No. 887,339. PATENTED MAY 12, 1908.

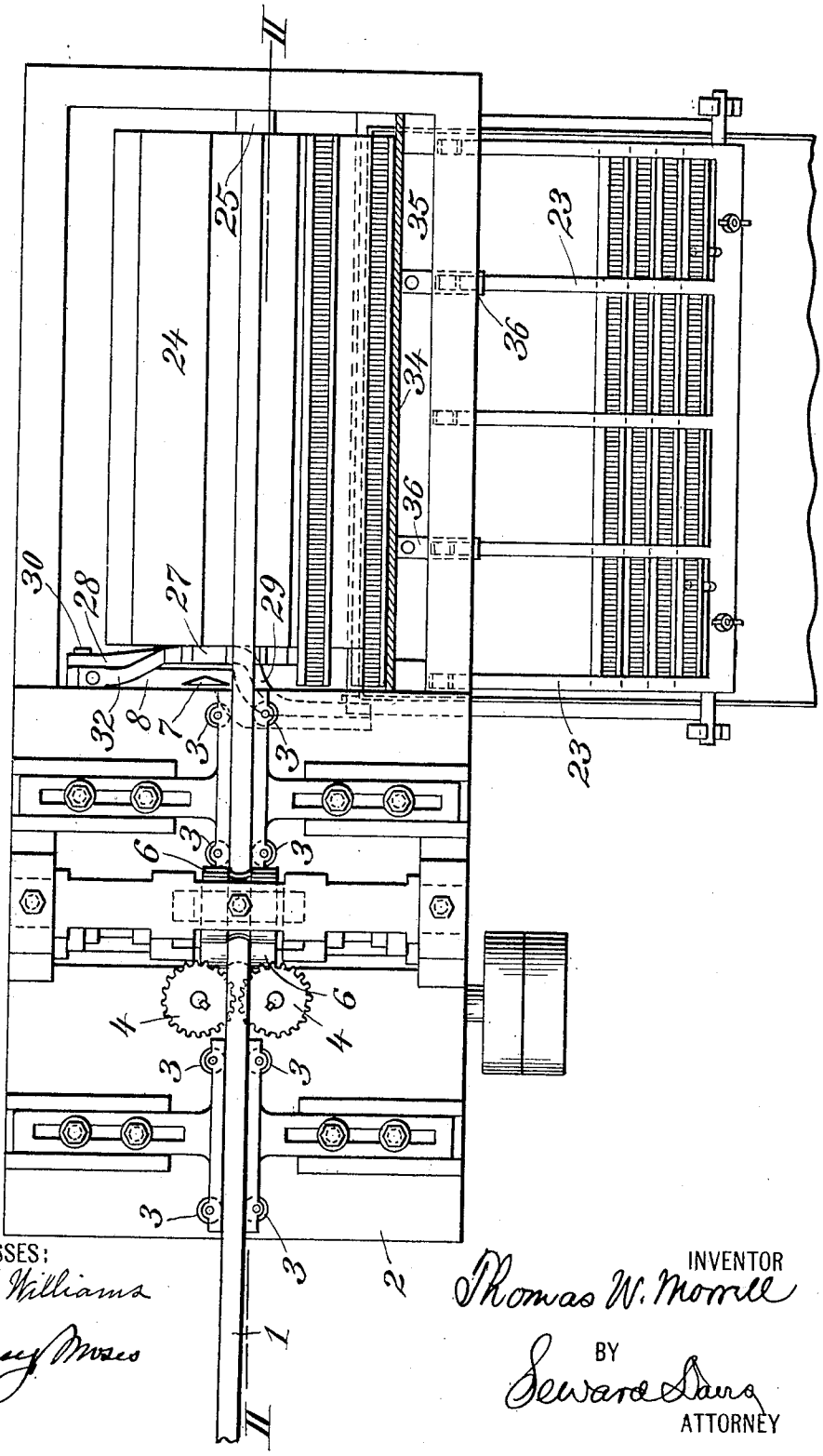
T. W. MORRELL.

CUTTING AND DELIVERING MECHANISM.

APPLICATION FILED NOV. 9, 1907.

3 SHEETS—SHEET 1.

FIG. 1.



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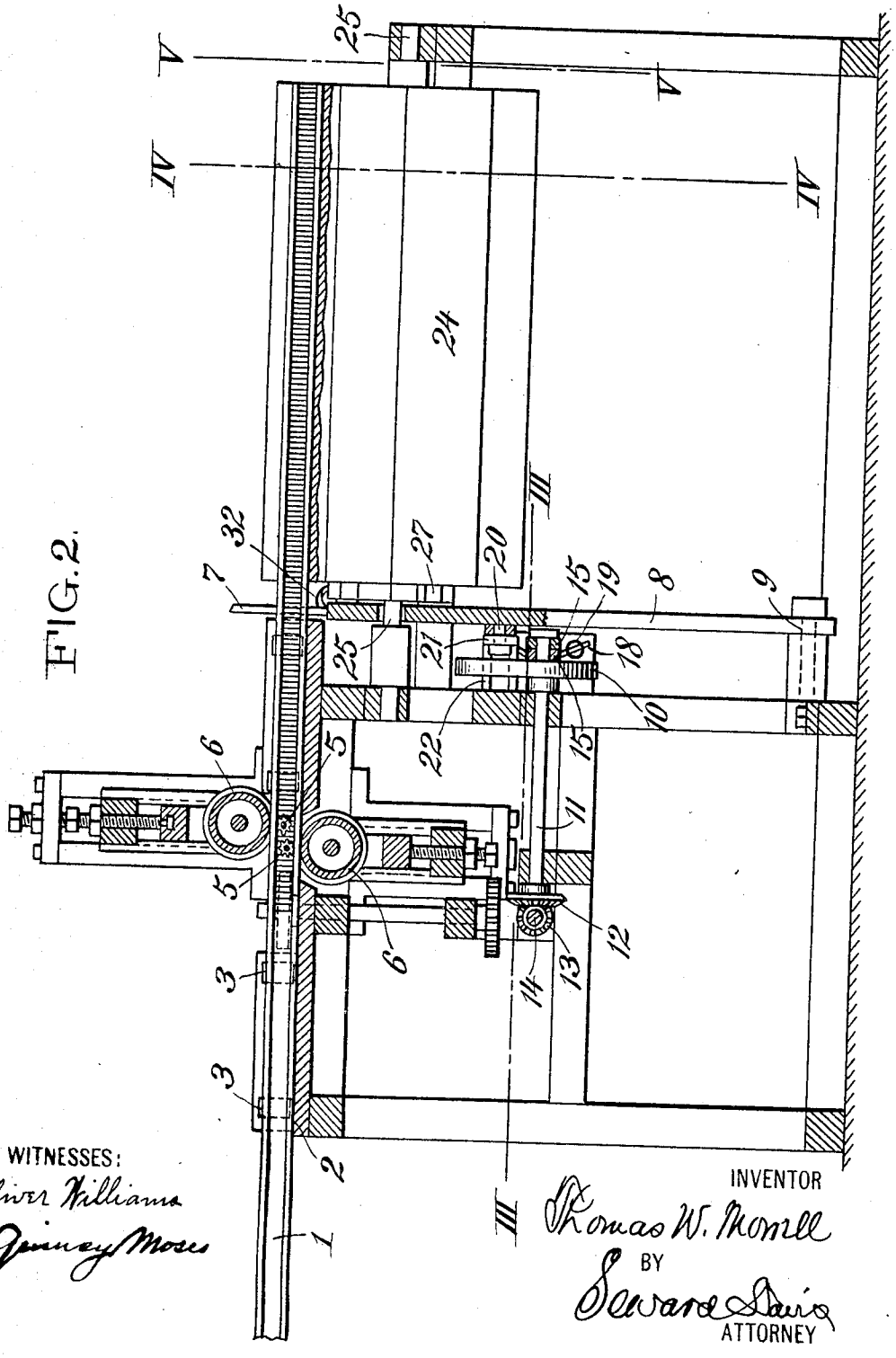
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3 SHEETS—SHEET 2.

FIG. 2.



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3 SHEETS—SHEET 3.

FIG. 4.

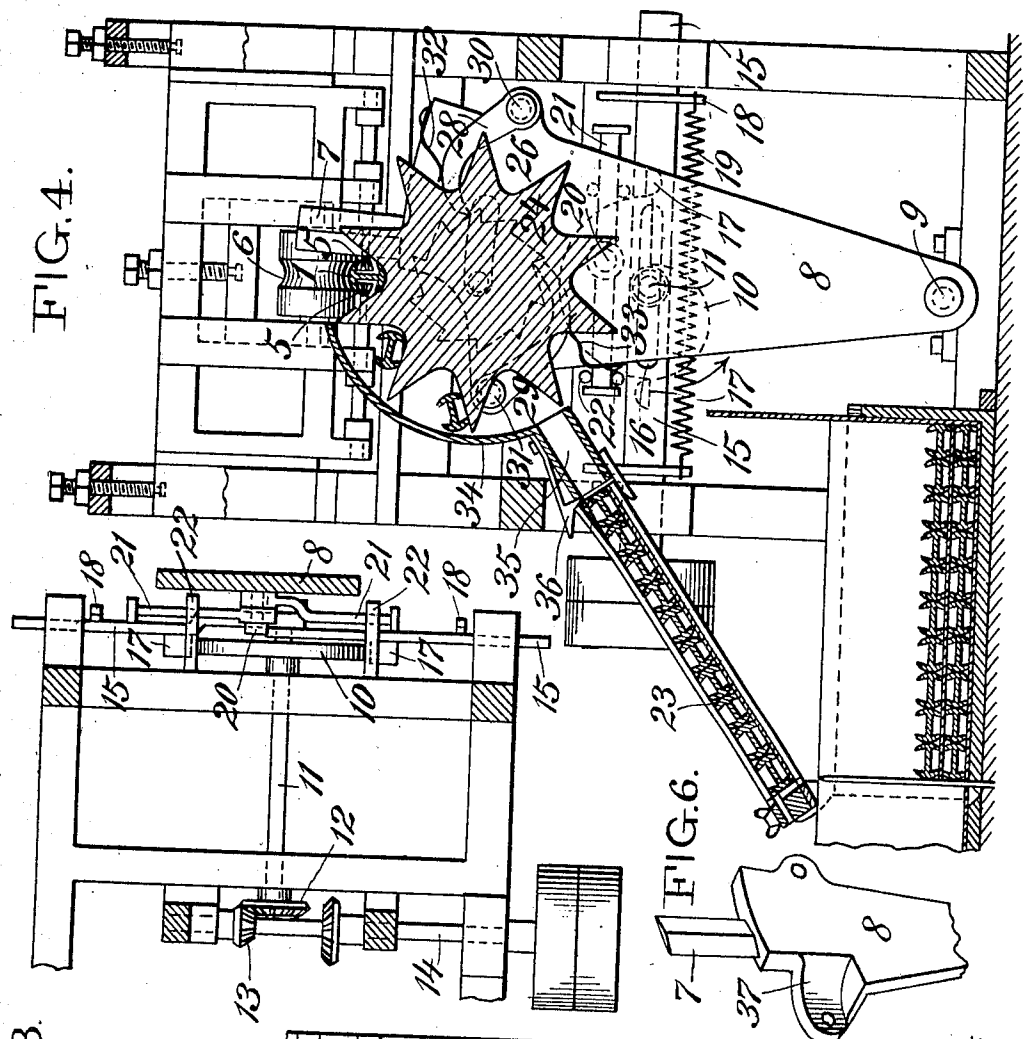
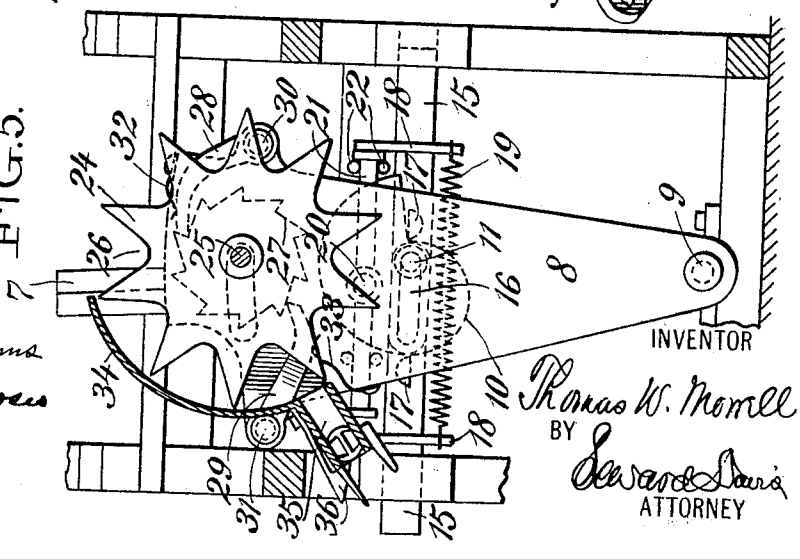


FIG. 6.

FIG. 3.

FIG. 5.



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UNITED STATES PATENT OFFICE.

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CUTTING AND DELIVERING MECHANISM.

No. 887,339. Specification of Letters Patent. Patented May 12, 1908.

Application filed November 9, 1907. Serial No. 401,397.

To all whom it may concern:

Be it known that I, THOMAS W. MORRELL, a citizen of the United States, residing in the town of Bloomfield, county of Essex and State of New Jersey, have invented certain new and useful Improvements in Cutting and Delivering Mechanism, of which the following is a specification.

My invention has for its object the provision of a cutting and delivering mechanism which can be used with an apparatus which continuously and rapidly delivers an endless strip of material which has to be cut into suitable lengths for packing and transportation. This case is a division of my application No. 367,121 filed April 8th, 1907, for machines for producing cames, which application shows and claims a mechanism of the nature described for operating upon came strips. My apparatus is, however, equally well adapted for use with any other machine of similar nature.

It is obvious that a machine having this object in view, must be capable of severing the traveling strip with great rapidity as the strip being fed continuously along would be seriously buckled or upset if the cutting mechanism were slow enough to obstruct its movement for an appreciable length of time. It is obvious, also, that some means must be provided for disposing of the lengths cut off so as not to choke the machine. For some purpose it might be sufficient to permit the severed lengths to drop into a receptacle directly below the cutter, but for other purposes and particularly where the article acted upon is easily damaged as in the case of cames, which are usually made of lead or other soft metal, some other means must be provided.

My invention contemplates the provision of a conveying means which will rapidly transfer the severed lengths to one side where they will be out of the way and be safe from damage. This mechanism I have constructed so that it will deliver the severed lengths to a fixed chute through which they slide by gravity to a removable chute, such as that shown and claimed in my application Serial No. 367,122 filed April 8, 1907, for process of packing cames. It is, however, not necessary to use such an apparatus with my delivering mechanism.

In the accompanying drawings forming a part of this application, wherein I have illustrated but one of the many concrete forms which my invention may take, Figure 1 is a plan view of my cutting and delivering mechanism shown in connection with the came-making machine of my application No. 367,121 above referred to, and showing also the removable chute of my other application referred to; Fig. 2 is a longitudinal vertical section on a line II, II of Fig. 1; Fig. 3 is a fragmentary horizontal section on the line III, III of Fig. 2 showing the knife operating cam, hammer slides and accompanying mechanism in plan. Fig. 4 is a transverse vertical section on the line IV, IV of Fig. 2; Fig. 5 is a similar section on a line V, V of Fig. 2, the parts of the came-making machine being omitted. Fig. 6 is a detailed perspective view of the upper part of the knife carrying frame and knife.

Referring to the drawings in detail: 1 is a came strip which is fed over the table, 2 of the came-making machine between the laterally adjustable guide rollers 3, then between a pair of positively driven fluted rolls 4, which serve to indent the heart of the came strip and at the same time to drive the came strip forward; then between two sets of rolls each set comprising a pair of toothed indenting rolls 5, and a supporting roll 6, and between another set of laterally adjustable guide rollers 3. As the came strip issues from these it is ready to be severed into lengths. This is done by the double edged knife 7, which is carried by the knife carrying frame 8, pivoted at its lower end at 9 to the base of the machine. This knife is driven alternately backward and forward at regular intervals properly timed to produce the desired length of strip. As above pointed out, it is desirable and necessary that each stroke of the knife should be as rapid as possible to avoid obstructing the strip in its travel, and for this purpose I have provided mechanism for delivering a hammer blow upon the knife-carrying frame, one specific illustration of which I have shown in the drawings and will now describe in detail:

I provide a cam 10, mounted upon a suitable shaft 11, and driven in any desired manner. In this instance I have shown it as driven through bevel gears 12, 13 from the main driving shaft 14 of the came-making apparatus. This cam has one-half of its operative face constructed on a curve of rapidly increasing radius, the other half of its face being circular and of a radius equal to the greatest radius of the increasing curve.

A radial offset or abrupt descent is thus formed between the increasing curve at its lesser radius and the circular part. I provide a pair of hammer slides 15 which operate in suitable guides in the main frame, the inner ends of the hammer slides being provided with horizontal longitudinal slots 16, through which passes the shaft 11, upon which the cam is mounted. The hammer slides are thus supported at their outer ends upon the main frame and at their inner ends upon the cam shaft, and are free to move in and out. Upon each of these slides I provide a projection 17, adapted to engage the cam surface. Each slide is also provided with a fixed bracket 18, which serves as a means for attaching the operating spring 19, and also has a hammer face. The operating spring 19 acts to draw the slides towards each other and to cause the projections or lugs 17 to at all times bear against the cam surface. From the face of the knife supporting frame projects a pin 20 upon which I pivot a pair of arms 21, the outer ends of which are guided between the pins 22 supported upon some suitable portion of the main frame. When the slides 15 are operated by the spring 19 the brackets 18 deliver their hammer blows upon the ends of these arms 21 alternately, which in turn transmit the blow to the knife carrying frame and cause the knife to quickly travel from one side of the came strip to the other, thus severing it.

For the purpose of removing the severed strips without injuring them, and transferring them to any suitable device or receptacle, as to the removable chute 23, I provide the rotary conveyer 24, mounted upon pintles 25 projecting from its ends, these pintles being carried in suitable bearings supported by the main frame. This rotary conveyer consists of a drum provided with a series of deep longitudinal grooves 26, each of a size to receive one length of came strip. The came strip coming from the forming machine enters one of these grooves and passes along it to its end or until the desired length of strip has passed the knife when the knife will be automatically operated by its cam and intermediate mechanism and will sever the strip at the desired point. At the same time or immediately thereafter the rotary conveyer must be moved around sufficiently to bring the next groove in position to receive the continuously traveling strip and to convey the already severed length on its way to the delivery point. It is obvious that this rotation of the conveyer must take place at the proper time and very quickly in order that the empty groove may be ready to receive the end of the continuously traveling strip. Any mechanism which will produce this result is satisfactory, but I have designed one particular form which I choose for illustration here, and which is constructed as follows: I provide upon the end of the rotating drum nearest to the cutting mechanism a ratchet wheel 27, and upon the knife carrying frame I pivot two pawls 28 and 29 upon the pins 30 and 31 respectively. These pawls are held in place against the ratchet wheel by the springs 32 and 33 respectively which are attached to the knife carrying frame. As the knife carrying frame is driven backward and forward these pawls, as will be seen, alternately engage the teeth of the ratchet wheel and drive it around thus turning the drum the proper distance just as the knife severs the length of strip.

In order that the end of the severed length of strip which projects from the groove in the rotary drum may clear the pawl 29 and that portion of the knife carrying frame which bears it, the said portion is offset at 30 as shown most clearly in Fig. 6. The pawl 29 is correspondingly offset as shown in plan view in Fig. 1.

As the lengths of came are carried around by the rotary conveyer, they are prevented from leaving the grooves by the guard plate 34. At the lower end of this guard plate is the fixed chute 35 through which the cames slide by gravity into the portable chute 23 above mentioned. Spring catches 36 are provided on the fixed chute which, when the portable chute is removed, move down into the path of the cames in the fixed chute and hold them therein until the portable chute can be emptied and returned, or another portable chute put in place.

The operation of my apparatus may be briefly described as follows: The continuously traveling strip coming from the forming, indenting or other treating mechanism, passes the knife and enters the appropriate groove in the rotary conveyer. Meanwhile the knife operating cam 10 is rotating in the direction of the arrow shown in Fig. 4 and is operating to move one of the lugs 17 from its inner position to its outer position by means of the curved surface of increasing radius while it at the same time holds the other lug in its outer position by means of the circular surface. The two lugs are thus moved apart carrying with them their respective hammer slides and thus causing the spring 19 to be extended to its maximum amount. Just as the strip reaches the end of the groove in the conveyer, or when the desired length has passed the knife, one of the lugs is reached by the radial offset in the cam and is thus permitted to be rapidly drawn or jerked in by the extended spring, thus moving the hammer slide and bracket in and causing the bracket to impinge violently upon the end of the corresponding arm 21 and to deliver thereupon a quick hammer blow, which in turn is transmitted to the knife carrying frame which is forced rapidly over to its

other position carrying the knife almost instantaneously through the traveling strip and severing it without in any substantial degree impeding its travel. Any slight obstruction which may occur is readily taken care of by a slight lateral buckling of the came strip back of the knife, allowance for which may be made if desired, by leaving a slight clearance between the guide rollers and the strip adjacent to the knife. Such action, however, is so slight as to be inappreciable. At the same time, the travel of the knife carrying frame causes the appropriate pawl 28 or 29 to engage a tooth in the ratchet wheel and thus turn the rotary conveyer until the next unoccupied groove comes opposite the end of the traveling came strip which immediately enters therein, the severed portion of the strip being carried forward in its groove toward the fixed chute.

I claim:

1. In combination, means for supporting and feeding a strip, a double-edged cutter movable to and fro across the path of said strip, a cutter support and means for delivering hammer blows upon said support for operating said cutter alternately in opposite directions to perform a cutting operation.

2. In combination, means for supporting and feeding a strip, a double-edged cutter movable to and fro across the path of said strip, a cutter support and means for delivering hammer blows upon said support for operating said cutter alternately in opposite directions to perform a cutting operation; said cutting means acting in timed relation to the feeding means whereby cames of uniform length will be produced.

3. In combination, means for supporting and feeding a strip, a cutter movable across the path of said strip, a cutter support and means for delivering a hammer blow upon said cutter support to cause the cutter to move across and entirely out of the path of said strip, while the strip is being fed forward, whereby the cutter will sever the strip without interfering with its forward motion.

4. In an apparatus of the character described, the combination of means for supporting and continuously feeding a strip, a cutter movable across the path thereof for severing the same, a spring for operating said cutter and means for alternately placing said spring under elastic stress and releasing the same, whereby the cutter delivers a quick powerful blow and severs the strip while it is being fed forward.

5. In an apparatus of the character described, the combination of a cutter and cutter support, arms pivoted to said support and means for delivering a blow upon said arms in alternation.

6. In an apparatus of the character described, the combination of a cutter and cutter support, means for operating said support consisting of a spring and a pair of slides connected thereby, and means for alternately placing said spring under elastic tension and releasing the same.

7. In an apparatus of the class described the combination of a cutter and cutter support, the slides 15 and spring 19, said slides being formed with projections 17 and a cam 10 provided with an abrupt descent and adapted to operate said slides by means of said projections.

8. In a machine of the class described, the combination of means for supporting and feeding a traveling strip, a rotary carrier drum, and a cutter carried by a support pivoted below the axis of said drum, said support being formed with a curved slot to allow the passage therethrough of the journal which carries the drum.

9. In a machine of the class described, the combination of means for supporting and feeding a strip and means for severing the forward end thereof while the strip is in motion, comprising a cutter, a spring adapted to operate said cutter, and means for placing said spring under elastic stress and suddenly releasing the same to enable it to operate the cutter.

10. In a machine of the class described, the combination of a cutter mounted on a movable support, a spring for moving said support alternately in opposite directions, and means for placing said spring under elastic stress and suddenly releasing the same to enable it to deliver a hammer blow with respect to said cutter support.

11. In combination, means for supporting and feeding a strip, a cutter movable across the path of said strip, said cutter being so constructed that it will leave said path unobstructed when it has completed its movement across said path, and means for causing said cutter to sever said strip with a hammer blow.

12. In combination, means for supporting and feeding a strip, a cutter operating with a quick hammer blow, a rotary conveyer for conveying laterally the severed portion of the strip and means for rotating the conveyer intermittently, in timed relation to the movements of the cutter.

13. In combination, means for supporting and feeding a strip, a cutter movable across the path of said strip and leaving said path unobstructed when at the limit of its stroke, a movable cutter support, and means for delivering a hammer blow upon the cutter support to drive the cutter across and out of the path of the strip, while the strip is being fed forward.

14. In combination, means for supporting and feeding a strip, a cutter movable across the path of said strip and leaving said path unobstructed when at the limit of its stroke, a cutter support, a movable hammer, and operating means for said hammer, for causing it

to strike the cutter support and drive the cutter across and out of the path of the strip to sever the strip; said operating means operating in timed relation to the strip feeding means whereby equal lengths will be cut from the strip.

15. In combination, a cutter, a movable cutter support, a rotary grooved drum with its axis transverse to the direction of movement of said cutter, and forming a conveyer whereby the material severed is transferred laterally, a ratchet wheel connected to turn with said rotary drum, and a pair of pawls carried by said cutter support and engaging said ratchet wheel.

16. In combination, means for feeding a strip, and means for severing the strip while in motion comprising a cutter adapted to pass by a quick hammer blow from a position on one side of said strip through said strip, and to a position on the other side of said strip, the path of the strip being unobstructed, while said cutter is in either of its said positions.

17. In combination, means for supporting and feeding a strip, a cutter operating in timed relation with the strip feeding means for severing said strip; a rotary conveyer for conveying laterally the severed portions of the strip; an inclined chute adapted to receive said portions from said conveyer, and means for retaining said portions in said inclined chute.

18. In combination, a cutter, a movable cutter support, a rotary grooved drum with its axis transverse to the direction of movement of said cutter, and forming a conveyer, whereby the material severed is transferred laterally; a ratchet wheel carried by the end of said drum adjacent to the cutter support; said cutter support having a portion offset away from said ratchet wheel, and an offset pawl pivoted at one end to said offset portion, the other end of said pawl engaging said ratchet wheel.

19. In combination, means for supporting and feeding a strip, a cutter and means for moving said cutter across and beyond the path of said strip, whereby said path is left unobstructed, said means comprising a hammer.

20. In combination, means for supporting and feeding a strip, a cutter movable across and beyond the path of said strip leaving said path unobstructed, a cutter support, and means for delivering upon said support a hammer blow, to cause the cutter to sever the strip.

THOMAS W. MORRELL.

Witnesses:

EDMUND QUINCY MOSES,

SEWARD DAVIS.