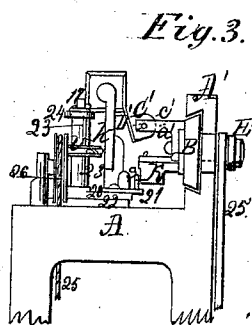
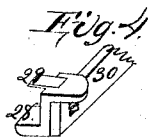
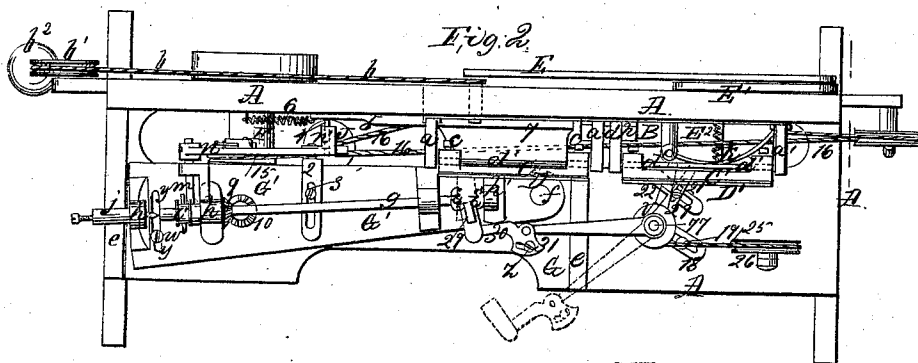
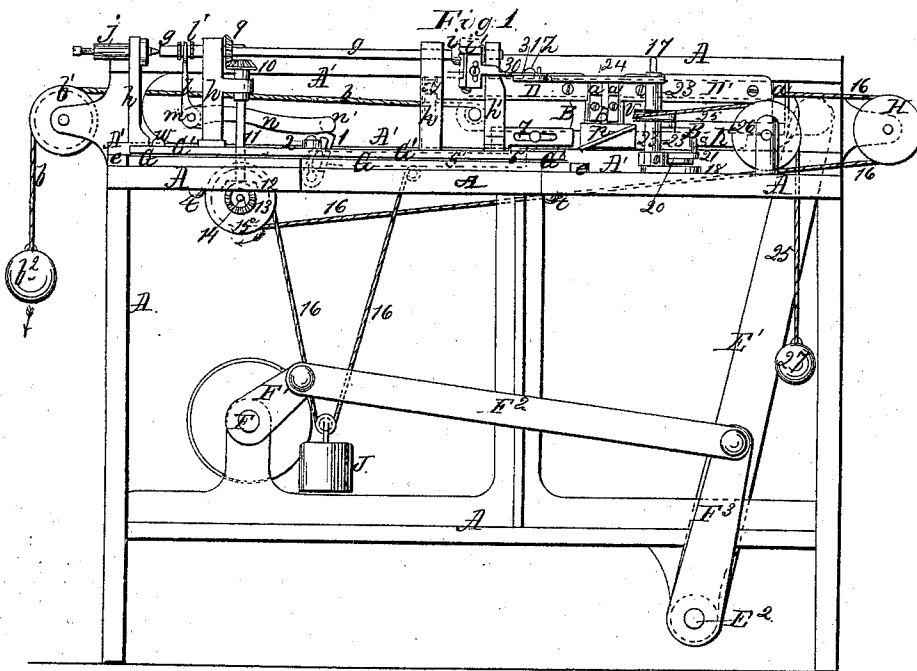


A. Millar,
Cork Machine.

Nº 31,990.

Patented Apr. 9, 1861.



Witnesses:
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UNITED STATES PATENT OFFICE.

ALEXANDER MILLAR, OF NEW YORK, N. Y.

CORK-CUTTING MACHINE.

Specification of Letters Patent No. 31,990, dated April 9, 1861.

To all whom it may concern:

Be it known that I, ALEXANDER MILLAR, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Machinery for Cutting Corks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, is a front elevation of the machine for cutting corks, showing the several parts in their relative positions, at the commencement of the operation of cutting. Fig. 2, is a plan view of the machine with the several parts in the same position as represented in Fig. 1. Fig. 3, is an elevation of the machine as seen from the right-hand end, or that end carrying the blank feeding arm. Fig. 4, is a perspective view of the "blank" carrying fingers detached from the machine.

Similar characters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements in machines for cutting bottle corks, in which an alternate reciprocating frame is employed carrying horizontal straight knives, and in connection with which knives and knife frame, the common rotating heads are used, which embrace and hold the "blanks" during the operation of the knives upon them, in forming the corks; and which afterward discharge the finished corks for receiving other blanks.

The object of the invention is to obtain, in combination with the automatic feeder, holder, and discharger, a means whereby the same may be adjusted and adapted to "blanks" of different sizes, so that very large, medium, and small corks may be cut in the same machine, or, so that straight corks, or corks having any degree of taper may be cut in a more perfect and efficient manner than in machines used heretofore.

The nature of my invention consists, firstly, in the employment of certain novel appliances combined with the common rotary "blank" holder (which embraces and holds the "blanks," or rough pieces of corks to be cut, and discharges them after the operation), which appliances will admit of such adjustments being given to the "blank" holder that tapering or straight bottle corks of different sizes may be cut with the same machine, by a very simple manipulation, as will be hereinafter de-

scribed. Secondly, in a novel arrangement of devices combined with the alternate reciprocating knife-frame, which will be hereinafter described, for regulating the rotation, and the advancing and receding movement of the revolving blank holder, so that the "blanks" or rough pieces of cork to be cut will be automatically, and in a simple and correct manner embraced by this revolving head while being cut, and discharged therefrom afterward at proper times, with relation to the movement of the knives and the "blank" feeder. Thirdly, in a novel manner of setting the knives which cut the corks, in the reciprocating frame, whereby they may be set at any desired angle with a vertical line, or raised or depressed as the nature of the work requires it. Fourthly, in the combination of certain appliances with the "blank" carrier or feeder, whereby the "blanks" or pieces of cork to be cut, will be automatically brought up to the revolving blank holder, at the proper time to be embraced by said holder; said carrier, or feeder, being operated by a cam on the knife frame, and a weight or spring and capable of being easily adjusted, and having its motions adapted to the several adjustments of the revolving blank holder, as will be hereinafter described.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The frame A is made of a rectangular form, of suitable size, strength, and material to contain and support the several parts of the machine; and within this frame is arranged a horizontal sliding knife frame B which works in suitable guide ways in a horizontal frame work A', which projects from the back and above the top of frame A, and extends from end to end of this frame. Projecting from, and secured to, the inside of this sliding knife-frame B, are four brackets *a, a, a', a'*, which are adjustable up or down, and between these brackets, the knife heads C, C', are placed and secured by pinch screws *c, c, c', c'*, which secure the heads to fixed horizontal rods *d, d'*, upon which the knife heads, C, C', are placed, and which serve as pivots to secure these knife heads to the brackets *a, a, a', a'* and to allow the heads to be moved and the knives D D' set to any desired pitch, when the screws *c, c, c', c'* are loosened. The knives D, D' are secured to the plane faces

of these adjustable knife heads $C\ C'$ in any suitable manner which will admit of the knives being detached from the heads for sharpening. The knives $D\ D'$ are straight flat plates of the best steel with straight edges, excepting one corner of the cutting edge of each knife which is slightly curved off to commence the cut. The cutting edges of these knives should be kept about on a horizontal plane with the axis of the cork to be cut, when it is held between the "blank" holder; and the faces of the knives should be slightly inclined from a vertical line, so that their edges, only, will touch the cork during their cutting operation. The knife D' with its head C' is set farther out from the face of the sliding frame B , than the knife D , the object of which arrangement is to take off the corners of the blank, only with the foremost knife D' , using the second knife D to finish the cork. These knives $D\ D'$ may thus be adjusted to a nicety so that they will perform their work without tearing the cork, and with a clear, clean cut.

The knife frame B , is operated by a jointed connecting rod E , an arm E' and a rock shaft E^2 , which latter shaft receives its motion from the main rotating shaft F , through arms F' , F^2 and a connecting rod F^3 , seen in Fig. 1. A cord b is attached to the forward end of sliding frame B , which passes over a pulley b and carries a counterbalancing weight b^2 on its lower end; this weight b^2 serves merely to equalize the movement of the frame B .

On the table or top of frame A is placed an adjustable bed plate G , which plate moves between two parallel transverse guide pieces $e\ e$, arranged at the ends of the bed plate G . These transverse guides e, e confine the bed plate G , between them, and allow it to advance or recede from the knives D, D' , and keep it parallel with the edges of these knives. The bed plate G is secured down to the table A by clamp screws or other suitable means, which will admit of the aforesaid adjustment. On this plate G , and at the point lettered f , in Fig. 2, is pivoted at one end an adjustable bed plate G' , which plate carries the mechanism for embracing and holding the "blanks" while they are cut by the knives $D\ D'$. This mechanism consists of the common revolving spring arbor g , which is mounted in bearing blocks h, h, h , which blocks are secured to and project up from the pivoted plate G' . The arbor or shaft g , has a hub i , with a serrated surface secured to one end, opposite which is a similar hub i' , which turns in the upper end of a bearing block h' ; between these two hubs the "blank" is received, and held during the operation of the knives D, D' . The rear end of the arbor g , bears against a point, behind which is a spring, inclosed in a hollow case j , which spring allows the

arbor g , to be moved slightly back, endwise, to release the finished cork, and this spring throws the arbor forward at the proper time to embrace a fresh "blank".

The arbor receives its end play from a forked lever arm l , the forked end of which grasps an annular grooved collar l which is keyed to the arbor g . The forked arm l has its fulcrum pin at m in the middle bearing block h ; the fulcrum pin projects inward toward the sliding frame B and has an arm n secured to it, which arm projects from the pin m nearly at right angles to the upright arm l . From the end of the arm n projects (toward the frame B) a friction roller n' which roller comes in contact with an inclined plate p , that projects from sliding frame B , and allows this plate to raise the end of the arm n and throw the arm l back, which carries with it the arbor g , and releases the finished cork from the hubs i, i' , at the proper time for its discharge. At the same time that the end of lever n is raised by the inclined plate p , a slotted arm 1 , is drawn under it, so as to keep it in its elevated state, thus keeping the hubs $i\ i'$ separated until the proper time for them to embrace another "blank," which takes place subsequent to the commencement of the cutting operation, as will be hereinafter described. The lower end of arm 1 , is pivoted to the lower end of the adjustable bracket 2 , which bracket lies on the plate G' and is secured to this plate by a set screw 3 , the stem of which passes down through a slot which is in the horizontal part of bracket arm 2 . The slot will allow the arm to be adjusted in a direction with its length. The pivoted arm 1 , may thus be brought nearer to or set farther from the sliding frame B .

4 is a fulcrum pin for arm 1 which pin projects out at right angles from a horizontal, sliding spring bar 5 , which bar is secured to the inside of frame A' , directly under the sliding knife frame B . The fulcrum pin 4 , projects through the slot in arm 1 and moves this arm from under the arm n . The spring operates upon the bar 5 , to move the arm 1 back again under arm n when this arm is raised by the inclined plate p .

7 is a slotted horizontal bar which is adjustable in a direction with its length, which bar is secured to the lower edge of knife frame B , over the spring bar 5 . This bar 7 , has a projection on the lower part of its forward end, which projection comes in contact with a corresponding projection on the upper side of the back end of bar 5 , at a proper time, when the sliding knife frame B is receding, and moves this bar 5 slightly back, which operation moves the arm 1 out from under the arm n and allows this arm n to fall, which operation moves the arbor g , back,—with the assistance of the spring in

case *j*,—to embrace a "blank" to be cut during the advancing movement of the knife frame B. The arbor *g* is rotated during this advancing movement of the knife frame B, or while the knives D, D', are operating, by a pinion spur wheel 9, which is on the arbor *g*, and which is attached to this arbor by a key-tenon, that will admit of the aforementioned end play being given to the arbor. This will give a rotary movement to the arbor. The pinion 9 engages with a horizontal pinion 10, which pinion is keyed to the upper end of the vertical shaft 11; this shaft passes down through the plate G', and G, and table A, and carries on its lower end a pinion 12, which pinion engages with a pinion 13, on a short, horizontal, transverse shaft 14. This shaft 14 is hung below the table A, in bearing blocks, which are secured to plate G' and which pass through the adjustable bed plate G, and table A, which are cut away for this purpose.

The shaft 14 carries on the end nearest the frame A' a grooved pulley wheel 15, over which pulley is passed the weighted driving cord 16. This wheel 15, is set so as to turn loosely on its shaft during the receding movement of the knife frame B, and to turn the shaft during the advancing movement of this frame B when the knives are operating. The common ratchet and pawl are used with wheel 15, to give this latter motion to the shaft 14. The pulley cord 16 connects with the back end of the knife frame B, passes over a grooved pulley H, and is carried forward under the table A, and passed under, and over pulley 15, thence down and under a pulley, which is attached to weight J, and finally it is attached to the under side of the table A. The advancing and receding movement of knife frame B, combined with weight J, will, by this arrangement of the pulley cord 14, give an alternate rotating motion to the grooved pulley wheel 15; and the rotating motion which this pulley 15 receives from the knife frame B during its advancing movement will be transmitted to the arbor *g*, by the appliances above described, and this arbor will only rotate the "blank" during the operation of the knives D, D', in forming the cork.

Near the front or right hand end of the frame A, and mounted on top of the table A, is the "blank" carrier, or feeder, which carries the blanks, placed into it by hand, up to the "blank" holders, or hubs, *i i'*, at the proper time to be embraced by these holders. This feeding mechanism is so adjustable that it can be made to operate in harmony with the forward end motion of the arbor, *g*, at any angle to which the arbor, *g*, may be set. For this purpose the perpendicular stem, 17, is secured at its lower end, to a slotted portion 18, which portion

may be moved in a direction with its length, or it may be turned around upon the table A by loosening the screw, 19, which secures it to the table.

20, is an arm which projects out at right angles to the stem 17, and which moves loosely on this stem. This arm 20, has a slotted arm 21, attached to it in such a manner, that its end may be extended or brought nearer to the stem 17. This latter arm 21, has a vertical pin *s*, projecting up from its end, which pin is operated upon by a curved spring cam K, which cam is pivoted to the knife frame B, and gives a vibrating motion to the arms 20, and 21, as the knife of frame B moves back.

22 is an adjustable stop pin for regulating the movement of arms 20, and 21.

Surrounding the fixed stem 17 is a tube 23, which is secured to, and moves with the arms 20 and 21, and to the upper end of which is secured a long horizontal arm 24, which carries the device for grasping the "blank," and delivering it to the hubs, *i i'*.

v is a grooved pulley which is secured to the tube 23, from which pulley a cord 25 is carried off and passed over pulley 26. A weight 27, is attached to the end of cord 25, which weight moves the arms 20, and 21, and 24, back to their original position, after the arm 21, is free from the cam K. The receding movement of the cam K, thus moves the arm 24, up to the hubs *i i'*, and the weight 27, returns the arm 24, to its original position.

The device which grasps and carries the "blanks" up to the hubs, and which leaves the "blanks" between the hubs after they grasp it, consists of two fingers 28, 29, the latter of which is simply a spring plate which is secured to the former, a suitable distance from it to grasp and hold the "blank," when slipped under it. These fingers are made vertically adjustable on the end of a horizontal arm 30, which arm is pivoted to the end of arm 24, and has a slotted sector projection 31, which will allow the arm 30 to be adjusted and set nearer to or farther from the hubs *i i'* by a set screw *z*. The vertical adjustment of the fingers 28, and 29, will allow them to be set so that "blanks" of any thickness may be brought properly within the embrace of the hubs *i i'*. This latter adjustment of the fingers, combined with the lateral adjustment of the arm 30, will allow the fingers to be set so that the center of the "blank" will be placed exactly in a line with the axis of the hubs *i i'*, when the fingers with the blank are carried between said hubs.

The operation of the machine is as follows: Motion being communicated to the horizontal driving shaft F, by any convenient power, an alternate reciprocating motion is given the knife carrying frame B,

which motion transmits to the arbor *g*, an intermittent rotary motion, in a direction toward the edges of the knives, through the medium of the weighted cord 16, grooved pulley 15, with its ratchet and pawl, shaft 14, and bevel, pinion spur wheels 13, 12, 10 and 9. The frame B also operates the arbor *g*, with an endwise motion; and it gives a vibratory motion to the "blank" carrying fingers 28, and 29, causing these fingers to bring the "blank" up to the end of arbor *g*, to be embraced by it at a proper time. These movements cause the following effects to be produced through the respective agencies of parts hereinafter detailed, in their regular order of action. We will suppose the several parts in the position represented in Fig. 1 of the drawings with a "blank" to be cut, properly placed between the fingers 28, and 29, and the fingers brought up (the mechanism carrying the fingers being properly adjusted) between the hubs *i*, *i'*, by the cam K on frame B, during the receding movement of the frame B, and we will also suppose that the projection on the end of bar 7, on frame B, has moved the bar 5, and dropped lever *n*, so as to allow the spring in case *j*, to force the end of arbor *g*, tightly up against the "blank" so that the "blank" is embraced between the hubs *i*, *i'* ready to be operated upon by the knives D D'. The knife frame B now advances up to the "blank" between hubs *i*, *i'* and before the knives commence to form the cork, the blank carrying fingers 28, and 29, should be in the position represented in red lines, Fig. 2, ready to receive a fresh "blank." The advancing movement of the frame B, slackens the cord 16, and the weight J, draws this cord over the pulley 15, and rotates this pulley, which now gives motion to the arbor *g* as before described and the arbor rotates the "blank". The knife D', now commences to cut and take off the corners of the "blank", after which the cork is finished and the succeeding knife D'.

Immediately the knife D' leaves the cork, or stops cutting, the inclined plate *p* on frame B will raise the end of lever *n*, and force back the arm *l*, which will move the arbor *g* back and release the finished cork; the short arm 1 will be drawn under arm *n*, at the same time this arm *l*, is raised, by the spring 6, which spring will also move back the bar 5. The arm *l*, will keep the arm *n*, up and the arbor *g*, in the position described, until the frame B, returns and places the "blank" carrier with a fresh "blank" between the hubs *i*, *i'*. The frame B now recedes and the cam K is brought in contact with the pin on arm 21, and this arm 21, is moved back until the fingers 28, and 29, have carried a blank between the hubs *i*, *i'*. The frame B now moves still farther back,

and the projection on bar 7, moves back the bar 5, and the arm 1 which is connected with it, is thus drawn out from under the arm *n*, allowing this arm to fall and the spring in case *j*, to force the arbor *g*, forward to embrace the fresh blank. In this manner the operation is continued and a cork is cut at each advancing movement of the knife frame, while during the receding movement of this frame, a fresh blank is placed between the hubs *i*, *i'* by the fingers 28, and 29.

The horizontal plate or bed piece G, may be moved up toward or drawn out from the knives by loosening the screws *t*, *t* which secure it down to the table A. By thus adjusting the bed plate G, the arbor *g* with the mechanism for operating it will be moved with the plate G, and by this transverse adjustment, "blanks" of any size may be presented to the knives D, D' and cut to any desirable gage or diameter.

The bed plate G', which is pivoted at one end to the lower transversely adjustable plate G, and to which all the mechanism for embracing and rotating the "blanks" and discharging the finished cork is secured, has a horizontal adjustment, and in this adjustment it describes a short arc from the pivot *f*; *u* is a set screw which passes through a curved slot *y*, in plate G, (at the opposite end of this plate G', to the pivot *f*) which screw secures the plate G' and the arbor *g*, at any desirable angle with the edges of knives D D'. Now by this last adjustment of the plate G' the axis of the arbor *g*, may be set at any desirable angle with the edges of the knives, so that a cylindrical cork, or a cork having any desirable degree of taper may be cut by the knives D D'. After adjusting the bed plate G, to the diameter of the cork to be cut, and the plate G' to the desirable taper of the cork, it is necessary to adjust the "blank" carrying fingers 28, and 29, so that they will place the "blank" properly between the hubs *i*, *i'*, in harmony with the end movement of the arbor *g* to receive the blank.

The adjustment of the knife heads C, C' admit of any degree of pitch to be given the knives D D', and thus their cutting edges may be set so as to cut the corks, large or small, to a great advantage in the saving of stock.

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

1. The laterally adjustable bed plate G arranged on table A and combined with the blank holder *g*, and its accessories; and in combination therewith the second adjustable plate G' arranged on bed plate G and pivoted at one end *f* substantially as set forth for the purpose of adjusting the blank holders during the operation of the knives in cutting the corks.

2. In combination with the horizontal reciprocating knife frame B, the inclined plate *p*, pivoted arm *n*, shaft *m*, arm *l*; and the grooved collar *l'*, an arbor *g* with the pivoted arm 1, horizontal bar 5, on frame A' spring 6, and the bar 7 on knife frame B,—all arranged and operating in harmony, substantially as herein described and represented.

10 3. Securing the horizontal knives D, D', to the knife frame B substantially in the manner herein set forth, so that these knives may be adjusted vertically and at the same

time, so that they may be pitched to any desirable angle with a vertical line.

15 4. The extension arms 20, and 21, adjustable stem or post 17, tube 23, and blank carrier arm 24, adjustable pivoted arm 30, pulley wheel *v*, with its weight and cord 27, 25;—in combination with a cam K, on knife 20 frame B, all arranged and operating as and for the purposes herein set forth.

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