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CUT-OFF MECHANISM FOR CIGARETTE MACHINES.

APPLICATION FILED SEPT. 16, 1912.

1,075,274.

Patented Oct. 7, 1913.

3 SHEETS—SHEET 1.

Fig. 1

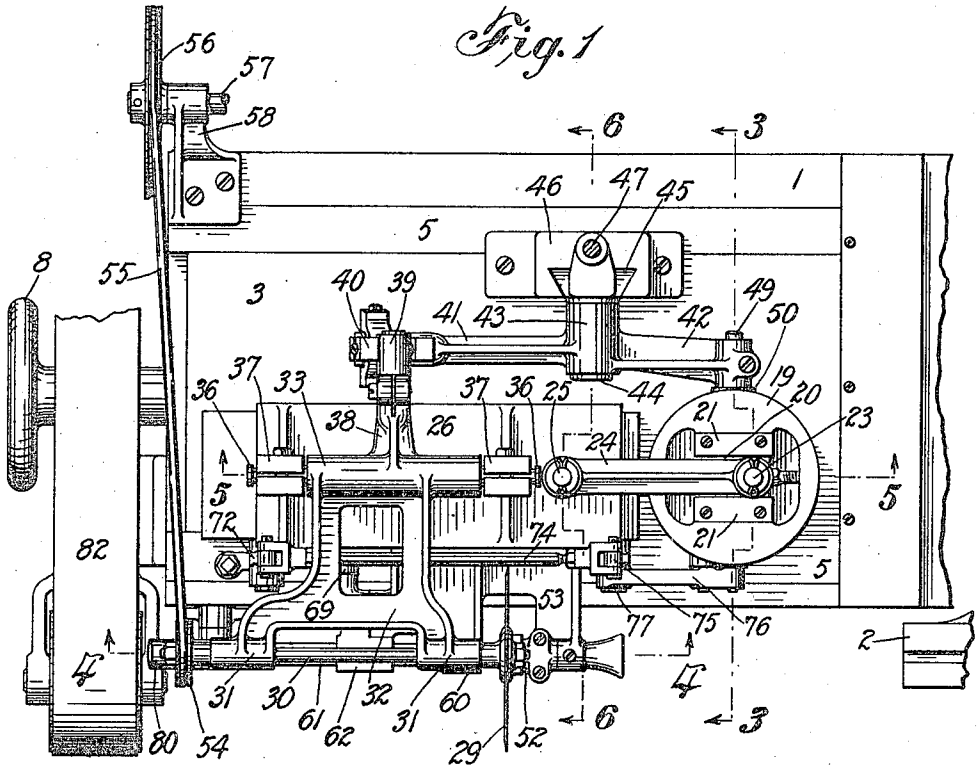


Fig. 4

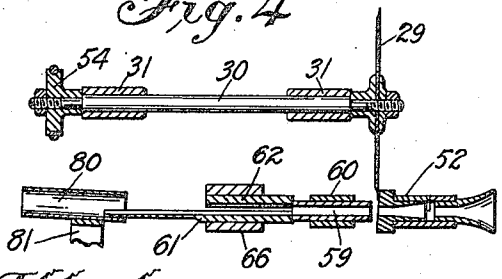
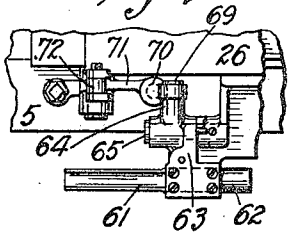


Fig. 7



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3 SHEETS—SHEET 2.

Fig. 2

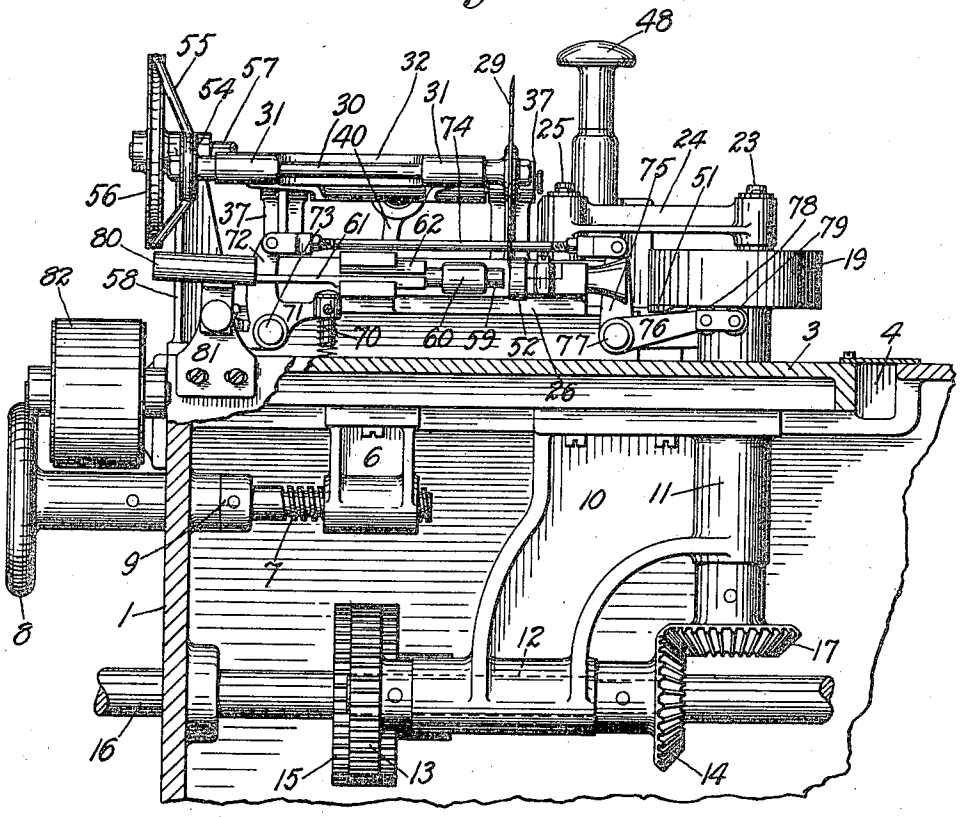
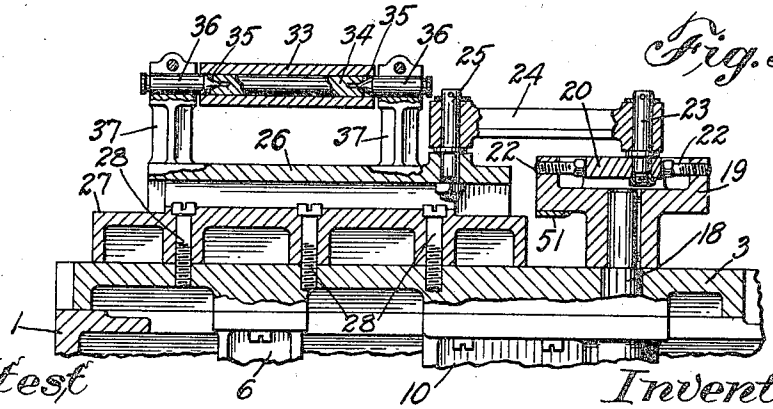


Fig. 5



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3 SHEETS—SHEET 3.

Fig. 3

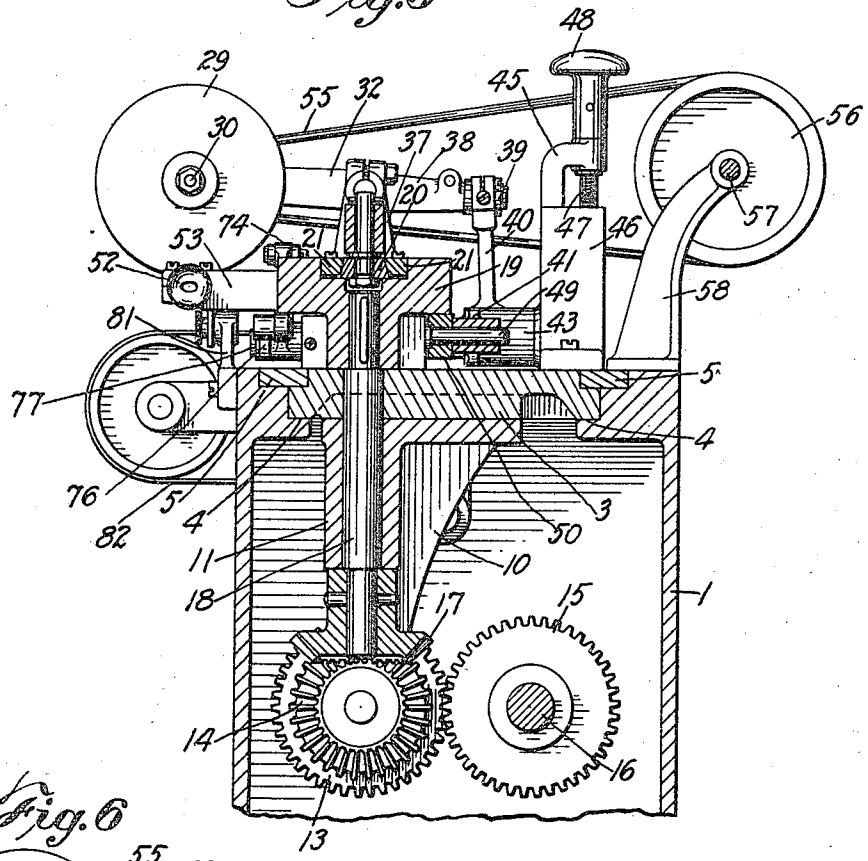


Fig. 6

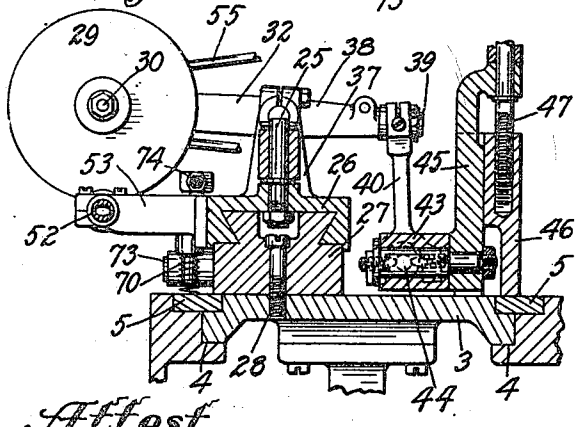
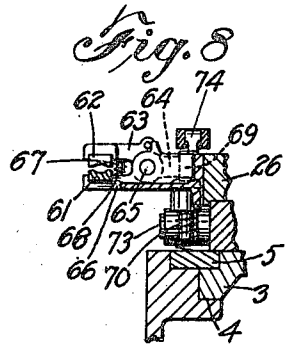


Fig. 8



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UNITED STATES PATENT OFFICE.

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CUT-OFF MECHANISM FOR CIGARETTE-MACHINES.

1,075,274. Specification of Letters Patent. Patented Oct. 7, 1913.

Application filed September 16, 1912. Serial No. 720,465.

To all whom it may concern:

Be it known that I, ELBERON D. SMITH, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Cut-Off Mechanism for Cigarette-Machines, of which the following is a specification.

This invention relates to an improvement in cut-off mechanism for cigarette machines and is particularly adapted for use in connection with high speed cigarette machines of the continuous rod type. Machines of this type usually include a printing mechanism which prints a strip of paper as it comes from a reel during the operation of the machine, the strip of paper being afterward carried up around the cigarette rod and pasted or crimped to form the wrapper of the cigarette. The cigarette rod forming mechanism of such machines includes an endless traveling belt which contacts with and advances the cigarette rod and its wrapper through the machine by frictional contact. There is more or less slip between the belt of the cigarette rod forming mechanism and the cigarette rod and its wrapper in low speed machines. In high speed machines this slip is more pronounced. When a cigarette rod formed in a machine of this type is cut up by the cut-off mechanism into individual cigarettes, it is important that the mark or device printed upon the different cigarettes be all equidistant from the end thereof; otherwise they would present an unsightly appearance when packed in boxes for the market. The relative slip of the endless belt and the cigarette rod in the cigarette rod forming mechanism results in varying the position of the mark or device with respect to the ends of the individual cigarette. The slip itself varies in accordance with the varying atmospheric conditions which affect the tobacco in the cigarette rod, either swelling it or causing it to be diminished in size. In machines of this type heretofore known, it has been customary to mount the cut-off mechanism in a fixed position and a definite distance from the cigarette rod forming mechanism. In such constructions there is no means for overcoming the defect due to the slipping in the cigarette rod forming mechanism.

The present invention has for its main object the production of a machine embodying a cigarette rod forming mechanism and a cut-off mechanism, and means whereby the two mechanisms are caused to coöperate to vary the position of the cut-off in accordance with any slipping which may take place in the cigarette rod forming mechanism.

A further object is the production of a device of the general character just mentioned which includes means for producing a relative bodily movement of the cigarette rod forming mechanism and the cut-off mechanism to vary the coöperative relation of said mechanisms whereby the position of the cut with respect to the device or mark printed on the cigarette rod wrapper may be adjusted without altering the feed of the tobacco and without stopping the machine.

A further object is the production of a machine of the general character mentioned in which the cigarette wrapper is creased, the creasing mechanism and the cut-off mechanism being together movable with respect to the cigarette rod forming mechanism.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions, combinations and parts 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 like parts, Figure 1 is a plan view of a device constructed in accordance with the invention; Fig. 2 is a front elevation, partly broken away, of the device shown in Fig. 1; Fig. 3 is a cross-sectional elevation taken on the line 3—3 in Fig. 1; Fig. 4 is a sectional elevation taken on the line 4—4 in Fig. 1; Fig. 5 is a sectional elevation on the line 5—5 of Fig. 1; Fig. 6 is a cross-sectional elevation taken on the line 6—6 in Fig. 1; Fig. 7 is a detail plan view of the creasing mechanism; and Fig. 8 is a detail cross-sectional view of the structure shown in Fig. 7.

In carrying the invention into effect, there is provided a bed, a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and coöperating with the cigarette rod forming mechanism, and means for producing a relative

bodily movement of the cigarette rod forming mechanism and the cut-off mechanism to vary the coöperative relation of said mechanisms, and all of these mechanisms and means may vary in construction within wide limits. In the best constructions, there is further provided a carrier movable upon the bed and supporting the cut-off mechanism and being adapted to be moved to vary the coöperative relation of the cigarette rod forming mechanism and the cut-off mechanism while the machine is in operation, and this carrier may also vary in construction within wide limits. In the best constructions also, there is provided a creasing mechanism coöperating with the cut-off mechanism and having the same adjustability with respect to the cigarette rod forming mechanism as the cut-off mechanism itself, and this creasing mechanism may also vary in construction within wide limits.

In the device selected to illustrate the invention, there is provided a bed 1 consisting of a box-like structure adapted to inclose the main operating gearing by means of which the machine is driven. Since a more detailed description of the bed is unnecessary to a full understanding of the present invention, it is omitted in the interest of brevity. It may be here remarked, however, that the bed 1 will be designed to support not only the cut-off mechanism but the cigarette rod forming mechanism, the printing mechanism and the various other mechanisms necessary in a machine adapted to form continuous rod cigarettes. There is further provided a cigarette rod forming mechanism which is supported by the bed. The particular construction of the cigarette rod forming mechanism lies wholly outside of the present invention and it will therefore be neither illustrated nor described in detail herein. The cigarette rod forming mechanism, however, will in any case include a rod forming tube or bar marked 2 which is supported by the bed of the machine in the usual manner. There is further provided a cut-off mechanism supported by the bed 1 and which coöperates with the cigarette rod forming mechanism to sever the continuous rod passing through the latter into individual cigarettes. As shown, the cut-off mechanism is mounted upon a carrier consisting of a plate 3 movable in ways 4 formed in the upper surface of the bed 1. The carrier is rabbeted and held in place by means of gibs 5. Bolted to the under side of the carrier 3 is a bracket 6 through which is threaded a screw 7 which projects beyond the end of the bed 1. Upon the projecting end of the screw is secured a hand wheel 8 by means of which the screw may be operated. A collar 9 is provided for the screw inside of the end of the bed, the function of this collar being to prevent outward longitudinal movement of the screw. It will be readily understood that by the means just described the carrier 3 may be moved in a direction parallel with the axis of the tube 2 of the cigarette rod forming mechanism, and it is obvious that any mechanism mounted upon the carrier will be moved in a like manner.

Depending from the under side of the carrier 3 is a second bracket 10 having formed therein a vertical bearing 11 and a horizontal bearing 12. Journaled in the horizontal bearing 12 is a short shaft carrying at one end a spur gear 13 and at the other end a miter gear 14. The spur gear 13 is in constant mesh with a wide faced driving gear 15 mounted upon shaft 16 which is one of the main power shafts of the machine. By an inspection of Fig. 2, it will be readily seen that the carrier 3 and the bracket 10 may be moved within limits in either direction without throwing the gear 13 out of mesh with the wide faced gear 15. The miter gear 14 is in mesh with a second miter gear 17 pinned or otherwise fastened to a vertical shaft 18 which is journaled in the bearing 11 before referred to. Upon the upper end of the shaft 18 is fixed a wheel 19. The upper face of this wheel is countersunk and provided with a slide 20 which is held in position by means of gibs 21 screwed or otherwise fastened to the wheel 19. This slide 20 is adjustable by means of two screws 22 (see Fig. 5.) The slide further carries an upstanding post 23 located near one of its ends. It will be readily understood that by the construction just described, the position of the post 23 with respect to the axis of the shaft 18 may be adjusted. This is necessary when cigarettes of different lengths are to be made on the same machine.

Journaled upon the post 23 is a connecting rod 24 which is also journaled upon a stud 25 fixed in a dove-tailed slide 26 which is movably mounted upon a corresponding dove-tailed block 27, which block is secured to the carrier 3 by means of screws 28. The slide 26 carries the knife which severs the continuous cigarette rod into individual cigarettes. It will be readily understood that by means of the mechanism just described the slide 26 and the knife will be given the to-and-fro movement which is necessary to produce the desired effect and which is well known in the art.

For the purpose of cutting the continuous cigarette rod into individual lengths, there is provided a rotating knife 29 fixed upon a shaft 30, which shaft is journaled in bearings 31 formed on a lever bracket 32. The shaft 30 is directly over the path of movement of the cigarette rod as it is advanced from the cigarette rod forming mechanism. The bracket 32 is provided with a hub 33

within which is fixed a stud 34 (see Fig. 5), which is provided with cone bearings at 35. These bearings coöperate with cone studs 36 which are clamped in uprights 37 rising from the slide 26 before referred to. The studs 36 and bearings 35 form the fulcrum of the lever bracket 32 and said bracket is adapted to be oscillated on said studs. The bracket 32 has a rearwardly projecting arm 38 to which a collar 39 is clamped. This collar 39 is engaged by the upper end of a connecting rod 40. The lower end of the connecting rod 40 is pivoted to one end of a lever 41—42, which lever has a hub 43 intermediate its ends. The hub 43 is journaled upon a stud 44 fixed in a vertical slide 45. This slide is adapted to be moved longitudinally in a bracket 46 rising from the carrier 3 before referred to. There is further provided a screw 47 which engages the slide 45 and the bracket 46 as is clearly shown in Fig. 6 and which has an operating knob 48 fixed to its upper end. The arm 42 of the lever 41—42 carries a stud 49 upon which is mounted a bowl 50 engaging a cam 51 formed on the under side of the wheel 19 before referred to. Coöperating with the rotating knife 29 is a ledger plate 52 of well-known construction and which is supported by an arm 53 projecting forwardly from the slide 26 before referred to. The shaft 30 carries at the end opposite the rotating knife 29 a pulley 54 over which runs a belt 55 deriving its motion from a pulley 56 fixed upon a shaft 57, which shaft is journaled in a bracket 58 rising from the bed 1. The shaft 57 derives its motion from any suitable source of motion, such for instance as one of the main power shafts of the machine not shown.

It will be readily understood that during the operation of the machine the knife 29 rotates continuously and that the mechanism just described produces a rocking movement of the bracket 32 which in turn produces a movement of the operating edge of the rotating knife 29 across the path of movement of the advancing cigarette rod in a manner well known in the art. It will be further understood that since the fulcrumed stud 44 of the lever 41—42 is movable by means of the screw 47 and knob 48, the knife may be adjusted transversely; that is to say, across the path of movement of the cigarette rod, while the machine is in operation.

For the purpose of creasing the cigarette when desired, there is provided a creasing device supported by and movable with the carrier and means for throwing the creasing device into action simultaneously with the forward movement of the cut-off mechanism. This device includes a tubular guide 59, the axis of which is in a line with the axis of the ledger plate before referred to. The tubular guide 59 is supported by a bracket 60 extending forwardly from the slide 26 before referred to. Beyond the tubular guide 59 is an open trough 61, the lower side of which is in alinement with the lower bore of the guide 59 so that a cigarette moving through the guide 59 may be advanced along the trough 61 without meeting obstruction. Coöperating with the trough 61 is a creasing member 62 located immediately over the trough. This member is secured to a lever 63—64 which is fulcrumed at 65 to a suitable boss formed on a bracket 66 which extends from the slide 26 and supports the trough 61. A spring 67 coiled around a stud 68 immediately to the rear of the trough 61 and creasing member 62 serves to normally keep said trough and said member apart. The rear arm 64 of the lever 63—64 carries a bowl 69. Located in the path of movement of the bowl 69 is a spring pressed stud 70 mounted upon one end of a bellcrank 71—72, which bellcrank is fulcrumed at 73. As the slide 26 moves forward, the bowl 69 rides up over the head of the stud 70, thus forcing the creasing member 62 down toward the trough 61 against the action of the spring 67, thereby creasing the severed cigarette as it moves forward. For the purpose of preventing a downward movement of the creasing member 62 during the reverse or rearward movement of the slide 26, the stud 70 is retracted from the path of movement of the bowl 69 when the latter is retreating. This is accomplished in the following manner: To the upper end of the arm 72 of the bellcrank 71—72 is pivoted a connecting rod 74, which rod is also pivoted to one arm 75 of a bellcrank lever 75—76. This bellcrank lever 75—76 is fulcrumed at 77 to the slide 26, and the arm 76 carries a pair of bowls 78 and 79, one of which is adapted to be engaged at the proper time by the cam 51 before referred to, which cam is located on the under side of the wheel 19. The two bowls 78 and 79 are provided so that one of them will be in the proper position to operate the stud 70 irrespective of the adjustment of the carrier with respect to the cigarette rod forming mechanism. After a cigarette has been creased, it is advanced through a guiding tube 80 suitably supported on a bracket 81 rising from the bed of the machine. From the guiding tube 80 it falls upon a traveling belt 82 of a construction and operation well known in the art.

In view of the foregoing, a detailed description of the operation of the device is deemed unnecessary, and is therefore omitted in the interest of brevity.

It will be understood that changes and variations may be made in the structure by means of which the invention is carried into

effect. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and coöperating with the cigarette rod forming mechanism, and means for producing a relative bodily movement of the cigarette rod forming mechanism and the cut-off mechanism to vary the coöperative relation of said mechanisms.

2. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and coöperating with the cigarette rod forming mechanism, and means for producing a relative bodily movement of the cigarette rod forming mechanism and the cut-off mechanism to vary the coöperative relation of said mechanisms while they are in operation.

3. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and having a shearing device coöperating with the cigarette rod forming mechanism said shearing device having a to-and-fro movement with respect to the cigarette rod forming mechanism, and means for producing a relative bodily movement of the cigarette rod forming mechanism and the cut-off mechanism as a whole to vary the coöperative relation of said mechanisms.

4. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and coöperating with the cigarette rod forming mechanism, means for producing a relative bodily movement of the cigarette rod forming mechanism and the cut-off mechanism to vary the coöperative relation of said mechanisms, and means for producing a transverse adjustment of the cut-off mechanism while said cut-off mechanism is in operation.

5. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and coöperating with the cigarette rod forming mechanism, means for producing a relative bodily movement of the cigarette rod forming mechanism and the cut-off mechanism to vary the coöperative relation of said mechanisms while they are in operation, and means for producing a transverse adjustment of the cut-off mechanism while said cut-off mechanism is in operation.

6. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and coöperating with the cigarette rod forming mechanism, and means for producing a bodily movement of the cut-off mechanism with respect to the cigarette rod forming mechanism to vary the coöperative relation of said mechanisms.

7. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and coöperating with the cigarette rod forming mechanism, and means for producing a bodily movement of the cut-off mechanism with respect to the cigarette rod forming mechanism to vary the coöperative relation of said mechanisms while they are in operation.

8. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a carrier movable upon the bed, a cut-off mechanism supported by the carrier and coöperating with the cigarette rod forming mechanism, and means for producing a bodily movement of the carrier to vary the coöperative relation of said mechanisms.

9. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a carrier movable upon the bed, a cut-off mechanism supported by the carrier and coöperating with the cigarette rod forming mechanism, and means for moving the carrier in a direction parallel to the axis of the cigarette rod forming mechanism to vary the coöperative relation of said mechanisms.

10. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a carrier movable upon the bed, a cut-off mechanism supported by the carrier and coöperating with the cigarette forming mechanism, and a screw coöperating with the bed and carrier for moving the carrier in a direction parallel to the axis of the cigarette rod forming mechanism to vary the coöperative relation of said mechanisms.

11. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a carrier movable upon the bed, a cut-off mechanism including a shearing device supported by the carrier and coöperating with the cigarette rod forming mechanism, a driving mechanism supported by the carrier and adapted to produce a to-and-fro movement of the shearing device, and a screw coöperating with the bed and carrier to move said carrier in a direction parallel with the axis of the cigarette rod forming mechanism to vary the coöperative relation of said mechanisms.

12. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a carrier movable upon the bed, a cut-off mechanism

including a shearing device supported by the carrier and coöperating with the cigarette rod forming mechanism, a driving mechanism supported by the carrier and adapted to produce a to-and-fro movement of the shearing device, and a screw coöperating with the bed and carrier to move said carrier in a direction parallel with the axis of the cigarette rod forming mechanism to vary the coöperative relation of said mechanisms, and means for transversely adjusting the shearing device while in operation.

13. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a carrier movable upon the bed, a cut-off mechanism including a shearing device supported by the carrier and coöperating with the cigarette rod forming mechanism, a driving mechanism supported by the carrier and adapted to produce a to-and-fro movement of the shearing device, a screw coöperating with the bed and carrier to move said carrier in a direction parallel with the axis of the cigarette rod forming mechanism to vary the coöperative relation of said mechanisms, and a screw actuated device for transversely adjusting the shearing device while in operation.

14. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and cooperating with the cigarette rod forming mechanism, means for producing a relative bodily movement of the cigarette rod forming mechanism and the cut-off mechanism to vary the coöperative relation of said mechanism, and a creasing device supported by and movable with the cut-off mechanism.

15. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a cut-off mechanism supported by the bed and cooperating with the cigarette rod forming mechanism and including a shearing device, means for producing a to-and-fro movement of the shearing device, means for throwing the shearing device into action during the forward movement of the cut-off mechanism, means for moving the cut-off mechanism to vary its coöperative relation with the cigarette rod forming mechanism, a creasing device supported by and movable with the cut-off mechanism, and means for throwing the creasing mechanism into operation during the forward movement of the cut-off mechanism.

16. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a carrier movable upon the bed, a cut-off mechanism supported by the carrier and including a shearing device coöperating with the cigarette rod forming mechanism, a driving mechanism supported by the carrier for producing a to-and-fro movement of the shearing device, a screw coöperating with the bed and carrier to produce a bodily movement of the carrier to vary the coöperative relation of the cigarette rod forming mechanism and cut-off mechanism, a creasing device supported by and movable with the carrier, and means for simultaneously throwing the shearing device and creasing device into action during the forward movement of the cut-off mechanism.

17. In a cigarette machine, the combination with a bed, of a cigarette rod forming mechanism supported by the bed, a carrier movable upon the bed, a cut-off mechainsm supported by the carrier and including a shearing device coöperating with the cigarette rod forming mechanism, a driving mechanism supported by the carrier for producing a to-and-fro movement of the shearing device, a screw coöperating with the carrier and bed to produce a bodily movement of the carrier while said mechanisms are in operation to vary the coöperative relation of the cigarette rod forming mechanism and cut-off mechanism, a creasing device supported by and movable with the carrier, and means for simultaneously throwing the shearing device and creasing device into action during the forward movement of the cut-off mechanism.

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

ELBERON D. SMITH.

Witnesses:

SYDNEY I. PRESCOTT,

FRANK H. VICK, Jr.