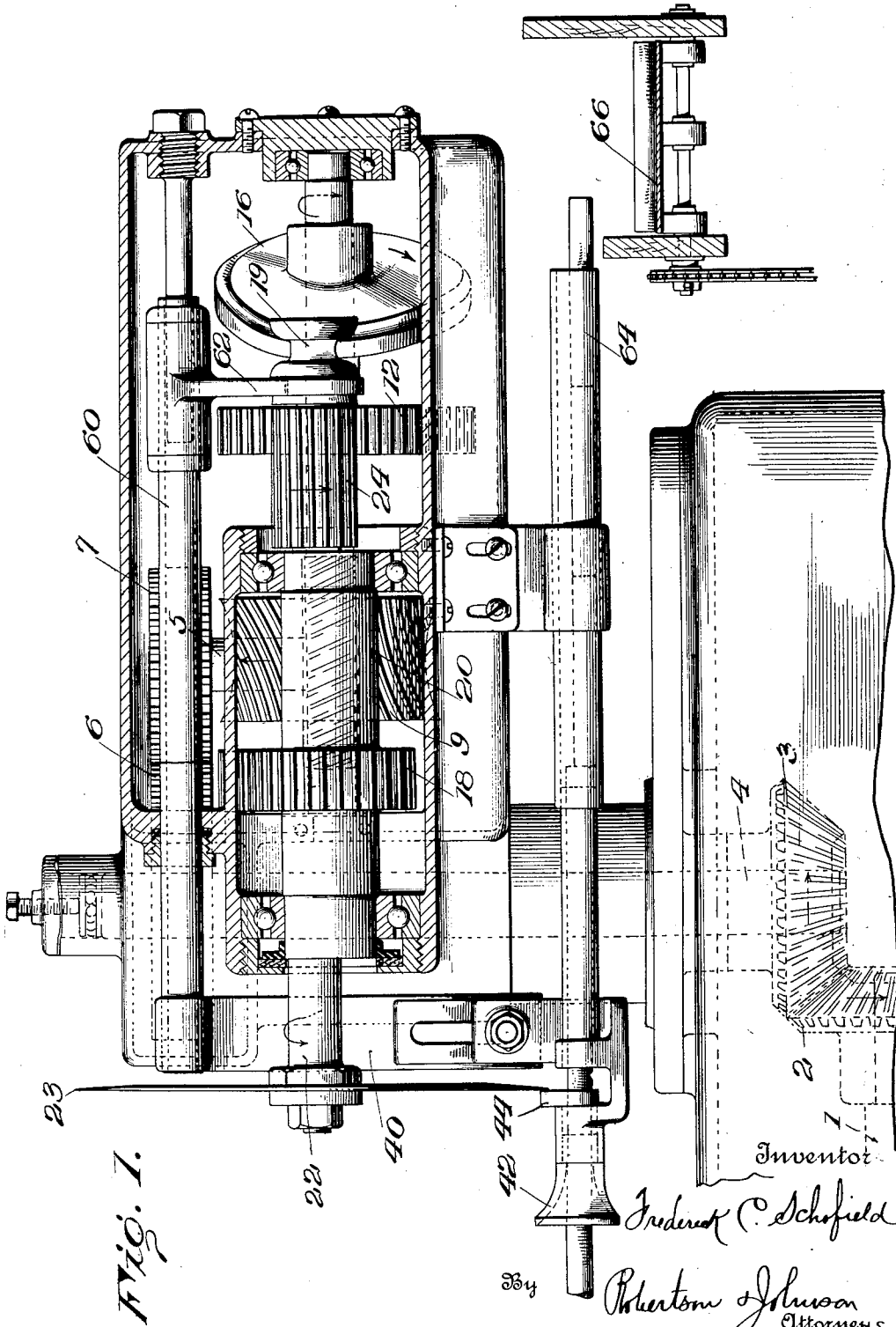


F. C. SCHOFIELD.
CUTTING ATTACHMENT FOR CIGARETTE MACHINES.
APPLICATION FILED NOV. 4, 1918.

1,348,057.

Patented July 27, 1920.

3 SHEETS—SHEET 1.

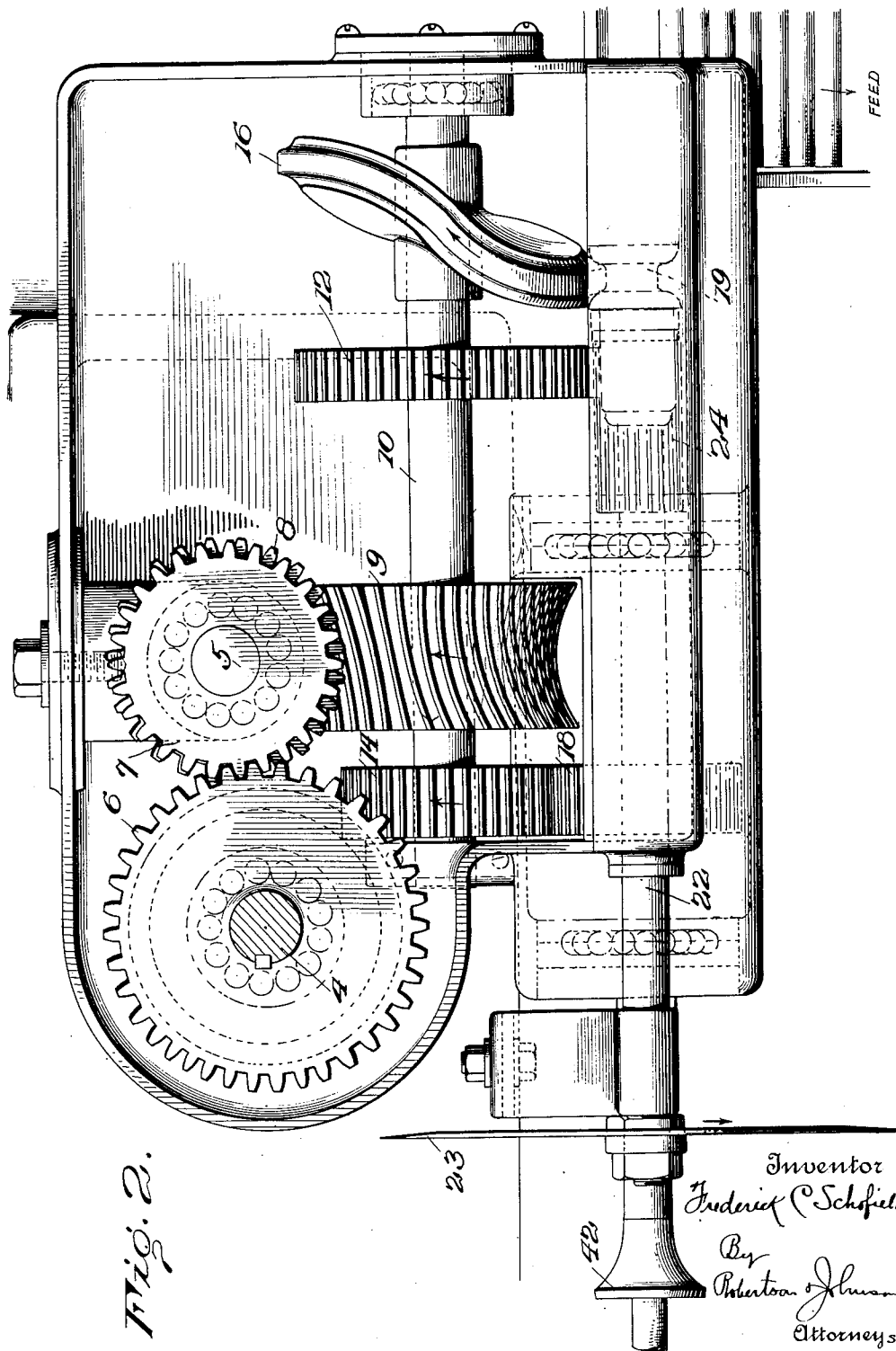


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3 SHEETS—SHEET 3.

Fig. 3.

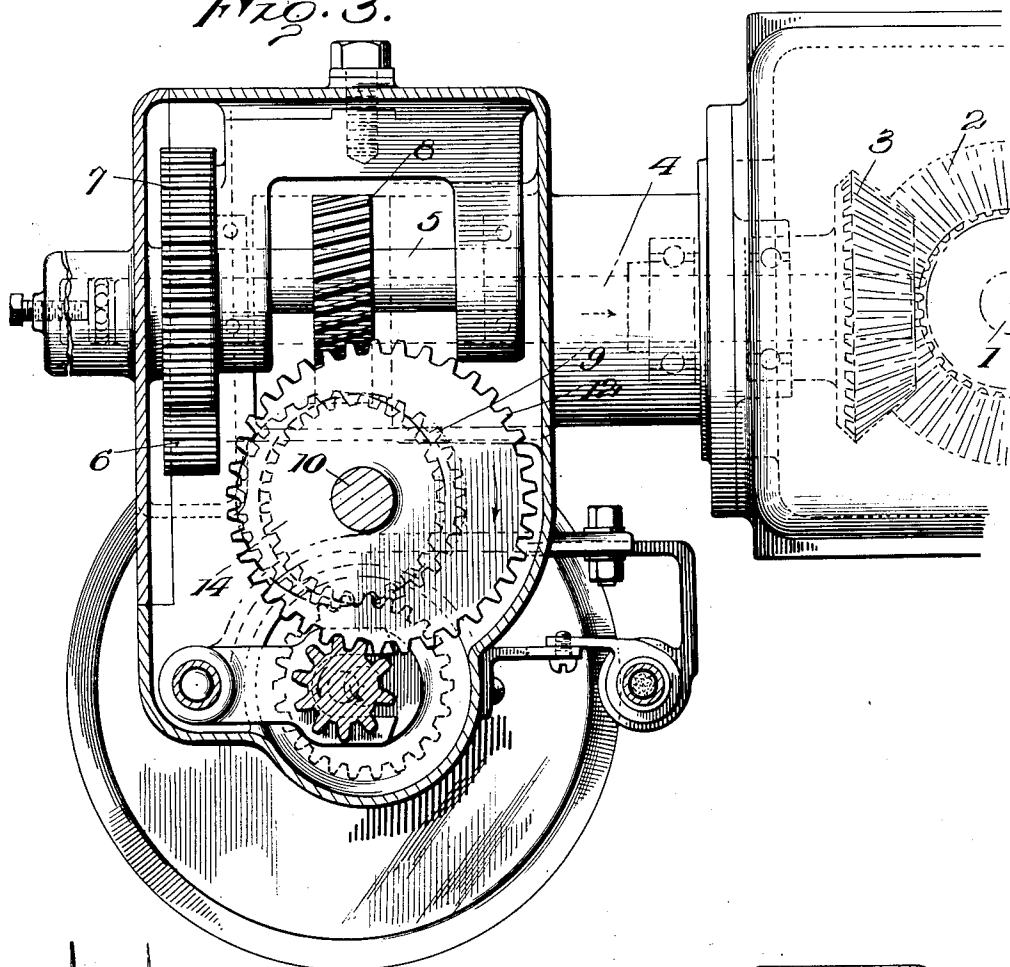
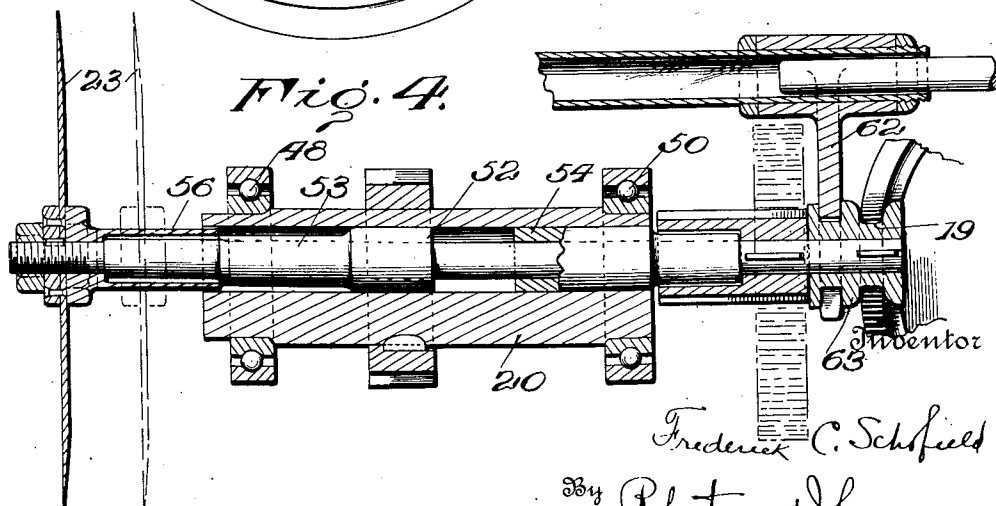


Fig. 4.



Frederick C. Schofield

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UNITED STATES PATENT OFFICE.

FREDERICK C. SCHOFIELD, OF SALEM, VIRGINIA, ASSIGNOR TO COMAS CIGARETTE MACHINE COMPANY, OF SALEM, VIRGINIA, A CORPORATION OF VIRGINIA.

CUTTING ATTACHMENT FOR CIGARETTE-MACHINES.

1,348,057.

Specification of Letters Patent.

Patented July 27, 1920.

Application filed November 4, 1918. Serial No. 261,103.

To all whom it may concern:

Be it known that I, FREDERICK C. SCHOFIELD, of Salem, in the county of Roanoke and State of Virginia, have invented certain
5 new and useful Improvements in Cutting Attachments for Cigarette-Machines, of which the following is a specification.

This invention relates to improvements in attachments for cigarette machine, and the
10 object of the invention is to provide a cutting mechanism capable of being attached to any cigarette machine and by which the cigarettes may be cut from the continuously
15 moving cigarette rod as fast as the machine makes said rod. The invention, in its preferable embodiment, is shown in the drawings forming part hereof, and it will now be hereinafter described and then definitely
20 claimed.

In the aforesaid drawings:

Figure 1 is a side elevation, partly in section, of a machine showing my invention.

Fig. 2 is a longitudinal section taken at right angles to that shown in Fig. 1.

Fig. 3 is a cross-section.

Fig. 4 is a longitudinal section through the cutter shaft and its connected parts.

Referring now to the details of the drawings by numerals: 1 designates a main shaft
30 of the cigarette machine (not shown) from which power is used to drive the attachment forming my invention. Power is transmitted from said shaft 1 by means of the bevel gearing 2 and 3 to the shaft 4. Fixed to said
35 shaft 4 is a gear 6 which meshes with a companion gear 7 which is fixed to and drives a shaft 5 upon which is secured a spiral gear 8. The latter meshes with a similar
40 spiral gear 9 on a shaft 10 to which shaft is also fixed gears 12 and 14 and a cam 16, all of which therefore rotate together (see Fig. 2). The aforesaid gear 14 meshes
45 with a gear 18 on the exterior of a sleeve 20 and the cutter shaft 22 passes eccentrically through this sleeve 20 and has secured to it a wide faced gear 24 near its rear end, a rotary cutter 23 being fixed to its opposite
50 end (see Fig. 1). From this construction it is apparent that as the cutter shaft revolves (eccentrically) with the sleeve 20, it is given a planetary movement, since it revolves with the sleeve 20 and at the same time is rotated on its axis by means of its wide faced gear 24 meshing with the gear
55 12 before referred to. This last mentioned

gear 12 is eccentrically mounted upon its shaft so as to be always in gear with the wide faced gear 24. The aforesaid cam 16 has its peripheral edge engaging the grooved end 19 of the cutter shaft so as to cause said
60 shaft to move longitudinally, the shaft moving back and forth through the aforesaid sleeve 20, the latter having no lateral movement but only a rotary movement. At the same time the cutter shaft is also compelled
65 to move longitudinally with its wide faced gear 24. Near the free end of the cutter shaft is a hanger 40 supporting the cigarette bell 42 and a ledger plate 44. The cam 16, which has been referred to as moving the
70 wide faced gear 24 and the cutter shaft longitudinally to move the rotary knife 23 in one direction with the cigarette rod and return it in the opposite direction to which the cigarette rod moves, is also eccentrically
75 mounted upon its shaft so as to always be in rolling contact in the grooved end 19 of the cutter shaft.

The effect of this construction is to move the cutter shaft and its cutter forward with
80 the cutter rod for practically half the length of a cigarette, when, owing to the planetary movement given to the cutter rod, by the sleeve 20, said cutter shaft and its cutter make a sudden dip, and as the cutter is rotating on its own axis as it makes the dip as
85 part of its eccentric movement, the cutter descends while moving in the same direction and at a speed the same as the cigarette rod, thereby cutting off the cigarette. At
90 this moment, while moving at the same speed as the cigarette rod, the eccentric movement given by the sleeve 20 moves the cutter and its cutter shaft upwardly from the cigarette rod, thus freeing the latter, at which point
95 the cam has so moved as to be ready to begin the returning movement. The peculiar arrangement shown causes the cutter shaft and its cutter to accelerate in speed as it reaches and passes through the cigarette, reaching
100 its highest speed at the center of the cigarette where the greatest amount of material is to be cut, and gradually lessens its speed as it passes through the cigarette and reaches the minimum speed half way on the return
105 stroke of the cutter.

In order that the construction of the cutter shaft mounted eccentrically in its sleeve 20 may be better understood, reference should be made to Figs. 1 and 4. From
110

the latter it will be seen that the sleeve 20 is mounted in ball bearings 48 and 50 so that it can have rotary movement only in said bearings, and that, in the eccentric bore of said sleeve 20, there are bearings 52 and 54, which permit the cutter shaft to have both rotary and longitudinal movement therein. It will also be observed that on the cutter shaft, just to the right of the cutter as viewed in Fig. 4, there is a sleeve 56 which travels longitudinally with the cutter shaft and slides over the projecting end 53 of the bearing 52, so as to prevent, as far as possible, foreign particles from entering the bearings as the shaft moves in and out with respect to the sleeve 20, and to also serve as a sort of dash pot to absorb the momentum of the cutter shaft. At the other end of the cutter shaft, the wide faced gear 24 which is keyed to the shaft has a sleeved end which passes over a projecting end of the bearing 54, and also serves as a dash pot to absorb the momentum of the oscillating parts. Of course as the cam moves the cutter shaft and said wide faced gear 24 to the right in Fig. 4, the wide faced gear 24 moves away from the sleeve 20 and its bearing 54.

The hanger 40, which has been described as supporting the cigarette bell 42 and the ledger plate 44, is suspended from a longitudinally movable rod 60 (Figs. 1 and 4) and to this rod is connected an arm 62 which has its free end embracing the collar 63 on the end of the cutter shaft, so that as the cam 16 causes said cutter shaft to move longitudinally back and forth, the rod 60 and its connected cigarette bell 42 and ledger plate 44 are compelled to move simultaneously with said cutter shaft.

As the cigarettes are cut they are shoved through the tube 64 and fall onto a conveyor 66 of any desirable construction by which they are delivered, as may be desired.

The operation of my machine is as follows: Assuming that the parts are in the position shown in Fig. 1, movement being transmitted from the main shaft 1 to the shaft 4, the gears 6 and 7 cause the shaft 5 to rotate, and through the gearings 8 and 9, shaft 10 is rotated with its gears 12 and 14 and the cam 16. The gear 14 causes the sleeve 20 to rotate, thus giving a planetary movement to the cutter shaft and simultaneously the gear 12 gives said cutter shaft a rapid rotary movement, while the cam 16 causes the cutter shaft, the cutter, the cigarette bell and the ledger plate to move to the right as viewed in Fig. 1. The planetary movement just referred to causes the cutter shaft and the cutter to suddenly dip with respect to the cigarette bell 42 and ledger plate 44 and as it is being rotated on its axis, the cutter thus moves against the cigarette rod and cuts it, said cutter during this dipping, cutting movement being moved by

the cam 16 to the right at the same speed as the rod moves, so that the cigarette rod is cut as it travels. After the cutting is completed, and while the rod and cutter are still moving to the right, the eccentrically bored casing is moving the shaft and cutter upwardly, free from the rod. The latter continues its movement to the right, but by this time the cam 16 is in position to now move the cutter shaft, cutter, cigarette bell and ledger plate to the left in order that the movements just described may be repeated to cut off another cigarette.

From the foregoing and the accompanying drawings, it will be seen that I have invented a cutting mechanism that can be operated at great speed, one in which there is a small weight of material that has to be operated back and forth, and hence there is not a great mass of metal to be reciprocated and cause great stress on the working parts of the device. It will also be noted that the reciprocal movement of the knife is accomplished by the use of a cam working in a groove in a collar, the latter being mounted at one end of the knife shaft. Since the knife spindle is rotating rapidly in its bearings, the amount of force required to slide it back and forth is almost *nil*, which leaves practically nothing for the cam to do but overcome the inertia of the reciprocating parts.

It will be manifest that modifications and changes may be made without departing from the spirit of my invention, and therefore reference should be made to the appended claims to determine the scope of the invention.

What I claim as my invention is:

1. In a device of the character described, the combination of a cutter shaft and its cutter, a casing within which said cutter shaft is eccentrically journaled, means for moving said shaft back and forth within said casing, and means for imparting a rotary motion to said casing and thereby giving an eccentric movement to the cutter shaft.

2. In a device of the character described, the combination of a cutter shaft and its cutter, a cigarette bell and ledger plate, a grooved part at the end of said cutter shaft, a cam co-acting with the grooved end of said cutter shaft for moving all of said parts back and forth longitudinally of the cutter shaft, and means for imparting an eccentric motion to said shaft and its cutter as the parts move longitudinally, whereby the cutter is moved back and forth against the ledger plate at right angles to its longitudinal movement.

3. In a device of the character described, the combination of a cutter shaft and its cutter, a casing within which said cutter shaft is eccentrically journaled, a cam and grooved

part for moving the shaft longitudinally within said casing, and means for imparting a rotary motion to said casing and thereby giving an eccentric movement to the cutter shaft.

4. In a device of the character described, the combination of a cutter shaft and its cutter, a casing within which said cutter shaft is eccentrically journaled, means for rotating said casing whereby the cutter shaft is given an eccentric movement, a gear located near the end of said cutter shaft, a cam for moving said gear and said shaft longitudinally back and forth with respect to said casing, an eccentrically mounted gear meshing with the gear on the end of said cutter shaft, and a cigarette bell and ledger plate movable back and forth with said cutter and its shaft the rotation of the aforesaid casing causing the cutter to dip with respect to said ledger plate, the cam causing the cutter shaft and its cutter to move longitudinally back and forth in said casing, and the eccentric gear causing the shaft to rotate on its axis as it is given an eccentric motion.

5. In a device of the character described, the combination of a cutter shaft and its cutter, a casing within which said cutter shaft is eccentrically journaled, means for rotating said casing whereby the cutter shaft is given an eccentric movement, a gear located near the end of said cutter shaft, a

cam for moving said gear and said shaft longitudinally back and forth with respect to said casing, a cigarette bell and ledger plate, and a hanger for supporting the same in coöperative relationship with said cutter, the hanger and the cutter shaft being connected together so that they move simultaneously.

6. In a device of the character described, the combination of a cutter shaft and its cutter, a casing within which said cutter shaft is eccentrically journaled, bearings within said casing, and a sleeve projecting from the aforesaid cutter into and closing the opening in the casing and sliding over the projecting end of the bearing.

7. In a device of the character described, the combination of a cutter shaft and its cutter, a casing within which said cutter shaft is eccentrically journaled, bearings within said casing each having a projecting end, a sleeve projecting from the aforesaid cutter closing the opening in one end of the casing and sliding over one of said projecting ends, and a gear connected with said shaft and having a recess within which the projecting end of the opposite bearing slides.

In testimony whereof I affix my signature in presence of a witness.

FREDERICK C. SCHOFIELD.

Witness:

C. B. PATTERSON.