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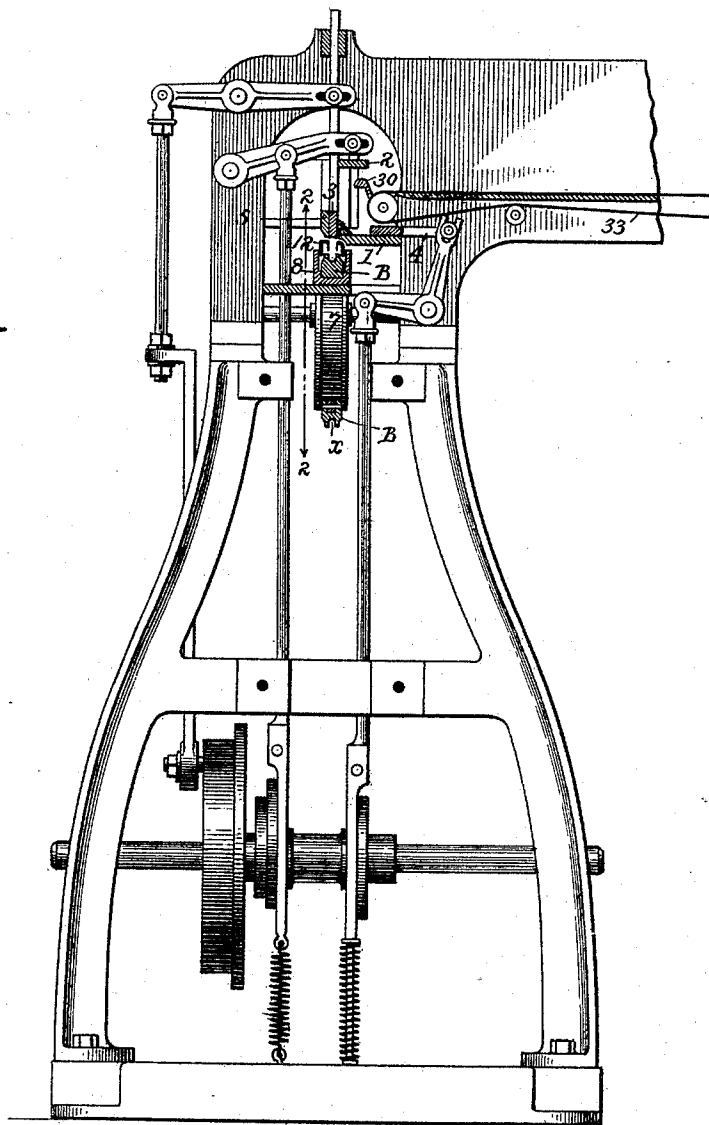
5 Sheets—Sheet 1.

R. HARDIE.
CIGARETTE MACHINE.

No. 495,613.

Patented Apr. 18, 1893.

Fig. 1.



WITNESSES

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(No Model.)

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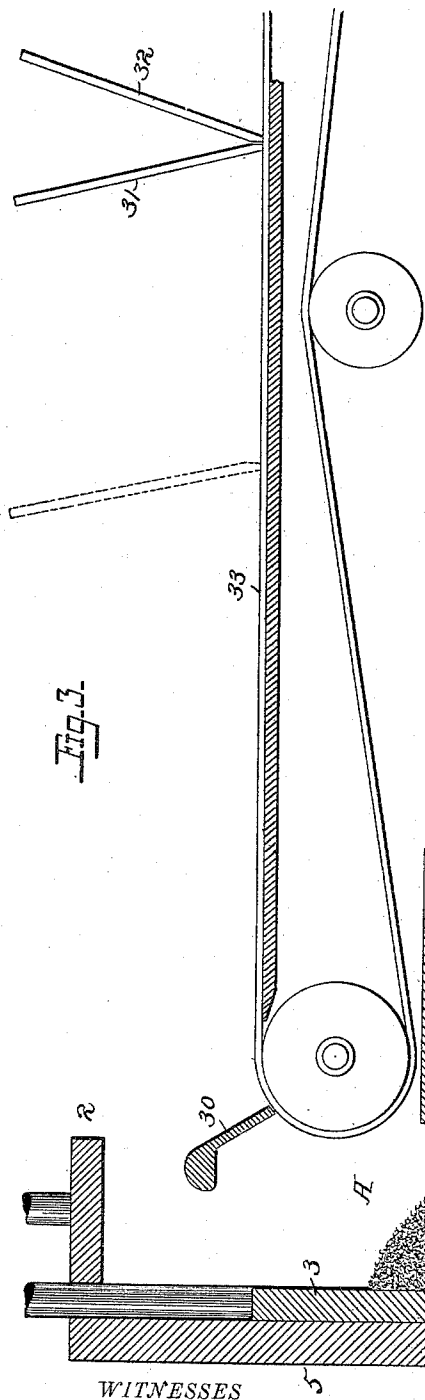


Fig. 3.

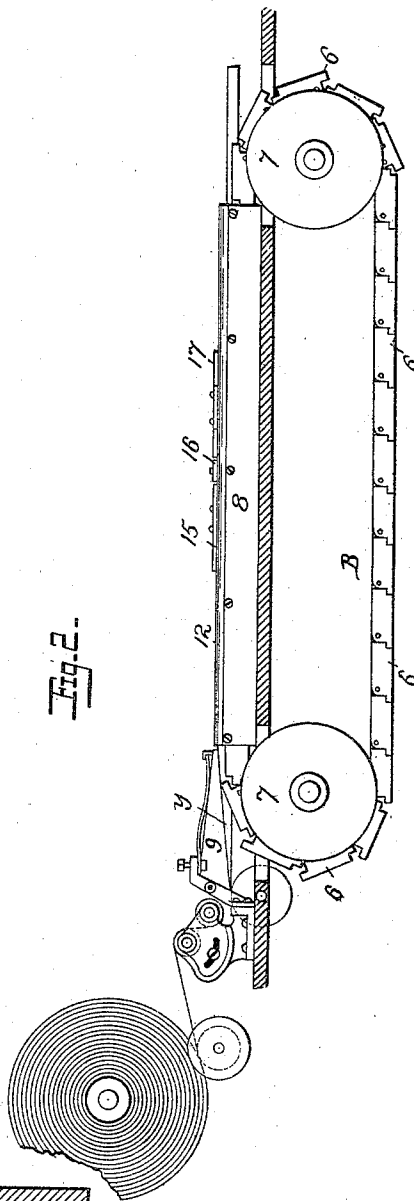


Fig. 2.

WITNESSES

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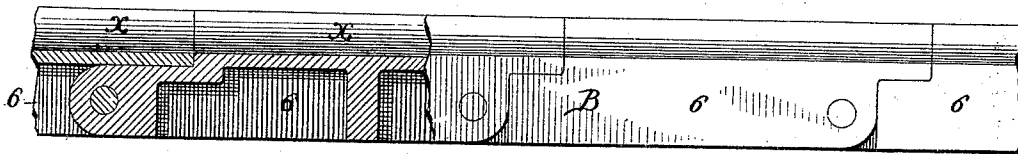
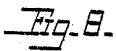
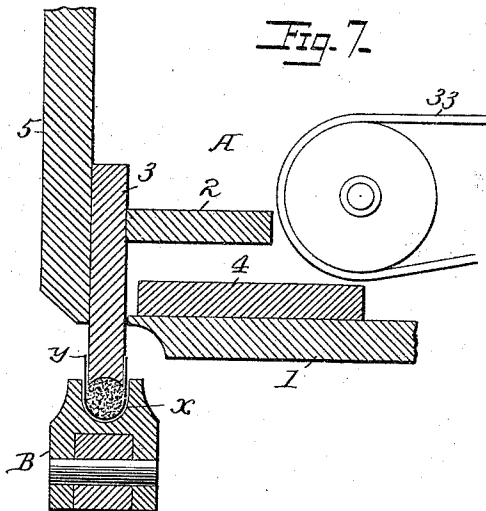
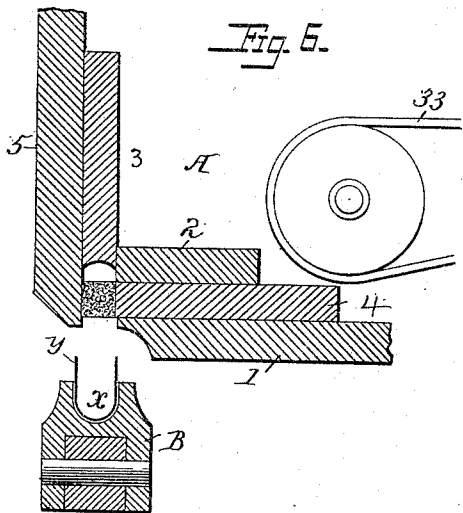
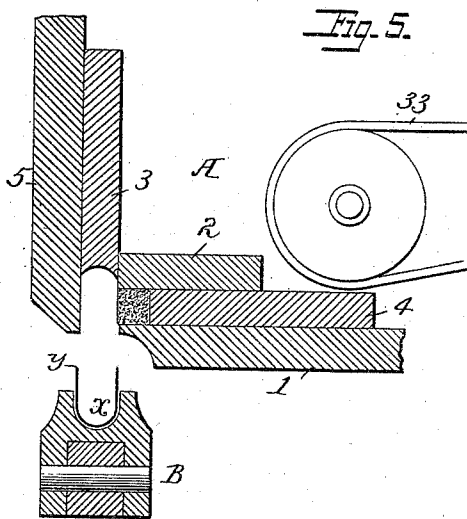
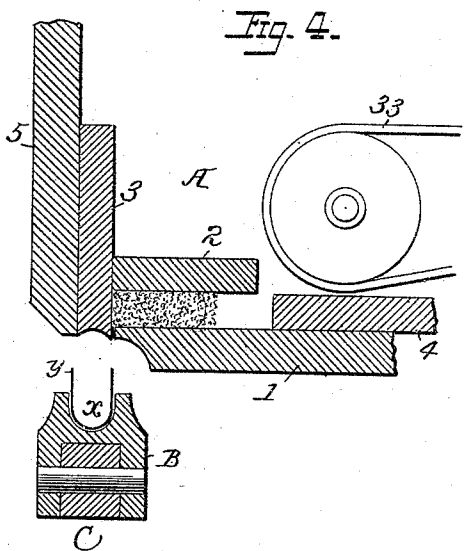
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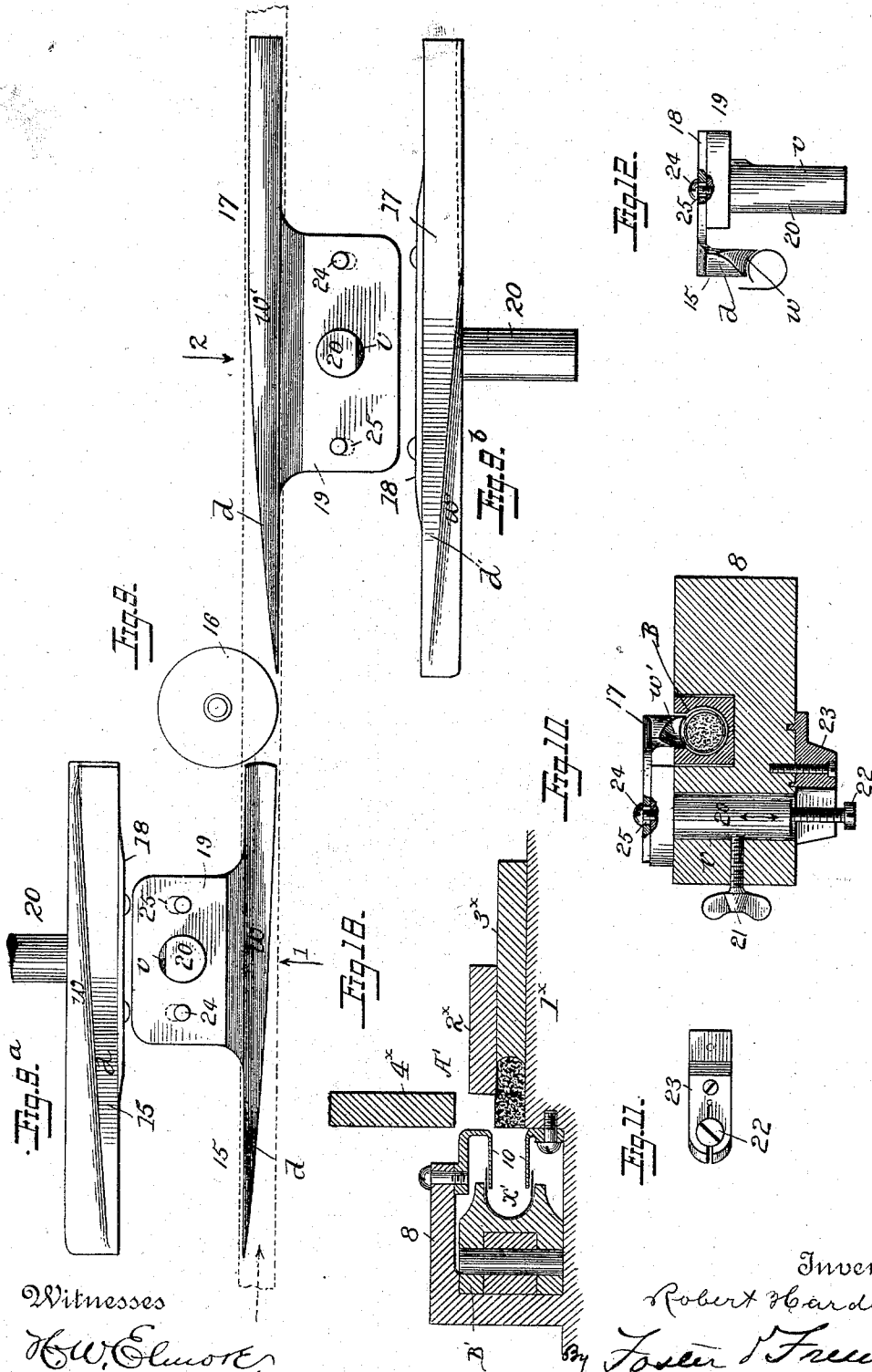
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(No Model.)

5 Sheets—Sheet 5.

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Fig. 13.

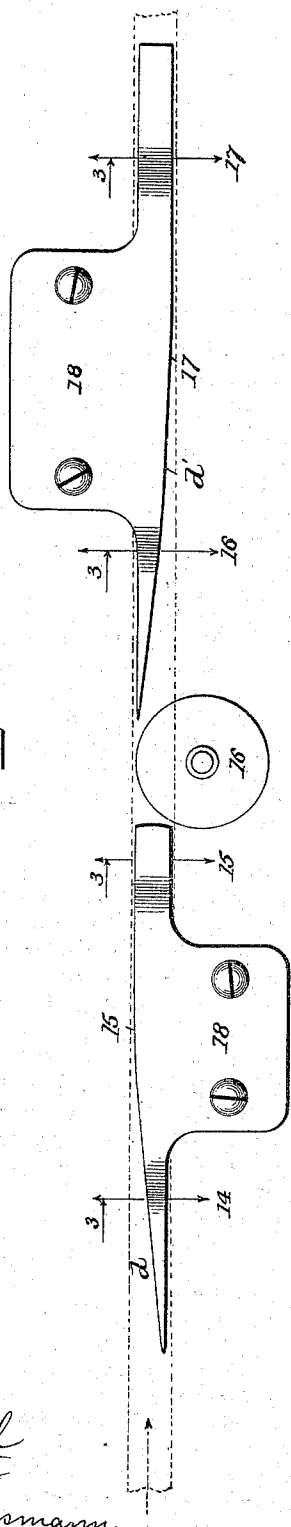


Fig. 17.



Fig. 16.

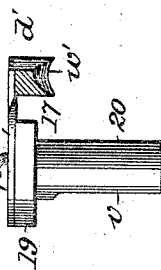
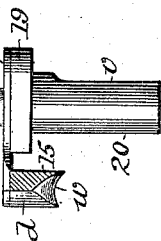


Fig. 15.



Fig. 14.



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UNITED STATES PATENT OFFICE.

ROBERT HARDIE, OF BROOKLYN, ASSIGNOR TO HENRY C. ELLIOT, OF NEW YORK, N. Y.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 495,613, dated April 18, 1893.

Application filed July 8, 1890. Serial No. 358,064. (No model.)

To all whom it may concern:

Be it known that I, ROBERT HARDIE, a citizen of the United States, residing at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Cigarette-Machines, of which the following is a specification.

My invention relates to machines for making cigarettes and especially to certain improvements in the machine for which Letters Patent were granted to me May 27, 1890, No. 429,031, and my invention consists of certain details of construction fully set forth hereinafter and illustrated in the accompanying drawings, in which—

Figure 1, is a part sectional elevation of sufficient of a cigarette machine to illustrate my improvements. Fig. 2, is a longitudinal section on the line 2—2, Fig. 1. Fig. 3, is an enlarged sectional view showing the devices for feeding and molding the filler. Figs. 4, 5, 6, and 7, are sectional views illustrating the progressive formation of the filler. Fig. 8, is a full sized part longitudinal section of the traveling receptacle. Fig. 9, is an inverted or bottom plan view illustrating the pasting disk and the folding bars for successively turning in the edges of the paper strip. Fig. 9^a is an edge view of the forward folding bar, inverted, and looking in the direction of the arrow 1, Fig. 9. Fig. 9^b is an edge view of the second folding bar when in the position which it occupies in the machine, and looking in the direction of the arrow 2, Fig. 9. Fig. 10, is a transverse section across the feeding channel and its supports showing one of the folding bars for turning in the edges of the paper, and its supports. Fig. 11, is a detached view of one of the supports. Fig. 12, is a detached view of one of the said folding bars. Fig. 13, is a top plan view of the folding bars and the intermediate pasting disk, showing their relative arrangement in the machine. Figs. 14, 15, 16 and 17 are cross sections on the lines 14, 15, 16 and 17, respectively of Fig. 13, looking in the direction of the arrows 3. Fig. 18, shows a modification of the filler forming mechanism.

The tobacco compressing means or mold A, may be constructed in different ways so as to compress a row of loose tobacco upon four

sides, thereby molding or reducing it to square form in cross section. In the construction shown in Figs. 1 to 7, the mold consists of four parts, namely, first, a bed 1, upon which the rows of loose tobacco are fed in succession by any suitable conveying or feeding appliances; second, a parallel vertically reciprocating compressor 2, which is moved upward from the bed 1, to permit the tobacco to be fed upon the latter, and then moves toward the bed, to compress the mass thereon to the desired thickness in one direction; third, a vertical plunger 3, at right angles to the bed 1, and compressor 2, and immediately beyond the end of the latter which plunger 3 serves to close the side of the mold in one direction; and fourth, a horizontal plunger 4, movable over the bed 1, between the latter and the compressor and to and from the vertical plunger 3, the plunger 4, being drawn back to permit the mass of tobacco to be deposited upon the bed 1, and then moves forward after or as the compressor 2, approaches the bed, so as to compress the tobacco to the desired extent in the other direction. The mold thus consists of four parts between which each row of tobacco is compressed into a long square rod. The bed 1, is stationary at all times, in the construction shown, although it may be movable if desired.

While the rod of tobacco might be conveyed longitudinally from between the parts of the mold, I prefer to discharge it laterally, and in such case the vertical plunger 3, after the formation of each rod, is raised to the position shown in Fig. 5, and the horizontal plunger 4, is then carried forward, forcing the rod from between the bed 1 and compressor 2, when it may fall into a suitable receptacle or receiving channel.

To insure the discharge of the rod in proper position into the receptacle, I prefer to make use of the vertical plunger 3, to carry the rod downward after it has been pushed from between the bed 1 and compressor 2, so as to positively carry down the rod, and to prevent the turning of the rod in its descent, I arrange a guard plate 5, opposite the end of the bed 1, and extending upward, against which guard plate the rod of tobacco bears as it is carried downward by the plunger 3.

The receptacle B, is arranged below the molding devices, in the preferred construction shown in Figs. 1 to 7, in position to receive the rods of tobacco forced downward from the mold, and said receptacle is provided with a channel *x*, preferably rounded at the under side, while the edge of the vertical plunger 3, is grooved so that a slight pressure upon the rod when it is in the receptacle, by the action of the plunger 3, will tend to impart a rounded form transversely to the rod, but without materially compressing it, the rod in fact expanding slightly when released from the mold, for which reason the channel *x*, is preferably wider than the cross-section of the rod when in the mold. The rod after being deposited in the receptacle B, is carried longitudinally by the movement of the receptacle, and the succeeding rod is deposited in the latter in such manner that its end overlaps that of the rod first deposited, and the descent of the plunger 3, compresses the overlapping ends of the rods together whereby the succession of rods are connected to form one continuous rod constituting the filler.

The successive rods may be deposited in the channel *x*, in direct contact with the face of the latter, the wrapper being subsequently applied, but I prefer to convey the wrapper to the receptacle B, folding the wrapper to a U-shape corresponding to the channel *x*, and depositing the rods in succession in the wrapper.

The filler or the filler and wrapper together may be conveyed along the channel *x*, by means of a belt traveling through the channel, in connection with the molding devices above described, but I prefer to dispense with a belt and to employ a continuous traveling receptacle B, in the form of an endless chain, or series of connected links 6, 6, each of which is recessed to form a part of the channel when the links are in line wheels 7, 7, supporting the continuous receptacle and a guide 8, arranged between the wheels maintaining the upper portion of the receptacle in a straight line for a sufficient distance to allow for the folding and pasting of the wrapper as described hereinafter.

The strip of paper *y*, constituting the wrapper passes through or beneath a suitable former 9, whereby the strip is folded transversely to a U-shape before or as it enters the channel *x*, the edges of the paper standing above the sides of the channel, as shown in Figs. 3 to 7, and the traveling receptacle to which motion is imparted from any suitable driving shaft carrying with it the wrapper and the filler.

To prevent the tobacco rods from bending down the edges of the wrapper as they are deposited within the latter I provide guards 10, 10, parallel to the channel *x*, and extending with their lower edges slightly below the top of the receptacle B, and opposite the sides thereof, so that each rod will be carried down between the guards 10, 10, and will not make contact with the wrapper until it is below the

edges thereof. The guards 10, 10, are supported by brackets 12, attached to the sides of the guide 8.

The links 6, of the continuous receptacle may be of hard material, as metal, or they may be of vulcanized rubber, or the connections may be of metal and the channel portions of rubber vulcanized to a sufficient degree of hardness to preserve their shape but yielding to a sufficient extent to prevent the wounding of the paper wrapper and serving better than metal to maintain such a hold upon the paper as will prevent the latter from slipping.

After the tobacco filler or rod has been deposited in the wrapper one edge of the latter is folded down upon the filler by means of a stationary folding bar 15. This folding bar extends over the top of the channel and has a grooved or concaved under surface *w*, inclined downward in the direction of the feed, (Fig. 12) the said bar tapering or being beveled laterally at one side or edge face *d* to a point at the end toward which the wrapper is carried so that the inclined or beveled side or face *d*, gradually turns in one standing edge of the paper strip until the same approaches a horizontal position and the paper is gradually carried beneath the lower grooved or recessed and inclined face *w*, which latter completes the folding down of the paper upon the filler leaving the opposite edge standing vertically. The vertical edge now travels past a paster of any suitable character as for instance a pasting disk 16, Fig. 9 which applies a line of paste upon the inner face of the standing edge after which the latter is brought against the laterally inclined or beveled side or edge face *d'*, of a second folding bar 17, which face *d'* is inclined in the opposite direction from the face *d* of the bar 15, and folds down the pasted edge of the paper strip toward a horizontal position after which a grooved or channeled face *w'*, at the under side of the second will turn the edge of the paper strip completely over upon the infolded edge beneath, and will hold the same in contact therewith as the filler and wrapper travel together until the paste is set and the edges of the wrapper thereby connected together. It will be noticed that the outer lower edge of each of these folding bars has a greater degree of inclination than the corresponding opposite edge owing to the inclined edge or side face *d* or *d'*, and at the forward end of the bar the said edge gradually vanishes into said side face, while at the rear portion of each bar the two edges of the lower grooved face occupy substantially the same horizontal plane.

The folding bars above described may be used in other classes of machines where there are stationary channels, receptacles or guides and carrying belts. In such case where the belt is employed it will be folded over by the inclined faces and around the wrapper as indicated in Fig. 10.

It is very desirable and often necessary to

remove the folding bars to permit the wrapper to be introduced into the channel or to obtain access in case of the fracture of the paper or other injury and in order to permit this to be done and yet avoid the necessity of repeatedly readjusting and testing the adjustment of the bars I provide the latter with detachable connections and bearings that absolutely define the position of the bar as soon as it is put in place so that after it is once adjusted it may be removed and when again placed on its support will occupy exactly the same position it had before. Different adjusting and guiding and securing means may be employed, that shown in the drawings having proved very effective. Thus, each folding bar is secured to an arm 18, projecting from a block 19, provided with a pin 20, having a flat face *v*, at one side.

In the frame or guide 8, is a circular socket for the reception of the pin 20, and a set screw 21, which may be brought to bear against the face *v*, to fasten the pin in place, and there is also a vertical adjusting screw 22, which affords a bearing for the end of the pin 20, and determines the vertical position of the latter and of the bar. To prevent the screw 22 from being thrown out of adjustment by the vibration of the machine the bearing or nut 23, through which said screw passes is split Fig. 11 forming two fingers which tend to clamp the screw with a spring pressure and prevent it from readily turning.

The lateral adjustment of the folding bar is effected by securing the arm 18, to the block 19, so as to be adjustable in any suitable manner, as for instance by screws 24, passing through slots 25, in the arm.

In the modification shown in Fig. 18, the mold *A'*, is constructed substantially as above described, consisting of the bed 1^x, the vertically reciprocating compressor 2^x, the horizontal plunger 3^x, and the vertical plunger 4^x. In this instance, however, the open side of the channel *a'*, of the receptacle *B'*, is arranged opposite to and in line with the horizontal plunger 3^x, of the mold, instead of below the latter, the plunger 3^x, serving, in addition to its other function, to discharge the tobacco rod from the mold and force it into said channel.

By the use of a continuous traveling, receiver receptacle or conductor I am enabled to dispense with the use of the usual conducting tape or belt, and of the guides which must necessarily be employed in such cases and to this extent can simplify and reduce the cost of the machine as well as simplify the operations of filling, folding and pasting the wrapper. After the filled wrapper passes from the belt or traveling receptacle it is sheared at intervals to form cigarettes by means of any suitable shearing appliances not necessary to be here described.

While any suitable means may be employed for depositing rows of loose tobacco in succession upon the bed 1, of the molding and

compressing device I prefer to make use of feeding and separating blades 30, 31, 32, operating above a belt or platform 33, substantially as described in my aforesaid Letters Patent. The platform 33, may be stationary or it may be as shown, in the form of an endless belt which aids in feeding the material and which belt may be operated continuously or intermittently as may be found advantageous.

It will be evident that the improved features above described may be used in connection with each other as set forth, or they may be used separately in connection with other appliances in other forms of cigarette machines. It will also be evident that various appliances may be employed for imparting the desired traveling movement to the feeding belt, the channeled receptacle and conveyor and for reciprocating the parts, 2, 3, 4, of the molding and compressing device and as I make no claim to any particular form of actuating devices I do not here illustrate the same.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. In a cigarette machine; the combination of means for feeding successive rows of tobacco, a mold consisting of four parts, namely, a bed upon which said rows of tobacco are fed, by said feeding means a compressor movable toward and from the bed, a vertical plunger movable beyond the end of the compressor, and a horizontal plunger movable between the bed and compressor, and a receptacle in position to receive the rods of tobacco discharged from the mold, substantially as described.

2. In a cigarette machine, the combination of means for feeding successive rows of loose tobacco, a four part mold consisting of a bed upon which said rows of tobacco are fed by said feeding means, a compressor movable toward and from the bed, a vertical plunger movable beyond the end of the compressor, and a horizontal plunger movable between said bed and compressor, and a traveling receptacle in line with one of said plungers to receive the rods of tobacco discharged from the mold, substantially as described.

3. The combination in a mold for a cigarette machine, of a stationary bed arranged to receive successive rows of tobacco, a parallel compressor movable to and from the stationary bed, a vertical plunger immediately beyond the end of said compressor, and a horizontal plunger movable above the bed, toward and from the vertical plunger, substantially as set forth.

4. The combination with the mold consisting of the bed 1, parallel compressor 2, movable toward and from the bed, the vertical plunger 3, movable beyond the ends of the compressor and bed, and a horizontal plunger 4, movable between the compressor and bed, of a guard plate 5, substantially as set forth.

5. The combination with the mold consisting of a stationary bed, a parallel compressor movable to and from the latter, a vertical plunger movable past the end of the compressor, and a horizontal plunger movable between the bed and compressor, of a traveling receptacle B, arranged below and in line with the vertical plunger to receive the molded rods discharged from the mold, substantially as set forth.

6. In a cigarette machine, the combination with the traveling receptacle having a channel, means for feeding a continuous wrapper into the channel, and a mold for forming rods of tobacco and delivering them successively into the wrapper in the channel, of independent elongated folding bars arranged longitudinally and one in advance of the other, in the path of the upturned edges of the wrapper, and having beveled edge faces oppositely arranged to fold down first one edge, and then the other, as the edges successively travel past and in contact with said beveled faces, substantially as set forth.

7. In a cigarette machine, the combination with the traveling receptacle having a channel, means for feeding a wrapper into the channel, and a mold for forming and delivering tobacco rods into the wrapper, of a folding bar having a laterally inclined edge face at one side, and an inclined grooved under face, and arranged in position to fold down one edge of said wrapper, and a second folding bar having an inclined grooved under face, a laterally inclined edge face inclined in a reverse direction to the edge face of the first bar, and arranged to turn down the other edge of the wrapper, substantially as set forth.

8. A folder bar consisting of an elongated body having a lower grooved and inclined face *w*, and an inclined edge face *d*, substantially as set forth.

9. A folder bar consisting of an elongated body provided with a lower grooved and inclined face *w*, the outer edge of said face having a greater degree of inclination than the corresponding opposite edge, and an inclined edge face *d*, substantially as set forth.

10. A folder bar consisting of an elongated body having an inclined edge face *d*, and a

lower grooved and inclined face *w*, the edges of said face *w*, occupying substantially the same horizontal plane at the rear end of the bar, and the outer of said edges having a greater degree of inclination than the corresponding opposite edge, and vanishing into the edge face *d*, at the forward part of the bar, substantially as set forth.

11. In a cigarette machine, the combination with the frame, of a folding bar, and a supporting arm therefor carried by a pin 20, a socket in the frame to receive said pin, and an adjusting screw 22, constituting a bearing for the pin, substantially as set forth.

12. The combination with the frame having a socket, of a pin adapted to the socket, means for vertically adjusting the pin therein, an arm supported by and laterally adjustable upon said pin, and a folding bar carried by said arm, substantially as described.

13. The combination with the frame having a socket, of a detachable supporting pin fitting said socket, an arm secured to the pin by a slotted connection, and a folding bar carried by the arm, substantially as specified.

14. The combination with the frame having a socket, of a detachable supporting pin fitting said socket, the block 19, upon the pin, the arm 18, secured to the block by a slotted connection, and a folding bar carried by the arm, substantially as described.

15. The combination with the frame having a socket, of a pin fitting said socket, an arm supported by the pin and carrying a folder bar an adjusting screw 22, constituting a bearing for the pin, and a split bearing 23, for the screw, substantially as described.

16. The combination with the frame having a circular socket, a pin fitting the socket and provided with a flat side *v*, a set screw 21, a vertical adjusting screw 22, and a folder bar carried by an arm supported upon the pin substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT HARDIE.

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