A. ROBERT.
Machine for Cutting Corks.

No. 211,184. **Patented Jan. 7, 1879.**

Fig. 1.

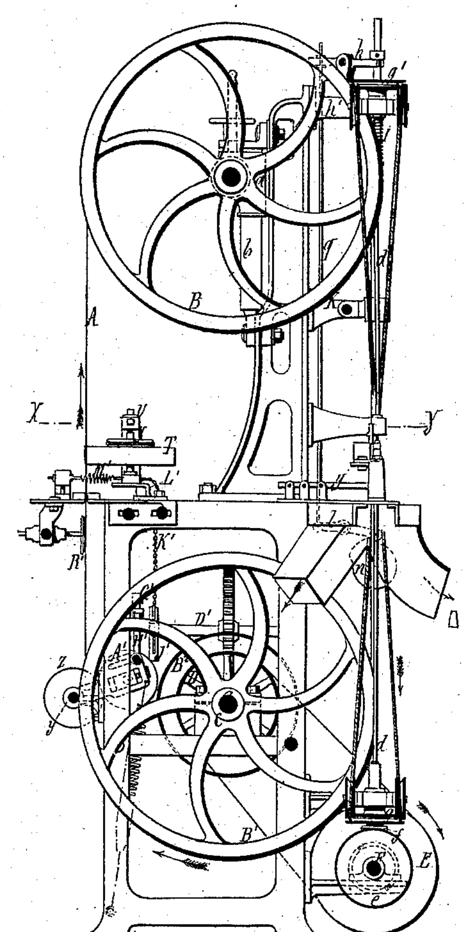

Fig. 2.

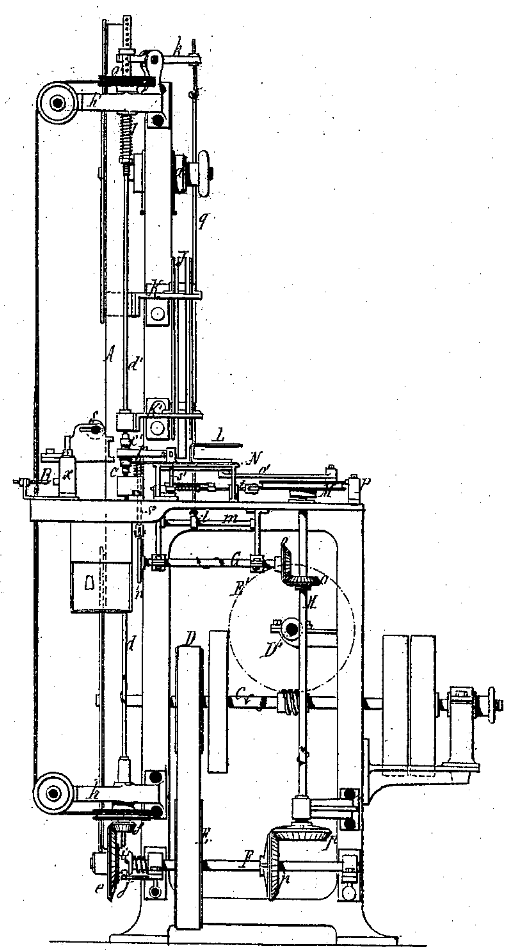

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Fig. 4

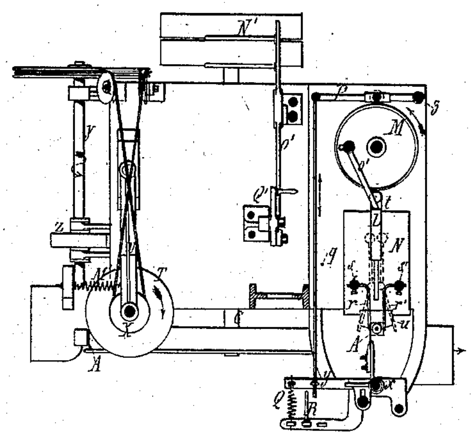

Fig. 3.

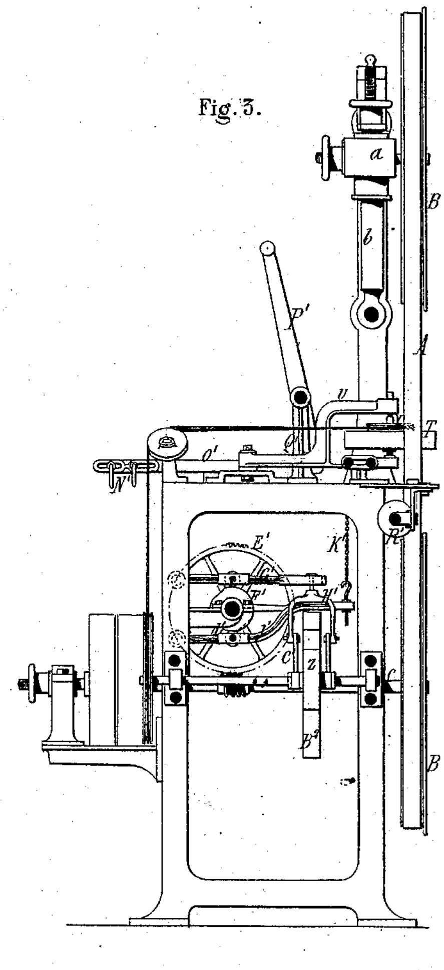

Fig. 5.

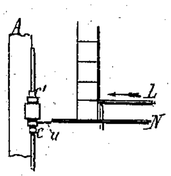

Fig. 6.

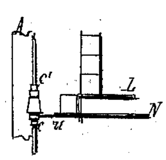

Fig. 8.

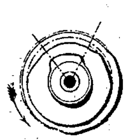

Fig. 7.

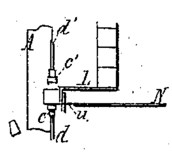

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Fig. 9

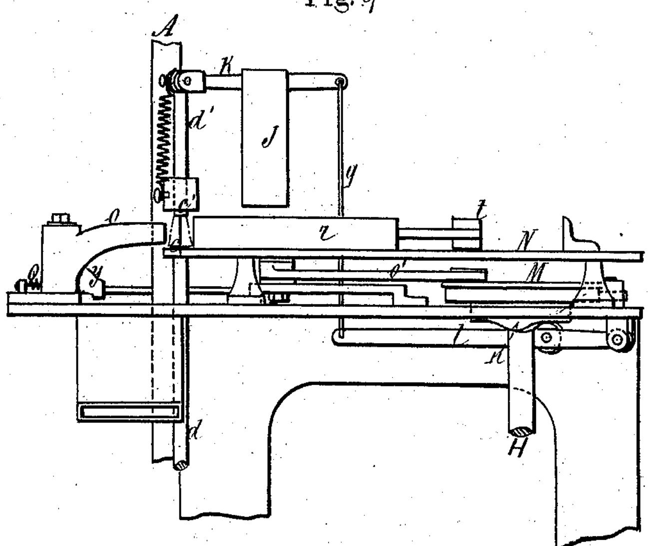

Fig. 10

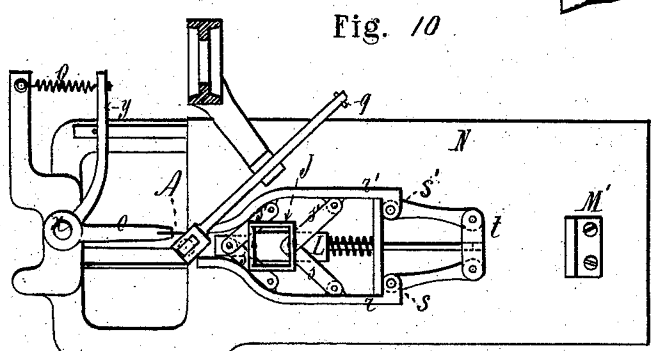

Fig. 11

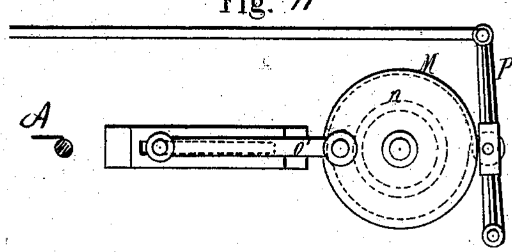

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Fig. 12

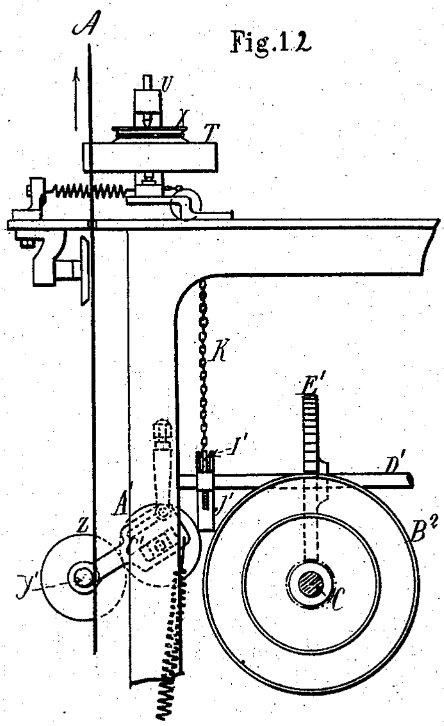


Fig. 13

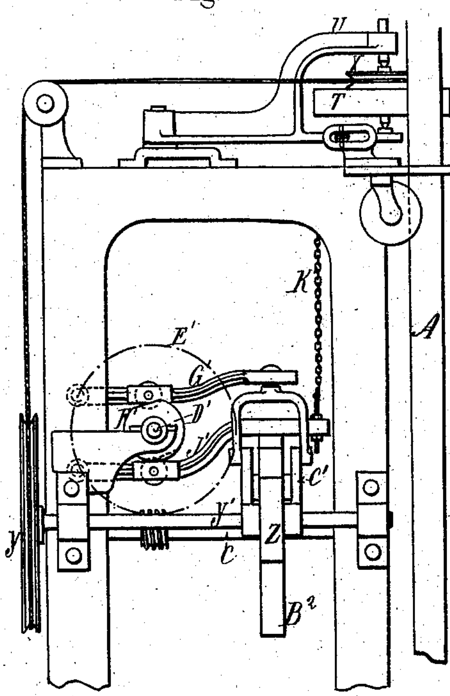
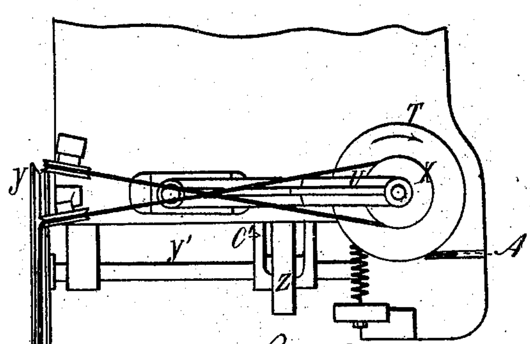


Fig. 14



Witnesses.

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UNITED STATES PATENT OFFICE.

ARTHUR ROBERT, OF PARIS, FRANCE.

IMPROVEMENT IN MACHINES FOR CUTTING CORKS.

Specification forming part of Letters Patent No. **211,184**, dated January 7, 1879; application filed August 30, 1877.

To all whom it may concern:

Be it known that I, ARTHUR ROBERT, of the firm "Société Civile pour la Fabrication Mécanique des Bouchons de Liège," Rue du Delta No. 13, Paris, France, engineer, have invented an Improved Machine for Cutting Corks, of which the following is a specification:

The machine for cutting corks which forms the subject of the present invention is characterized by the following points: The displacement of the piece of cork cut into cubes is effected automatically. The cork is conducted between two jaws or holders, fixed on a revolving spindle, and is cut by a blade, which may be either continuous, like an endless band-saw, or have a reciprocating motion.

The relative position of the cutting-blade with reference to the piece of cork varies in proportion as the latter is cut. This variation is automatic. It is produced by the movement of the machine itself.

The sharpening of the endless blade is effected automatically by means of a small grindstone, which is brought against the blade at a suitable time.

My improved machine is represented in several views in the annexed drawings.

Figures 1 and 2 show the arrangement of the cutting-blade, and also the arrangement and action of the different parts serving for cutting corks. Fig. 3 is an elevation showing the mechanism for automatically sharpening the blade. Fig. 4 is a horizontal section through the line X Y of Fig. 1. Figs. 5, 6, and 7 are views showing the different stages in the manufacture of a cork, and will be explained when speaking of the action of the machine; Figs. 9, 10, 11, 12, 13, and 14, detached views enlarged, the better to illustrate the invention.

In the machine which I have shown the cutter is an endless blade, A, say one-twenty-fourth of an inch thick, which may be considered an endless band-saw deprived of its teeth. This blade is mounted on two grooved pulleys, B B′, which impart a continuous movement to it. The lower pulley, B′, is fixed on the driving-shaft C, which is driven by belting or otherwise. In order to increase the adhesion of the blade I place a band of india-rubber between it and the pulley. To regulate the tension of the blade I arrange the pulley B on a sliding support, *a*, capable of sliding on a column, *b*, fixed to the frame of the machine. The tension is produced as required by a screw operated by a small hand-wheel taking its point of support on the column *b*.

The tool carrying the piece of cork to be cut is composed of two striated jaws, *c c′*, mounted respectively on vertical spindles *d d′*. The piece of cork is held tightly between these jaws, as seen in Figs. 5 and 9. The two spindles *d d′* are rotated by the intermediation of two pulleys, D and E, connected together by a belt, one of which is mounted on the driving-shaft, and the other on an intermediate shaft, F. This shaft carries a bevel-wheel, *e*, with sliding clutch, gearing with a small pinion, *f*, fixed on the spindle *d*. This motion is transmitted to the upper spindle, *d′*, by leather bands or cords passing over grooved pulleys *g g′*. To preserve the direction of the motion these bands are crossed and guided by four grooved rollers held by supports *h h′*.

The sliding clutch above referred to serves to momentarily stop the rotation of the spindles *d d′*, because directly the cork is finished these spindles remain motionless, so as to give the parts time to feed another square or piece of cork between the jaws. A few words will make the action of this clutch clear. It is composed of a socket, *i*, fixed on the shaft F by means of a key, so that it can slide longitudinally on the latter. This socket carries a small cam, which meets at the proper time a small roller, *j*, fixed by an arm to one of the supports of the shaft F. A coiled spring tends constantly to push the socket *i* against the wheel *e*, which is loose on its shaft. It will be understood that the cam meeting the roller *j* compels the socket *i* to quit the wheel *e*, and consequently the latter stops at once.

When the cork is finished it is obvious that the two spindles *d d′* should separate to allow it to fall. For this purpose, while the lower spindle, *d*, remains fixed, the upper spindle, *d′*, receives a vertical movement, as hereinafter described.

On the support *h′* is fixed an oscillating lever, *k*, which embraces at one end the spindle *d′*, which has a square part at its upper end, so as to rise vertically. The other end of the lever k carries a wire rod, q, connected to a lever, l, which gives it motion. This lever is fixed on a shaft, m, receiving a to-and-fro motion from a cam, n, fixed on an intermediate shaft, G. This latter is driven by bevel-wheels, one of which is fixed on a vertical shaft, H, which itself gets motion from the shaft F by means of bevel-wheels p.

The oscillation of the lever l gives a pull to the rod q, and consequently raises the spindle d'. This latter is always brought back to its normal position by the coiled spring I. The square part of the spindle d' is formed with several holes to allow of regulating the lever k.

It will be seen by Figs. 2 and 11 that the edge of the blade is placed so as to be able to cut the material tangentially.

Figs. 2 and 9 show a funnel, J, by which the pieces of cork are introduced. It forms a box, and is composed of four iron bars fixed by angle-pieces to supports K K', one of which, K, serves as a guide to the blade, and the other, K', as a support to the spindle d'.

The pusher L (see Figs. 2, 4, 5, 6, and 10) makes the pieces of cork advance between the jaws c c'. It is actuated by a crank, o', connected at one end to a plate, M, fixed on the shaft H. The other end of the crank o' is jointed to a slide formed in a piece with the pusher L. (See Fig. 11.) This slide works between the sides of a table, N. The plate M has a sliding piece to allow of regulating the length of travel of the pusher.

The mechanism for guiding the cork between the jaws c c' is composed of two arms, r r', bent at a right angle, and oscillating, respectively, on axes s s'. These latter are connected (see Fig. 4) by a double joint to a rigid bar, t, sliding horizontally in the pedestals which serve as the supports for the table N.

The bar t carries at its end a roller, which bear against one of the side faces of the plate M. This has a projecting part, as seen in Fig. 4. A coiled spring makes the roller of the bar t always bear against the plate. The result is, that when the projecting part comes against the roller the bar t recedes and causes a slight oscillation to be given to the axes s s', and consequently the arms r r' occupy the position shown in dotted lines. Directly the projecting part frees the roller, the spring, having been compressed, forces the bar t back to its original position.

In Fig. 4 the two arms r r' are shown in their first position—that is to say, holding and guiding the piece of cork.

The action of the plate M directly upon the bar t may be dispensed with, and be as shown in Fig. 10, when the two arms r r' are hinged, as at s s', same as before; but the said arms are connected to the pusher L by toggle-joints, the same coiled spring tending to close the arms; but when the pusher L is moved backward the first effect is to open the arms and hold them so until they are beneath the funnel J; then, as the pusher L again moves forward, the arms r r' will close upon the blank and hold it until it is delivered to the clamps c c'.

It should be remarked that the table N is at the level of the lower jaw, c. As this table would interfere with the making of the cork, I have a small movable table, u, which, during the operation, is slightly below the jaw c, so that the cork can turn freely.

Directly the cork is finished the small table rises to the level of the table N. The movement of the table u is produced by the cam n, which has already been mentioned. This cam acts on a rod, v, which lifts the table.

As soon as the cam n has acted, a coiled spring draws back the rod v to its original position. This movement is produced at the same time as the elevation of the spindle d', as both are worked by the same cam.

The cutting-blade should approach the center of the cork as the cutting proceeds, because, the pieces of cork being cut square, the blade should at first only remove the corners of the square, and then advance gradually. With this object I have arranged a support, O, capable of oscillating around the point or axis x, and carrying two jaws, which embrace the blade. The said axis x carries a lever, y, connected by a wire rod to a lever, P. This lever is jointed at z, and carries a roller which bears against one of the side faces of the plate M. At one part of this face is a slight eccentricity, which causes the lever P to move. By the impulse given to the latter the blade advances slightly toward the center of the cork. The travel of the blade is regulated by the threading of the wire rod. A coiled spring, Q, always pulls back the roller against the plate. In order to make thicker corks it is only necessary to suitably regulate the position of an abutment, R, which comes against the lever y. The two jaws which embrace the blade carry a guide-roller, S.

I will now explain the automatic sharpening of the cutting-blade. After a few minutes' work the blade requires grinding or setting; and in order not to be obliged to perform this operation by hand, I have devised special mechanism, which I proceed to explain. (Shown enlarged in Figs. 12, 13, and 14.)

A horizontal grindstone, T, is placed on a forked lever, U, which, jointed to the frame of the machine, has a horizontal movement. (See Figs. 1, 2, and 4.) The grindstone carries a grooved pulley, receiving rotary motion from the pulley X, fixed on an intermediate shaft, Y. As this stone should only rotate occasionally, I have designed the following mode of driving it: The shaft Y carries a pulley, Z, driven by friction by the pulley A', covered with leather, this being, in its turn, driven by the pulley B' on the driving-shaft C. In the position shown in Figs. 1 and 12 the pulley A' does not turn, as it is not in contact with the pulley on the driving-shaft. In order to move up or to separate the pulley A', the shaft Y carries a forked support, C', which embraces the pulley A', the contact of which with the pulley Z is regulated by means of a screw. The transverse shaft D′ carries a wheel, E′, driven by an endless screw on the driving-shaft. This shaft also carries two cams, placed inversely. The first, F′, moves a lever, G′, by acting on a roller fixed on this lever. One of its ends is jointed to the frame, and the other carries a fork, H′, which takes hold of the support C′. A coiled spring always tends to draw the pulley A′ against the pulley B′.

It will be easily understood that when the flat part of the cam F′ comes opposite the roller, the lever, being disengaged, will be drawn by the coiled spring, and, consequently, the pulley A′ will be in contact with the pulley B′. The second cam, I′, produces the forward or backward movement of the stone. A lever, J′, also jointed at one of its ends to the frame, carries a roller which runs on the cam I′. The other end is connected to a chain, which, after passing over a roller, L′, above, (see Fig. 1,) is fixed to a forked lever, U.

It will be understood that when the flat part of the cam I′ comes against the roller, the lever J′, being disengaged, is submitted to the influence of the coiled spring M′, which constantly draws the lever U toward the blade. When the roller runs against the round part of the cam the stone is forced away.

Thus, when the wheel E′ has made one revolution the two cams will act on the stone. The time for sharpening can be regulated by employing a larger or smaller wheel. A small stone, R′, turning only by contact, removes from the blade any unevenness which the large stone produces. It is always kept in contact by a small coiled spring.

The putting of the machine into gear is effected by means of a fork, N′. (Represented in Figs. 3 and 4.) This fork is mounted on a transverse bar, O′, jointed at one end to a lever, P′, which itself oscillates on the support Q′. This lever is provided with a handle.

The cork is cut into cubical pieces, the side of which is equal to the length of the corks to be made. These pieces are introduced by the attendant into the funnel. The pusher L drives before it the first piece, which is guided by the two arms *r r′*, and proceeds to the position seen in Fig. 5. The upper jaw, *c′*, descends, and the spindles *d d′* begin to rotate, together with the piece of cork. Owing to the automatic displacement of the cutting-blade, as hereinbefore explained, the piece of cork is rounded and a finished cork is produced, as shown in Fig. 6. In these two figures it will be seen that the small table, *u*, has always been below the table N. The cork being thus finished, the jaw *c′* is raised, as well as the movable table, *u*. The pusher L advances with another piece of cork, which causes the finished cork to fall, and the operation recommences. The finished cork falls through the pipe S′, and the waste through T′. The speed of the machine is about sixty revolutions a minute.

Fig. 8 shows, superposed one upon the other, the cam *n*, which gives the up-and-down movement to the table *u*, and the plate M, with the projecting parts which give motion to the pusher and cause the automatic displacement of the blade.

I do not broadly claim a mechanism for automatically presenting blanks and cutting corks, as such, I am aware, is not new.

I claim—

1. The combination, substantially as described, of the endless blade A, revolving clamps *c c′*, funnel J, and pusher L.

2. The combination, substantially as described, of the endless blade A, revolving clamps *c c′*, guide K for the blade, funnel J, pusher L, and arms *r r′*.

3. The combination, substantially as described, of the endless blade A, revolving clamps *c c′*, and guide K for the blade, and oscillating support O, with jaws to embrace the blade.

4. The combination, substantially as described, of the endless blade A, revolving clamps *c c′*, and guide K for the blade, and horizontal grindstone T, with mechanism, as described, to impart an intermittent rotary motion to said grindstone.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

ARTHUR ROBERT.

Witnesses:
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J. ARMENGAUD, Jeune.