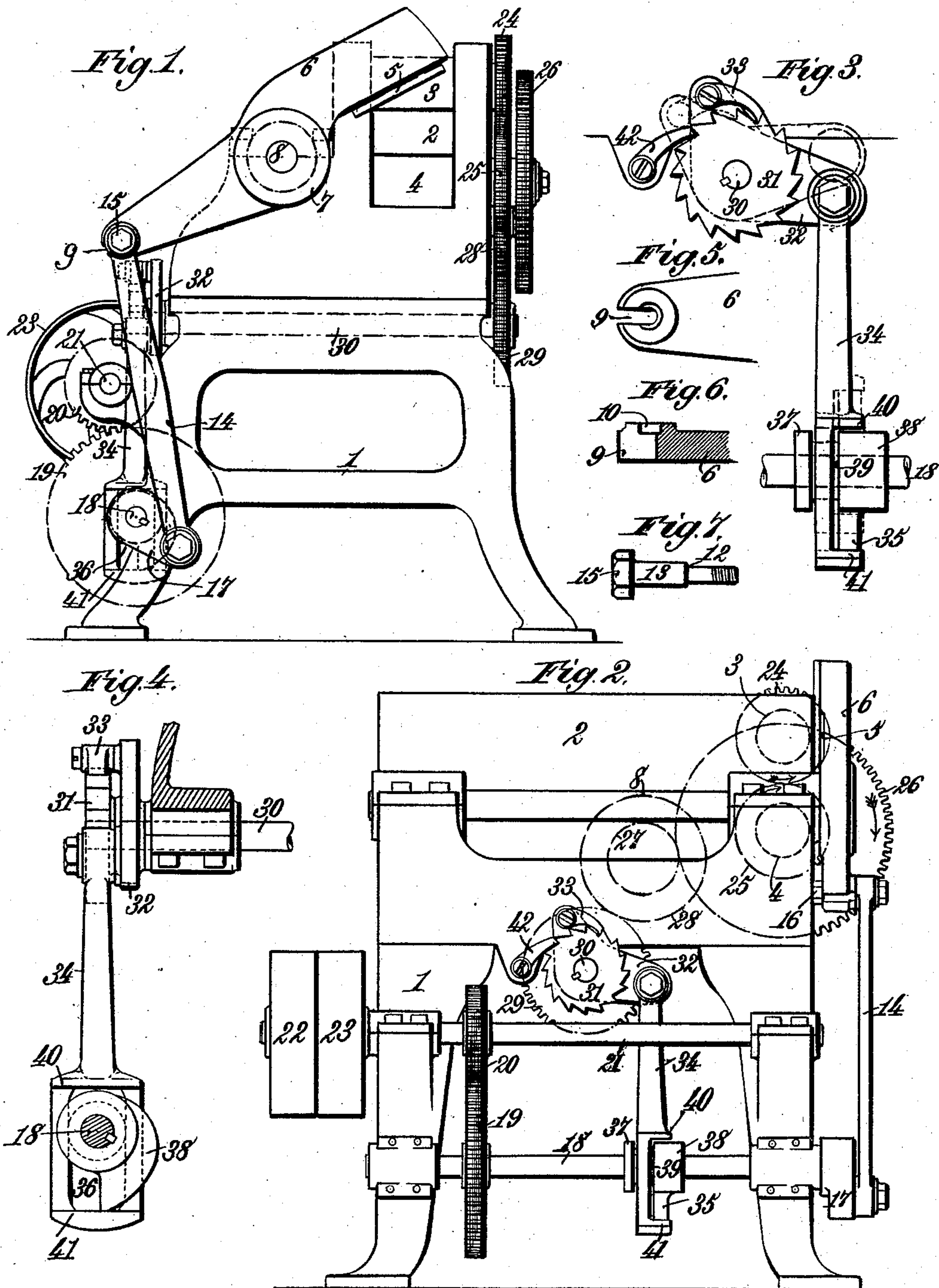


(No Model.)

J. H. HUBBELL.
MACHINE FOR CUTTING OR SLICING TOBACCO.

No. 575,953.

Patented Jan. 26, 1897.



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MACHINE FOR CUTTING OR SLICING TOBACCO.

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To all whom it may concern:

Be it known that I, JOSEPH H. HUBBELL, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented new and useful Improvements in Machines for Cutting or Slicing Tobacco, of which the following is a specification.

This invention relates to that class or type of machines for cutting, shaving, or slicing articles or materials, such as tobacco and other substances, wherein a cutting blade or knife is reciprocated in front of the mouth of a feed-throat in which the article, material, or substance is intermittently advanced by feed mechanism into position to be cut, shaved, or sliced by the cutting blade or knife.

The chief object of the present invention is to provide new and improved means for intermittently feeding the article, material, or substance a definite distance at each operation, whereby the article, material, or substance is subdivided in particles or pieces of uniform dimensions, length, or thickness.

The invention also has for its object to provide new and improved connected mechanisms for automatically operating a cutting blade or knife and actuating feed-rollers with precision and at regular intervals in such manner that the article, material, or substance to be severed into sections of substantially uniform dimensions, length, or thickness is fed into the plane of the cutting blade or knife during such time as the latter offers no obstruction to the advance of the article, material, or substance.

The invention also has for its object to provide new and improved means for intermittently operating feed-rollers which at regular intervals advance the article, material, or substance into position to be cut, shaved, or sliced into particles or sections of approximately uniform size or thickness.

The invention also has for its object to provide new and improved means whereby the operative connection between the blade or knife arm or carrier and the driving mechanism therefor can be readily broken or disconnected to permit the arm or carrier to be raised into convenient position for renewing, replacing, or repairing the cutting blade or knife.

To accomplish all these objects, my invention involves the features of construction, the combination or arrangement of parts, and the principles of operation hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a front elevation of a cutting or slicing machine constructed in accordance with my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a detail side elevation of the pawl-and-ratchet mechanism for transmitting intermittent motion to the feed-rollers of the cutting or slicing machine. Fig. 4 is a detail front elevation of the same. Fig. 5 is a detail front view of a portion of the blade or knife arm or carrier. Fig. 6 is a longitudinal sectional view of the same; and Fig. 7 is a detail view of the bolt for detachably connecting the blade or knife arm or carrier with the link which operates the same.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates the main frame of the machine, which may be of any construction suitable for the purpose, and which therefore does not require any further explanation. This frame is provided in any suitable manner with a feed-throat, as at 2, in which the article, material, or substance to be cut, shaved, or sliced is placed, so that it will pass between and be acted upon by upper and lower feed-rolls 3 and 4, which present the material to the action of the cutting blade or knife 5, arranged in front of the mouth of the feed-throat, so that by each stroke of the blade or knife the material is cut, shaved, or sliced.

The cutting blade or knife is ordinarily detachably secured to a vibratory blade or knife arm or carrier 6, having a hub 7 centrally between its extremities, which is mounted upon a shaft, journal, or stud-bearing 8, extending from the front of the main frame, so that when the arm or carrier is vibrated or oscillated the cutting blade or knife will ascend and descend directly in front of the mouth of the feed-throat.

The end of the arm or carrier opposite the end which carries the cutting blade or knife is constructed with a longitudinal slot 9, and in one side of the slotted part of the arm or

carrier is formed a countersink 10 of greater diameter than the width of the slot, so that a portion of the countersink lies in an unslotted part of the arm or carrier and the other part 5 lies in coincidence with the slotted part thereof. The countersink 10 is designed to receive the shoulder 12, formed centrally between the extremities of a bolt 13, Fig. 7, which connects the actuating connecting rod or link 14 with 10 the blade or knife arm 6.

The bolt 13 is provided at one end with a head 15 and at its opposite end with a screw-thread to receive a nut 16, the construction being such that when one end of the connecting rod or link 14 is mounted on the enlarged 15 body portion of the bolt and the nut 16 is tightened the shoulder 12 will enter the countersink 10 of the knife arm or carrier 6, and, since this countersink and the enlarged body 20 of the bolt are of greater diameter than the width of the slot 9, it will be obvious that a very secure connection between the connecting rod or link 14 and the knife arm or carrier 6 is obtained, while, at the same time, if 25 the nut 16 be loosened so that the bolt 13 can be sufficiently withdrawn to disengage the shoulder 12 from the countersink 10, the reduced end portion of the bolt can then be moved out of the slot 9 to disconnect the connecting rod or link 14 from the knife arm or 30 carrier and enable the blade-carrying end of the latter to be raised into convenient position for renewing, replacing, or repairing the cutting blade or knife.

35 The blades or knives used in tobacco and other cutting, shaving, or slicing machines require to be frequently renewed, replaced, or repaired, and their attachment to the ordinary swinging arms or carriers is such that 40 the latter require to be moved to an approximately perpendicular position in order to conveniently reach the devices which attach the blade or knife to the arm or carrier.

The link 14 is connected with and operated 45 at one end by a crank-arm 17, and the relative length of the crank-arm and connecting rod or link 14 are such that the knife arm or carrier cannot be ordinarily raised to approximately perpendicular position without 50 disconnecting the parts at one point at least.

The construction of the slot 9, countersink 10, and bolt 13 as above set forth accomplishes the object stated and enables the operative connection between the knife arm or 55 carrier and the connecting rod or link to be readily broken, so that the arm or carrier can be raised into convenient position for renewing, replacing, or repairing the cutting blade or knife whenever required. It will be observed that the construction of the parts for 60 accomplishing the result stated is such that it is only necessary to loosen the nut 16 of the bolt 13 sufficient to enable the latter to be moved such distance as will free its shoulder 12 from the countersink 10, when the bolt, 65 carrying with it the connecting rod or link 14, can be moved out of the slot 9 for the pur-

pose of breaking the operative connection between the knife arm or carrier and the connecting rod or link. After a new blade or 70 knife has been attached to the arm or carrier it is possible to easily and quickly perfect the operative connection of the link and knife arm or carrier by moving the bolt into the slot 9 until the shoulder 12 is in coincidence 75 with the countersink 10 and then tightening the nut 16, which secures a very firm and substantial connection of the parts.

The crank-arm 17 is secured to one end of a counter-shaft 18, journaled in bearings on 80 the main frame and having a spur-gear 19, engaged with and driven by a pinion 20 on a drive-shaft 21, which is also journaled in bearings on the main frame. The shaft 21 is provided at one end with fast-and-loose pulleys 85 22 and 23, so that it can be stopped and started at the will of the operator. During the time the power-driven shaft is rotating the counter-shaft will also be rotated, and through the medium of the crank-arm 17 and connecting 90 rod or link 14 the knife arm or carrier 6 will be vibrated or oscillated in a vertical plane, so that the cutting blade or knife is caused to ascend and descend directly in front of the mouth of the feed-throat. 95

Although I have described the slot 9 and countersink 10 as formed in one end of the knife arm or carrier, so that the operative connection with the driving mechanism of the knife arm or carrier is broken where the connecting rod or link connects with the arm or 100 carrier, I wish it clearly understood that the parts may be transposed to the crank-arm 17, so that instead of detaching one end of the connecting rod or link from the knife arm or 105 carrier one end of the connecting rod or link can be disconnected from the crank-arm 17. This variation is obvious and is to be regarded as an equivalent of the construction hereinbefore described with reference to the slot 9, 110 countersink 10, and attaching-bolt 13.

The feed-rolls 3 and 4 are geared together at one end through the medium of gear-wheels 24 and 25, so that they will rotate in unison 115 and at the same surface speed. The shaft of the lower feed-roll 4 is provided with a comparatively large spur-gear 26, with which engages a pinion, as at 27, on a shaft which carries a gear 28, meshing into a gear 29 on a 120 transverse horizontal shaft 30 in such manner that if an intermittent rotary motion is imparted to the shaft 30 a corresponding motion will be transmitted to the feed-rolls. The shaft 30 is intermittently rotated by a pawl- 125 and-ratchet mechanism actuated by the counter-shaft 18, as I will now describe in detail.

A ratchet-wheel 31 is keyed or otherwise firmly secured to the shaft 30, and on the latter, at one side of the ratchet-wheel, is journaled a pawl-carrier 32, preferably made in 130 the form of a bell-crank lever, one arm of which carries a pawl 33 to engage the ratchet-wheel, while the other arm is connected to a rod or yoke 34, which is reciprocated verti-

cally by the action of a cam or eccentric 35, provided on the counter-shaft 18. The lower end of the rod or yoke 34 is provided with a vertical slot 36, through which the counter-shaft 18 extends, and the cam 35 is constructed with two separated collars 37 and 38, united by a sleeve 39, which is mounted on the counter-shaft and extends through the slot 36 of the rod or yoke 34. The collars 37 and 38 effectually prevent the lower end of the rod or yoke 34 from shifting laterally out of proper operative connection with the cam 35, while the sleeve 39, which connects the collars 37 and 38, being of a diameter substantially the same as the width of the slot 36, serves as a guide-bearing for the rod or yoke in its vertical movements. The rod or yoke 34 is provided with lateral offsets 40 and 41, arranged, respectively, above and below the counter-shaft, so that during the rotary motion of the latter the cam or eccentric operates like a tappet, first on one offset and then on the other, to reciprocate the rod or yoke and thereby oscillate the pawl-carrier 32. When the rod or yoke 34 is moved downward by the cam or eccentric 35, the pawl 33 rotates the ratchet-wheel 31 a predetermined distance, depending, of course, on the length of the stroke of the rod or yoke. When the rod or yoke rises, the pawl is restored to its normal position for the purpose of again rotating the ratchet-wheel. On the back stroke of the pawl the ratchet-wheel is held against back motion through the medium of an ordinary stop-pawl 42, pivoted to a part of the main frame.

It will be obvious from the foregoing explanation that my invention comprises two connected power-driven mechanisms, whereby the cutting blade or knife is reciprocated across the mouth of the feed-throat, and the feed-rolls are intermittently rotated for the purpose of feeding the tobacco or other article, material, or substance which it is desired to cut, shave, or slice into particles or sections of approximately uniform dimensions, length, or thickness. The intermittent action of the feed-rolls must occur at regular intervals relative to the action of the cutting blade or knife and the parts must be so constructed, arranged, and timed that the feed of the material must occur at a time when the cutting blade or knife offers no obstruction to the movement of the material out of the mouth of the feed-throat. For this reason the cutting blade or knife is usually given what may be termed a "surplus of travel" over what is actually required to cut through the projecting article, material, or substance. The surplus of travel may be given in its ascending motion after the knife has risen above the mouth of the feed-throat, and it is at this time that the article, material, or substance should commence to advance and be projected the required distance through the mouth of the feed-throat at the time that the cutting-blade commences to act upon the

material. When the cam or eccentric 35 ceases to act on the lower offset 41, the rod or yoke 34 stops its downward pull on the pawl-carrier 32 and the pawl 33 ceases to act on the ratchet-wheel, in consequence of which the rotation of the feed-rolls is stopped, and at this time the knife has completed its surplus travel and commences to cut through the projecting substance which the feed-rolls have fed forward into the plane of the cutting blade or knife. As the cutting blade or knife passes through the material and returns across the mouth of the feed-throat the cam or eccentric is acting on the upper offset 40 and the pawl is being restored to normal position for a subsequent operation.

My invention will be found very useful in cutting, shaving, or slicing tobacco; but while it is particularly designed for this purpose, I wish it clearly understood that the machine may be used generally for cutting, shaving, or slicing articles, materials, or substances into particles or sections of approximately uniform dimensions, length, or thickness.

Having thus described my invention, what I claim is—

1. The combination with a knife-arm, and feed-rolls for feeding material into the plane of the knife, of a transverse shaft provided with a ratchet-wheel and geared to the feed-rolls, a pawl for engaging the ratchet-wheel, a pivoted pawl-carrier, a rotary shaft having a cam, a vertically-movable yoke actuated by said cam and connected with the pawl-carrier to oscillate the same, a crank on the said cam-shaft, and a connection between the crank and the knife-arm, substantially as described.

2. The combination in a cutting and slicing machine, of two feed-rolls geared together, a transverse shaft geared to one of the feed-rolls, a pivoted, swinging knife-arm having a cutting-knife, a rotary cam-shaft having a cam, a link connecting the cam-shaft with one end of the knife-arm, a yoke engaging the cam and moved vertically thereby, a pawl-carrier pivotally connected to the yoke and having a pawl, a ratchet-wheel secured to said transverse shaft and rotated intermittently by the pawl of the pawl-carrier, and means for operating said cam-shaft, substantially as described.

3. The combination of a pivoted swinging knife-arm having an attached cutting-knife, feed-rolls for feeding the material into the plane of the knife, a transverse shaft provided with a ratchet-wheel and geared to the feed-rolls, a pawl for operating the ratchet-wheel, a pawl-carrier on which the pawl is mounted, a longitudinal rotary shaft having a cam, a vertically-movable yoke actuated by said cam and connected with the pawl-carrier, a crank on said longitudinal shaft, and a link connecting said crank with one end of said knife-arm for swinging the same on its pivot, substantially as described.

4. The combination of a pivoted swinging

knife-arm having an attached cutting-knife, feed-rolls for feeding the material into the plane of the knife, a transverse shaft having a ratchet-wheel and geared to the feed-rolls, 5 a pawl for operating the ratchet-wheel, a pawl-carrier on which the pawl is mounted, a counter-shaft provided with a cam and a crank, a link connecting the crank with one end of the pivoted knife-arm, a vertically- 10 movable yoke actuated by the cam of the counter-shaft and connected with the pawl-carrier, and a main driving-shaft geared to said counter-shaft, substantially as described.

5. The combination with a vibratory knife 15 arm or carrier, and feed-rolls for feeding material into the plane of the knife, of a transverse, horizontal shaft geared to one of the feed-rolls and provided with a ratchet-wheel, an oscillatory pawl-carrier having a pawl en- 20 gaging the ratchet-wheel, a rod or yoke connected with the pawl-carrier, a rotary shaft having a cam for reciprocating the rod or yoke, a crank mounted on said rotary cam-shaft and connected with the knife arm or 25 carrier, and means for rotating said cam-shaft, substantially as described.

6. The combination of a pivoted knife-arm having at one end a slot, and a countersink which is of a diameter greater than the width

of the slot, a bolt having a shoulder inter- 30 mediate its ends adapted to seat in said countersink and when withdrawn therefrom to move through the slot out of connection with the knife-arm, a connecting-rod mounted on 35 said bolt, and means for operating said connecting-rod for vibrating the knife-arm, substantially as described.

7. The combination with a vibrating knife- 40 arm, and feed-rolls for feeding material into the plane of the knife, of a shaft geared to one of the feed-rolls and provided with a ratchet-wheel, a pawl-carrier having a pawl engaging the ratchet-wheel, a rod or yoke 45 having a longitudinal slot and opposite off-sets, a shaft extending through the slot of the rod or yoke, and a cam having a sleeve mounted on said shaft and provided with two opposite collars between which the slotted 50 end of the rod or yoke is arranged, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH H. HUBBELL.

Witnesses:

JOHN L. H. FRANK,
GEO. W. FRANK.