



No. 632,901.

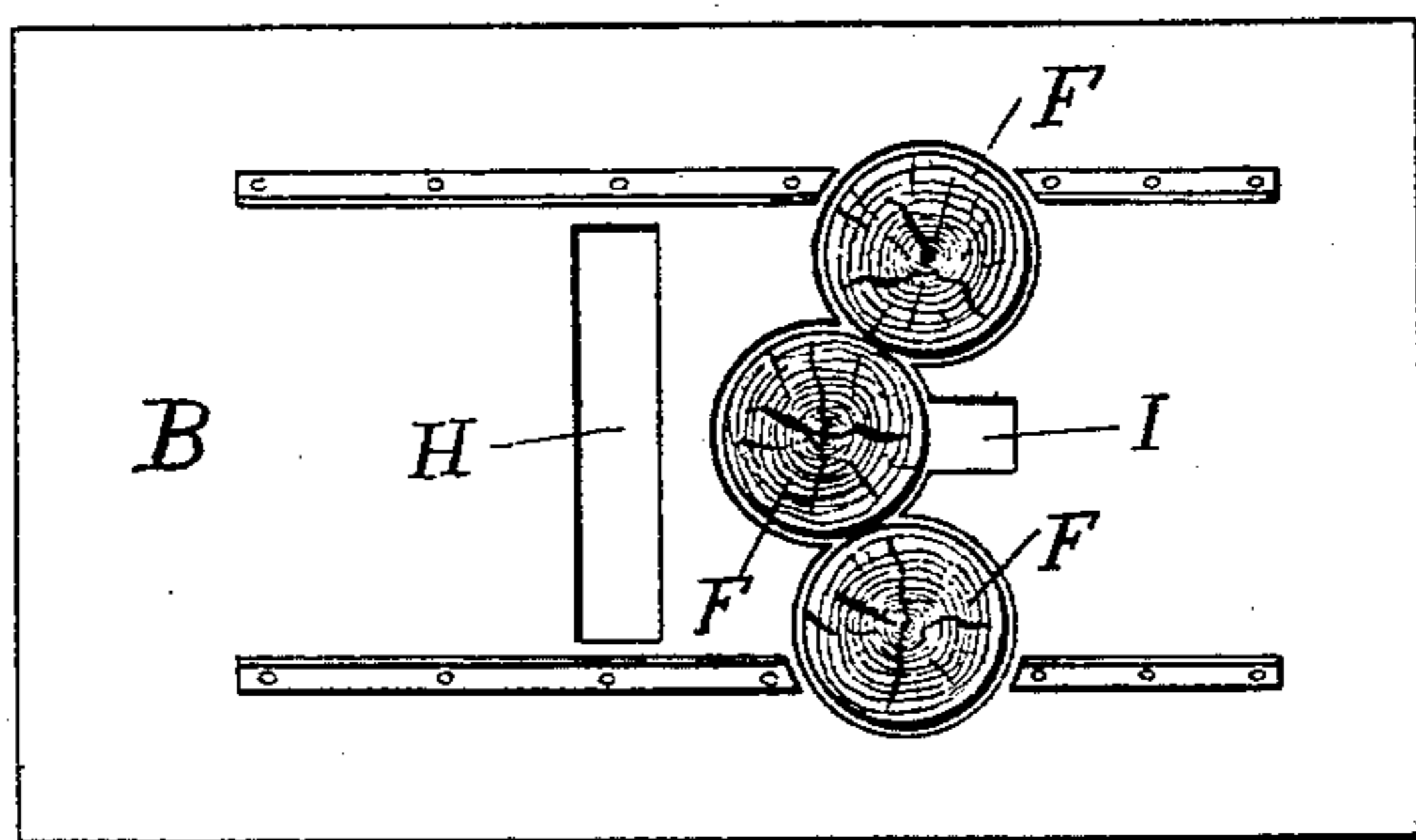
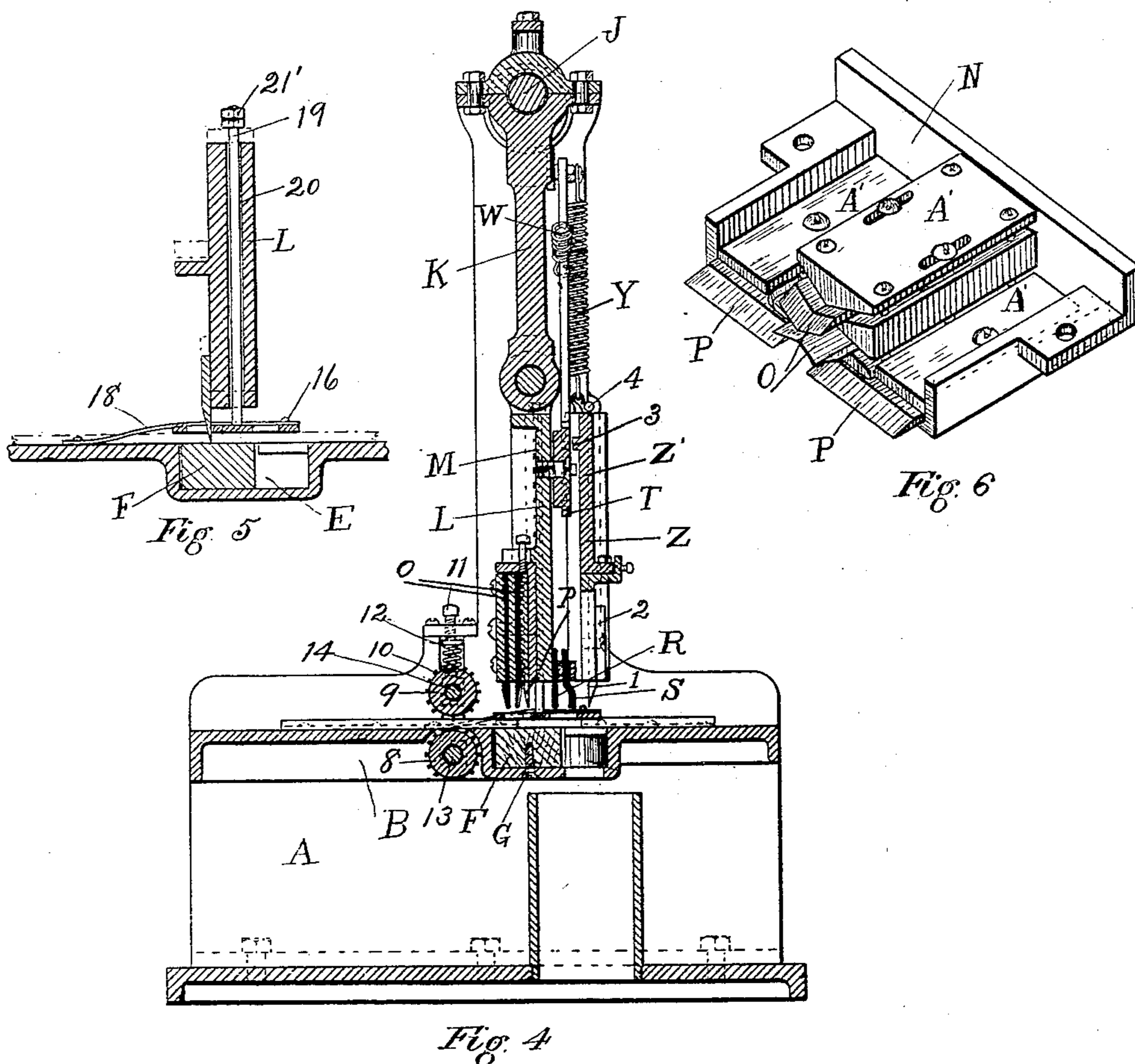
Patented Sept. 12, 1899.

L. P. HAWKINS.  
MATCH MACHINE.

(Application filed Apr. 1, 1897.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses:

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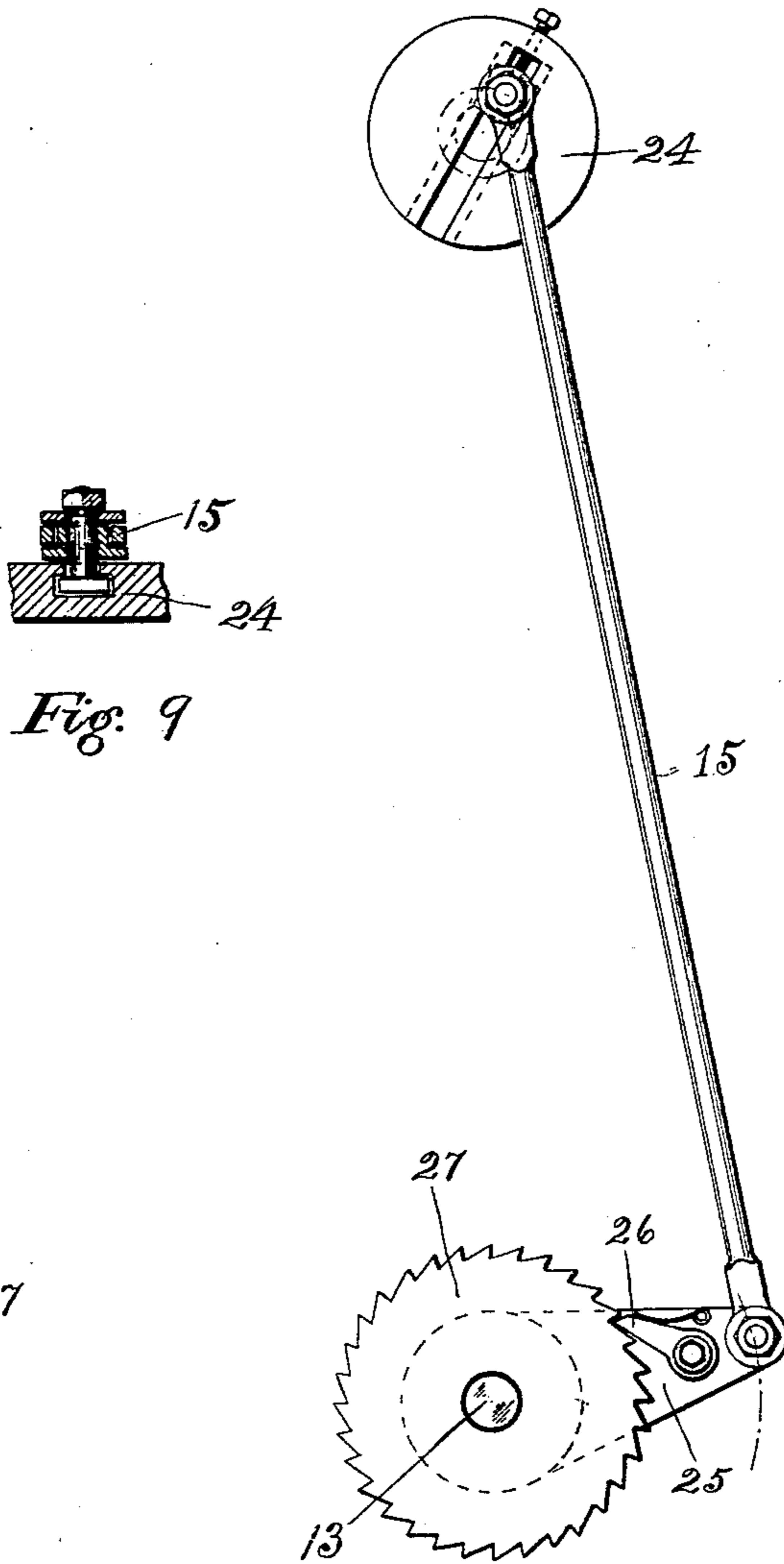
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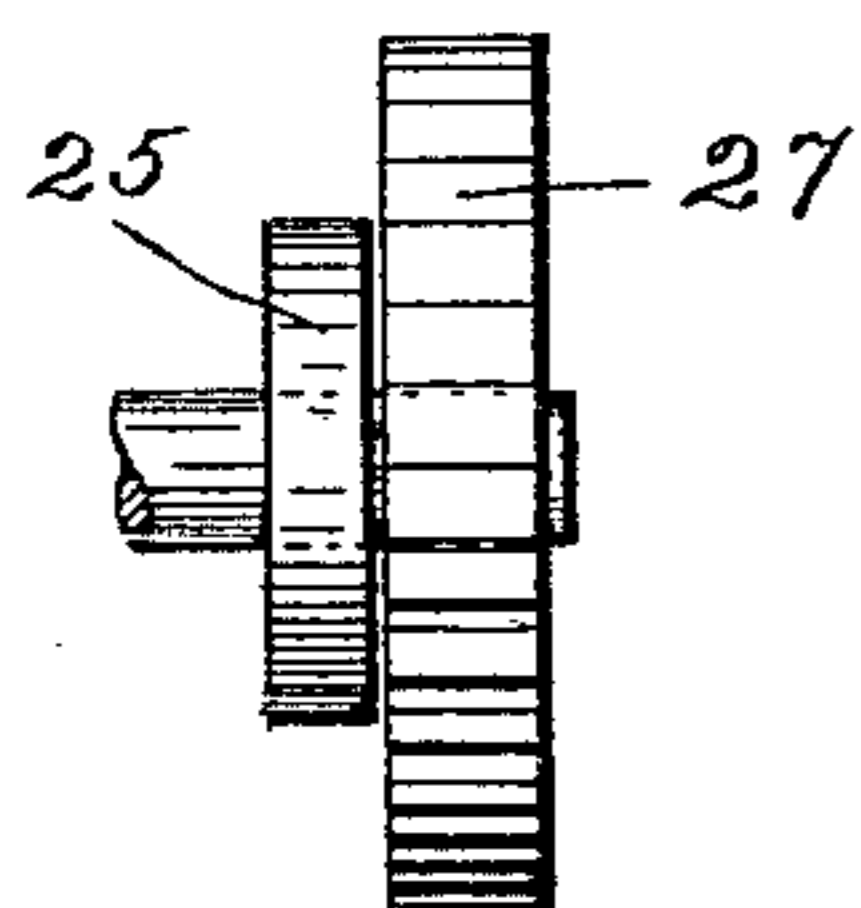
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(No Model.)

3 Sheets—Sheet 3.



*Fig. 9*



*Fig. 10*

*Fig. 8*

Witnesses:  
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# UNITED STATES PATENT OFFICE.

LORENZO P. HAWKINS, OF DEERING, MAINE.

## MATCH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 632,901, dated September 12, 1899.

Application filed April 1, 1897. Serial No. 630,291. (No model.)

*To all whom it may concern:*

Be it known that I, LORENZO P. HAWKINS, a citizen of the United States, residing at Deering, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Match-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for forming match-cards from veneer, and the novel features are illustrated in the drawings herewith accompanying and making a part of this application, in which—

Figure 1 is an elevation of the back side of the machine, a portion being broken away. Fig. 2 is a diagrammatic plan showing position of the several knives and the ejector relative to each other and showing a plan of the card after it has passed under the knives and ejector. Fig. 3 is a perspective view of the veneer-plate holder. Fig. 4 is a central vertical sectional view of Fig. 1. Fig. 5 is a detail sectional view of the cross-head, veneer-plate holder, and base. Fig. 6 is a perspective view of the head which carries the point-cutting and splint-separating knives. Fig. 7 is a plan of the base. Fig. 8 is a side elevation of the connecting-rod and its connections for operating the feed-roll. Fig. 9 is a detail sectional view taken on lines X X of Fig. 8, and Fig. 10 is a detail showing ratchet and means for connecting rod 15 with shaft 13.

Same letters and numerals of reference refer to like parts.

In said drawings, A represents the framework of the machine; B, the base, which may be removably secured in the frame by means of a tongue C, adapted to slide in grooves or ways D in the frame. The base has a socket E therein, in which is set a cutting-block. Instead of a single block a plurality of blocks F, circular in shape and secured in said socket by means of screws G, which pass up through the bottom of the base and into the bottom of the blocks, may be employed. The arrangement of the blocks is such that the cutting-off knives fall on the outside blocks and the slitting-knives fall on the middle block and

one of the outside blocks, preferably at the point of tangency, in which case the knives will have a bearing throughout their entire extent; but the principle involved would be the same if the blocks did not touch each other, the main point being that the portions of the blocks which receive the knives may be readily changed by the turning of the blocks, and the point-cutters and cut-off knife falls upon the middle block. Thus by turning the blocks on screws G as pivots the cutting-points on the faces may be varied indefinitely. In said base are slots H and I, the former over the lower feed-roll and the latter under the ejector.

Supported in the frame is a shaft J, on which is eccentrically mounted a connecting-rod K. Attached to connecting-rod K is a cross-head L, adapted to reciprocate vertically in grooves M in the sides of the frame. Secured to said cross-head is a knife-holding frame N, and rigidly secured in said frame N are two V-shaped knives O and on either side thereof and out of line therewith straight slitting-knives P. These knives may be held in position by suitable clamping-plates A'. Secured to the cross-head at a point directly in line with the apexes of knives O is a transversely-set knife R and ejector S. Also secured to said cross-head is a ratchet T, having thereon a lug U. Secured to the frame is a pivoted pawl V, the end of which is held in engagement with said ratchet by means of a spring W. Sliding in grooves Z' in the frame is a second cross-head Z, held in a normally-raised position relative to the V-shaped and slitting knives by springs Y. To the end of said last-named cross-head is secured cutting-off knives 1, which may be held in position by a clamping-plate 2. On the inner surface of said last-named cross-head is a lug 3, which when the cross-head is raised lies in the path of the lug on the ratchet before mentioned. To limit the upward movement of said last-named cross-head, I insert spring-controlled stops 4, which may be withdrawn to permit the cross-head to be raised sufficiently to remove it from the grooves in the frame when necessary to repair any part of the mechanism. The ratchet is held

against rotation in the opposite direction by means of a pivoted brake 5. (Shown in dotted lines in Fig. 1.) The pressure of brake 5 may be regulated by a thumb-screw 6, adapted to engage therewith.

The veneer is fed to the knives over the base between the flanges by means of feed-rolls 8 and 9, the one below and the other above the base, respectively, at a point directly adjacent to the slot in the base. These feed-rolls may be corrugated or have teeth thereon, as seen at 10 in Fig. 4. The pressure of the rolls on the veneer passing between them may be regulated by thumb-nut 11, and in order to allow them to yield slightly to accommodate any unevenness in the veneer a spring 12 is inserted between the nut and the hub of the feed-rolls. The feed-rolls are mounted on shafts 13 and 14, respectively, a gear on the end of shaft 13 meshing with a gear on shaft 14, the first-named of said shafts being driven by a rod eccentrically connected with the main shaft by means of a crank-disk 24, secured thereto. The lower end of rod 15 is pivotally secured to a lug 25, the other end of which is loosely mounted on shaft 13. On the carrier is a pawl 26, engaging with a ratchet 27, rigidly secured on shaft 13.

The veneer is held firmly upon the cutting-blocks by means of a presser-plate 16. The presser-plate is held firmly down upon the veneer by means of the spring-arms 18, to which it is attached and is lifted to allow the veneer to be fed along by means of links 19, which pass loosely up through holes 20 in the cross-head. On the upper ends of said links are nuts 21 sufficiently above the top of the cross-head to allow a short space between the nut and the top of the cross-head when the latter is down, as seen in Fig. 5. The presser-plate is provided with slots 21 and 22 therein to receive the knives and the ejector hereinbefore mentioned. The cutting-off knives may pass just outside the rear edge of the plate or at the recessed part 23, as seen in Fig. 3.

Having thus described in detail the mechanism of my improved machine, I now proceed to explain the operation of the several parts.

The veneer is fed to the knives over the base between the flanges thereon by the feed-rolls, as seen in Fig. 4. As the veneer feeds along a V-shaped slit is first made therein by the first V-shaped knife. The cross-head then rises, withdrawing the knife from the veneer before the presser-plate is lifted, and then in its continued upward movement lifting the presser-plate and permitting the veneer to move along one match-space. The cross-head descends again, said first knife cutting a V-shaped slit in the veneer and the second V-shaped knife cutting a V-shaped slit opening in the opposite direction, the ends of the slits intersecting and thus with the two slits forming a diamond-shaped slit

at the center of the card, and on each succeeding descent of the cross-head the V-shaped cutters operate to form a similar diamond-shaped cut in the veneer. As the veneer feeds along the slitting-knives come into operation, but not until after the diamond-shaped slit has been completed, said slitting-knives being located behind the V-shaped knives. At a still greater distance behind the V-shaped knives and directly in line with the apexes thereof is arranged a transverse cutting-off knife so set relative to said first-named knives that it cuts the matches at their common points. In front of said last-named knife is an ejector, which serves to force the diamond formed by the V-shaped slits out of the card and down through the slot in the base. All of said knives and the ejector are arranged either one match-space apart or so that no two register in time. It will be seen by reference to Fig. 2 that the straight slitting-knives are arranged so that the slits *a* formed thereby extend beyond or overlap the slits *b*, formed by the diamond cutters. It will also be seen that the slits *c*, formed by the cutting-off knives, extend beyond or overlap the outer ends of the slits *a*, formed by the straight slitting-knives. In order to make perfectly smooth and well-defined points to the matches, I have spaced the V-shaped cutters apart, so that the extremities of the V-shaped slits cut in the veneer overlap, as seen in Fig. 2, whereby the complete severance of the diamond-shaped portion to be removed is secured, and at the same time a small incision is made in the match at the point at or near where the straight part begins, which facilitates combustion by presenting a small sliver to the action of the flame. The position of the transverse cutting-off knife and ejector relative to the other knives is shown at *d* and *e*, respectively, in Fig. 2. At each reciprocation of the cross-head the pawl engages and rotates the ratchet one tooth-space. The ratchet being provided with teeth equal to the desired number of matches in a card, it follows that once in every revolution of the ratchet the lug will engage the lug on the auxiliary cross-head and force it down, thus bringing the cutting-off knives into operation and separating the veneer into cards containing a given number of matches.

The arrangement of the knives as herein set forth tends to prevent the splitting of the card, which is liable to happen when the several cuts between two given matches register in time.

The construction and operation of the presser-plate is important, because comparatively brittle wood, like pine, which is best adapted for match-making purposes, may be cut without breakage, the presser-plate holding the veneer firmly over substantially the whole surface being cut upon the bed, it not being raised to allow it to feed along until after the knives are withdrawn from the veneer. This arrangement, taken in connec-

tion with the reciprocating knives, obviates the necessity of mechanism for lifting the veneer away from the knives.

Another important advantage of the present machine consists in the plurality of blocks pivotally set and adapted to rotate in contact with each other, whereby the cutting-points on the surface of the blocks may be changed *ad infinitum* to bring new parts to receive the several knives, including the knives extending from one block to the other, across the points of contact.

Having thus described my invention and its use, I claim—

1. In a machine for making match-cards from a strip of veneer, in combination, a suitable frame, a cutting-bed, feed-rolls and a reciprocating cross-head provided with straight slitting-knives not extending to the edges of the veneer and V-shaped knives to form the points of the matches, the slitting-knives and V-shaped knives being spaced apart in the direction of the feed one or more even times the width of a match so as not to cut the point and the slit which extends therefrom at the same time, whereby the likelihood of splitting the matches individually from the card is lessened.

2. In a machine for making match-cards from a strip of veneer, in combination, a cutting-bed, feed-rolls and a reciprocating cross-head provided with straight slitting-knives not extending to the edges of the veneer, V-shaped knives to form the points and a transverse cutting-off knife to sever the adjacent matches at their common end, said straight slitting-knives, V-shaped knives and cutting-off knife being spaced apart in the direction of the feed one or more even times the width of a match so as not to cut the point, the straight slits extending therefrom and the transverse cut which separates two matches at their common end at the same time, whereby the likelihood of splitting the matches individually from the card is lessened.

3. In a machine for making matches in cards from a strip of veneer, in combination, a suitable cutting-bed, feed-rolls, a reciprocating cross-head provided with slitting-knives not extending to the edge of the veneer, V-shaped knives, a transverse cutting-

off knife and an ejector, said slitting-knives, V-shaped knives, transverse cutting-off knife and ejector being spaced apart in the direction of the feed one or more even times the width of a match, the V-shaped slits, straight slits, transverse cut and the ejection of the diamond formed by the V-shaped slits do not take place simultaneously in respect to a given match.

4. In a machine for making match-cards from a strip of veneer, in combination, a suitable frame, a cutting-bed, feed-rolls and means coöperating therewith adapted to convey the veneer over said bed one match-space at each reciprocation of the cross-head, a reciprocating cross-head provided with match-forming knives, a presser-plate covering a plurality of matches provided with slits therein at points over said cutting-bed through which said knives are adapted to register and means for periodically lifting said plate from the veneer.

5. In a machine for making matches in cards from a continuous strip of veneer, in combination, a suitable frame, a cutting-bed consisting of a plurality of circular disks pivotally secured to the bed-plate and capable of rotation therein in contact with each other, a reciprocating cross-head provided with suitable knives for forming the match in the veneer-strip and means for feeding said veneer over said bed, substantially as and for the purposes set forth.

6. In a machine for making match-cards from a strip of veneer, in combination, a suitable frame, a cutting-bed, means for feeding a strip of veneer over said bed and a reciprocating cross-head provided with V-shaped point-forming knives spaced apart in the direction of the feed, each blade of the V-shaped knives being longer than the inclined side of the match-point, whereby the extremities of the slits formed by said knives overlap each other.

In testimony whereof I affix my signature, in presence of two witnesses, this 29th day of March, 1897.

LORENZO P. HAWKINS.

Witnesses:

ELGIN C. VERRILL,  
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