

(No Model.)

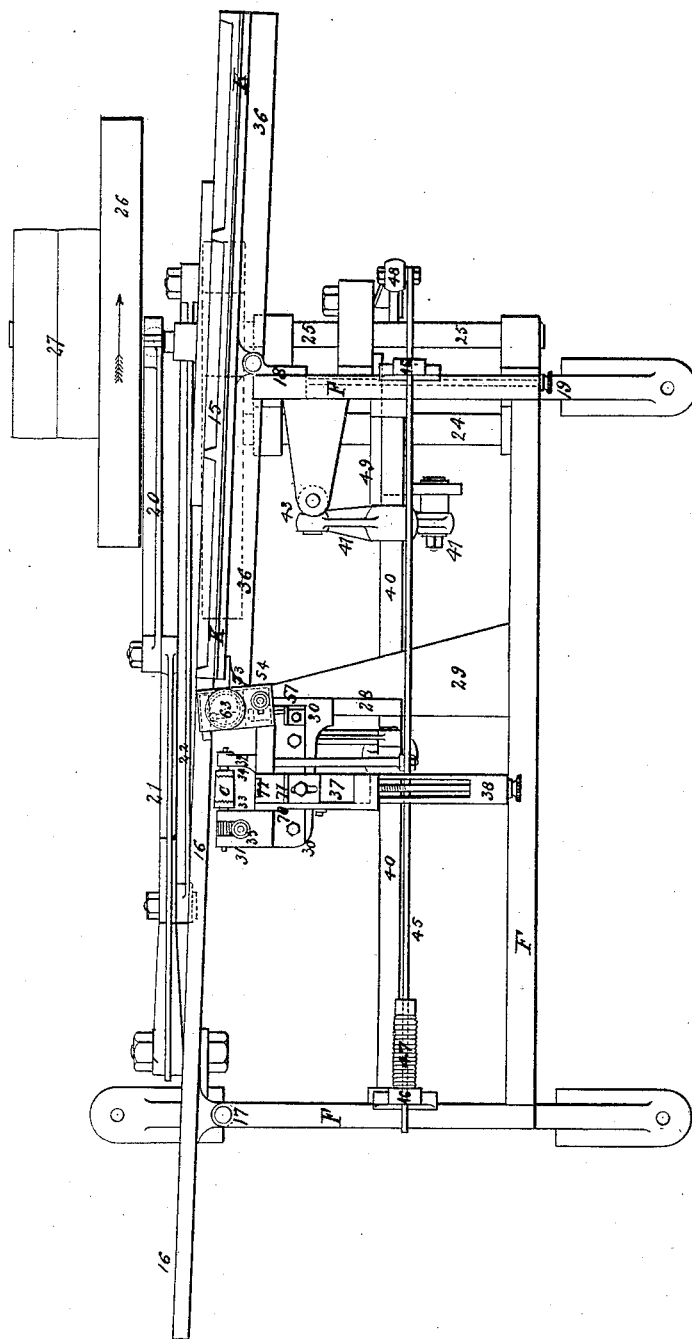
3 Sheets—Sheet 1.

J. LISTON.  
CORK CUTTING MACHINE.

No. 345,909.

Patented July 20, 1886.

F I G. 1.



Witnesses:  
John E. Parker  
David S. Williams

Inventor  
John Liston  
by his Attorneys  
Howe & Tins

(No Model.)

3 Sheets—Sheet 2.

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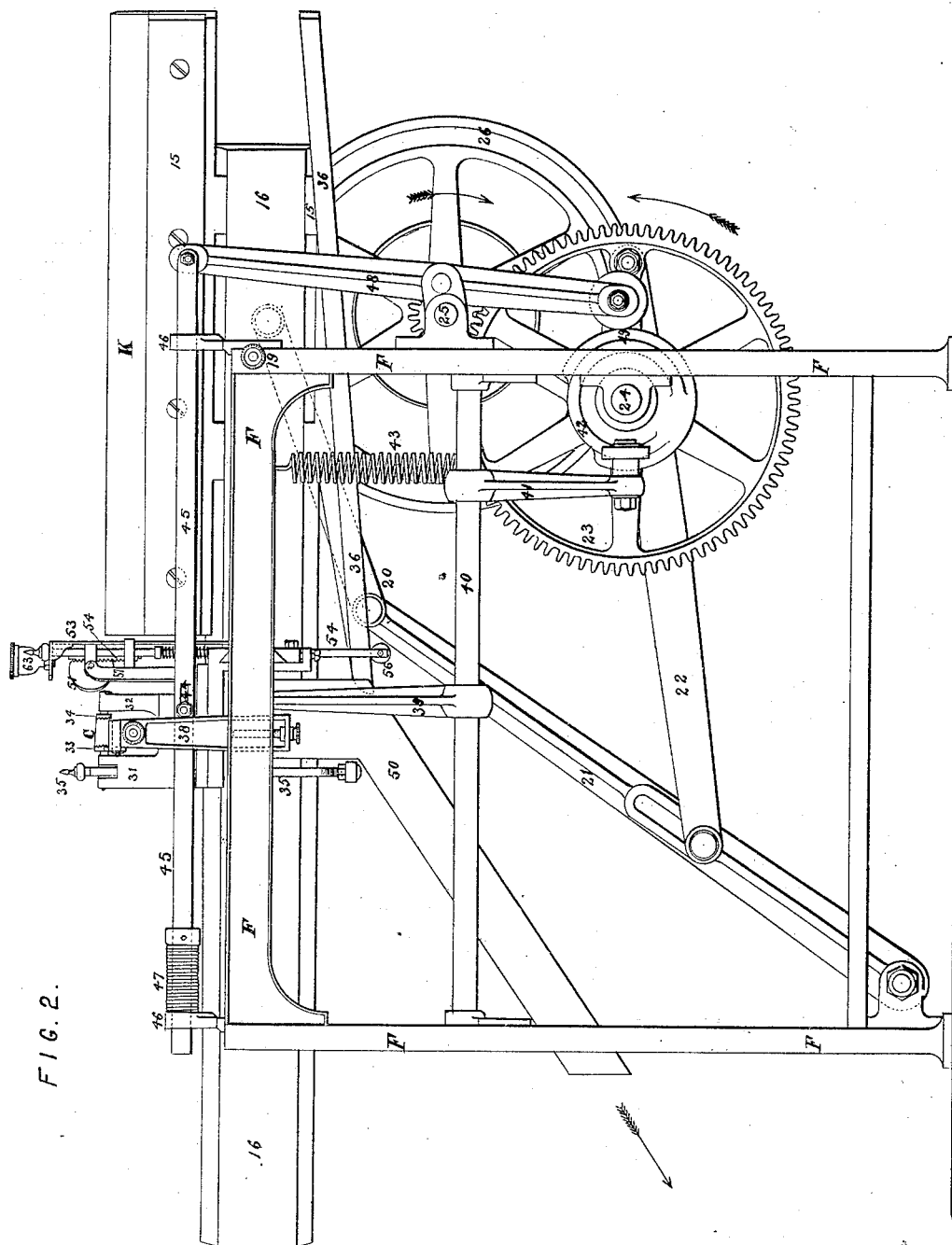


FIG. 2.

Witnesses:

John E. Parker  
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Inventor

John Liston  
by his Attorneys  
Howe & Sons

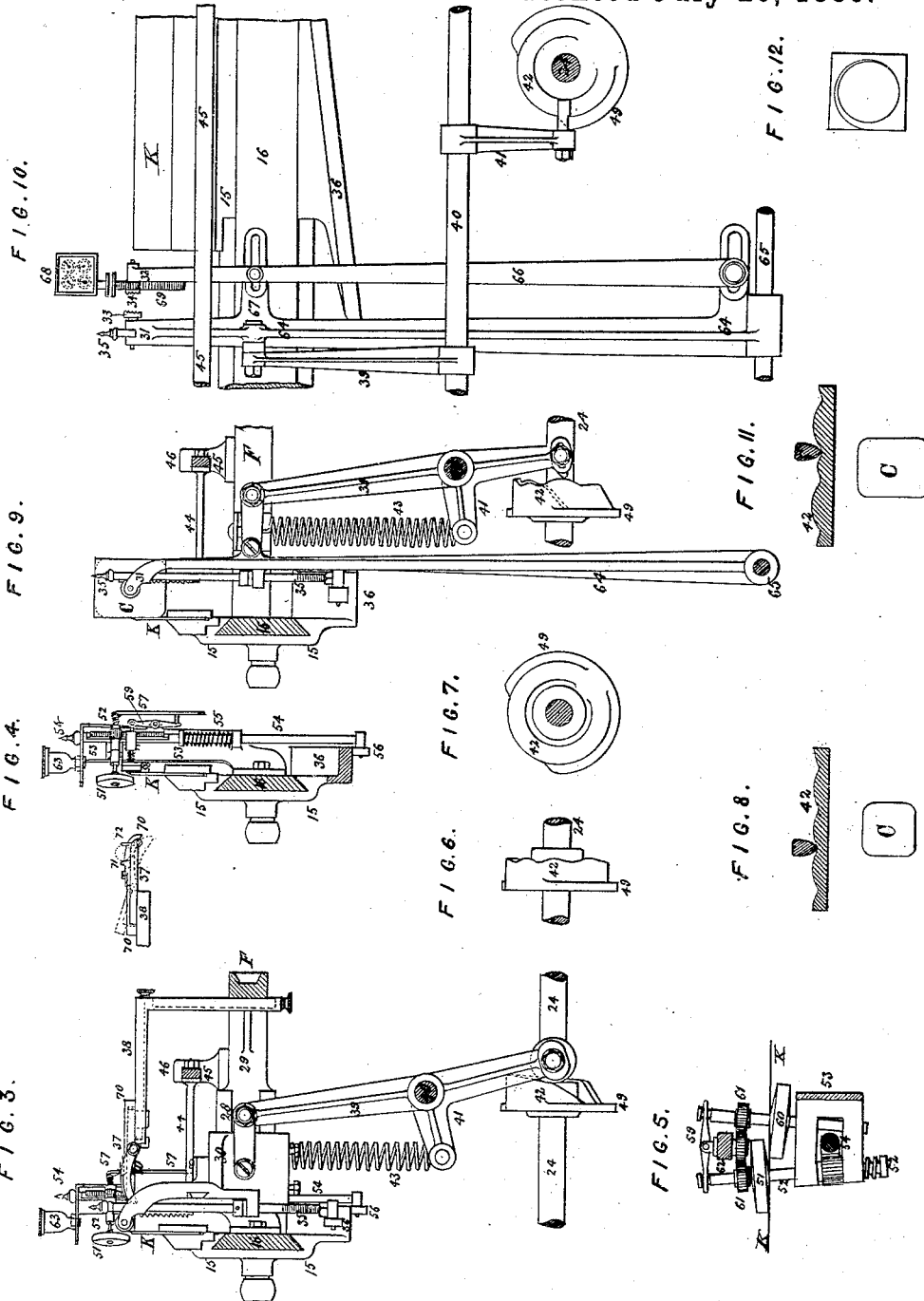
(No Model.)

3 Sheets—Sheet 3.

J. LISTON.  
CORK CUTTING MACHINE.

No. 345,909.

Patented July 20, 1886.



Witnesses:  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

JOHN LISTON, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

## CORK-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,909, dated July 20, 1886.

Application filed November 19, 1885. Serial No. 183,316. (No model.) Patented in England April 9, 1884, No. 6,166; in France April 10, 1884, No. 161,469; in Germany April 30, 1884, No. 31,421, and in Portugal December 22, 1885, No. 1,019.

*To all whom it may concern:*

Be it known that I, JOHN LISTON, a subject of the Queen of Great Britain and Ireland, and a resident of Glasgow, in the county of Lanark, Scotland, have invented certain Improvements in Apparatus for Cutting or Shaping Corks, Bungs, Floats, or Similar Articles, (for which I have obtained a British patent dated April 9, 1884, No. 6,166, a French patent dated April 10, 1884, No. 161,469, a German patent dated April 30, 1884, No. 31,421, and a Portuguese patent dated December 22, 1885, No. 1,019,) of which the following is a specification.

My said invention has for its object the cutting or shaping of corks, bungs, floats, or similar articles in an expeditious and economical manner by means of an improved apparatus.

In my improved apparatus a straight knife of sufficient length to cut the entire circumference of a cork or similar article at one stroke is made to reciprocate, by preference horizontally, and while it is moving in one direction the piece of cork is presented to it and made to rotate by a holder. The edge of the knife is maintained in efficient condition by a small sharpening-stone, which acts upon it in a special manner between every cutting-stroke; and this stone may have combined with it to act on the other side of the knife either a second rotating stone or a non-rotating piece of stone or other suitable material. A rotating or non-rotating piece of wood or leather or other suitable material may also be applied to impart a sharpening finish to the edge after each action of the stone or stones.

For cutting special forms—such as oval forms or those of cork floats—special cams are provided, which move the holder of the cork piece to and from the edge of the knife, and to impart more or less of a conical or tapered form to the cork or article the knife and the guide on which it moves are made capable of angular adjustment relatively to the axis of rotation of the cork-piece holder.

My improved apparatus may be arranged for cutting two or more corks or similar articles simultaneously, and while it is specially designed for operating on the material cork, it may also be used for cutting or shaping

corks, bungs, or similar articles of other materials.

In order that my said invention and the manner of performing the same may be properly understood, I hereunto append three sheets of explanatory drawings, to be hereinafter referred to, and representing cork-cutting apparatus as made with my improvements.

Figures 1 and 2 are a plan and front elevation of the machine. Fig. 3 on Sheet 3 is a transverse vertical section showing the principal operating parts, Fig. 4 being a similar section as at a different part, while Fig. 5 is a sectional plan showing the application of two rotating sharpening-stones; and Figs. 6, 7, and 8 are views of a cam for giving a particular shape. Figs. 9 and 10 are sectional elevations as at right angles to each other, showing a modification of certain parts; and Fig. 11 is a diagram of the cam shown in Figs. 9 and 10, for giving a particular shape to the cork piece. Fig. 12 shows the line of cut which is, by preference, followed in shaping a cork.

In these drawings, the same reference letters and numerals are used to mark the same or like parts wherever they are repeated.

In the machine shown in Figs. 1 and 2 the knife K, which is horizontal, with its cutting-edge presented upwardly, is at what, in this specification, is called the "back" of the machine, being fixed to a knife bar or slide, 15, fitted to reciprocate horizontally on a V-edged guide-bar, 16, carried by the framing F of the machine. This guide-bar 16 is directly connected to the left-hand end of the framing F by a vertical hinge-joint, 17, and at the other end of the framing it is connected by a vertical hinge-joint to a block, 18, fitted to slide within the top cross-frame bar, and adjustable by a screw-spindle, (indicated by dotted lines,) and having on its front end a milled head or button, 19, for turning it by. The knife bar or slide is moved from side to side by a link, 20, jointed to a lever, 21, which is centered at the lower part of the framing F, and has jointed to it a link, 22, connecting it to an eccentric or crank pin on a spur-wheel, 23. This spur-wheel 23 is on a shaft, 24, carried by the framing F, and is driven by a pinion

on a first-motion shaft, 25, having on it a fly-wheel, 26, and fast and loose pulleys 27, for a driving-belt; or the shaft 25 may be arranged for being driven by means of a treadle or by means of a crank-handle.

On a transverse V-edged guide-bar, 28, formed on a bracket, 29, fixed to the framing F, there is fitted a slide, 30, which carries the cork piece C while being operated on by the knife K. This slide 30 has on it one head, 31, which is formed on or fixed to it, and another head, 32, which is movable upon it, and these heads carry chucks or centers 33 34, with grooved faces, between which the cork piece C is held. One chuck, 34, turns loosely or freely in the movable head 32; but the other, 33, has fixed or formed on its spindle a pinion with which there gear rack-teeth on a vertical rod, 35, working in a guide in the head 31 and slide 30, and having adjustably fixed on its lower end a small anti-friction roller, to be acted upon by an inclined flange, 36, formed on or fixed to the inner side of the knife-bar 15. The knife K moves toward the left hand when cutting, and then this inclined flange 36, in passing under the rod 35, raises it up and causes its rack-teeth to turn the chuck 33, and with it the cork piece C.

Instead of moving the vertical rod 35 for turning the cork piece C by the inclined flange 36, the requisite motion may be imparted to it by a separate cam on the main shaft 24, or in any convenient way. When the knife-bar 15 returns toward the right hand, the rod 35 descends by its own weight. The cork piece is placed by hand in a cradle, 37, which is in front of or inward from the position in which the cork piece is when being cut, this cradle 37 being adjustable horizontally or inward and outward on a bracket, 38, which is itself adjustable vertically on the upper front bar of the framing F.

The cradle 37 is hereinafter more particularly described. The slide 30 moves forward or away from the knife when about to receive a fresh cork piece, its movement being effected by a lever, 39, to which it is connected by a link, and which is fast on a horizontal shaft, 40, having also fast on it a bell-crank lever, 41, one arm of which is fitted with an anti-friction roller to bear on a cam, 42, on the main shaft 24, the other arm being connected to a spring, 43, which keeps the lever in contact with the cam. The movable head 32 is fitted on a small V-edged guide upon the fixed head 31, and is moved by a rod, 44, which passes through a hole in it, and is adjustably fixed to a horizontal bar, 45, fitted to slide in guides 46, fixed to the framing F. A spring, 47, presses the bar 46 toward the right hand, and a lever, 48, acted on by an edge-cam, 49, moves it toward the left hand, this cam 49 being in the same piece with the cam 42 on the main shaft 24. The cam 49 is shaped and timed to act so that the movable head 32 recedes from the fixed head 31 when the cutting of a cork is finished, this allowing the cork to

drop from between the centers 33 34 down a discharge-spout, 50, and the head 32 is kept apart while the slide is moved forward from the knife, and until it is in position for gripping the fresh cork piece which has been placed in the cradle 37. The movable head 32 then returns toward the other head, 31, and causes the cork piece to be gripped between the centers 33 34, so as to be carried out of the cradle 37 toward the knife, when the slide 30 moves backward again, the cam 42 being shaped and timed to produce this movement of the slide 30 as soon as the fresh cork piece has been gripped, and just before the knife K begins to move toward the left hand.

At a little distance to the right hand of the slide 30 are placed the parts for carrying and working the sharpening stone or stones. One small rotating stone, 51, acts on the back edge of the knife K while the latter moves toward the right hand, this stone 51 having a slightly-coned acting face, which is made to bear properly on the knife by having its spindle 52 placed in a slightly-inclined position. The stone 51 is carried by its spindle 52 in the upper part of a bracket, 53, fixed to the inner side of the guide-bar 16, as best seen in Fig. 4, and the spindle has on it a pinion, which gears with rack-teeth on a vertical rod, 54, guided in the bracket 53, and pressed upward by a helical spring, 55. The lower end of the rod 54 has fitted to it an anti-friction roller, 56, which is acted on by the under side of the inclined flange 36, hereinbefore referred to as fixed on the knife-bar 15. As the action of the stone 51 on the knife K is not suitable excepting when the latter is moving toward the right hand, the stone 51 is moved back out of contact when the knife is moving toward the left hand, this being done by a bar or blade, 57, attached to the slide 30, and which bears on the front end of the spindle 52 of the stone 51 when the slide is moved back, a small helical spring on the spindle moving it forward again when the slide 30 moves forward.

In Fig. 4 a non-rotating piece, 58, of stone or other suitable substance, is shown as applied to the inner side of the knife K, this piece 58 being fixed to a spindle passing through a socket formed on the bracket 53, and having its inner or front end connected to a lever, 59, centered at its middle. The other end of this lever 59 has a pin or projection, which is acted on by the blade or bar 57 of the slide 30, so as by the reversing action of the lever 59 to move the piece 58 away from the knife when the slide 30 moves toward the knife, a helical spring on the spindle of the piece 58 moving it against the knife when the slide 30 is moved away therefrom.

In Fig. 5 rotating stones 51 60 are shown for acting on both sides of the knife K, the one, 60, for the inner side of the knife, being driven by means of three pinions, 61, from the spindle 52 of the other stone, 51, and a lever, 59, made with forked ends to engage in grooves in the spindles of the two stones, being

arranged to move the inner stone, 60, away from the inner side of the knife whenever the other stone, 51, is moved away from the outer side or back of the knife. The lever 59 and the middle pinion, 61, are carried upon an arm, 62, fixed to the bracket 53 so as to overhang. An oil-cup, 63, is fixed on the top of the bracket 53, and from it oil is led down by fibrous threads to pads of leather or other suitable material, held by wires so as to bear against the knife at or near its edge; but these pads and their holders are not shown, as they would render the parts somewhat indistinct.

When parts for applying a finishing sharpening action (like that obtained by using a strop) are employed, they may be arranged and moved into and out of action in the same manner as the stones 51 60, being placed at the right-hand side of the stones.

Instead of carrying the cork-holding details on a slide, 30, as shown in Figs. 1, 2, and 3, hereinbefore described, they may be carried, as shown in Figs. 9 and 10, at the upper end of a long vertical lever, 64, centered or fixed on a rocking shaft, 65, at the bottom of the machine, the movable head 32 being upon a lever, 66, adjustably centered on a short arm at the bottom of the lever 64, and being guided at an upper part by a pin fixed to it and working in a slot in an arm, 67, formed on the lever 64.

Any convenient counting mechanism may be fitted to the machine; but I prefer such mechanism to be actuated by parts which only act when a cork piece is being operated on. By way of example, a small casing, 68, is shown in Fig. 10 with counting wheels and dials fitted in a position to be acted on by a rod, 69, so as to indicate the number of corks or articles cut. This rod 69 is formed with rack-teeth to be moved by pinion-teeth formed on the center 34, and as this center turns only when there is a cork piece between the centers, the counter is not acted on unless a cork piece is being operated on.

The cam 42 shown in Figs. 2 and 3 is suitable for cutting plain round corks, and may be shaped so as simply to move the slide 30 forward for receiving the cork piece, and backward to a position near the knife suitable for the size of the cork to be cut, the slide remaining in the same position while the cork is being cut. I however prefer to cut round corks in a manner which will be understood from Fig. 12, representing the end of a cork piece with the line of the cut on it. The cut extends more than once round the cork, a thin shaving being taken off at the second round and leaving the finished surface extremely smooth and fine.

The cam 42 is shaped to move the holder in a manner to produce the desired kind of cut, whether it be that shown in Fig. 12 or any other that may be found preferable, and when the machine is designed to give a cut extending more than once round in this way the knife must be made long enough to make the

entire cut at one stroke, regard being had to the rotation of the cork piece in relation to the movement of the knife. The edge of the knife K may be either parallel to the direction of its motion, or it may be slightly inclined thereto in any direction, the cam 42 being in any case shaped suitably for obtaining the desired cut by the combination of the movements of the knife and cork piece.

Figs. 6, 7, and 8 show the form of a cam 42 to be used when cutting a piece C such as is shown below Fig. 8, being in the form of a square with rounded corners.

Fig. 8 is the straightened representation of a cylindrical section of the raised part of the cam.

The cam 42 shown in Figs. 9, 10, and 11 is shaped for producing the cork piece C shown below Fig. 11 and also in Fig. 9, Fig. 11 being the cylindrical section of the raised part of the cam as straightened or flattened.

The cradle 37, into which the cork pieces are put, is shown in Fig. 3, the left-hand side being delineated in that figure, while the right-hand side of it is shown in a supplementary figure between Figs. 3 and 4. The cradle 37 consists of a narrow plate adjustably fixed on the bracket 38, and has jointed at the left-hand side of it a movable side, 70, weighted at its front end. On the plate there is an adjustably-fixed stop, 71, and hinged to its back end there is a finger, 72, having applied to it a small spring, which tends to keep it upright. The cork piece is placed by hand between the fixed stop 71 and the spring-finger 72, and with one end against the movable side 70. When the holder-slide 30 moves forward, the center 33, riding upon the edge of the movable side 70, turns down its after part in the manner indicated by dotted lines in the supplementary figure. The movable head 32, with its center 34, then grips the cork piece against the other center, 33, and the slide 30, moving backward, carries the cork piece to the knife, turning down the spring-finger 72 in doing so.

The inclined flange 36, for moving the rods 35 and 54, which turn the cork piece and sharpening-stone, is represented as cast on the knife-bar 15. It may, however, be a separate piece adjustable thereon.

I am aware that sharpening devices have been used in connection with cork-cutting and other machines; but, so far as I am aware, they have been used only on one side of the cutter. In my machine I keep the cutting-edge true by using sharpeners on both sides.

What I claim as my invention is—

1. The combination of the frame of a cork-cutting machine and a longitudinally-traversing knife with a slide carrying the cork and movable at right angles to the knife, a lever, 39, connected to the slide, a shaft, 40, carrying said lever, a lever, 41, on the shaft, and an operating-cam, 42, all substantially as described.

2. The combination of the cork-carrying

slide of a cork-cutting machine having rotary centers for the cork pieces with a traversing knife carrying an inclined flange, 36, and devices, substantially as described, between the flange and the cork-centers for rotating the latter by the traversing movement of the knife, all substantially as set forth.

3. The combination of the cork-carrying slide of a cork-cutting machine and centers for the cork pieces, one of said centers having a pinion, with a traversing knife and an inclined flange, 36, and a rod, 35, adapted to be acted on by the said flange, and having a rack engaging with the pinion of the center aforesaid, all substantially as specified.

4. The combination of the traversing knife of a cork-cutting machine having an inclined flange, 36, with a cork-carrying slide free to be moved toward and from the said knife, and carrying rotary centers for the cork piece, and a rod, 35, adapted to be acted on by the said flange when the slide is up toward the knife, and engaging with the centers to rotate the cork piece, all substantially as described.

5. The combination of the frame, traversing knife, and cork-carrying slide of a cork-cutting machine with a guide bar, 16, for the knife, pivoted near one end, 17, to the frame, an adjustable block, 18, to which the opposite end of the bar is pivoted, and an adjusting-screw, 19, for the said block.

6. The combination of the frame of a cork-cutting machine and the cork-carrying slide with a traversing knife and two sharpeners mounted on the frame on opposite sides of the knife and in the path of the latter on its backward movement, substantially as described.

7. The combination of the frame, traversing knife, and cork-carrying slide with a longitudinally-movable spindle mounted in the frame at an angle to the knife, and carrying a sharpener adjacent to the knife-edge, the said slide carrying a bar to act on said spindle to push the sharpener away from the knife as the slide moves up to the latter, all substantially as set forth.

8. The combination of the cork-carrying slide and traversing-knife carrying an inclined flange, 36, with a shaft, 52, having a sharpener for the knife, and carrying a pinion, and a rod, 54, having a rack gearing into said pinion and adapted to be acted on by the said inclined flange, to rotate the sharpener, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN LISTON.

Witnesses:

EDMUND HUNT,  
D. FERGUSON.