R. E. ROSEWARNE.

TOBACCO CUTTING MACHINE.

APPLICATION FILED JUNE 29, 1906.

925,512.

Patented June 22, 1909.

5 SHEETS—SHEET 1.

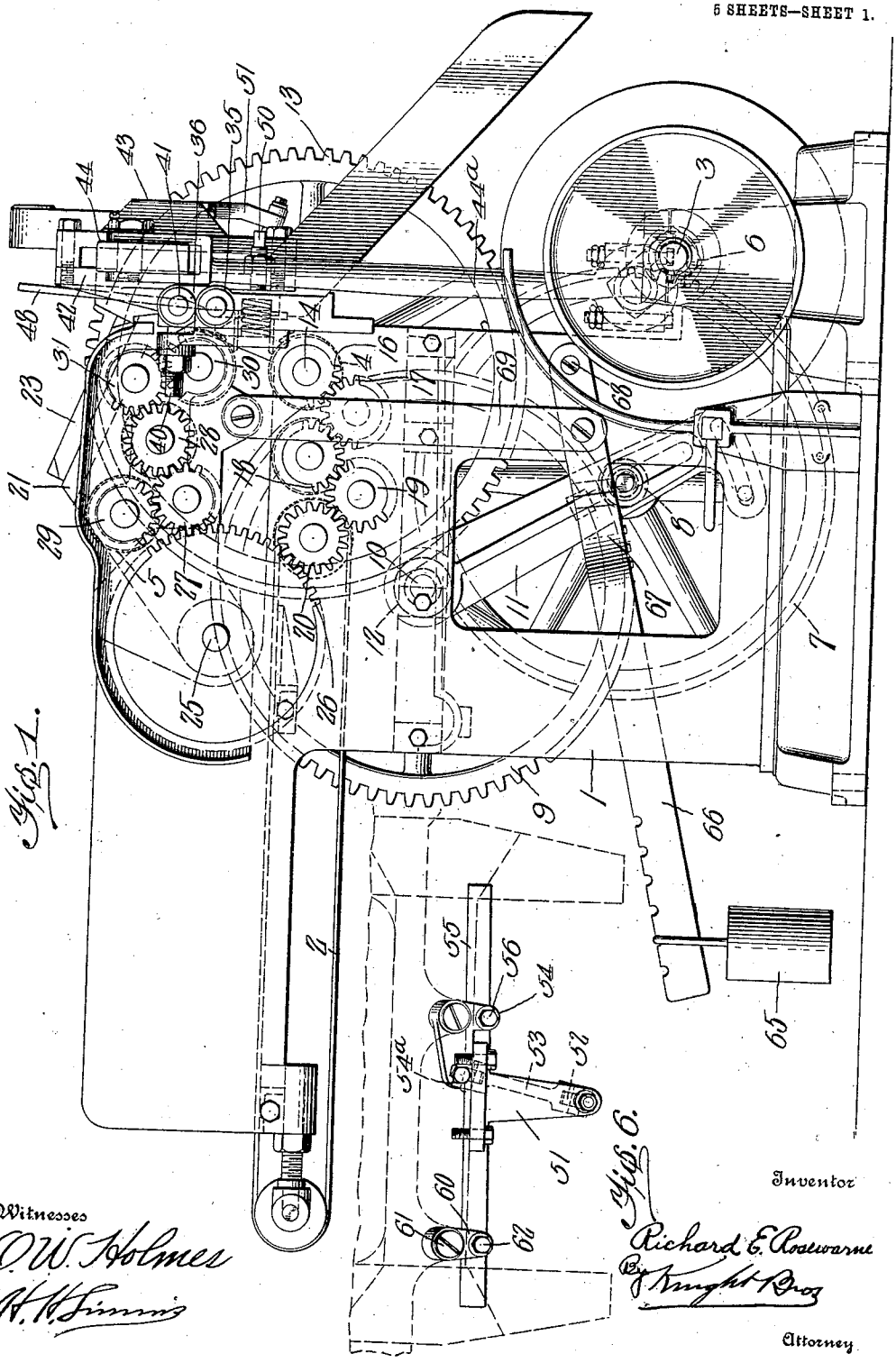


Fig. 1.

Fig. 6.

Witnesses

O. W. Holmes

H. W. Simmons

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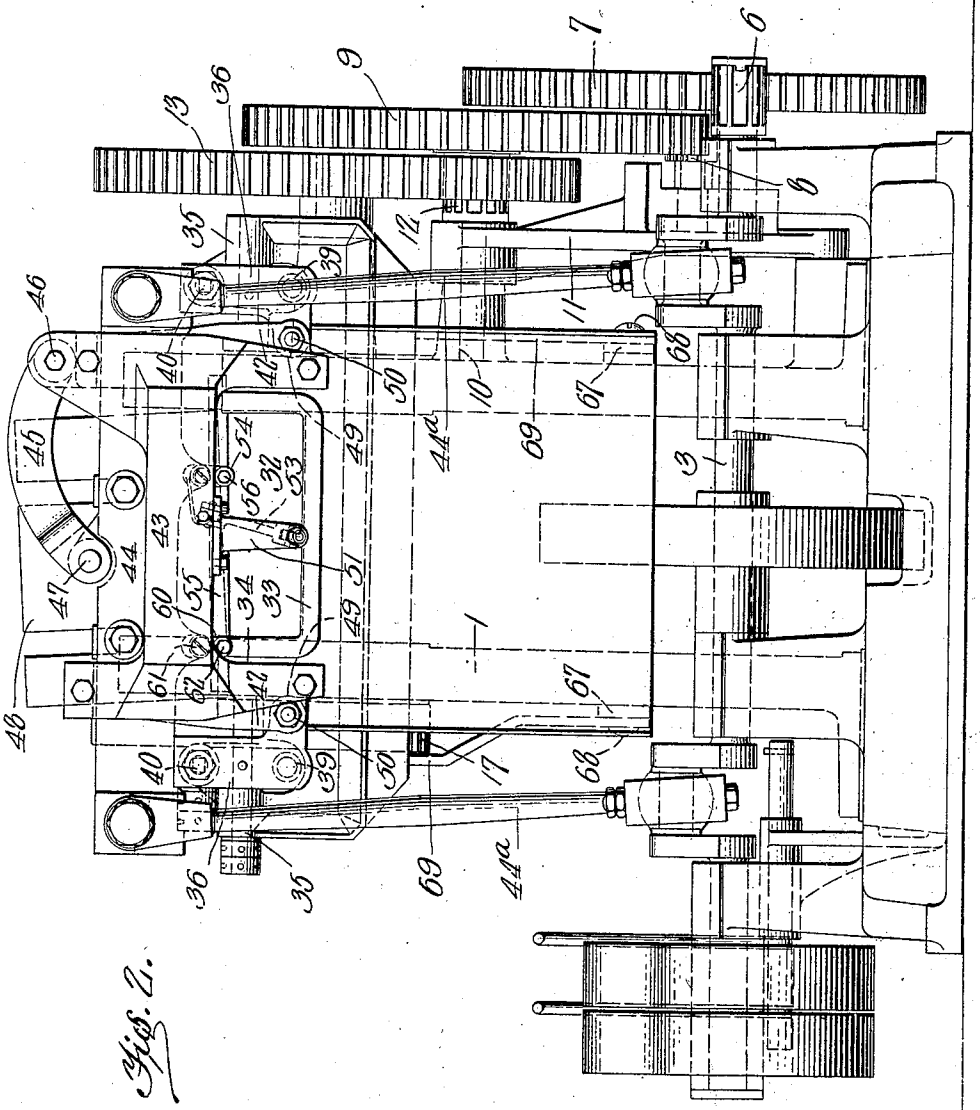


Fig. 2.

Witnesses

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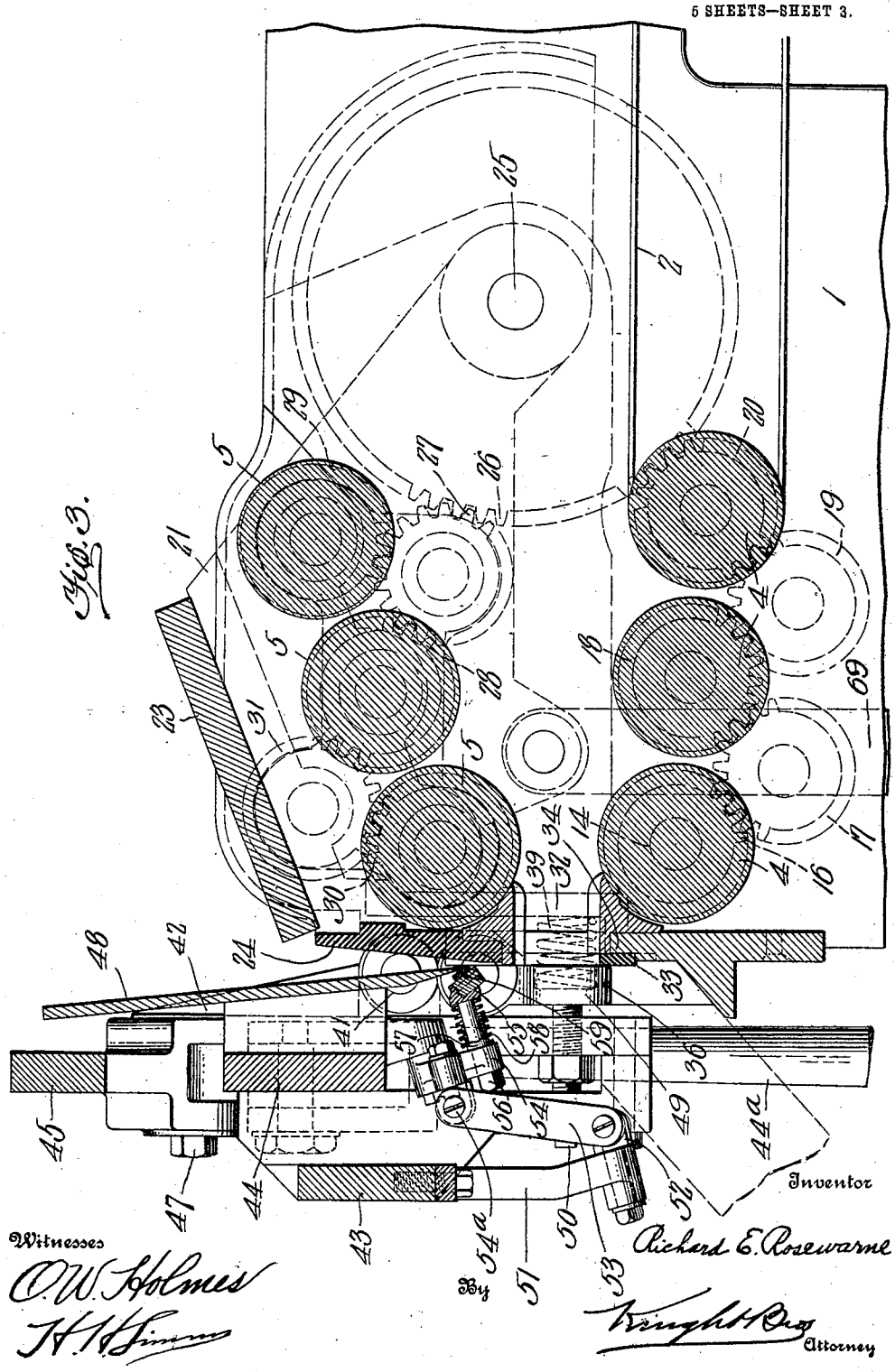
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5 SHEETS—SHEET 3.

Fig. 3.



Witnesses

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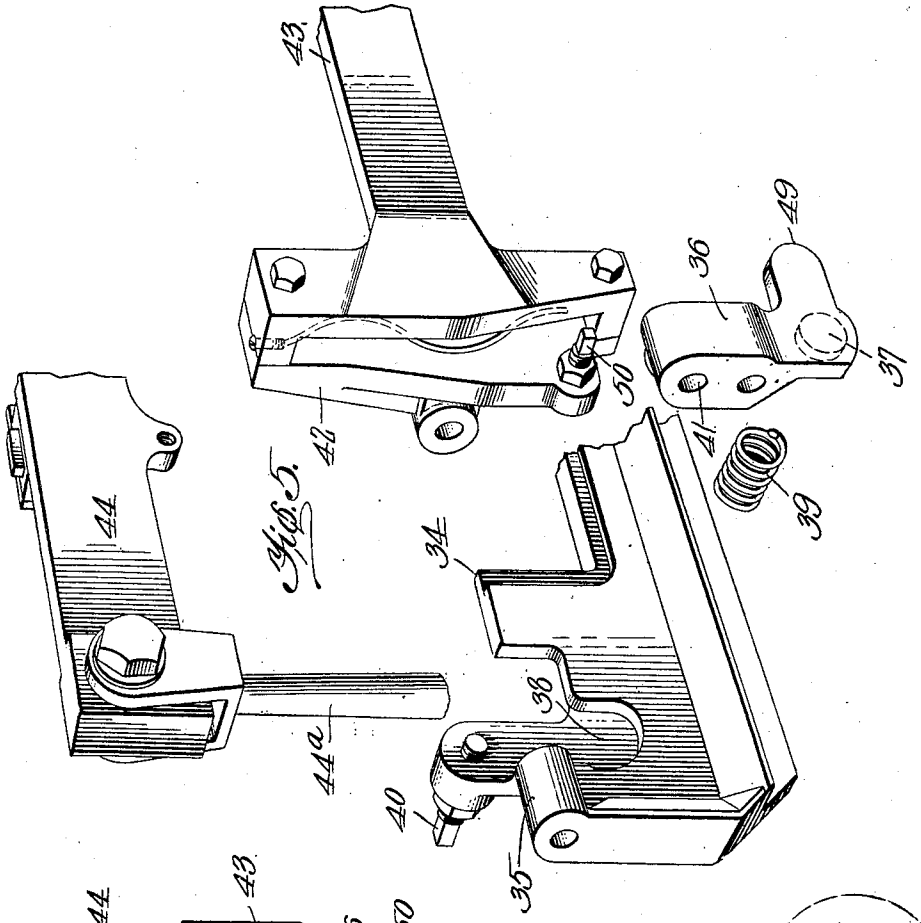


Fig. 5.

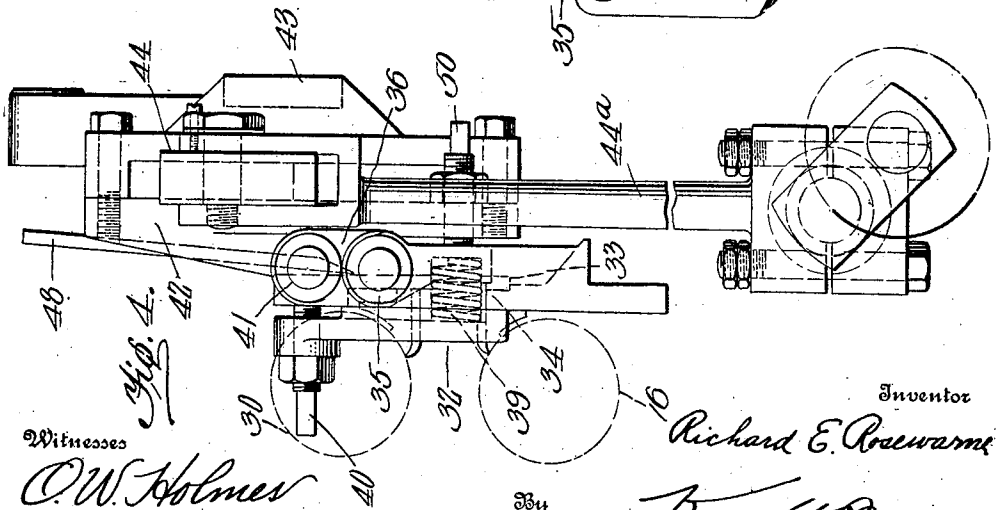


Fig. 4.

Witnesses

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5 SHEETS—SHEET 5.

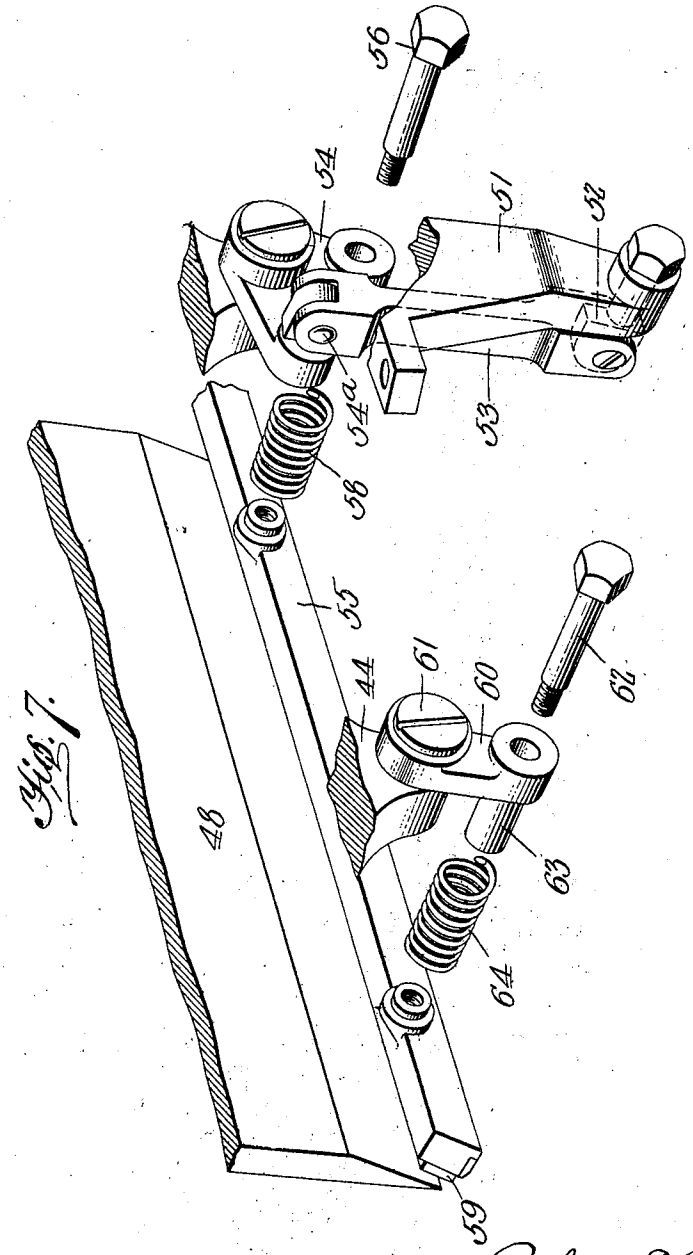


Fig. 7.

Witnesses

O. W. Holmes

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UNITED STATES PATENT OFFICE.

RICHARD E. ROSEWARNE, OF COVINGTON, KENTUCKY, ASSIGNOR TO THE MILLER, DU BRUL AND PETERS MANUFACTURING COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

TOBACCO-CUTTING MACHINE.

No. 925,512. Specification of Letters Patent. Patented June 22, 1909.

Application filed June 29, 1906. Serial No. 324,078.

To all whom it may concern:

Be it known that I, RICHARD E. ROSEWARNE, a citizen of the United States, residing at Covington, in the county of Kenton, State of Kentucky, have invented certain new and useful Improvements in Tobacco-Cutting Machines, of which the following is a description.

This invention relates to tobacco cutting machines.

One object of the invention is to improve the feeding mechanism.

In an application filed by Napoleon Du Brul on October 15, 1904, Serial No. 228,543, there is disclosed a continuous feeding mechanism in which an upper series of rolls is mounted on a frame which swings freely relatively to a lower series, about a center at the intake of the rolls, motion being transmitted to the upper rolls through a pinion or gear having an axis common to the turning axis of the frame. In the above-mentioned application, the pinion or gear rotates in a direction to cause the swinging frame to move toward the lower compressing rolls, and, when the compressing mechanism becomes choked, instead of the free end of the frame yielding, the reverse takes place, and, as a consequence, something breaks. In most instances, the breakage occurs in the pinions which cause the rotation of the rolls. In my feeding mechanism, this difficulty is obviated.

Another object of my invention is to improve the cutting mechanism.

In another application of Napoleon Du Brul, filed Feb. 15, 1905, Serial No. 245,761, there is disclosed an oscillating frame mounted adjacent the throat cutting plate of the feeding mechanism and carrying a knife reciprocating on said frame and adapted to contact with the cutting plate and sever the tobacco discharged by the feeding mechanism, the knife being operated by a pitman which is connected at its other end to a crank shaft, whereby the knife is caused to operate on the frame and the frame is caused to oscillate, thus causing the knife to move in the path of an ellipse. In the construction shown in this latter application, owing to the knife moving in an elliptical path, the cutting portion of the knife's path is curved. Further, there is provided no means for properly setting the knife to the discharge throat cutting plate either when the machine is first set up or when the cutting plate wears. In my improvement, I provide means for neutralizing the concave effect of the crank throw, during the cutting part of the stroke, producing a straight line path for the knife at this part of its movement. I further provide means for setting the knife to the cutting plate of the discharge throat of the feeding mechanism.

Still another object is to provide a sharpening mechanism that will operate at each stroke of the knife and will not interfere with the latter's cutting action.

Other and further objects will appear in the following description and will be more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of a tobacco cutting machine employing my improvements. Fig. 2 is an end elevation of the tobacco cutting machine. Fig. 3 is a sectional view through the feeding and the cutting mechanisms. Fig. 4 is an enlarged side elevation of the cutting mechanism. Fig. 5 is a separated perspective view of a portion of the cutting mechanism, showing some of my improvements. Fig. 6 is a detail front elevation of the sharpening mechanism. Fig. 7 is a separated perspective view of the sharpening mechanism.

Referring more particularly to the drawings, 1 indicates the frame, 2 the endless feeding belt, 3 the drive shaft, 4 the lower feed rolls, around the first of which the endless belt passes and 5 the upper feed rolls.

Feeding mechanism.—Motion is transmitted from pinion 6 on drive shaft 3 to large gear 7 which turns a small pinion 8 on the same shaft and gears with a gear 9 mounted on a stub shaft 10 which is in turn supported on the side frame. An arm 11 carrying the compound gear 7 and 8, is journaled upon shaft 10. Stub shaft 10 also carries a small pinion 12 which meshes with a gear 13 mounted on a shaft 14 on which the lower back roller is secured, said shaft having on its opposite end and on the opposite side of the machine, a pinion 16. Pinion 16 meshes with an idler 17 geared to the second lower roll pinion 18 which in turn meshes with an idler 19 geared to the first lower roll pinion 20. The upper series of rolls is mounted upon a swinging frame comprising two side members 21 connected by cross pieces 23 and 24 and journaled on opposite sides of the

frame 1 about an axis 25 at the intake of the feeding mechanism. Turning about an axis common to the axis of the swinging frame, is a gear 26 which meshes with the pinion 20 and is connected to idler 27 geared to pinion 29 of the first upper roll and to the pinion 28 of the second upper roll, the second roll pinion 28 being geared to the third or last roll pinion 30, by means of an idler 31. It will be noted that the gear 26 gears directly to the first lower roll and is connected to the first upper roll by an idler, thus causing the rotation of the gear 26 during feeding, in a direction that will tend to lift the swinging frame and thus to prevent the breaking of any parts when the feeding rolls become clogged. The freely swinging frame carrying the upper series of rolls is yieldingly held in its lower position by means of a weight 65 adjustably mounted on an arm 66 bifurcated at one end to provide two arms 67 pivoted at 68 to the frame of the machine and connected by links 69 to the swinging roll frame.

Cutting mechanism.—The tobacco passes from the feeding rolls through a discharge throat 32 having a cutting plate 33 surrounding the same, the plate being mounted on a front plate 34. At opposite ends of the front plate are provided bearings 35 on each of which is pivoted intermediate its ends a link or lever 36. Each link or lever is provided on one side of its pivot with a pocket 37 seen best in Fig. 5 while the front plate is provided with a pocket 38 beneath each link or lever. Each pocket 38 contains a helical spring 39 which also seats in the pocket 37 of one of the links or levers. The upper end of the links or levers, that is, the ends opposite those which the springs 39 engage, are provided with bearings 41 on which are pivoted the back plates 42 of the oscillating knife frame, the back plates 42 being connected by a front plate 43 which is spaced from the back plates to permit a knife holder 44 to reciprocate between them. The knife holder 44 is guided in the oscillating frame by a link 45 which is pivoted at 46 to the oscillating frame and is pivoted at 47 to the knife holder 44, causing the knife 48, carried by the holder 44, to make a shear cut. The movement of the knife holder is produced by a pair of pitmen 44^a, one at each end of the holder, said pitmen being connected at their other ends to the drive shaft 3 which causes these ends of the pitmen to move in the path of a circle as shown in Fig. 4 and consequently to reciprocate the knife on its oscillatory frame and to oscillate said frame. This oscillation of the frame causes the knife 48 to take the path of an ellipse. To neutralize the concave effect of the crank throw during the cutting part of the knife's movement (see heavy part of the circle in Fig. 4), the links or levers 36 are provided with lateral extensions 49 on the sides of their pivots opposite to those sides on which the oscillatory frame is pivoted, and the oscillatory frame carries parts in the form of adjustable set-screws 50. At the beginning of the cutting part of the knife's movement, the screws 50 begin to engage the extensions 49 on the levers or links 36 and a further inward movement of the oscillating frame shifts the fulcrum or pivot of the oscillating frame in opposition to the springs 39 so that the knife makes a straight cut. So that the knife may be properly set to the throat cutting plate 33, either when the machine is first set up or when the cutting plate 33 has become worn, I provide means for effecting the shifting of the fulcrum of the oscillatory frame to and from the cutting plate, said means being in the form of set screws 40 which limit the inward movement of the links or levers at their upper ends, due to the action of the springs 39.

Sharpening mechanism.—To the lower edge of the front plate 43 of the oscillating frame is bolted a depending hanger 51 in the lower end of which is swiveled a bolt 52. This bolt has the lower end of a link 53 pivoted to it, the upper end of said link being pivoted to a bolt 54^a which is swiveled in the end of one arm of a bell crank lever 54. Bell crank lever 54 is pivoted to the knife holder 44 on an angle corresponding to the angle of the knife edge and has its other arm pivoted to an abrasive holder 55 by means of a bolt 56 which passes loosely through the arm of a bell crank lever and a hollow stud 57 on said arm, a helical spring 58 surrounding said stud and bolt and bearing against the holder to maintain the abrasive material yieldingly against the beveled knife edge. The abrasive holder or member 55, which may contain a single strip of abrasive material 59 or a number of sections, is further supported from the knife holder 44 by means of an arm or link 60 which is also disposed at the same angle as the arm of the bell crank lever being pivoted at 61 to the holder 44 and connected to the abrasive holder 55 by a bolt 62 which extends through a hollow stud 63 on the arm. A helical spring 64 surrounds the stud 63 and bolt 62 and assists in maintaining the abrasive material yieldingly against the knife edge.

The operation of the sharpening mechanism is as follows: The link being connected to the oscillating frame and the bell crank being connected to the knife holder, it will be apparent that the knife holder is adapted to reciprocate the abrasive member 55. When the knife descends, the abrasive material will be moved vertically away from the cutting edge to permit the cutting of the tobacco to take place and when the knife ascends, the same will be moved to the cutting edge. As the knife moves sidewise during its reciprocation and as the abrasive material also moves sidewise due to its being

supported by the arms, the abrasive material will rub sidewise on the edge of the knife, and this sidewise movement is amplified owing to the knife and the abrasive material moving simultaneously sidewise in opposite directions.

It will thus be seen that I have provided a sharpening mechanism which automatically sharpens the knife after each cut.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a tobacco cutting machine, a feeding mechanism, comprising an upper series of rolls, a frame upon which said rollers are journaled, said frame being mounted to swing freely about an axis at the intake of the feeding mechanism and distant from the axes of said feed rolls, and a pinion turning about an axis common to the turning axis of the frame, geared to the feeding rolls to turn them in the feeding direction, and to rotate during such feeding in a direction to act to elevate the frame should the feeding mechanism become clogged.

2. In a tobacco cutting machine, a feeding mechanism comprising two series of rolls, a frame upon which one series of the rolls is journaled, said frame being mounted to freely swing about an axis at the intake of the feeding mechanism and distant from the axes of said feed rolls, and a pinion turning about an axis common to the turning axis of the frame, geared to the series of rolls on the frame so that during the feeding rotation of the said rolls the pinion turns in a direction to tend to swing the frame so as to carry the said series away from the other series, and geared to the other series to receive rotation therefrom.

3. In a cutting mechanism, an oscillatory frame, a knife holder adapted to reciprocate thereon, means for oscillating the frame and reciprocating the knife, and means for shifting the fulcrum of the frame during the cutting portion of the knife's movement to cause this portion of its movement to become straight.

4. The combination with an oscillating frame, a reciprocating knife holder mounted thereon, and a pitman connected to the knife holder to oscillate the frame and reciprocate the knife, of means for shifting the fulcrum of the frame to cause the cutting portion of the knife's path to become straight.

5. The combination with an oscillating frame, of a reciprocating knife holder mounted thereon, a pitman connected to the knife to reciprocate the knife and to oscillate the frame, pivoted levers on which the frame oscillates, springs acting to maintain the levers in one position, and means carried by the frame and engaging the levers during the cutting portion of the knife's movement to shift the fulcrum of the frame and make said cutting portion straight.

6. The combination with an oscillating frame, of a reciprocating knife holder mounted thereon, a pitman connected to the knife holder to reciprocate the knife and to oscillate the frame, pivoted levers by which the oscillating frame is carried, and means causing the shifting of the levers during the cutting portion of the knife's movement to shift the fulcrum of the oscillating frame.

7. In a tobacco cutting machine, the combination with an oscillating frame, of a reciprocating knife holder mounted thereon, means causing the reciprocation of the knife and the oscillation of the frame, levers pivoted intermediate of their ends and having the oscillating frame pivoted on one side of their pivots, and means carried by the oscillating frame and engaging the levers on the opposite sides of their pivots to shift the same during the cutting portion of the knife's movement.

8. In a tobacco cutting machine, the combination with an oscillating frame, of a reciprocating knife holder mounted thereon, means causing the reciprocation of the knife and the oscillation of the frame, levers pivoted intermediate of their ends and having the oscillating frame pivoted on one side of their pivots, means carried by the oscillating frame and engaging the same on the opposite sides of their pivots to shift the levers during the cutting portion of the knife's movement, and springs acting on the levers in opposition to the means on the oscillating frame.

9. In a tobacco cutting machine, the combination with the front plate, of levers pivoted to the front plate, an oscillatory frame mounted on the levers on one side of their pivots, a knife holder mounted to reciprocate on the oscillatory frame, a crank shaft, a pitman connecting the crank shaft and the knife holder, and means carried by the oscillatory frame and acting on the ends of the levers on the side of their pivots opposite that on which the frame is mounted.

10. In a tobacco cutting machine, the combination with the front plate, of levers pivoted to the front plate, an oscillatory frame mounted on the levers on one side of their pivots, a knife holder mounted to reciprocate on the oscillatory frame, a crank shaft, a pitman connecting the crank shaft and the knife holder, means carried by the oscillatory frame and acting on the ends of the levers on the side of their pivots opposite that on which the frame is mounted, and springs acting on the levers in opposition to the means on the oscillatory frame.

11. In a tobacco cutting machine, the combination with the front plate provided with pockets, of levers pivoted intermediate of their ends to the front plate and provided with pockets on one side of their pivots, heli-

cal springs seating in the pockets of the front plate and of the levers, an oscillatory frame mounted on the levers on the opposite side of their pivots, a knife holder mounted to reciprocate on the frame, means reciprocating the knife holder and oscillating the frame, and set screws carried by the frame and acting on the levers in opposition to the springs during the cutting portion of the knife's movement.

12. In a tobacco cutting machine, the combination with the throat cutting plate, the oscillatory frame, and the knife holder adapted to reciprocate thereon, of means for oscillating the frame and reciprocating the knife holder, and means for shifting the fulcrum of the oscillatory frame to and from the throat cutting plate.

13. In a tobacco cutting machine, the combination with the throat cutting plate, the oscillatory frame, and the knife holder adapted to reciprocate thereon, of means for oscillating the frame and reciprocating the knife holder, pivoted levers on which the oscillatory frame is mounted, and set screws engaging said levers to set the same in proper relative position to the throat cutting plate.

14. The combination with the throat cutting plate, of levers pivoted intermediate of their ends, springs acting on the levers on one side of their pivots, an oscillatory frame mounted on the levers on the other side of their pivots, a knife holder adapted to reciprocate on the oscillatory frame, means for oscillating the frame and reciprocating the knife holder, and set screws carried by the oscillatory frame and engaging the levers during the cutting portion of the knife stroke to make this portion straight.

15. The combination with the throat cutting plate, of levers pivoted intermediate of their ends, springs acting on the levers on one side of their pivots, an oscillatory frame mounted on the levers on the other side of their pivots, a knife holder adapted to reciprocate on the oscillatory frame, means for oscillating the frame and reciprocating the knife holder, and set screws controlling the positions of the levers to set the knife to the throat cutting plate.

16. The combination with the throat cutting plate, of levers pivoted intermediate of their ends, springs acting on the levers on one side of their pivots, an oscillatory frame mounted on the levers on the other side of their pivots, a knife holder adapted to reciprocate on the oscillatory frame, means for oscillating the frame and reciprocating the knife holder, set screws carried by the oscillatory frame and engaging the levers during the cutting portion of the knife stroke to make this portion straight, and other set screws limiting the movement of the pivot of the oscillatory frame toward the throat cutting plate.

17. In a tobacco-cutting machine, the combination with a reciprocating knife, of a guide-frame therefor, and a sharpening mechanism mounted on the guide-frame in such manner as to be automatically operated to sharpen the knife after each cut of the knife.

18. In a tobacco cutting machine, the combination with the reciprocating knife holder carrying a knife, of an abrasive member mounted on the knife holder to reciprocate therewith and movable relatively to the knife, and mechanism causing the abrasive member to move to sharpen the knife after each cut.

19. The combination with a frame, of a knife holder mounted to reciprocate on the frame and carrying a knife, an abrasive member carried by the reciprocating knife holder, and connections between the abrasive member and the frame causing the abrasive member to sharpen the knife after each cut.

20. The combination with a frame, of a knife holder mounted to reciprocate on the frame, and carrying a knife, an abrasive member, arms pivoted to the abrasive member and to the knife holder, and connections between the frame and the abrasive member to cause the abrasive member to sharpen the knife after each cut.

21. The combination with a frame, of a knife holder mounted to reciprocate on the frame and carrying a knife, an abrasive member, a bell crank lever pivoted to the knife holder and to the abrasive member, and connection between said bell crank lever and the frame.

22. The combination with a frame, of a knife holder mounted to reciprocate on the frame, and carrying a knife, an abrasive member, a bell crank lever pivoted to the knife holder and to the abrasive member, and a link connecting the frame with the bell crank lever.

23. The combination with a frame, of a knife holder mounted to reciprocate on the frame and carrying a knife, an abrasive member, an arm pivoted to the knife holder and yieldingly connected to the abrasive member, a bell crank lever pivoted to the knife holder and yieldingly connected to the abrasive member, and a link connecting the bell crank lever and the frame to transmit motion to the abrasive member.

24. The combination with a reciprocating knife holder carrying a knife, of a part on which said knife holder reciprocates, and a sharpening mechanism connected to the said part and to the knife holder and operated upon the reciprocation of the knife.

25. The combination with the frame, of the knife holder reciprocating on the frame and carrying a knife, a yielding abrasive member supported by the knife holder, and connection between the abrasive member and the frame operating said member to sharpen the knife.

26. The combination with a frame, of a knife holder, mounted to reciprocate on the frame and carrying a knife, an abrasive member, an arm pivotally connected to the knife holder and to the abrasive member, a bell crank lever pivotally connected to the knife holder and the abrasive member, springs interposed between the abrasive member and the arm and between the abrasive member and the bell crank lever and the arm, and a link pivotally connected to the frame and to the bell crank lever.

The foregoing specification signed at Cincinnati this first day of June, 1906.

RICHARD E. ROSEWARNE.

In presence of two witnesses:

H. WHYRICH,

F. BROERMAN.