3 Sheets—Sheet 1.

J. L. JONES.

Plug-Tobacco Making Machines.

No. 196,460. Patented Oct. 23, 1877.

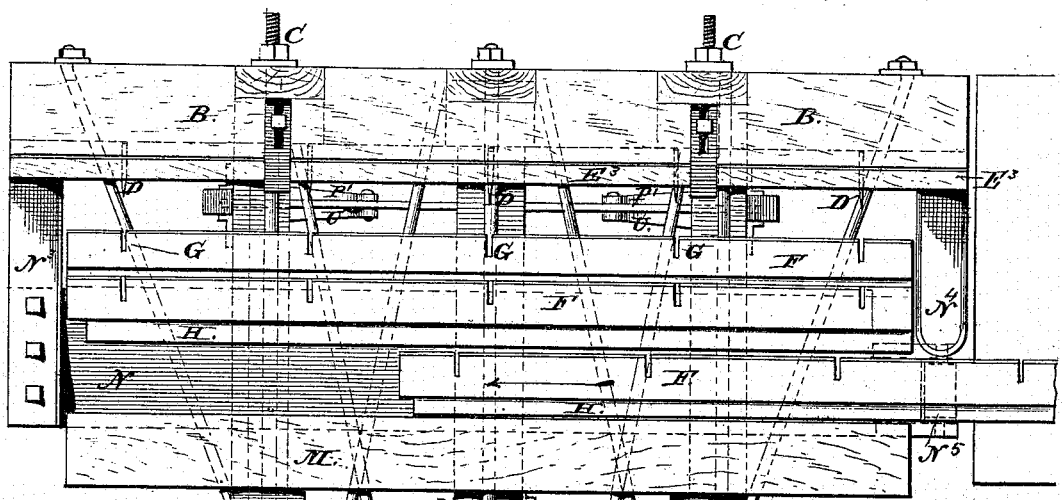

Fig. 1.
Plan or Top View.

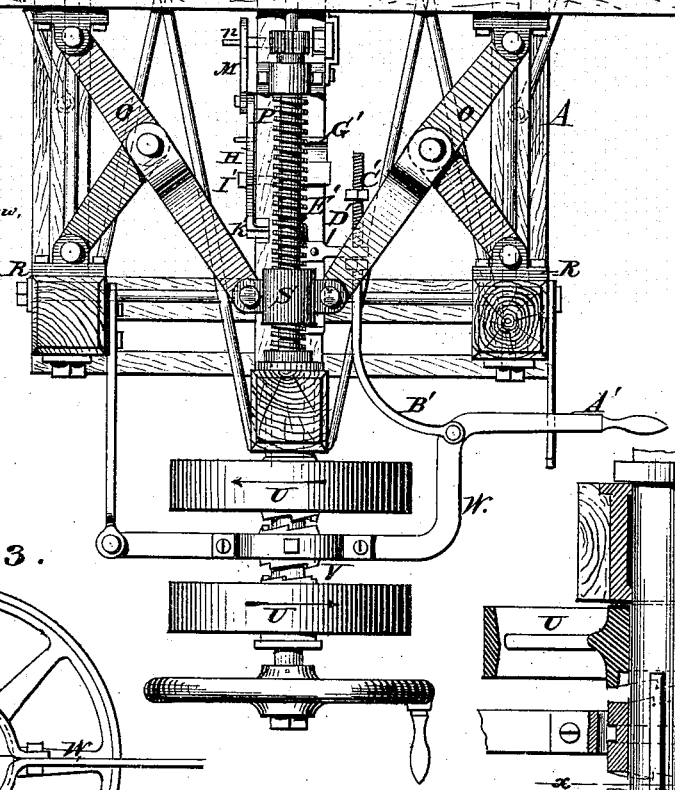

Fig. 2.

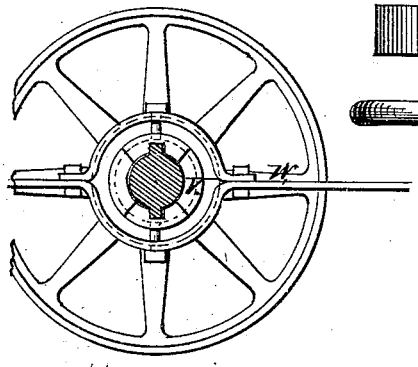

Fig. 3.

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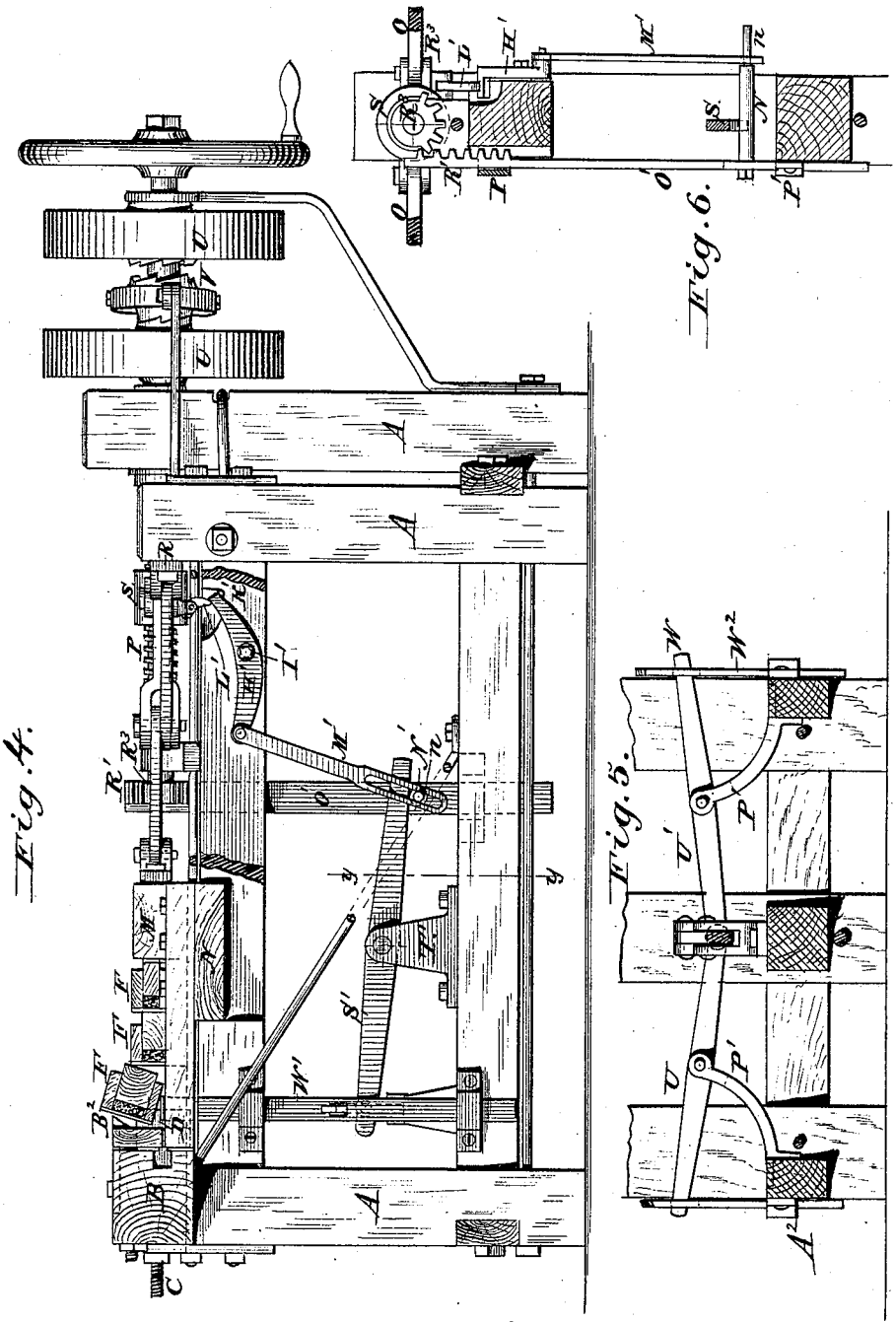

Fig. 4.

Fig. 6.

Fig. 5.

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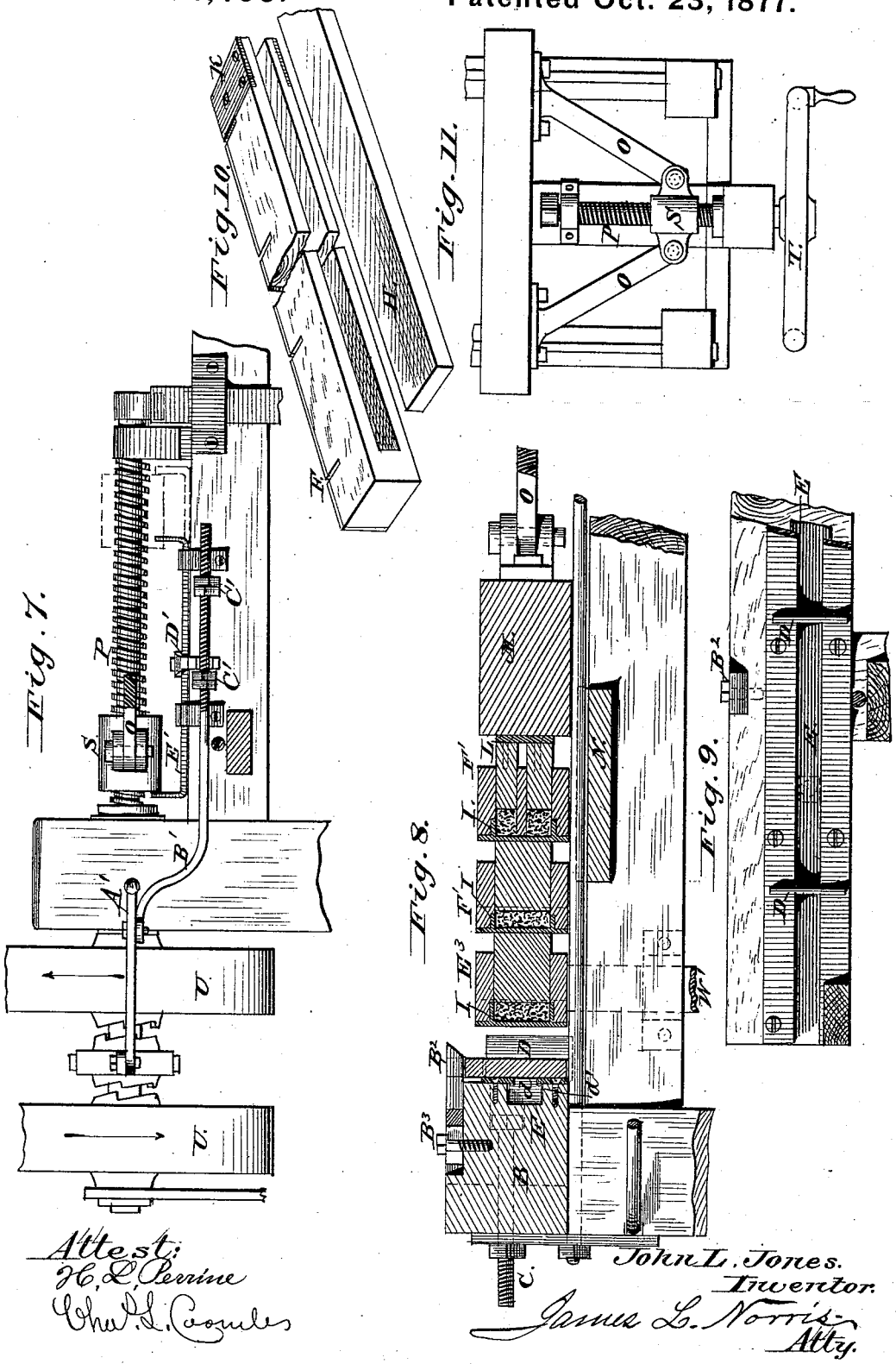

Attest:
H. L. Perrine
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UNITED STATES PATENT OFFICE.

JOHN L. JONES, OF GREENSBOROUGH, NORTH CAROLINA.

IMPROVEMENT IN PLUG-TOBACCO-MAKING MACHINES.

Specification forming part of Letters Patent No. **196,460**, dated October 23, 1877; application filed September 20, 1877.

To all whom it may concern:

Be it known that I, JOHN L. JONES, of Greensborough, in the county of Guilford and State of North Carolina, have invented certain new and useful Improvements in Machine for Manufacturing Plug-Tobacco, of which the following is a specification:

This invention relates to an improved machine for manufacturing plug-tobacco, in which the plugs are pressed, formed, and cut in a movable mold provided with a follower, and adapted to be compressed between a stationary bed and a movable plunger or follower operated by suitable mechanism, to be forced toward the stationary bed.

My invention consists, first, in the combination, with the stationary bed, of a longitudinal groove formed in the face thereof, and a series of removable cutters, and a gage for holding them in place, said cutters being adapted to be adjusted at various intervals in said groove, in order to vary the lengths of the plugs to be cut, as more fully hereinafter set forth; second, in the combination, with the stationary bed and its cutting-knives, of series of interchangeable knife-gages, slotted at intervals corresponding with the intervals at which the knives are arranged, and varying in thickness according to the thickness of the plug to be cut, whereby the knives can be gaged to cut plugs of different thickness and length, as more fully hereinafter specified; third, in a trough, mold, or former, closed at one end and open at the other, with its movable follower, whereby the nip or waste cut from the end of the bar may be removed in condition to form the end of the next succeeding bar, as more fully hereinafter set forth; fourth, in the combination, with the movable plunger or follower for compressing the mold and its operating mechanism, of certain mechanism automatically operated to arrest the travel of the follower or plunger, as more fully hereinafter set forth; fifth, in the combination, with the mechanism which operates the movable plunger or follower for compressing the troughs, molds, or formers, of certain mechanism for elevating the troughs, molds, or formers after the final pressing and cutting of the plugs, for the removal of said troughs, molds, or formers from the apparatus, as more fully hereinafter specified; and, sixth, in the combination, with the mechanism for elevating the troughs, molds, or formers, of an adjustable beveled trip secured to the stationary bed, for the purpose of upsetting the trough, mold, or former, and throwing it in position for removal, as more fully hereinafter specified.

In the drawings, Figure 1 represents a top view of my improved machine; Fig. 2, a detached view of the rear portion of the leading-screw, and the loose pulleys and clutch mounted thereon; Fig. 3, a cross-section through the clutch and leading-screw; Fig. 4, a view representing partly a side elevation and partly a vertical section of the machine; Fig. 5, a detached view of the devices for elevating the troughs. Fig. 6 is a sectional view through the slide R, showing the devices by which it is thrown into operation. Fig. 7 is a detached view, showing the mechanism for automatically arresting the motion of the leading-screw; Fig. 8, a detached sectional view of the stationary bed, plunger, and troughs, molds, or formers; Fig. 9, a detached view of the stationary bed, showing the groove therein for the adjustable knives; Fig. 10, a detached perspective view of the trough, mold, or former and its follower; and Fig. 11, a detached view, showing a modified form of the toggle-lever applicable to a hand-machine.

The letter A represents the frame or table of the machine, which supports the various working parts of the same; and B, the stationary bed, against which the troughs, molds, or formers are pressed. Said bed extends transversely across the top of the table or frame A, at one side thereof, and is adjustably secured thereto by means of screw-bolts and nuts C, in such manner as to permit of a limited movement with respect to the movable plunger or follower, in order that it may be adjusted to regulate the power brought to bear upon the troughs, molds, or formers. Said bed B is provided with a series of cutters or knives, D, which are secured at intervals corresponding to the lengths into which the plugs are to be cut.

These knives or cutters may be secured to the bed in any desired manner, but are preferably made removable and adjustable, so that the lengths of the plugs may be varied, for

which purpose the face of the bed is constructed with a longitudinal groove, E, T-shaped in cross-section, and the cutters are provided with shanks *d*, slotted, as shown at *d'*, which set into and are held by said longitudinal groove E, in such manner that the knives can be shifted and secured at any desired intervals along the face of the stationary bed.

In order to provide for cutting plugs of various thicknesses, a series of interchangeable knife-gages, E^3, are employed. Said gages vary in thickness, and are slotted at intervals to correspond with the intervals at which the knives are set. By changing said gages, as required, the distance to which the knives project therefrom can be varied at will, so as to enter troughs, molds, or formers to a greater or less depth, according to the thickness of the plug to be cut through.

The letter F represents a trough, former, or mold, provided with a metallic bottom having a series of slots, G, at intervals corresponding to the intervals of the knives or cutters of the stationary bed B. Said trough, mold, or follower is constructed with an open side, and may be formed open at both ends, but is preferably made closed at one end and open at the other, in order that the nip or waste of the plug may be removed in condition to be packed in the closed end of the next succeeding trough, mold, or former to be filled, as more fully hereinafter set forth.

The letter H represents a movable follower of such size and shape as to fit exactly in the chamber in said trough, mold, or former, for the purpose of compressing and packing the tobacco therein.

The letter I represents two longitudinal flanges, one of which is formed near each edge of the bottom of the trough, mold, or former, said flanges extending upward and forming a portion of the interior walls of said trough, mold, or former, for the purpose of re-enforcing said walls at the point where the greatest pressure is exerted, so as to prevent the mold from spreading or breaking down under great pressure.

The letter K represents a re-enforce, secured to the open end of the trough, mold, or former, and forming a portion of the bottom and sides of the same, to strengthen said trough, mold, or former at said open end.

In order to adapt the trough, mold, or former to narrow work, it is sometimes constructed with one or more longitudinal partitions, L, dividing it into compartments; and a series of followers corresponding to the number of compartments, and preferably connected together, are employed to work into said compartments in a similar manner to the single trough, mold, or former and its follower.

The letter M represents a movable plunger or follower, arranged to travel back and forth upon a horizontal bed, N, extending transversely across the top of the table or bed of the machine, at a suitable distance from the stationary bed, to allow the troughs, molds, or formers to be inserted between it and said bed in proper position.

The letters N^3 N^4 represent two guides, located at each side of the machine, for guiding the troughs, molds, or formers laterally properly to the stationary bed. One of said guides is cut away to admit the freshly-filled troughs, molds, or formers as it enters the machine endwise, and the machine at the point opposite such cut-away portion is provided with a roller, N^5, to facilitate the insertion of said trough, mold, or former.

The letter O represents a toggle-lever, operated by means of a leading-screw, P, by means of which the follower or plunger is actuated. In the modes of construction shown in Figs. 1, 4, and 7, a compound toggle-lever is employed, connected to the plunger and to the frame or bed of the machine at R, but in that shown in Fig. 11 a simple toggle-lever is employed, connected to the follower or plunger. The leading-screw in both cases passes through a screw-threaded rider, S, forming part of the toggle-lever, which is carried back and forth by said screw to operate the lever according to the direction in which the screw is rotated.

The leading-screw may be operated by hand or by power, as may be found convenient. In case it is operated by hand, it will be simply necessary to provide it with a hand-crank, T, as shown in Fig. 11; but when operated by power it may be provided with any gearing by means of which such power may be transmitted to it. In the present instance, as shown in Figs. 1, 4, and 7, the power is applied by means of a pulley and endless belt.

When thus operated, I have found it convenient to automatically arrest the movement of the plunger or follower at the ends of its forward and return movements; and in order to effect this, the end of the leading-screw is provided with two loose pulleys, U U, and a rotating clutch, V, keyed to the plain portion of the screw, and capable of a longitudinal movement thereon, so as to be caused to interlock either of the pulleys, according to the direction in which the screw is to be rotated. The letter W represents a lever connected to said clutch, by means of which the longitudinal movement of the same is effected, said lever being provided with a handle, A^1, by which it may be operated by hand to start the screw after it has been automatically arrested. The letter B^1 represents a bent arm extending from said lever to one side, its forward end being carried along in a direction parallel to the leading-screw. Said forward end is threaded, and provided with adjustable screw-threaded tappets or nuts C', against which a tappet, D', on a reciprocating slide, E^1, operates. Said slide is provided at each end with a lug, G', against which the rider S of the toggle-lever strikes at the end of its backward and forward movements, serving to shift the slide and its tappet-arm, and, by means of the tappets C' and arm B^1, shift the clutch-lever, so as to

throw the clutch out of gear with the driving-pulley, and thus arrest the motion of the leading-screw.

The letter H′ represents a lever, pivoted at I′ to the frame of the machine, its upper end being bent to one side, as shown at K′, so as to fall under a pawl, L′, on the rider of the toggle-lever. Said pawl is so arranged as to ride over the bent end K′ of the lever I′, at the forward movement of the rider, but to engage said bent end and trip said lever on its return movement. To the lower end of said lever H′ is attached a link, M′, extending downwardly, and provided with a longitudinal slot, N^1, at its lower end. In said slot sets a pin, *n*, projecting from the end of a vertical slide, O′, secured in ways P′, attached to the bed or frame of the machine. The upper end of said slide is provided with a short rack, R^1, which is adapted to be operated by a segmental pinion, R^3, on the end of the leading-screw at the end of the forward throw of the same, as more fully hereinafter explained.

S′ represents a lever, pivoted to a standard, T′, secured to the lower part of the table or frame of the machine. The lower end of said lever sets over the pin *n* of the slide N^1, and is adapted to be elevated by said pin when the slide rises. The forward end of the said lever S′ is connected to a compound lever, U′, the arms of which are pivoted in standards secured to the frame of the machine. The free ends of said compound lever set through slots W^1 in studs W^2, adapted to move in ways A^2, secured to the frame A, the upper ends of which are bent, and rest, when in a normal position, directly under the trough, mold, or former adjoining the stationary bed, so as to elevate said trough, mold, or former by their upward movement at the proper time. The letter B^2 represents a trip, one or more of which may be employed, adjustably secured to the upper side of the stationary bed B by means of set-screws B^3, or otherwise, and projecting forward over the trough, mold, or former adjoining said bed. Said trips are beveled at their forward ends, in order to upset the trough when it is thrown in contact with them, as more fully hereinafter explained.

The operation of my improved machine is as follows: The plunger or follower is drawn back, in which condition the machine is ready for the reception of the troughs, molds, or formers. A series of seven of such troughs or formers I have found a convenient number to employ in practice, six of the same being subjected to pressure in the machine, while one is out filling.

The tobacco is placed loosely in the troughs, molds, or formers, and the follower inserted behind the same, with its edge projecting. At the commencement of the operation a sufficient number of the thus loosely-filled troughs are placed between the stationary bed and follower to fill the space between the same, and pressure is brought to bear by putting the leading-screw into operation, forcing the plungers in upon the tobacco, and leaving the edges flush with the rear faces of the troughs, molds, or formers. The trough, mold, or former adjoining the stationary bed will be forced upon the knives by this operation, and the bar in the same will be cut into plugs of the desired length. The screw is then operated to withdraw the plunger or follower, releasing the pressure on the troughs, and when the rider of the toggle-joint reaches the bent lever operating the mechanism for elevating the troughs adjoining the stationary bed it will trip said lever, raising the slide into such position that its rack will engage the segmental pinion on the end of the leading-screw, by means of which said slide will be elevated, raising the end of the lever S′, and elevating the slide W^2, so as to throw up the trough adjoining the stationary bed. The said trough, coming in contact with the beveled ends of the trips B^2, will be upset by them, and will remain in position resting against the upper edge of the next succeeding trough, ready for removal. Said trough is removed, and on the next pressing operation is placed directly behind a freshly-filled trough, which is fed in from one side of the machine, and this operation is continued until five of the pressed troughs and one loosely-filled trough are made up into a set in the machine, when the apparatus is in complete working condition. After this the pressing operation is continued, each trough, after removal, being placed behind the freshly-filled trough, as above mentioned.

In this manner the tobacco is subjected to a series of pressures, by which the greatest compactness and solidity are given to it. As the bars are successively cut, the nip or waste which is separated at the open end is removed, the cutting operation forming a square end thereon, leaving said nip in condition to form the end of the bar in the succeeding trough to be filled.

The leading-screw, at the end of the forward and backward strokes of the plunger or follower, is automatically arrested, to permit the removal of the trough adjoining the stationary bed and the insertion of a fresh trough, by means of the loose pulleys, and the mechanism for shifting the friction-clutch which throws them into and out of gear with the screw. The screw is started in either direction by operating the clutch-lever by hand.

What I claim, and desire to secure by Letters Patent, is—

1. In combination with the stationary bed, provided with a longitudinal groove, a series of removable cutters and the gage for holding them in place, said cutters being adapted to be adjusted at various intervals in said groove, in order to vary the length of the plugs to be cut, as more fully hereinafter set forth,

2. In combination with the stationary bed and its cutting-knives, a series of interchangeable knife-gages, slotted at intervals at which the knives are arranged, and varying in thickness according to the thickness of the plug to

be cut, substantially as and for the purpose set forth.

3. A trough, mold, or former, closed at one end and open at the other, in combination with the movable follower, adapted to fit into said trough, whereby the nip or waste cut from the end of the bar may be removed in condition to form the end of the bar in the next succeeding freshly-filled trough, mold, or former, substantially as set forth.

4. In combination with the movable plunger or follower for compressing the troughs, molds, or formers, and the leading-screw and toggle-lever for operating said plunger, the pulleys, loosely mounted on the leading-screw, the longitudinally-moving clutch, the clutch lever and arm provided with tappets, and the tappet-bar and slide, operated by the rider of the toggle-lever, whereby the motion of the leading-screw is automatically arrested, as and for the purposes set forth.

5. In combination with the plunger and its operating mechanism, a lever adapted to be tripped by a pawl on the rider of the toggle-lever, the vertically-moving slide provided with a rack at its upper end, the pinion on the leading-screw for operating said slide, and the lever and vertically-moving slides, for elevating the trough adjoining the stationary bed, the whole constructed to operate substantially as set forth.

6. In combination with the mechanism for elevating the trough adjoining the stationary bed of the machine, the beveled trip or trips for upsetting the elevated trough, substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

JOHN L. JONES.

Witnesses:
JAMES L. NORRIS,
JAMES SARGENT.