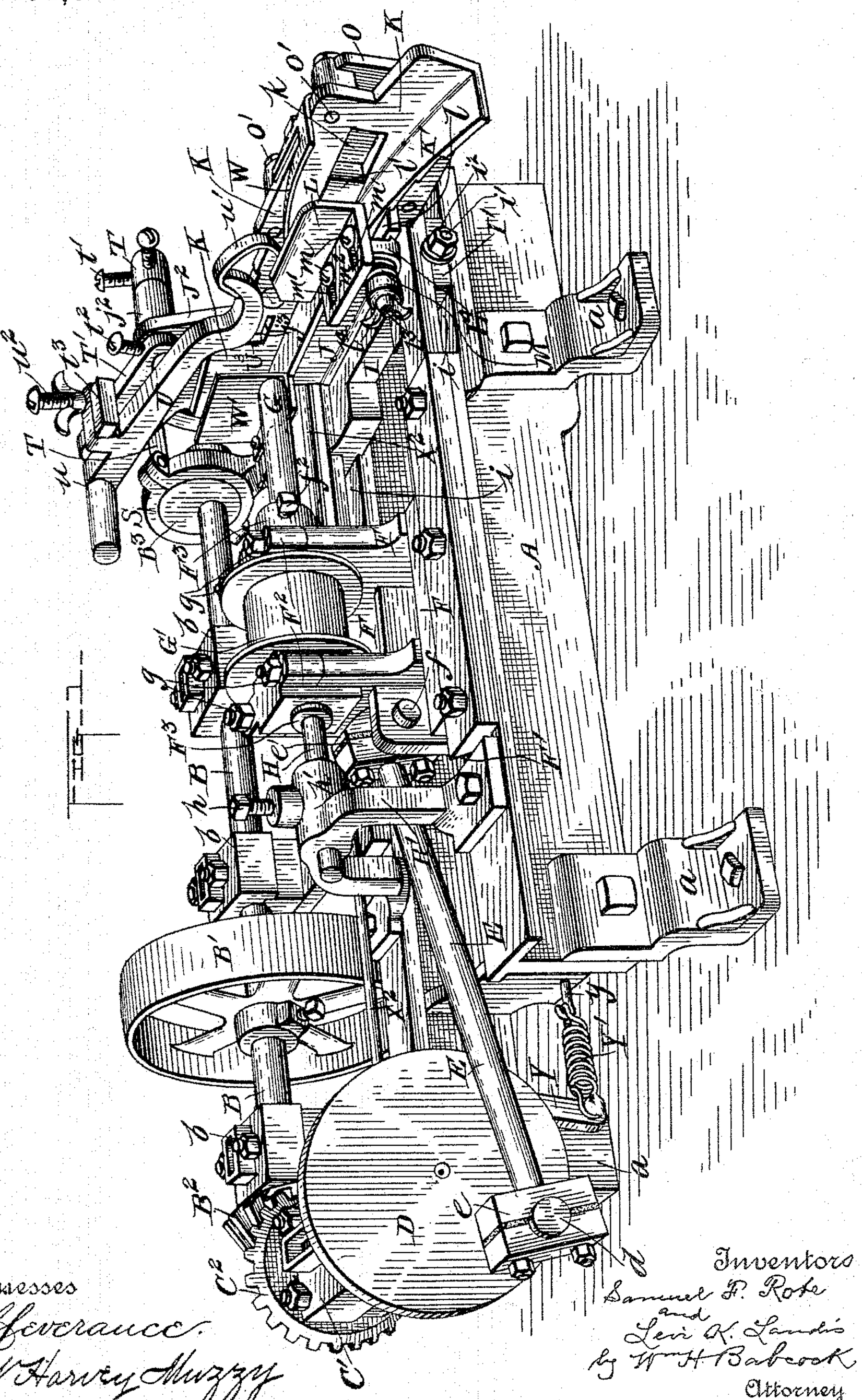
(No Model.) 3 Sheets—Sheet 1.

S. F. ROTE & L. K. LANDIS.

CORK CUTTING MACHINE.

No. 491,375. Patented Feb. 7, 1893.



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(No Model.) 3 Sheets—Sheet 2.

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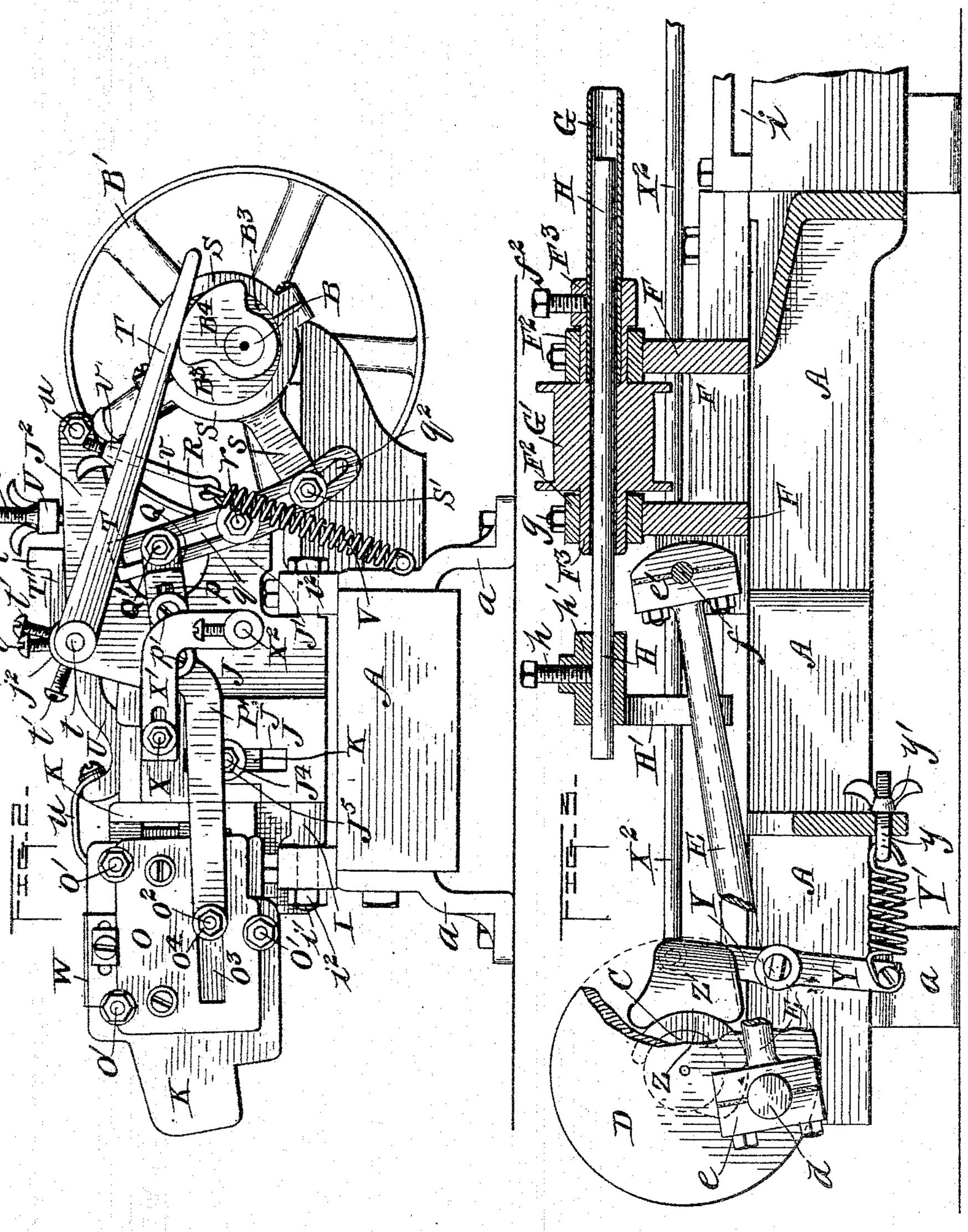

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FIG. 4.

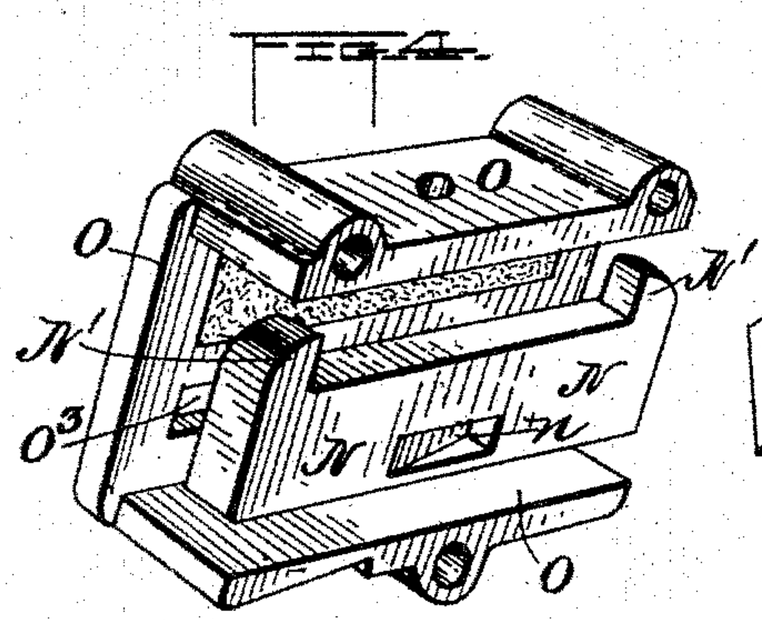


FIG. 5.

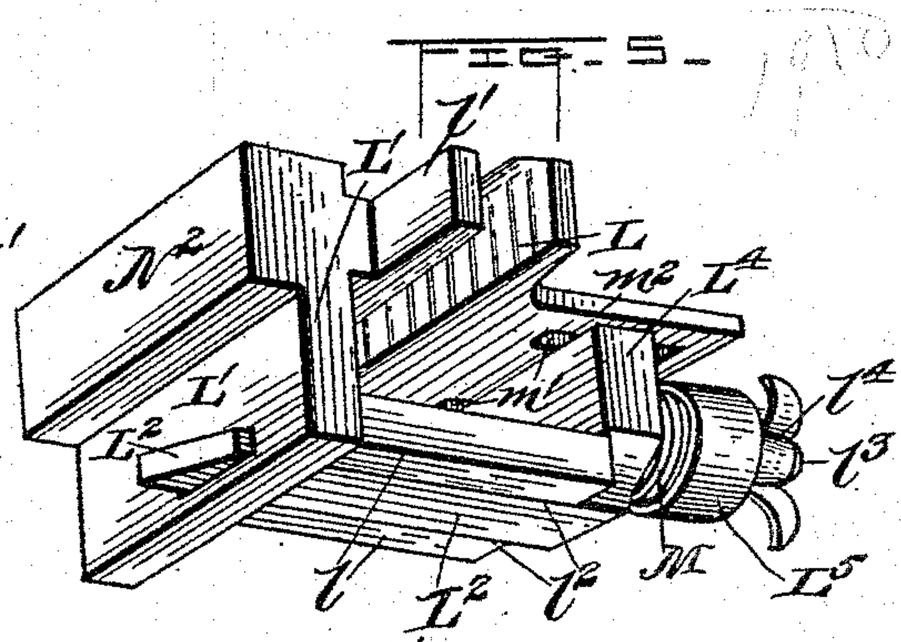


FIG. 6.

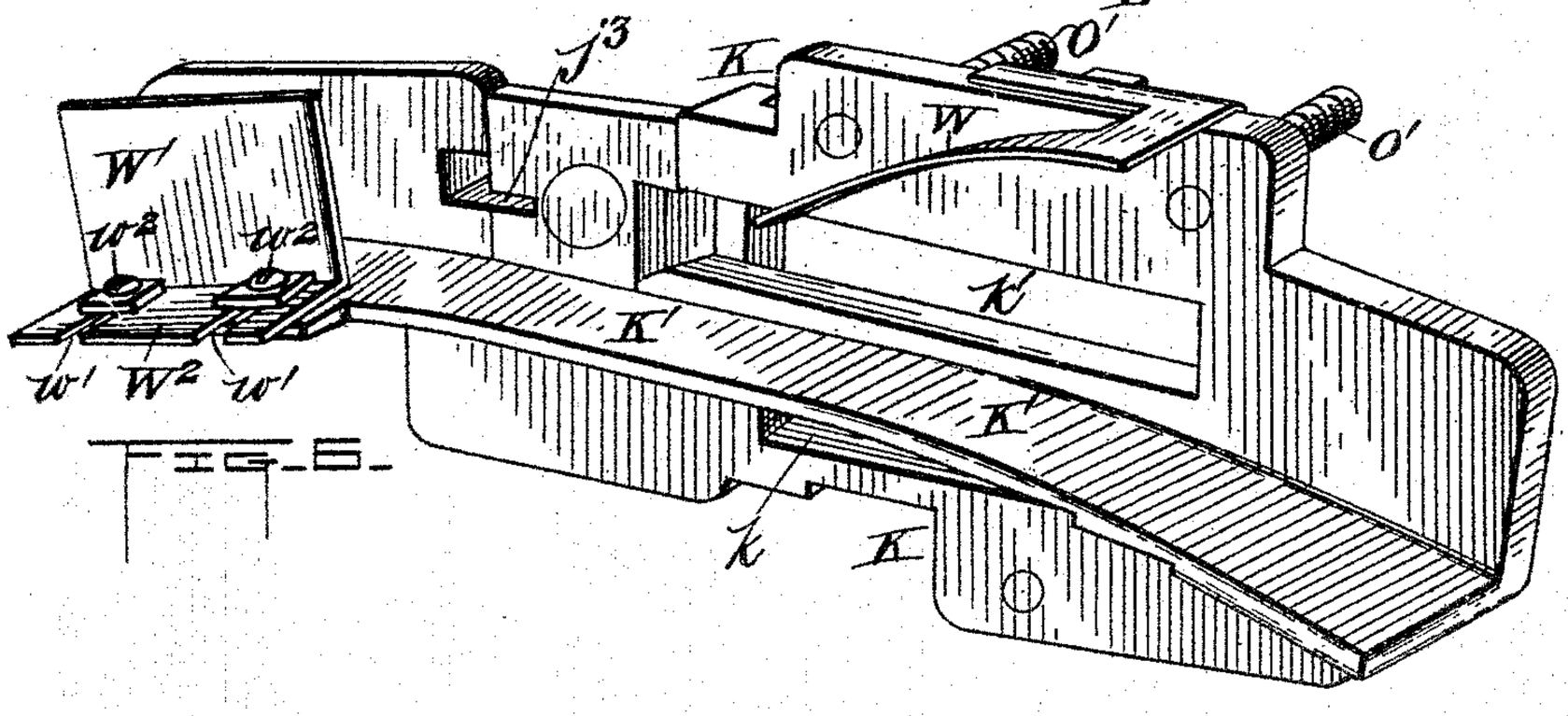


FIG. 7.

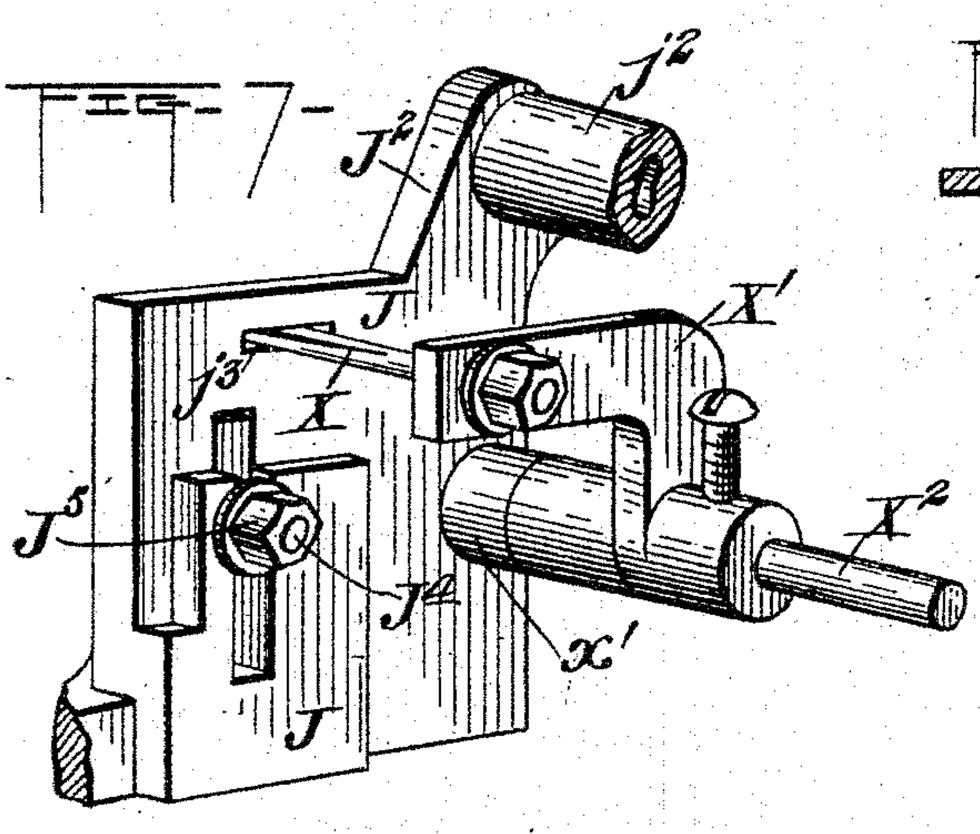
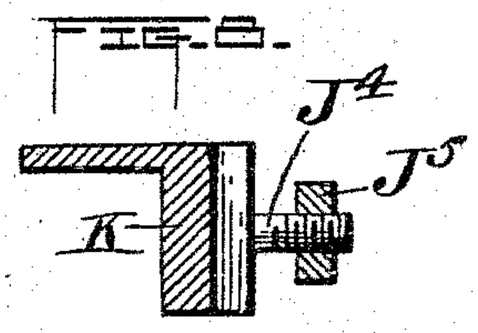


FIG. 8.



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UNITED STATES PATENT OFFICE.

SAMUEL F. ROTE AND LEVI K. LANDIS, OF LANCASTER, PENNSYLVANIA.

CORK-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 491,375, dated February 7, 1893.

Application filed May 21, 1892. Serial No. 433,881. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL F. ROTE and LEVI K. LANDIS, citizens of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Cork-Cutting Machines; and we 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.

The chief object of this invention is to provide an automatic machine for blocking or cutting out bottle corks from cork strips, the said machine feeding the strips to the cutters and holding them in proper position for blocking, and the feeding and holding devices being made adjustable to conform to the size of the strips and the size of corks desired.

To this end the said invention consists partly in certain improvements in the feeding mechanism; partly in certain improvements in the devices for holding the strips when the feeding devices withdraw; partly in certain devices for preventing the strips from being fed forward too far, the said devices gaging the space between corks in order that as little material as possible may be wasted; and finally in certain details of adjustment, and other features hereinafter set forth and claimed.

Our invention also includes certain improvements in the devices for operating and guiding the cutter and some additional features of construction which need not now be more particularly stated.

In the accompanying drawings Figure 1 represents a perspective view of a machine embodying our invention; Fig. 2 represents an end elevation of the same taken at the operating ends; Fig. 3 represents a longitudinal section through the cutter and cutter-carriage and adjacent parts; Fig. 4 represents a detail perspective view of the guide-casing and operating plate of the feeding clamp, taken from the inner side; Fig. 5 represents a perspective view of the feeding clamp detached from the machine, but without the said casing and plate; Fig. 6 represents a perspective view of the detachable and adjustable frame which supports the feeding devices; Fig. 7 represents in detail perspective the raised and slotted wall J hereinafter described, the holding or gaging finger which works through the same the adjusting nut J^5 the end of the screw-threaded rod or stud J^4 and divers proximate parts; and Fig. 8 represents a detail vertical section of a part of the detachable and adjustable frame K, taken from the side opposite to that shown in Fig. 6, and showing the screw-threaded rod or stud J^4 with the nut J^5 thereon.

In the said drawings A designates the supporting frame of the machine, resting on legs A.

B designates the driving-shaft, which turns in bearings *b* on the said frame and is provided with a belt-wheel B′ for receiving power and a bevel-wheel B^2 for transmitting it. This bevel wheel meshes with a similar bevel wheel C^2 on one end of a short shaft C arranged at right angles to the main shaft and turning with said wheel in a broad bearing box C′ formed on the said frame. The other end of shaft C is provided with a disk D, having a wrist-pin *d* arranged eccentrically on the outer face of it, to which the rear end of a pitman E is connected by a suitably packed clamping box *e*. The forward end of said pitman is similarly clamped by a box *e′* to a transverse pin *f* of a sliding cutter-carriage F. This carriage consists of a movable frame, sliding in guideways F′ of the main-frame A, the said frame or carriage F being raised above the said main frame, to form in effect two cross-heads at a higher level, provided with sectional bearings or blocks F^2, in which the tubular arbor F^3 of the tubular cork-cutter G is clamped by means of nuts *g*, in two pairs, turning on screw-threaded posts or studs of the said frame. The said arbor with the cutter is free to turn in the said bearings, but, also moves back and forth with the said carriage. A fixed horizontal clearer H is clamped by a screw *h* in a socket *h′* of a supporting arch H′, bolted to the said main frame, the said clearer being concentric with the said tubular arbor and cutter, and extending forward within the latter nearly to the cutting end thereof. The said cutter by the operation of the said disk wrist pin and pitman is thrust forward to cut a bottle cork from a sheet or strip of that material, and simultaneously rotated by means of a belt applied to a drum or pulley G′ on the said

cutter, this rotation contributing greatly to the cutting action. Then the continued operation of the said disk and connections withdraws the said cutter; and the said clearer, remaining motionless, forces the cork out of the said cutter, so that it will drop down below. The said clearer may be adjusted farther back, to compensate for wear at the cutting end of the cutter. The latter is detachable from its arbor, being held by screws f^2 in the enlarged and socketed forward end of the said arbor.

By connecting our cutter-reciprocating devices to the cutter-carriage instead of directly to the arbor, we are enabled to avoid the clearer and thus make use of the efficient mechanism shown without entanglement or impediment. Hitherto the arbor has generally been reciprocated in fixed bearings, necessitating the placing of these far enough apart to allow for the backward and forward travel of the driving pulley, compelling the use of a longer arbor than we now employ, and making it requisite also to use a treadle or other ineffective form of actuating mechanism, or to connect the parts in some unusual and inconvenient way.

In order to compensate for the wear of the cutter, and keep the cork always in the same position with reference thereto, the cork supporting devices are made adjustable longitudinally with respect to the main frame A. As shown, we effect this by employing a platform I, which is movable in guide ways i of the said frame A. These guideways are slots extending through the sides of the said frame and receiving lateral extensions I′ of the said platform reduced in thickness. From each of these extensions, a screw-threaded stud i' protrudes outside of the said frame and receives a nut i^2, which binds against the outside of the latter and thus fastens the said platform in the position to which it has been adjusted. By loosening the said nuts and moving up the said platform toward the said cutter and then tightening the said nuts again, in the familiar manner of such adjustment, the cork may be kept always at the same distance from the cutting edge, when the cutter is at its farthest point of withdrawal, and consequently the stroke of that tool will be always equal and exactly sufficient to properly cut the corks from the strip, without injury to the edge. On this adjustable platform all the parts are mounted that have to do with holding and regulating the motion of the cork strips. First there is a raised rigid plate or wall J cast with or secured to the said platform, and constituting at its edge a guide for a vertically adjustable frame K, which is much wider than its height and slightly curved downward. On the face of this frame is the rigid race or feed-way K′ for the strips of cork, as these are successively presented for cutting. These strips are fed by the following devices. In a longitudinal guide slot k of the frame under the said race or feedway the base plate l of a feeding clamp is free to move backward and forward, a guide block l' of the raised and relatively stationary jaw or back plate L′ of the said feeding clamp fitting and similarly sliding in another slot k' of the said frame above the said feedway, so as to more effectually brace the said clamp and be ready to hold the strip. The forward plate or jaw L of the said clamp is made movable toward and from the said plate or jaw L′ and frame K; being provided with a flat horizontal bar L^2, which extends through a guideway l^2 in the said base plate l, the said guideway and bar being dovetailed to provide for the support of the latter and of the jaw or plate L, while permitting their adjustability. The rear or outer end of the said bar extends through the said base plate and frame K, so as to be in position to be struck by a plate sliding along the rear face of the latter, and is beveled outwardly and away from the point of cutting or blocking, so that every such contact of said plate while moving in that direction will open the said jaw L by forcing inward the said bar.

The closing of the jaw L is effected by a spring M which surrounds a rod l^3, extending from the inner end of the said base plate l through a plate or casting L^4 raised on the corresponding end of the bar L^2. The outer end of the said rod is screw-threaded to receive a nut l^4 which holds in position a cap L^5. The spring is located between the said cap and the said plate or casting, and forces the latter toward the frame K carrying with it the movable jaw L. This movable jaw or plate L is not in one piece with the bar L^2 or the plate or casting L^4, but is connected with the latter by means of clamping screws m which pass through slots m', longitudinal with regard to frame A, formed in a horizontal base extension m^2 of the said jaw or plate, the said screws entering the raised plate or casting L^4. By means of these screws and slots, the said jaw or plate L may be adjusted to suit a broader or narrower strip of cork, without disturbing any other part of the feeding clamp.

The plate N for acting on the beveled end of the bar L^9 has a correspondingly beveled recess n to receive this end. The plate L′ of the feeding clamp is thickened above the said plate N, to form a long broad shoulder N^2, which serves as an upper guide for the latter during its independent reciprocatory movement. But the said plate N is made longer than the said shoulder and provided at its ends with raised lugs N′, one of which will come in contact with one of the ends of the said shoulder when the said plate N moves forward or backward more than a very little way. This is calculated so that the plate N may first act independently on the bar L^2 so as to open the jaw L, compressing the spring M in doing so, and will then move back the entire feeding clamp to the end of its travel. As the plate N moves independently in the

opposite direction, it first leaves the spring M free to operate and this closes the jaw or plate L against the strip of cork, which will be held between the said jaw and the guide-block l' of jaw or plate L' so that the said strip will be carried forward the predetermined distance with the feeding clamp, to present the next uncut part of the said strip for blocking. The forward movement of the said feeding clamp is caused by the engagement of the outer lug N' of the plate N with the corresponding end of shoulder N^2, as the said plate N moves forward. A guide-casing O, which is open at the ends, is secured to the frame K by bolts O', forming a cap or cover for the plates L' and N, which holds them in place, and braces and strengthens them, though allowing the endwise motion of both of them together, and of the latter plate alone to a limited extent, as set forth.

The slots k and k' are made long enough to allow the travel of the feeding clamp to be increased or diminished in conformity to the diameter of the cork which is desired. The connections whereby the said feeding clamp is reciprocated require similar adjustability of throw. Therefore we employ a connecting rod or bar P' having a longitudinal slot p to receive adjusting screws p' which turn into a link Q, the other end of the said connecting rod being attached pivotally to a rod O^2 extending rigidly outward through a horizontal slot O^3 of guide-casing O, the said stem or rod being screw-threaded at its outer end to receive a nut O^4 which keeps the said rods together.

The link Q is pivotally mounted at its outer end on a stud or bolt Q', which is fastened to the upper end of a lever R, the latter being pivoted at its middle on a fixed stud r and having its lower end connected by a bolt S' to the arm s of a yoke or ring S that surrounds an eccentric B^3 on the driving-shaft B. The bolts Q' and S' pass through slots q' q^2 longitudinal with respect to the said lever, which allow their adjustment by the usual expedient of loosening, shifting and tightening, so as to regulate the throw for increased or lessened travel of the feeding clamp, in accordance with the other adjustment already described. Through these connections the rotation of the main-shaft reciprocates the feeding clamp as set forth, also opening it before each backward movement and allowing it to close before each forward movement as set forth. The pivot stud r is attached to a rigid lateral extension J' of the wall or plate J and it is stationary, except the forward and backward adjustment of the said wall with the platform I. The wall J is also provided with another lateral extension J^2, extending somewhat above it and having a bearing sleeve j^2 rigid therewith. In this sleeve an arbor or rock shaft t is mounted, having on its ends two arms T T' clamped there by screws t' t^2 so as to be capable of radial adjustment. The longer arm T rests on a cam B^4 of main-shaft B, so as to be lifted thereby as the said main shaft rotates, and alternately allowed to descend. The shorter arm T' has at its free end an overlapping cross piece t^3, rigid with it, which is arranged to press on the top of a long pressure arm U, this latter being pivoted by its outer end on a stud or rod u fixed on the said extension J^2. The free end of this pressure arm is provided with a bent spring v' the approximately horizontal lower part of the latter resting on the strip of cork as this strip is delivered to it by the feeding clamp. The pressure is caused by a spring V, which is attached at one end to an arm fixed on extension J' or some other stationary part of the frame and at the other end to the arm T aforesaid, which it draws down to force the cross piece t^3 of arm T' on the pressure arm U. This yielding spring-pressure allows the holding device to accommodate itself to any irregularity of the strip which it receives. The spring of course acts on the feeding arm only when the latter is in contact with arm T'. At other times the feeding arm is not under pressure.

The lower face of the free end of arm U is made nearly level with the corresponding part of spring v', and will press on the strip of cork as it passes beyond this spring, the latter serving as a preliminary holding device and slightly yielding guide and the lower face of the said arm constituting a presser foot U^3 which holds that part of the strip of cork which at any time is opposite the cutter for blocking. If there were no spring v', the feeding clamp would have to make a much longer journey in delivering the strip to the said pressure arm, and moreover any breakage or inequality in the cork might lead to disastrous or wasteful consequences, as it would not be properly guided under the presser foot. But the spring v' alone would not reliably hold the strip while the cutting goes on, nor prevent it from being fed too far, thereby wasting the material.

The presser foot must not be allowed to descend too far, so as to be in the way of the knife. To gage its position and make this adjustable in conformity to the diameter of the knife and the cork to be blocked, also the height of the strip from which it is to be cut, we provide the pressure arm U with a rigid plate or bar, extending over the fixed extension J^2 of wall J. A screw U^2, passing down through this plate or bar, rests on the top of the said extension and by screwing it up or down the point to which the presser foot will be allowed to descend is varied to suit the requirements of the case. The vertical adjustment of the frame K must correspond thereto in order that the central line of the strip may be opposite the center of the cutter, which retains always its position in one horizontal plane. To this end the wall J is provided with a vertical slot J^3, which allows a screw-threaded stud or rod J^4 rigid with frame K to extend out through it, receiving a clamping

nut J^5 for use in the usual manner. Whenever a higher strip of cork is to be fed the feed-way is lowered and the presser foot is raised by the adjustments described, each movement being to allow for having one half of the strip above the level of the center of the cutter and the other half below it.

To allow the cam B^4 carried by the main-shaft B to lift the arms T T′ and release the pressure arm U when that is adjusted for a thick strip of cork thus necessarily holding up said arms, we loosen the screws t' which hold the arm T to the arbor or rock-shaft t, and turn the said arm down, so as to be more readily acted on by the said cam; then tighten the said screws again. The screw t^2 of arm T′ is preferably used for fastening only, but radial adjustment of this latter arm in the opposite direction would have the same effect.

The spring V is attached to the arm T by means of a screw-threaded rod v and a nut v', the latter of which is used for tightening the tension of the said spring to adjust it in accordance with the pressure desired.

W designates a fixed spring, attached at one end to the frame K, the free end thereof being bent down into the feedway so as to rise when a cork strip is fed under it to the point in front of the cutter, but the said spring W will not allow its return. This spring also acts as a pressure guide preventing the strip of cork from rising from the said feed way. Beyond the said cutter in the direction of feeding the cork, an adjustable wall or plate W′ similar in position to jaw or plate L is mounted on the said feedway, being provided with a horizontal part or base W^2 having slots w' running lengthwise of the machine. Clamping screws w^2 pass through these slots and into the body of the feedway below. By tightening and loosening these, the adjustment of said plate is made possible.

To prevent the cork strip from being fed too far, we employ a rigid finger X working through an opening j^3 in the wall J in the direction opposite to that of the cutter. This finger is on an arm X′ of a long reciprocating rod X^2 the forward part of which is guided and supported in a fixed bearing x' attached to or formed with the fixed wall J or other fixed part of the machine. The other end of the said rod is mounted on the upper end of an upright lever Y, which is pivoted by its middle to the main frame A, the lower end of the said lever being connected to a retracting spring Y′, which is fastened to said frame by a tension-adjusting screw-threaded rod y and nut y'. The said lever above its pivot is provided with a shoulder Z′ which is arranged for contact with a cam Z on shaft C at each rotation of the latter. The spring Y′ acts to draw the point of the said finger into its position for holding the strip of cork. The cam and shoulder act to withdraw or force back the said finger from such position. The main shaft is preferably driven at the rate of about two hundred revolutions a minute; and the cutter at the rate of about one thousand.

The general operation of the machine is as follows. The parts being properly adjusted to the condition and length of the cutter and the size of the strip, as described, the main shaft and cutter arbor are put in rotation and the cork strips are fed in one after another the feeding of each one carrying forward the one before it. The feeding clamp, by the operation of the connections before described, first is allowed to be closed on the strip by the pressure of its spring, then moves forward with the said strip just far enough to present the end of the block in position to be cut, the springs W and V′ yielding, and guiding it, and then holding it. Then the cutter advances and blocks or cuts out a cork from the strip, and, in returning, this cork is removed from the said cutter by the clearer. The feeding clamp withdraws, simultaneously with the withdrawal of the cutter, and just before withdrawing releases the strip of cork. The said feeding clamp then seizes a new strip of cork and feeds it forward, and shortly afterward the finger X is caused to protrude into the circular hole left in the cork strip by cutting the first cork out of it. The slight interval between this last action of the feeding clamp and that of the said finger is for the purpose of moving the first strip of cork sufficiently, by the feeding of the one behind it, to let the said finger avoid the partition left between the holes. This should be as thin as possible. The cutter then advances and cuts again a cork out of the strip, the finger presser-bar and springs holding the said strip in position. Simultaneously with the withdrawal of the cutter, the said finger also withdraws, leaving no obstacle to the free feeding of the strip. The presser foot comes down on the cork strip by the tension of its spring just before each advance of the cutter to do its work, and rises, relieving the said strip, when the cutter begins to recede.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a cork-cutting machine the combination of a relatively fixed jaw and a relatively movable one constituting together a feeding clamp with devices for giving the said clamp a forward and backward feeding motion, a spring acting on the said clamp and means for positively operating the said movable jaw against the said spring, the said positively acting means and spring being arranged to cause the said clamp to close on the strip of cork before feeding it forward and to automatically release the said cork before returning substantially as set forth.

2. In a cork-cutting machine, the combination of a relatively fixed jaw and a relatively movable jaw constituting together a feeding clamp, with a spring acting on said movable jaw to close the same actuating mechanism

for reciprocating the said feeding clamp as a whole and a device connected to said actuating mechanism and arranged to open the said jaw before the backward motion of the said clamp and to allow the said spring to close the said jaw before the said clamp begins its forward feeding motion, substantially as set forth.

3. In a cork-cutting machine the combination of a plate having lugs at the ends and an inclined recess or face with mechanism for reciprocating the said plate, a clamping jaw movable at right angles to the said plate and provided with a bar having a correspondingly beveled end arranged to be acted on by the beveled part of the said plate, a relatively fixed jaw arranged between the said lugs of the said plate, and a spring bearing against the said movable jaw to force it toward the said fixed jaw, the said plate having a slight independent motion by reason of the lugs being farther apart than the width of the jaw between them, so that the spring may be allowed to close the clamp on the cork-strip which is to be fed, before the feeding motion begins and the said plate may open the said clamp before carrying back the clamp to its first position substantially as set forth.

4. In a cork cutting machine the combination with a reciprocating cutter of a pressure arm bearing on the strip of cork above the point at which the cutting takes place, mechanism arranged to bear intermittently on the said presser foot and a spring bearing on the said mechanism to subject the said presser foot to yielding pressure when thus in contact but leaving it otherwise not under tension substantially as set forth.

5. In a cork-cutting machine, the combination with a cutter, of a presser foot arranged to bear on the top of the strip during the cutting, a rock-shaft having two arms one of which holds down the said presser foot, an eccentric on the main shaft acting against the other arm of the said rock shaft to lift it and free the presser-foot, and a spring attached to one of the said arms to hold them down and thereby hold down the said presser foot substantially as set forth.

6. In a cork-cutting machine, the combination of a cutter, feed way and feeding devices with a spring pressed presser-foot bearing on the strip of cork opposite or nearly opposite to the point where the cutting takes place and a spring attached to the said presser-foot and bearing on the said strip between the feeding devices and the presser-foot for guiding the strip to the latter and preventing damage from a broken or irregular strip substantially as set forth.

7. In a cork cutting machine the combination of a cutter and feed way with a pressure arm arranged to bear on the strip of cork, a pivotal device bearing intermittently on the said pressure arm, a spring drawing the said device against the said pressure arm and a gage for regulating the distance to which the said pressure bar will be allowed to descend under the action of the said spring substantially as set forth.

8. In a cork-cutting machine the combination of a cutter and feedway with a pressure arm arranged to bear on the strip of cork, a shaft *t* and arms T T′ arranged to bear with arm T′ on the said pressure arm, a spring operating to cause this action, a rock shaft having an arm arranged for raising the arm T′ against the action of the said spring and actuating mechanism for the said rock shaft substantially as set forth.

9. In a cork-cutting machine, the combination of a cutter and feedway with a spring-pressed pressure arm a screw for adjusting the same so that the holding position will be lower or higher and devices for correspondingly adjusting the feedway up or down at will, in order that the central line of the cork-strip may always be opposite the center of the cutter substantially as set forth.

10. In a cork-cutting machine, the combination of a cutter and feedway with a pressure arm for holding down the strips of cork, a gage-screw attached thereto for regulating the lowest position of the said arm, a rock-shaft having two detachable arms one of which bears on the said pressure arm, a spring holding down the said arms of the rock-shaft a cam acting against one of them to lift them, and a clamping screw whereby the said arm may be radially adjusted on the said shaft to correspond with the adjustment of the pressure arm substantially as set forth.

11. In a cork-cutting machine, the combination of the cutter and feeding mechanism with the feedway, a finger reciprocating longitudinally into and out of the said feedway beyond the cutter to prevent the strip from being fed too far a fixed part of the machine provided with an opening to admit and guide the said finger, and mechanism for alternately protruding and withdrawing the said finger substantially as set forth.

12. In a cork-cutting machine, the combination of a finger for preventing the strips of cork from being fed too far, a rod which is longitudinally movable and carries the said finger with it in such motion, a rotating shaft and cam acting to force back the said rod and finger and a spring acting to draw them forward so that the said finger will be in its holding position substantially as set forth.

13. In a cork-cutting machine, the combination of the longitudinally movable cutter and cutter-arbor with a shaft and pitman for reciprocating them, a sliding carriage providing bearings for the said arbor, a guideway for the said carriage and a fixed clearer which enters the said cutter arbor and cutter to eject the cork from the latter as the cutter withdraws substantially as set forth.

14. In a cork-cutting machine, the combi-

nation of a cutter with a feedway which is adjustable toward the said cutter to compensate for the wear of the latter and also vertically to conform to the size of the cutter and of the cork-strip substantially as set forth.

15. In a cork-cutting machine, a feeding-clamp for strips of cork, consisting of a relatively fixed jaw provided with a guide-way, a bar having a beveled protruding end and movable in the said guideway, a relatively movable jaw which is fastened to the said bar, screws passing through slots in this latter jaw to allow its independent adjustment to conform to the width of the cork strip, a spring connected to said bar and movable jaw for closing the latter, a plate and connections for opening the jaw and reciprocating the feeding-clamp as a whole and a frame forming the feedway which supports the said clamp and is slotted to receive parts of it for guiding and bracing them substantially as set forth.

16. A feeding clamp for a cork-cutting machine in combination with devices for opening and closing the movable jaw thereof and additional devices for independently adjusting the said jaw toward or from the other jaw in conformity to the thickness of the cork strip substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

SAMUEL F. ROTE.
LEVI K. LANDIS.

Witnesses:
A. F. DONNELLY,
CHARLES A. PETERS.