carrier 86 is rotated step-by-step and synchronously with the carrier 50. In the present instance, the carrier 86 is rotated and a proper relation is maintained between it and the carrier 50 by a driving connection embodying coöperating gears 95 and 96 which are fixed respectively on the shaft 51 of the carrier 50 and the shaft 97 of the carrier 86, the latter shaft being journaled in the upper and lower bearings 98 and 99. After the carriers 50 and 86 have been rotated to bring a bag holder into alinement with a receiving mold, the two carriers are locked in such relation by the locking lever 58 and the plunger 89 is then caused to descend by operation of the cam 14 and the interposed mechanism whereby the bag is transferred in the manner before stated, and after the transfer has been effected, the plunger 89 is returned to elevated position and it remains in elevated position until the carriers 50 and 86 have rotated to bring another bag into position to be transferred.

Rotation of the carrier 86 brings the molds thereon containing the bags into position to receive the charges of tobacco or other material. The present invention provides improved means for compressing the charge uniformly and for introducing the compressed charge into the bag in such a manner as to be uniformly distributed within the bag. This mechanism comprises a

supply hopper 34 which receives the tobacco from the conveyer which is actuated by and passes over the shaft 32. The lower or discharge end of the hopper is connected to a frame 100 and this frame is supported above the path of movement of the molds by a rigid bracket 101 which is secured to a table 102. The frame 100 embodies two side members arranged in parallel relation as shown in Fig. 2, and the space between these members contains a pair of coöperative packing or compressing members 103 and 104 which are in substantially the form of platens having flat compression surfaces. These packing or compressing members are fixed on shafts 105 and 106, such shafts being offset outwardly with respect to the planes of the compression surfaces of the respective packing members. One of the packing members, the member 104 in the present instance, swings in an arc-shaped path below the bottom or outlet end of the hopper 34 and serves to control the feed of the material from the supply hopper to the compression space between the packing members. For this purpose the member 104 carries a segmental valve 107 at its outer side and the periphery of this valve is curved about the shaft 106 as an axis. When the packing members are in position to compress the charge, the valve 107 will extend across and close the bottom of the hopper 34 as shown by the full lines in Fig. 8, and when the packing members are in open position to receive a charge of material, the valve 107 uncovers the bottom of the hopper and the member 104 serves to direct the material into the pocket or space formed between the packing members as shown by the dotted lines in Fig. 8. The packing members 103 and 104 are suitably connected whereby they may simultaneously swing toward and from one another. In the present instance, these members are connected by segmental gears 108 and 109 which cause operation of the packing members in predetermined relation, and one of the shafts, the shaft 106 in the present instance, has an arm 110 fixed thereto and this arm is operatively connected by a link 111 to a crank arm 112, the latter being fixed to a shaft journaled in a bearing 113 and said shaft has an arm 114 fixed thereto, this latter arm being provided with a roller or projection 115 which operates in a cam groove 116 which is formed in the cam 28, the latter serving to operate the press at properly timed intervals.

The lower ends of the packing members 103 and 104 are provided with grippers 117 and 118 which, when the packing members are brought into compressing position, enter the opening in the top of a bag contained by the mold positioned below the press and these grippers completely open the mouth of the bag and clamp the edges of the bag against the sides 88 of the mold, a secure connection being thereby formed between the packing members of the press, the bag, and the mold containing the bag, and when the charge of material is forced downwardly from between the packing members of the press and into the bag, there is no opportunity for the bag to become displaced and it is certain that the bag will receive the full charge, loss of material being thereby avoided. In those cases where the edge of the bag at one side is higher than that at the opposite side of the bag as shown diagrammatically in Figs. 9 and 10, the gripper 117 will engage the higher edge of the bag while the gripper 118 will engage the lower edge of the bag, the gripper 118 being made longer for this purpose. When the packing members are opened to receive a charge of material between them, the lower ends of these members will be brought together owing to the offset arrangement of the shafts 105 and 106 with respect to the compression surfaces of the members, and in the present instance, the gripper 118 will engage the inner surface of the member 103 and thereby form a closure for the bottom of the space between the packing members. After this space between the packing members has received a charge of material, the packing members are brought into parallel relation, producing a compression upon the charge. By offsetting the shafts 105 and 106 outwardly with respect to the compression surfaces of the members 103 and 104, uniform compression of the entire charge is effected and undue compression of that part of the charge between the lower ends of the packing members is avoided, as it will be observed that the lower portions of the packing members where the charge settles do not approach one another during the compressing operation. When the packing members have completed the packing operation, the compression surfaces of these members are in parallelism and they form, together with the side members of the frame 100, a chamber which contains the packed or compressed charge. This chamber containing the charge is of substantially the same shape as the shape to be possessed by the filled bag, and while the packing members are in this position and the mouth of the bag is held by the grippers, the packed charge is transferred to the bag. This transfer is effected by a plunger which operates vertically through an opening 119 which is formed in the top 120 of the frame 100, the plunger passing downwardly through the space formed between the packing members 103 and 104 and forcing the packed charge from this space and into the bag contained in the mold. In Fig. 8, the plunger for accomplishing this purpose embodies a stem

121 which is secured to an arm 122 carried by the cross head 90, and the lower end of this stem has a head 123. adapted to bear upon the top of the charge of tobacco confined between the packing members. In order to avoid accumulation of the tobacco upon the compression surfaces of the packing members, a wiper is combined with the plunger, this wiper as shown in Fig. 8 embodying a body of felt or similar material 124 which is compressed between a pair of heads 125, the body of felt 124 fitting closely against the walls of the opening 119, the compression surfaces of the packing members, and the inner surfaces of the frame 100, the pressure of the felt against these surfaces being regulated by the amount of compression exerted thereon by the heads 125, a nut 126 being threaded on the stem 121 to regulate such compression. To assist the felt body 124 in preventing the accumulation of tobacco upon the surfaces with which the tobacco comes into contact, a cup 127 is formed around the plunger-receiving opening 119 and a suitable number of apertures 128 lead from the cup into the said opening. The cup 127 is adapted to contain a supply of lubricating material which is supplied through these apertures to the felt body.

A modified form of plunger is shown in Fig. 11 wherein the lower end of the stem 121 is provided with a head 129 which is adapted to bear upon the charge of tobacco, and a plurality of felt bodies 130 are applied to the stem above the head 129, rigid metal separators 131 being interposed between the felt bodies and the whole is compressed by a pair of heads 132 and an adjusting nut 133.

The plunger for transferring the charge of tobacco, together with its wiper and lubricating means, is not claimed herein but forms the subject-matter of Letters Patent, No. 1,099,114, granted to me June 2, 1914, as a division of the present application.

By packing the material so as to form a uniformly compressed charge having substantially the shape to be possessed by the charge when contained in the bag or package and forcing this charge bodily and while in uniformly packed condition into the bag, the charge will be distributed evenly within the bag and, hence, the bag will be completely filled and it will retain its shape. In order to support the bags after they have been introduced into the molds on the carrier 86, a platform 134 is provided which is concentric with and arranged beneath the circular row of molds on said carrier, the bag resting upon this platform while the bag is positioned to receive its charge from the packer.

In the drawings, mechanism is shown conventionally for automatically closing the tops of the bags and for indenting the closed tops after the bags have received their charges. The closing mechanism for the bags forms no part of the present invention, but it will be described briefly as embodying a frame 135 which is pivoted on a shaft 136, the latter being supported in a rigidly mounted bracket 137, and the frame 135 carries the folders for closing the side and end folds of each bag. In operation this frame 135 is normally elevated above the molds on the carrier 86 and is lowered at each pause in the rotation of the carrier 86 for the purpose of closing the top of the bag positioned beneath it. For this purpose, the frame 135 has an arm 138 to which a link 139 is connected pivotally, this link extending downwardly through the table 102 and the lower end of this link is pivotally connected at 140 to a pivoted lever 141, the latter being pivoted to the base at 142 and cooperates with the cam 27, this cam operating at each revolution of the shaft 2 to lift the frame 135 into an inoperative position and to permit this frame to descend and bring the folding mechanism thereon in coöperative relation with a bag contained in the appropriate mold on the carrier 86. To effect closing of the top of the bag, the bag is lifted in its mold so as to bring the top of the bag into proper relation with the folding mechanism. The lifting of the bag in the mold is effected by a vertically movable plunger 143 which operates through a guide 144 on the table 102 and this plunger is operatively connected to a lever 145, this lever being pivoted at 146 and its rear end coöperates with the cam 25 on the shaft 2, the cams 25 and 27 being so timed that the plunger 143 will operate to elevate the filled bag and at the same time the frame 135 will descend to bring the folding mechanism into coöperative relation with the top of the elevated bag. The devices on the frame 135 for closing the end folds of the bag are connected to the shafts 147, these shafts being connected to operate in unison by the gear sectors 148 and one of these sectors has an arm 149 which is operatively connected by a link 150 to an arm 151, this arm having a hub 152 which is pivoted on the shaft 136, the arm 151 being connected to a rod 154, the lower end of this rod being forked at 155 so as to straddle the shaft 35 as a guide, and the rod 154 has a roller or projection which coöperates with the cam 42 on the shaft 35, the cam just mentioned operating first to close the end flaps or folds of the bag. The devices for closing the side folds of the bag are connected to the shafts 156 which are also carried by the frame 135, these shafts being operatively connected by the segmental gears 157, and one of these

gears has a projection 158 which coöperates with the forked end of an arm 159, said arm being pivoted on the shaft 136 and is operatively connected to a rod 160 the lower end of which is forked at 161 so as to straddle the shaft 35 is a guide and it bears a roller or projection which coöperates with the cam 43 on the shaft 35. The final fold of the bag is effected by the folder 162 which is also pivoted on the shaft 136 and is connected to a rod 163, the lower end of this rod 163 coöperating with the cam 26 on the shaft 2.

After the top of the bag has been closed by suitable folding mechanism, an example of which has just been described briefly, the folded top of the bag is preferably subjected to pressure by indenting mechanism whereby the top folds of the bag will have a permanent set that will tend to retain them in closed position. This indenting mechanism as shown in the present instance comprises a vertically movable plunger 164 which is arranged above the path of the molds on the carrier 86 and is guided to operate in a stationary guide 165. This plunger is operatively connected to one end of a lever 166, said lever being pivoted on a stationary bracket at 167 and its opposite end is operatively connected to a bar 168 the lower end of which is forked at 169 so as to straddle the shaft 35 as a guide, and this bar 168 has a roller or projection which coöperates with the cam 40 on the shaft 35. Each bag with the top thereof folded or closed is elevated in its mold so as to coöperate with the indenting plunger 164 by a plunger 170^a which operates from the under side of the carrier 86, this plunger being similar to the plunger 143 and is operated at appropriately timed intervals by a vertically movable bar 170, the lower end of the latter being forked at 171 so as to straddle the shaft 35 as a guide, and this bar has a roller or projection which coöperates with the cam 41 on the shaft 35. Each rotation of the carrier 86 brings a filled and closed bag into position beneath the indenting plunger 164 and while the carrier 86 is at rest, this plunger operates upon the closed end of the bag to indent the folded top thereof.

After the closed tops of the bags have been indented, they are removed successively from the molds on the carrier 86. According to the present invention, the bags are removed from the carrier 86 by a horizontal movement or a movement in a radial direction with respect to the axis of the carrier 86, removal of the bags in this manner being permitted owing to the fact that the inner and outer ends of the space between the side members 88 of the molds are open. The mechanism shown in the present instance for effecting the results just stated comprises an ejecting member 172 which is guided to operate horizontally in a stationary bearing 173 and the inner end of this member has a head 174 which is adapted to pass radially through the space between the side members 88 of each mold. The ejecting member 172 is operated by a lever 175 which is pivoted to the under side of the table 102 on the axis 176 and the upper end of this lever 175 is forked and cooperates with an operating projection 177 on the member 172. The lever 175 at an intermediate point is formed with a slot 178 which has a sliding engagement with a wrist pin 179 which is fixed to a crank or wrist plate 180 which is fixed to a shaft 181. The throw of the wrist pin 179 at each revolution of the shaft 181, which occurs while the carrier 86 is at rest, will cause the head 174 on the ejecting member to move outwardly and in a radial direction with respect to the axis of the carrier 86, this head on the ejecting member being thereby caused to engage the inner edge of the bag and to remove it from the mold by an outward movement, the bag being moved a distance substantially equal to its horizontal dimension from edge to edge and the ejected bag will feed such other bags in advance thereof an equal distance, the foremost bag in the row being thereby brought into alinement with the receiving end of a runway 182 along which the filled bags are to be fed in a flatwise direction. The feeding of the bags in a flatwise direction along the runway 182 is accomplished by a follower 183 which is slidable in a guide 184 and the follower 183 is reciprocated at appropriately timed intervals by a lever 185, the upper end of this lever being forked and coöperating with an operating projection 186 on the follower, the lower end of this lever being pivoted on a fixed axis 187 and the intermediate portion of the lever 185 is formed with a slot 188 in which operates a wrist pin 189, this wrist pin being fixed to a crank or wrist plate 190. The crank or wrist plates 180 and 190 are operatively connected by the bevel gears 191, these wrist plates being so related that after the ejecting member 172 has moved outwardly with respect to the carrier 86 to remove a package edgewise therefrom and has moved inwardly, the follower 183 will operate to feed flatwise a row of bags in the runway 182, the ejecting member 172 moving inwardly to its initial position and the follower 183 subsequently being retracted to permit another package to be positioned before it by the next operation of the ejecting member 172. While the row of bags is being advanced in this manner along the runway 182, their upper closed ends are exposed and the operator may conveniently apply labels or revenue stamps thereto when such are used. The filled and closed bags are deliv-

ered by the runway 182 to a traveling belt 192, this belt being driven by a roller 193 fixed to a shaft 194, and this shaft is driven continuously by a pulley 195 thereon, a belt 196 which coöperates with said pulley, and a pulley 197 which is fixed to turn with the shaft 35.

In order that the bag-receiving holders or formers may properly accommodate bags which lack uniformity of size, compensating means has been provided as shown in Fig. 12, such means in this instance embodying a bow or leaf spring 198 which is applied preferably to the narrow size of the section 66, the two ends 199 and 200 of this spring being suitably fitted into the wall of the section 66 and the middle or intermediate portion of the spring has a tendency to bow or spring outwardly. After a bag has been applied to the holder, the pivotally related sections 66 and 67 thereof are expanded or opened, and such operation causes the consequent stretching of the bag to compress more or less the spring 198, the degree of compression depending upon the size of the bag. The spring serves, therefore, to yieldably hold the bag or the holder, especially when the bags are somewhat oversize, and it prevents breakage of the bags which are undersized.

The grippers on the compression members of the press are particularly advantageous when bags having linings are used, the grippers in such cases serving not only to open the mouth of the bag and to hold the bag in position while receiving the charge, but such grippers operate to open the lining and to hold the lining closely and firmly against the walls of the bag, thereby preventing collapsing of the lining or entrance of the material between the lining and the bag while the charge is being introduced.

Instead of folding the ears at the lower corners of the bags upwardly against the sides of the bags as described, such ears may be folded under the bag and means is shown in Figs. 17–20 inclusive for effecting this purpose. In this instance, a folder 201 is employed which is curved concentrically of the carrier 50 and is provided with concentric flanges 202 and 203 between which the bottom of the bag travels. The bottom of this folder has a tongue 204 to engage the bottom of the bag, and slots 205 and 206 are formed between this tongue and the adjacent flanges through which the ears of the bag project downwardly as the bag enters the folder. (See Fig. 18). The bottom of the folder beyond the tongue 204 is formed with enlarged openings, and a pair of reversely inclined folding cams 207 and 208 are provided which act on the downturned ears and turn them inwardly beneath the bag, these ears being held in folded condition during the further travel of the bag over the folder.

I claim as my invention:—

1. In a machine of the character described, the combination of a carrier, a hollow receptacle holder on the carrier mounted to swing bodily into one position relatively to the carrier to receive a receptacle and movable bodily into a different position relatively to the carrier after receiving a receptacle, and means operative through the hollow holder to eject a receptacle therefrom.

2. In a machine of the character described, the combination of a carrier, a vertically movable bag ejector, and a hollow bag holder on said carrier tiltable toward a horizontal position to receive a bag and movable into an upright position in coöperative relation with said ejector to permit passage of the ejector therethrough.

3. In a bag filling machine, the combination of a carrier, a bag ejector, and a collapsible bag holder pivoted on the carrier and capable of swinging toward a horizontal position and collapsing to receive a bag and movable into an upright position in cooperative relation with said ejector.

4. In a bag filling machine, the combination of a carrier, a bag ejector, a collapsible bag holder movably mounted on the carrier, and means for causing the bag holder to move toward a horizontal position and collapse to receive a bag and to expand and move into an upright position in coöperative relation with the ejector.

5. In a bag filling machine, the combination of a carrier revoluble in a horizontal plane, a bag ejector, a collapsible bag holder pivoted on said carrier, and means operative during the rotary movement of the carrier for causing the bag holder to swing toward a horizontal position and collapse to receive a bag and to expand and move into an upright position in coöperative relation with the ejector.

6. In a bag filling machine, the combination of a carrier rotatable in a horizontal plane, a hollow bag holder pivotally mounted on said carrier, means operative during rotary movement of the carrier for causing the bag holder to swing toward a horizontal position to receive a bag and into an upright position to discharge the bag, and a vertically reciprocatory plunger operative through the hollow bag holder while the latter is in upright position to eject the bag therefrom.

7. In a bag filling machine, the combination of a rotatable carrier, a hollow bag holder movably mounted on the carrier, a cam, means coöperative with said cam during rotation of said carrier for causing the

bag receiving end of the holder to move outwardly relatively to the carrier and into one position to receive a bag and inwardly into a second position to discharge the bag, and an ejector operative through the hollow holder to remove the bag from such holder while the latter occupies said second position.

8. In a bag filling machine, the combination of a rotatable carrier, an annular row of hollow bag holders pivotally mounted on said carrier, a relatively fixed cam surrounding the axis of said carrier, devices coöperative with said cam during rotation of the carrier for causing the bag holders to successively swing into bag-receiving position and to subsequently swing into bag-discharging position, and an ejector operative successively through each hollow bag holder to remove the bag therefrom while the latter is in bag-discharging position.

9. In a bag filling machine, the combination of a rotary carrier, a reciprocatory bag-ejecting plunger, and an annular row of hollow collapsible bag holders movably mounted on the carrier, each bag holder adapted to move outwardly relatively to the carrier so as to occupy a bag-receiving position in collapsed condition and expansible and movable inwardly into a position in alinement with said plunger to permit passage of the latter therethrough.

10. In a machine of the class described, a bag former of substantially fixed size adapted to receive and shape a bag, and a spring attached to and expansible outwardly from one side of said former to engage the interior of a bag of a larger size than the former and hold the same thereon.

11. A bag holder comprising a former adapted to enter and open and shape a bag, and a bow spring attached at its ends to one side of the bag former and expansible outwardly from such side of the former into engagement with the interior of the bag to adapt the bag former automatically to bags of different sizes.

12. A bag holder comprising relatively movable sections adapted to enter a bag, means for expanding said sections within the bag, and a spring carried by one of said sections and coöperative with the bag, said spring being yieldable to permit expansion of the bag-receiving sections.

13. A bag holder comprising in combination relatively expansible sections adapted to enter a bag, a bow spring carried by one of said sections and coöperative with the interior of the bag, and means for positively expanding said sections within the bag.

14. In a bag filling machine, the combination of a movable carrier, a bag holder tiltably mounted thereon and capable of moving to and from bag-receiving position, said holder embodying relatively collapsible and expansible sections, and means for expanding said sections when said holder is moved from bag-receiving position.

15. In bag filling machine, the combination of a carrier, a bag holder pivotally mounted thereon and capable of swinging into bag-receiving and bag-discharging positions, said holder embodying relatively collapsible and expansible bag-receiving sections, means for causing said holder to swing into bag-receiving and discharging positions, and means operative automatically during the swinging of the holder into bag-discharging position for expanding the bag-receiving sections thereof.

16. In a machine of the class described, the combination of a rotatable carrier, a bag receiver and former mounted thereon, and means for folding the ears on the lower corners of a bag on said receiver comprising a support for the bottom of the bag, and flanges between which the bag travels during movement of the carrier, said flange being coöperative with the lower corners of the bag.

17. In a bag filling machine, the combination of a carrier, a hollow bag holder thereon, a second carrier provided with molds, means for positioning the bag holder on the first carrier and the mold on the second carrier in superposed relation, and a plunger operative through the hollow holder and into the mold to first remove the bag from the holder and then introduce it into the mold while said holder is in superposed relation to the mold.

18. In a bag filling machine, the combination of a carrier, a hollow bag holder thereon, a second carrier provided with a mold, means for positioning said carriers in fixed relation whereby said bag holder will occupy a constant position in alinement with and above said mold, and a plunger operative through said hollow holder and upon the bag to transfer the bag from the holder to the mold while said holder occupies a position above the mold.

19. In a bag filling machine, the combination of means for holding a bag in filling position, pivoted compression members movable into relatively angular receiving position and into parallelism to form a packed charge of material and carrying grippers to engage and expand the mouth of a bag, and means for introducing the packed charge into the bag while the charge is maintained under compression by said members and while the bag is held by said grippers.

20. In a bag filling machine, the combination of means for holding a bag in filling position, a supply hopper, relatively movable compression members arranged in receiving position to occupy an angular rela-

tion and movable into parallelism to compress and form packed charges of material, one of said members having a valve operative automatically to control the supply of material thereto from the hopper, and a plunger operative through the space between said members when in parallelism to introduce the packed charge of material into the bag.

21. In a bag filling machine, the combination of means for supporting a bag in filling position, a supply hopper, coöperative compression members operative to receive and compress a charge of material between them, one of said members being pivoted and provided with a segmental valve to control the flow of material from the hopper to the compression space between said members, and means for introducing the packed charge into the bag.

22. In a bag filling machine, the combination of means for supporting a bag in filling position, opposed relatively pivoted compression members mounted above the bag and coöperative to form a pocket for the material when in angular relation and movable into parallelism to compress such material to form a packed charge, and means for introducing the packed charge into the bag.

23. In a bag filling machine, the combination of means for supporting a bag in filling position, relatively pivoted compression members mounted above the bag and relatively movable into one position to form a pocket closed at the bottom to receive a charge of material and movable into a different position to compress such charge uniformly and to form a parallel walled compression chamber, and a plunger operative through said compression chamber for introducing the compressed charge of material into the bag.

24. In a bag filling machine, the combination of means for supporting a bag in filling position, a pair of compression members having compression faces and supporting pivots which are offset outwardly with respect to said compression faces, the lower ends of said members coöperating to form a closed pocket to receive a charge of material, an approaching movement of said members serving to uniformly compress such charge, and means operative through the space between said members while in compression position to introduce the compressed charge of material into the bag.

25. In a bag filling machine, the combination of a mold for holding a bag in filling position, and coöperative compression members mounted above the mold and operative to compress a charge of material between them and to grip and hold the edges of the bag in the mold.

26. In a bag filling machine, the combination of a mold for holding a bag in filling position, coöperative members mounted pivotally above the mold and having grippers operative to open the mouth of a bag in the mold, and means operative to introduce a charge of material into the bag while the latter is held by said grippers.

27. In a bag filling machine, the combination of a mold for holding a bag in filling position, coöperative members mounted above the mold and having grippers adapted to enter the mouth of a bag in said mold and to open the bag and clamp the edges thereof against the walls of the mold, and means for introducing a charge of material into the bag while the latter is held in open condition by said grippers.

28. In a bag filling machine, the combination of a mold adapted to contain a bag, cooperative members pivoted above the mold and having grippers movable in arc-shaped paths and adapted to enter the mouth of a bag in said mold to open such bag and clamp the edges thereof against the walls of said mold, means for introducing a charge of material between said grippers, means for operating said members to compress such charge, and means for transferring a compressed charge of material from between said members to the bag.

29. In a bag filling machine, the combination of a mold adapted to contain a bag, a movable carrier supporting said mold, cooperative compression members pivoted above the path of movement of the mold, grippers on the lower ends of said members and offset inwardly relatively to their pivots, said grippers being movable in directions downwardly and outwardly to enter the mouth of a bag in said mold and to clamp the edges of the bag against the walls of the mold, means for introducing a charge of material between said members to be compressed thereby, and means operable through a space between said members for introducing the compressed charge into the bag.

30. In a machine of the class described, the combination of a rotatable carrier provided with a circular row of bag-containing molds, each mold having substantially radial side walls and being open at their inner and outer ends, means for introducing bags into the tops of said molds, and an ejector movable radially of said carrier and operative through the open-ended molds thereon to remove bags laterally from such molds.

31. In a machine of the character described, the combination of a carrier wheel revoluble in a horizontal plane, a circular row of molds thereon, each mold embodying opposed vertical side walls and having an open top and inner and outer ends, means for supplying bags to the tops of said molds, and an ejector movable in a direction sub-

stantially radially of the carrier wheel and operative horizontally through the open-ended molds to remove bags therefrom.

32. In a machine of the class described, the combination of a carrier provided with a set of bag-containing molds, a runway adapted to contain a row of bags, an ejector operative to remove bags successively from the molds on said carrier and to feed the removed bags edgewise and in a direction transverse to the length of said runway, a follower operative to feed the projected bags in a direction lengthwise of said runway, and means for operating said ejector and follower in alternate order.

33. In a machine of the class described, the combination of a movable carrier having a bag holder thereon, and means for folding the ears on the lower corners of the bag embodying a support for the bottom of the bag having slots at opposite sides through which the ears may project downwardly, and devices beyond said slots and coöperative with the ears to fold the same during movement of the carrier.

34. In a machine of the class described, a holder embodying movably related sections adapted to enter a receptacle, said holder being tiltable bodily to and from a receptacle-receiving position, and means for causing said sections to collapse when the holder assumes a receptacle-receiving position and to expand when moved from such position.

35. In a machine of the class described, the combination of a holder embodying expansible and collapsible sections adapted to enter a receptacle, said holder being pivoted to swing in a vertical plane to and from a receptacle-receiving position, and means for collapsing said sections when the holder assumes a receptacle-receiving position and for expanding said sections when the holder moves from a receptacle-receiving position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDWARD L. BRACY.

Witnesses:
BEVERLY W. SMITH,
CLARA A. FISHER.