Dec. 29, 1925. 1,567,533

H. S. MARSH

CIGARETTE MACHINE

Filed March 15, 1920 5 Sheets-Sheet 1

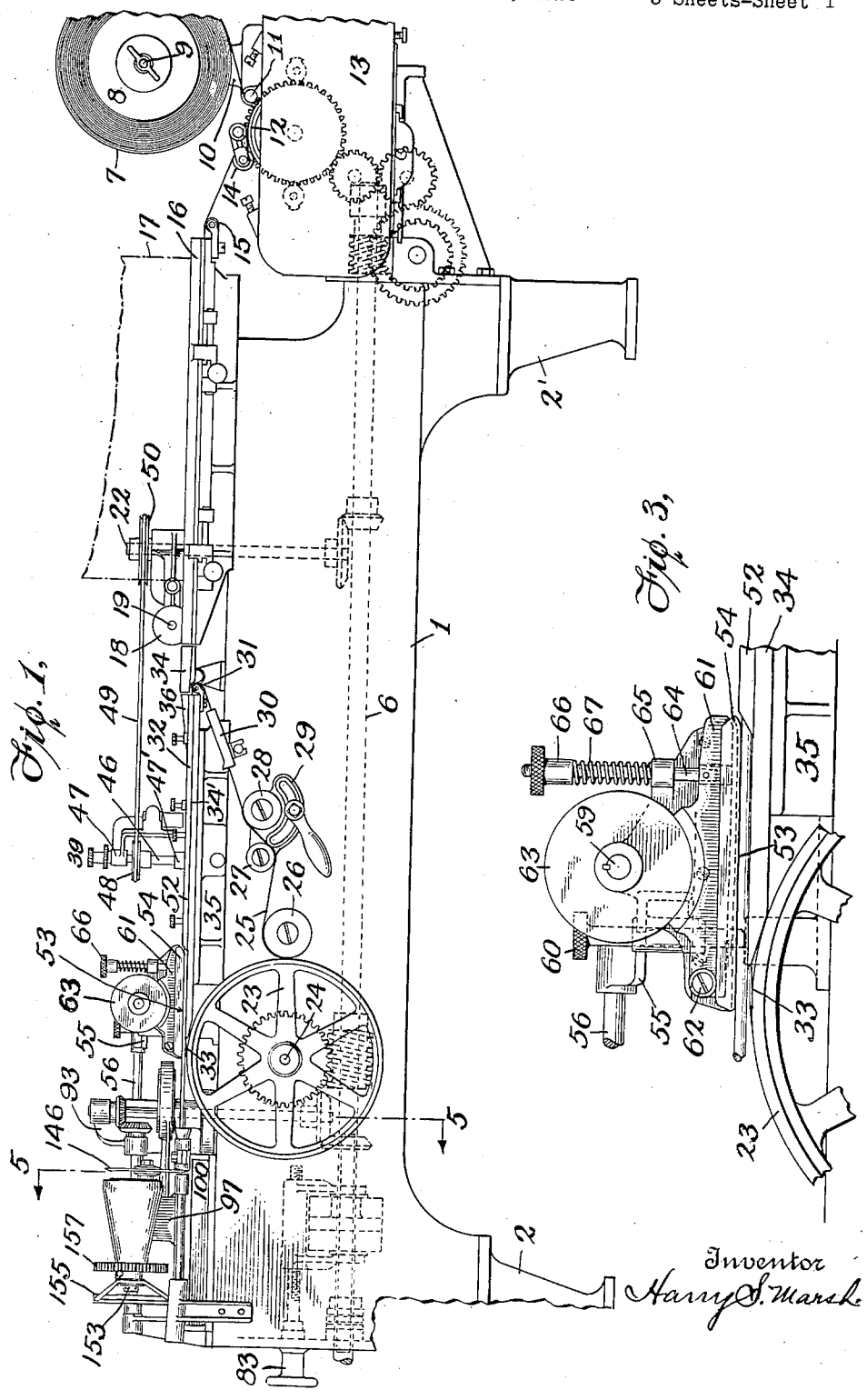


Fig. 1.

Fig. 3.

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Harry S. Marsh

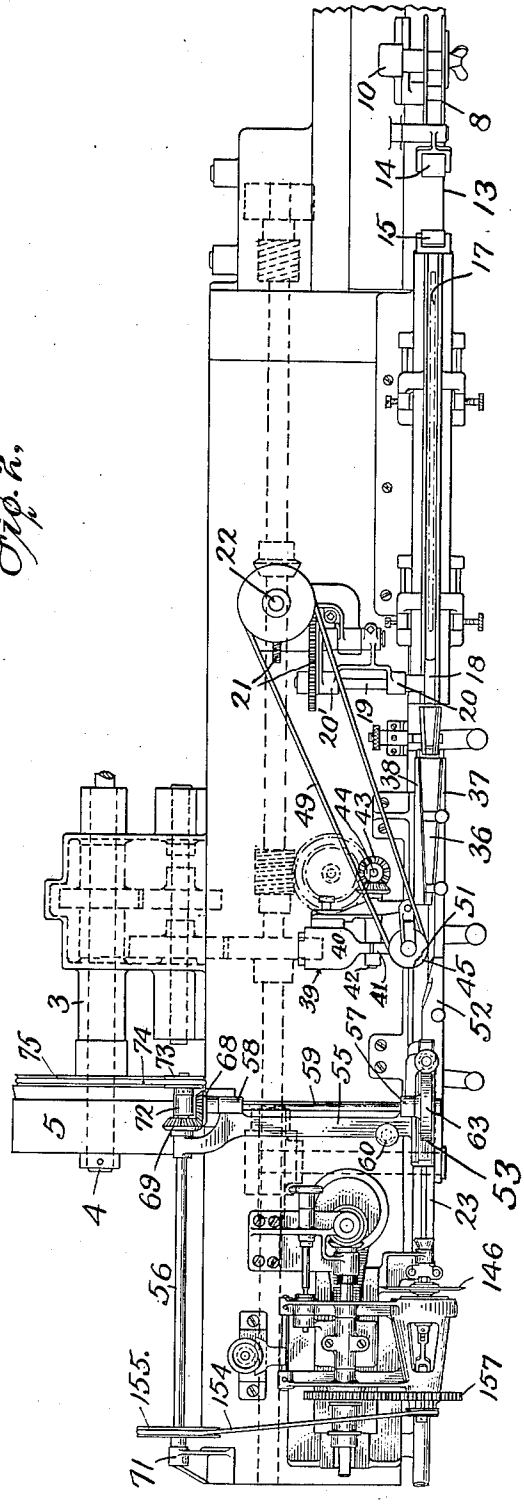
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Fig. 2.



Inventor
Harry S. Marsh

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Fig. 5,

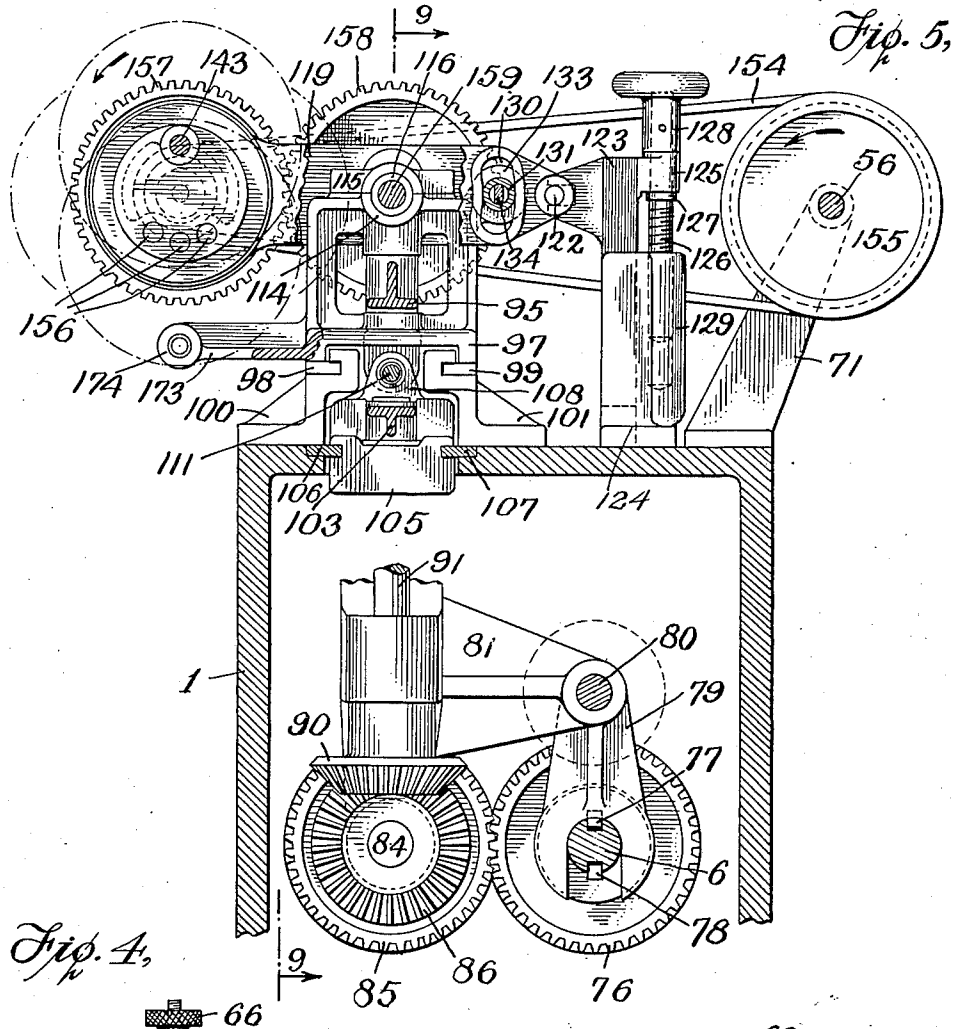
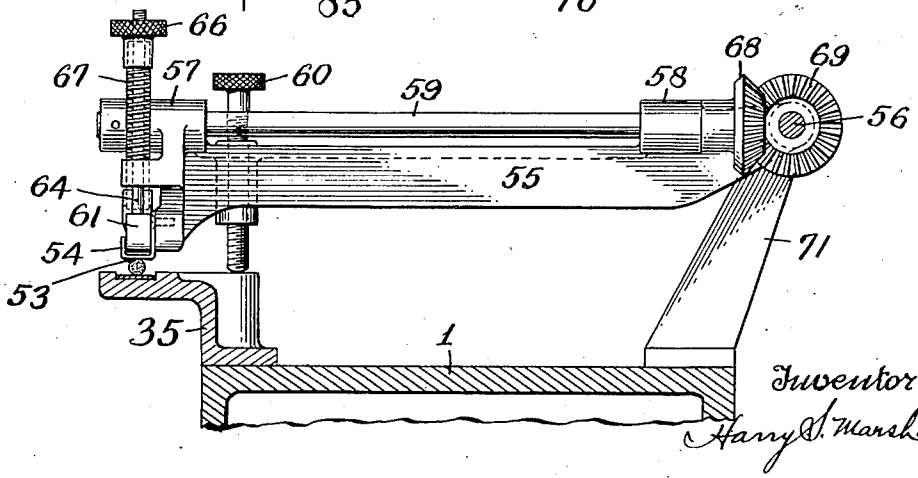


Fig. 4,



Inventor
Harry S. Marsh

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Fig. 6,

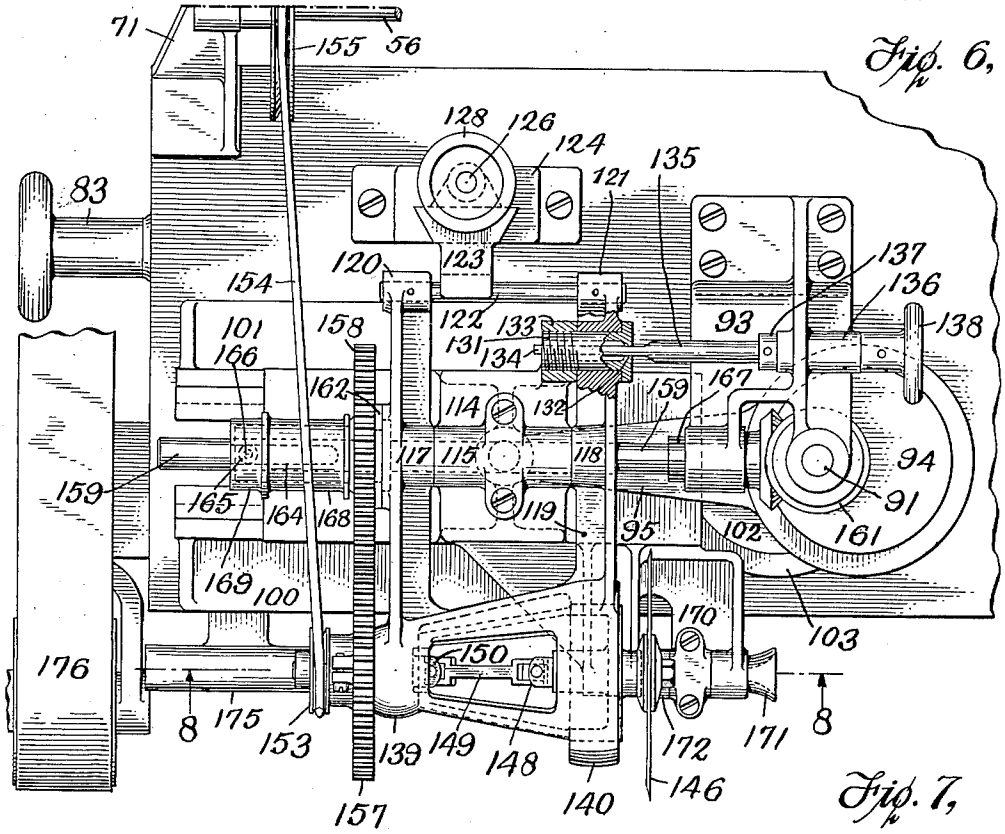


Fig. 7,

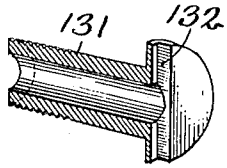
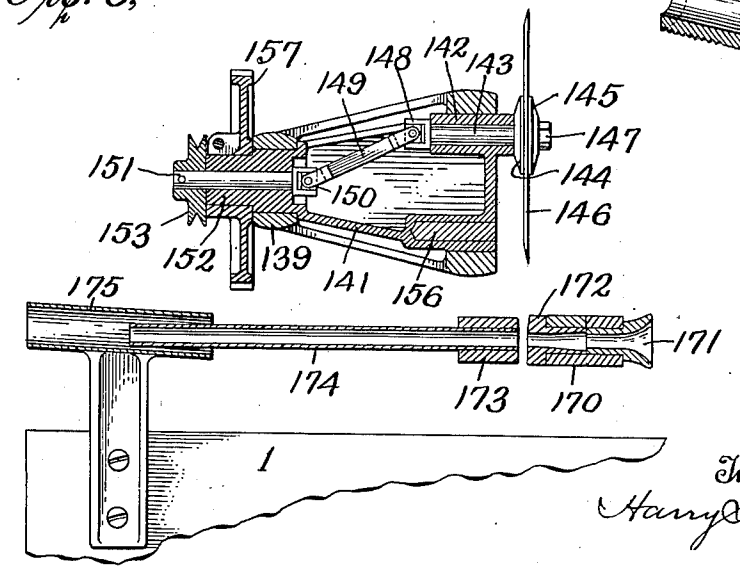


Fig. 8,



Inventor
Harry S. Marsh

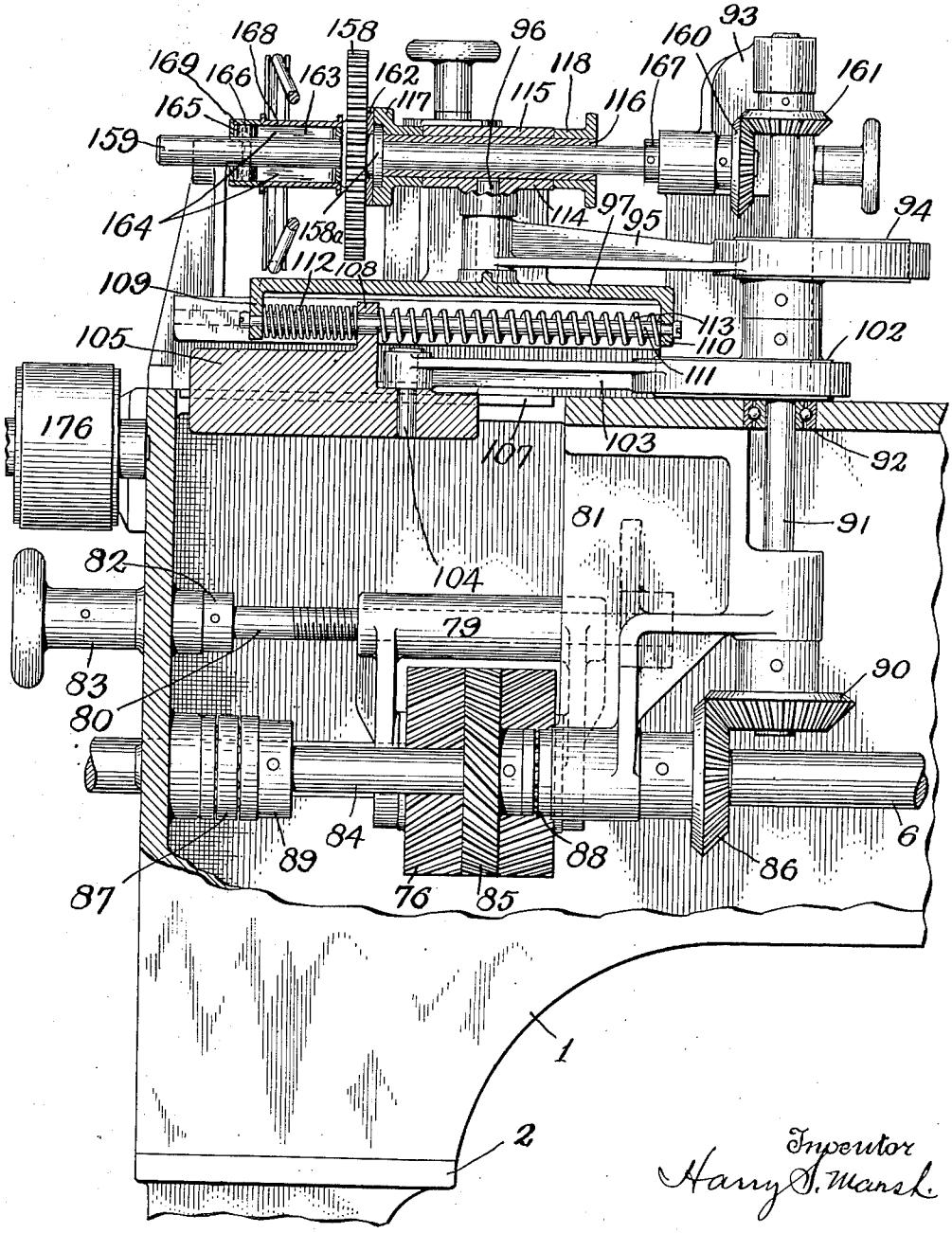
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H. S. MARSH

CIGARETTE MACHINE

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Fig. 9,



Inventor
Harry S. Marsh

Patented Dec. 29, 1925. 1,567,533

UNITED STATES PATENT OFFICE.

HARRY S. MARSH, OF BROOKLYN, NEW YORK.

CIGARETTE MACHINE.

Application filed March 15, 1920. Serial No. 365,957.

To all whom it may concern:

Be it known that I, HARRY S. MARSH, a citizen of the United States, residing at New York, in the borough of Brooklyn, State of New York, have invented new and useful Improvements in Cigarette Machines, of which the following is a specification.

This invention relates to an improvement in cigarette machines of the continuous rod type in which the paper forming the wrapper of the cigarette is fed from a reel in a narrow band which may pass through a printing device for the purpose of printing thereon a legend, trade-mark or other character or it may pass directly to a guide channel where the shredded tobacco is dropped in a uniform layer on it, passing then under a wheel or shoe for the purpose of pressing down any loose or upstanding strands of tobacco, then to a folding or paper curling device, being carried forward at this point by a suitably driven endless tape, where the edges of the paper are guided up and around the tobacco, one edge standing vertically, to the inner side of which paste is applied; then passing under a shoe which folds down the pasted side against the already folded down opposite side of the wrapper forming a pasted and closed cigarette rod. The rod then passes under a shoe which presses the seam into closer union and evaporates by means of heat some of the moisture in the paste, passing then to a device for cutting the rod into suitable lengths as completed cigarettes which are then dropped onto a conveyor belt for the purpose of moving them out of the path of the following cigarettes.

The main object of my invention is to provide a cutting-off mechanism of the reciprocating circular knife type capable of a high speed without producing the usual harmful vibrations present in the common type of reciprocating cutting-off mechanism and at the same time to provide simple means for sealing the cigarette rod securely at the high speed maintained.

A further object of my invention is to provide means for varying the relation of the cutting point on the cigarette rod to the printed character or characters on the paper wrapper while the machine is in operation and also to compensate for the slipping and stretching of the paper which varies with the condition of the atmosphere and the moisture content and quantity of the tobacco used.

A further object of my invention is to provide means for varying the height, while the machine is in operation, of the center of rotation and revolution of the circular knife to compensate for the varying diameter of the knife due to grinding its edge to a smaller diameter in sharpening.

With these and other objects in view not specifically mentioned, the invention consists in certain constructions and combinations which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings which form a part of this specification and in which like characters of reference indicate the same or similar parts,

Figure 1 is a front view of an embodiment of my invention.

Figure 2 is a top view of the same.

Figure 3 is a front view in greater detail of the seam sealing device, and

Figure 4 is a right hand side view of the same.

Figure 5 is an enlarged sectional view of the cutting-off mechanism taken on the line 5—5 of Figure 1 certain parts being broken away for greater clearness.

Figure 6 is an enlarged top view of the cutting-off mechanism, certain parts being shown in section.

Figure 7 is a sectional perspective view of the hollow screw which locks the cutting-off knife bearing in a fixed position after adjustment.

Figure 8 is a sectional view on the line 8—8 of Figure 6 of the knife mounting and cigarette guide.

Figure 9 is a sectional view of the cutting-off mechanism on the line 9—9 of Figure 5.

Referring to the drawings, 1 indicates a bed designed to support and co-ordinate the different devices utilized in the printing, filling, forming, sealing and cutting of the

cigarette rod. The bed is mounted on legs 2 and 2′ and carries at the rear a bracket 3 forming bearings for a shaft 4 carrying a driving pulley 5 by means of which the machine is operated.

The bracket 3 encloses gearing for transmitting the motion from the shaft 4 to a parallel shaft 6 which extends from one end of the machine to the other and to which are geared the several devices mounted on the bed.

As no novelty is claimed in this transmission mechanism, which is made up of spur, bevel and worm gearing, no special construction is described and many combinations of transmission units will be readily conceived.

At 7 a reel of cigarette paper of suitable width is mounted on a spool 8 journalled on a stud 9 carried by a bracket 10.

The paper passes from the reel 7 over a roller 11 and around a drum 12 of the printing mechanism 13 within which any trade mark, design or characters may be printed on the paper. As no novelty is claimed in the printing device, which may be of any suitable design, it will not be described in detail.

From the printer 13 the paper may pass over rollers 14 and 15 to the guide channel 16 or it may pass directly from the reel 7 to the guide channel 16 if no printing is desired on the paper.

Within the length of this guide channel, which is formed by walls slightly nearer together than the width of the cigarette paper and beneath the edges of which walls the paper passes, the shredded or granulated tobacco is showered by any suitable automatic or hand-fed feeding device in a gradually increasing layer as the paper traverses the channel. The funnel or chute through which the tobacco falls is shown by dotted lines at 17.

At 18 is shown a concave faced roller mounted on a shaft 19 carried in bearings 20 and 20′ which may be driven by gearing 21 from a vertical shaft 22 geared in turn to the main drive shaft 6. With certain types of tobacco this roller need not be positively driven but may be mounted on cone pointed or ball bearings and allowed to turn freely or it may be replaced by a stationary shoe for the purpose of pressing down any upstanding particles of tobacco.

At 23 is shown a tape wheel or pulley mounted on a shaft 24 which is journalled in the frame 1 and driven by worm and worm wheel from the main shaft 6.

The pulley 23 carries an endless tape 25 which passes over an idler 26 and rollers 27 and 28 of a tightening device 29 through a guide 30 to a roller 31, then into and through the rod forming and paper folding tube 32 returning to the pulley 23 at 33.

At 34 is shown a paper guide or bridge which supports the paper and tobacco as it passes from the channel 16 to the folding tube 32.

The folding tube shown comprises a longitudinally grooved base 34′ supported by a bracket 35, and a tapered tongue 36 and side plates 37 and 38 having curved faces for curling or folding the paper up and around the tobacco as it passes through the tube, the tobacco being pressed downward against the paper at the bottom of the groove in the base 34′ by the tongue 36, the paper and tobacco being carried forward through the tube 32 by the endless tape 25 which lies in the bottom of the groove in the base 34′.

At 39 is shown a pasting device of conventional form comprising a paste pot 40, a paste wheel 41, which receives paste from the pot, mounted on a shaft 42 driven by gearing 43 from a vertical shaft 44 which is in turn geared to the main shaft 6. A second paste wheel 45 whose edge extends over the top of the cigarette rod is mounted on a vertical shaft 46 mounted in bearings 47 and 47′ having a pulley 48 at its upper end which is driven by a belt 49 from a pulley 50 on the shaft 22.

The paste wheel 45 which is in contact with the concave face of the paste wheel 41 receives paste therefrom and applies it to the inner side of the upstanding edge of the paper as it passes this wheel at 51. The folder shoe 52 having a grooved under face then guides and presses the pasted edge of the paper down against the previously folded opposite edge, thus closing the paper tube surrounding the tobacco.

At 53, Figs. 1, 2, 3, and 4 is shown a sealing device comprising a channeled shoe 54 mounted at the end of an arm 55 pivoted on a shaft 56 and having bearings 57 and 58 for a shaft 59. The free end of the arm 55 is supported by an adjustable screw 60 bearing against a lug on the bracket 35.

Within the channeled shoe 54 is mounted a second shoe 61 pivoted on a stud 62 in the arm 55 having a curved upper surface which fits against the periphery of a wheel 63 secured on the shaft 59. Pivoted in its free end, the shoe 61 has a vertical rod 64 which passes through a lug 65 on the arm 55 and has an adjustable nut 66 on its upper threaded end. Between the lug 65 and the nut 66 and surrounding the rod 64 is disposed a compression spring 67 whose pressure through the rod 64 draws the shoe 61 upward into contact with the wheel 63.

The shaft 59 has at its rear end a bevel gear 68 which engages a bevel gear 69 on the shaft 56 mounted in bearings 71, 72. The shaft 56 has at one end a pulley 73 driven by a belt 74 from a pulley 75 mounted on the side of the main drive-pulley 5.

The cut-off mechanism shown in Figs. 1 and 2 and in greater detail in Figs. 5, 6, 7, 8 and 9 comprises a wide faced helical gear 76, in Figs. 5 and 9, slidably mounted on the main shaft 6 and having keys 77, 78 engaging longitudinal keyways in the shaft. The gear 76 is embraced by a yoke 79 the arms of which are forked and guided by the shaft 6. The hub of the yoke 79 is mounted on a threaded shaft 80 parallel to the shaft 6 and having bearings in the bed 1 and bracket 81 and having a collar 82 and hand wheel 83 which resist the end thrust of the shaft 80. By means of the hand wheel 83 and the threaded shaft 80 the yoke 79 and gear 76 may be moved longitudinally of the shaft 6 while the mechanism is in motion.

Adjacent to the shaft 6 Figs. 5 and 9 is mounted a parallel shaft 84 having bearings in the bed 1 and bracket 81 and carrying a helical gear 85 which engages the gear 76, and also carrying at one end a bevel gear 86. The shaft 84 has ball thrust bearings 87, 88 and a collar 89 to resist the end thrust due to the action of the helical gears.

The bevel gear 86 engages a bevel gear 90 on a shaft 91 mounted in bearings in bracket 81, bed 1 at 92 and bracket 93. Mounted on the shaft 91 is an eccentric 94 embraced by one end of a connecting rod 95 which connects at its opposite end by means of a pin 96 with a sliding carriage 97 mounted by means of tongues 98, 99 secured thereto, on guiding ways 100, 101 in turn mounted on the bed 1, parallel with and adjacent to the center line of the cigarette rod as it passes through the machine.

Mounted also on the shaft 91 is another eccentric 102 whose center of eccentricity is opposite to, or 180 degrees from that of the eccentric 94. The eccentric 102 is similarly embraced by one end of a connecting rod 103 which is connected at its opposite end by means of a pin 104 to a sliding weight or counter balance 105 slidably mounted on guiding tongues 106, 107 secured to the bed 1, directly underneath and parallel to the ways 100, 101.

The weight 105 has an upwardly extending lug 108 which enters a recess formed in the under surface of the carriage 97. The carriage 97 has at its ends downwardly projecting lugs 109, 110 to which is secured a rod 111 which passes through a hole in the lug 108 of the weight 105. Surrounding the rod 111 between the lug 108 of the weight and the lugs 109, 110 of the carriage are mounted opposed compression springs 112, 113. The purpose of these springs is to cushion the blows and aid the reversals of motion of the carriage 97 and weight 105 as they are reciprocated at high speed by the rotation of the eccentrics 94 and 102.

Projecting upwardly from and integral with the carriage 97 is a split bearing 114 having a cap 115 within which is secured a sleeve or bushing 116 which projects at its ends a short distance beyond the ends of the bearing 114 and cap 115.

On the projecting ends of the bushing 116 are pivoted the hubs 117, 118 of a knife carrying frame 119 which is capable of being rocked on its pivots for the purpose of adjusting the height of its knife carrying end.

Between the rearwardly extending ends of the frame 119 mounted in hubs 120, 121 is a rod 122 which is embraced by a forked projection of a vertical slide 123 mounted in a bracket 124 secured to the bed 1. The slide 123 has at its rear side a projecting bearing 125 for a vertically mounted adjusting screw 126 which has a shoulder 127 below and a handwheel 128 above the bearing 125.

The screw 126 is threaded into a tapped hole in a projection 129 of the bracket 124. By rotating the handwheel 128 and screw 126 the slide 123 may be raised or lowered, at the same time (through the forked projection 123 and rod 122) rocking the knife carrying frame 119 while the carriage 97 and frame 119 are reciprocating.

In one arm of the frame 119 is formed a curved slot 130 through which passes a hollow screw 131 in the flanged head of which is formed a narrow slotted opening 132. The screw 131 is threaded into a projecting lug 133 of the bearing 114 and against which the arm of the frame 119 may be clamped.

Passing through the slotted opening 132 and the hollow interior of the screw 131 is the flattened end 134 of a shaft 135 which is mounted in alignment with the screw 131 in a bearing 136 of the bracket 93 and is held against longitudinal motion by a collar 137 and handwheel 138 at opposite ends of the bearing 136.

By means of the shaft 135 the screw 131 may be loosened releasing the frame 119 to permit its adjustment and again clamped in position while the parts are reciprocating.

The frame 119 has bearings 139, 140 formed in the portion opposite to the adjusting and clamping devices, adapted to rotatably support a conical sleeve 141. The sleeve 141 carries in an eccentric bearing 142 a shaft 143 which in turn carries collars 144, 145 between which is clamped a circular knife 146 by means of a nut 147. Formed integrally with the shaft 143 is one member of a universal joint 148 of familiar construction which is connected by a rod 149 with a similar universal joint 150 one member of which is formed integrally with a shaft 151 which is mounted concentrically in the small end 152 of the conical sleeve 141. On the projecting end of the shaft 151

is mounted a grooved pulley 153 which is rotated by a belt 154 from a pulley 155 mounted on the previously described shaft 56.

The conical sleeve 141 has at its large end weights 156 of relatively heavier metal placed in a position to counterbalance the weight of the eccentrically mounted shaft 143, collars 144, 145 and knife 146 as well as any otherwise unbalanced weight.

The projecting small end of the conical sleeve 141 has a spur gear 157 secured thereon which engages with another spur gear 158 mounted on a shaft 159 which has bearings in the bushing 116 and a hub of the bracket 93. On the end of the shaft 159 is secured a bevel gear 160 which engages with another bevel gear 161 secured on the upper end of the vertical shaft 91.

The gear 158 has a hub 158ª in which is formed an annular groove which is embraced by a split yoke 162 secured to a flange formed on the hub 117 of the frame 119 for the purpose of carrying the gear with the frame 119 and its supporting carriage 97 in their reciprocating movements.

The gear 158 has on its other side a long hub 163 having longitudinal slots 164 in which are located rollers 165 mounted on a pin 166 which passes through and is secured in the shaft 159.

Thus while the shaft 159 is held against longitudinal motion by the gear 160 and a collar 167, its rotary motion is transmitted to the gear 158 through the pin 166 and rollers 165 while the gear 158 is reciprocating on the shaft.

The hub 163 of the gear 158 is covered by a guard sleeve 168 and a cap 169 which protect the slots 164 from dust and serve to retain the rollers 165 in place.

The carriage 97 has a projecting arm 170 which carries in line with the cigarette rod, a guide 171 and a shearing die 172 against which the circular knife cuts as it revolves about the center of the conical sleeve 141 and rotates on its own shaft 143.

The carriage 97 also has another projecting arm 173 which carries a guide tube 174 which enters a stationary guide 175 secured to the bed 1 Fig. 8.

Below and adjacent to the guide 175 is an ordinary conveyor belt 176 mounted on suitably driven pulleys (driving means not shown) carried by brackets secured to the end of the bed 1.

As the closed cigarette rod leaves the folder shoe 52 resting on the tape 25 it passes under the sealing shoe 54 which presses the seam into close union. By means of the heat generated by the friction of the wheel 63 against the shoe 61, which is made of heat conducting material, the heat being transmitted to the shoe 54 which is also made of heat conducting material, a portion of the moisture in the paste is evaporated, thus securely sealing the paper wrapper of the cigarette rod.

As the cigarette rod now has considerable rigidity it passes unsupported to and through the guide 171 and cutting die 172 of the cut-off mechanism.

Through the driving mechanism already described the eccentric 94 rotates with the shaft 91 imparting a reciprocating motion to the carriage 97 and the supporting mechanism of the knife 146 which is also rotated at a high rate of speed. At the same time the conical sleeve 141 carrying the eccentrically mounted knife 146 is rotated, through the driving mechanism described, causing the knife to rise and fall relative to the cigarette rod.

At a certain portion of the revolution of the eccentric 94 the motion of the knife is so timed as to travel in its reciprocating motion at approximately the speed of and in the same direction as the cigarette rod.

The revolving and rotating knife is so timed that during the short time when it is travelling with the cigarette rod its edge will pass downward across the opening in the shearing die 172 and rise again clear of the path of the cigarette rod before the relative speeds of the knife and rod have altered materially, producing a substantially square cut across the cigarette rod separating the desired length to form a finished cigarette.

Through the driving mechanism described the eccentric 102 rotates with the shaft 91 imparting a reciprocating motion to the weight 105 which motion is opposed to that of the carriage 97, due to the opposed relation of the eccentrics 94 and 102.

The weight of the weight 105 is intended to be equal to that of the carriage 97 and mechanism carried by it. As the weights of the two reciprocating bodies are equal and the motions are parallel and opposed to each other the vibrations produced by the reciprocating bodies are substantially equalized and the bed of the machine is not subjected to the vibrations common in the ordinary type of reciprocating rotary knife cut-off mechanisms.

The springs 112, 113, which are alternately compressed as the carriage 97 and weight 105 move in opposite directions, cushion the blows due to the stopping of the motions and aid the reversals of motion of the two bodies equally.

Should it be desired to change the relation of the cut to the printed design on the cigarette paper it will be necessary to alter the time of revolving and reciprocating the knife relative to the rod carrying tape 25. This is accomplished by turning the hand wheel 83 and threaded shaft 80 in the desired direction thereby moving the yoke 79 and helical gear 76 which being guided longitudinally of its shaft by its keys changes the

relation on the pitch circle of the gears in direct proportion to the tangent of the angle of the teeth of the helical gears.

While the invention has been shown and described in combination with a cigarette machine, it will be understood that it is not limited to such an application and may be used in conjunction with any apparatus in which moving rod-like structures should be cut into suitable lengths without interrupting their movement. It will also be understood that various structural changes may be made without departing from the principle of the invention as defined in the appended claims.

What is claimed is:

1. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a knife mounted on the carriage for cutting the rod and a counterbalance connected to the carriage for neutralizing the vibrations due to the reciprocating motion thereof.

2. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a knife mounted on the carriage for cutting the rod and a counterbalance resiliently connected to said carriage.

3. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a knife mounted on the carriage for cutting the rod, a reciprocating counterbalance, and resilient means between said carriage and counterbalance for cushioning the movement of said carriage and counterbalance at the end of a stroke.

4. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a conical shaped member rotatably mounted on the carriage, a shaft in said member along the axis thereof, a second shaft in said member at one side of the axis, a counterbalance on said member on the opposite side of the axis, a knife mounted on the second shaft, a connection between the shafts, means for rotating the first shaft, and means for rotating the member.

5. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a knife mounted on the carriage for cutting the rod, a reciprocating counterbalance and springs interposed between said carriage and said counterbalance.

6. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a knife mounted on the carriage for cutting the rod, a reciprocating counterbalance and buffer springs acting on said carriage and said counterbalance.

7. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a knife mounted on the carriage for cutting the rod, a reciprocating counterbalance and resilient means for cushioning the carriage and counterbalance at the ends of their strokes.

8. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a conical shaped member rotatably mounted on the carriage, a shaft in said member along the axis thereof, a second shaft in said member at one side of the axis, a knife mounted on the second shaft, a connection between the shafts, means for rotating the first shaft, and means for rotating the member.

9. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a conical shaped member rotatably mounted on the carriage, a shaft in said member along the axis thereof, a second shaft in said member at one side of the axis, a counterbalance on said member on the opposite side of the axis.

10. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a rotary member supported entirely on said carriage and a rotary knife having an eccentric bearing in said rotary member.

11. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a rotary member carried by said carriage, a rotary knife having an eccentric bearing in said rotary member, means for imparting associated rotary motion to said rotary member and knife and means for counterbalancing said knife.

12. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a rotary member carried by said carriage, a rotary knife having an eccentric bearing in said rotary member, means for imparting associated rotary motion to said rotary member and knife and a counterweight carried by said rotary member for counterbalancing said knife.

13. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a rotary member carried by said carriage, a rotary knife having an eccentric bearing in said rotary member, a flexible connection for imparting ro-

tary motion to said knife and means for imparting rotary motion to said rotary member.

14. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a rotary member carried by said carriage, a rotary knife having an eccentric bearing in said rotary member, a shaft passing through said rotary member, a flexible connection between said knife and shaft and means for imparting rotary motion to said rotary member.

15. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a counterbalance connected to said carriage for neutralizing the vibrations due to the reciprocating motion thereof and a rotary knife mounted for eccentric movement on the carriage.

16. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a counterbalance connected to said carriage, resilient buffers connected to, and cushioning the movements of said carriage and counterbalance and a rotary knife mounted for eccentric movement on said carriage.

17. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a reciprocating counterweight connected to said carriage, resilient means interposed between said carriage and counterweight for cushioning the movements of said carriage and counterweight and for imparting an initial return impulse to the parts, a rotary member on said carriage and a rotary knife having an eccentric bearing in said rotary member.

18. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a reciprocating counterweight, buffer springs acting on said carriage and counterweight, a rotary member carried entirely by said carriage, a rotary knife having an eccentric bearing in said rotary member and means for imparting associated rotary motion to said rotary member and knife.

19. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a reciprocating counterweight, springs interposed between said carriage and counterweight, a rotary member carried by said carriage, a rotary knife having an eccentric bearing in said rotary member, means for imparting associated rotary motion to said rotary member and knife, and a counterweight carried by said rotary member for counterbalancing said knife.

20. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a reciprocating counterweight, springs interposed between said carriage and counterweight, a rotary member carried by said carriage, a rotary knife having an eccentric bearing in said rotary member, a counterweight carried by said rotary member, a flexible connection for imparting rotary motion to said knife and means for imparting rotary motion to said rotary member.

21. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a reciprocating counterweight, springs interposed between said carriage and counterweight, a rotary member carried by said carriage, a rotary knife having an eccentric bearing in said rotary member, a counterweight carried by said rotary member, a shaft passing through said rotary member, a flexible connection between said shaft and knife for imparting rotary motion to said knife, and means for imparting rotary motion to said rotary member.

22. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a cutting knife on said carriage, driving mechanism for said carriage, and means for altering the relation between the parts of said driving mechanism to vary the cutting point of said knife longitudinally with respect to the rod while the machine is in operation.

23. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a cutting knife on said carriage and driving mechanism for said carriage including a pair of gears, one of said gears being adjustable with respect to the other while the machine is in operation to vary the cutting point of said knife longitudinally with respect to the rod.

24. In a machine provided with mechanism for forming material into a rod-like shape and advancing it, the combination of a reciprocating carriage, a cutting knife on said carriage, driving mechanism for said carriage comprising a pair of helical gears and means for adjusting one of said gears longitudinally of its shaft to vary the cutting point of said knife longitudinally with respect to the rod.

25. In a cigarette machine, the combination with a cigarette rod forming, propelling and cutting mechanism of a shoe adapted to bear against the seam of the rod and friction producing mechanism for heating said shoe to seal the seam.

26. In a cigarette machine, the combination with a cigarette rod forming, propelling and cutting mechanism of a shoe adapted to bear against the seam of the rod, friction producing mechanism for heating said shoe to seal the seam and means for varying the friction to vary the amount of heat imparted to said shoe.

27. In a cigarette machine, the combination with a cigarette rod forming, propelling and cutting mechanism of a shoe adapted to bear against the seam of the rod and a rotary friction wheel for heating said shoe to seal the seam.

HARRY S. MARSH.