July 3, 1951 C. S. OLSON 2,559,258

APPARATUS FOR CUTTING BODIES TO A POLYGONAL CONTOUR

Filed Feb. 19, 1947 3 Sheets-Sheet 1

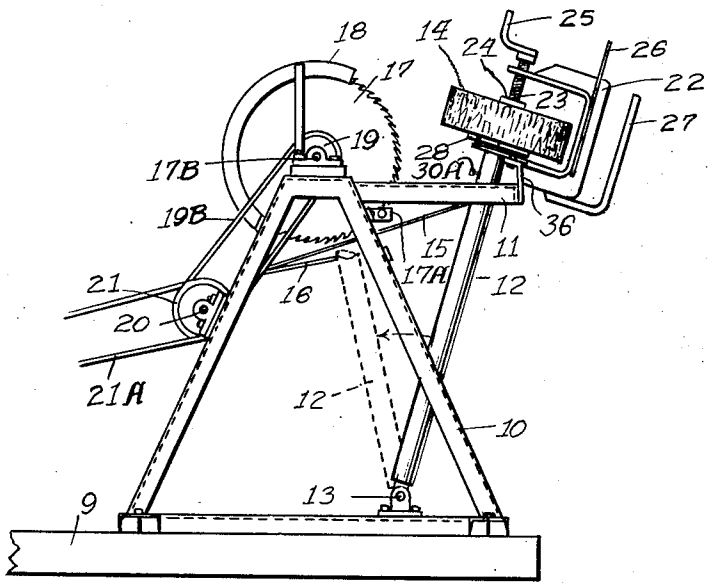


Fig. 1.

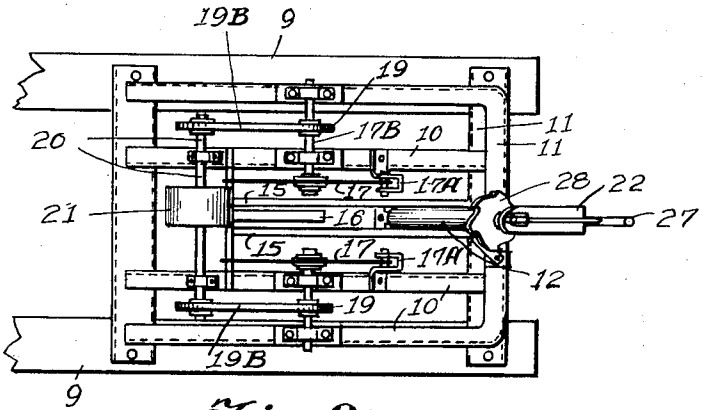


Fig. 2.

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Fig. 3.

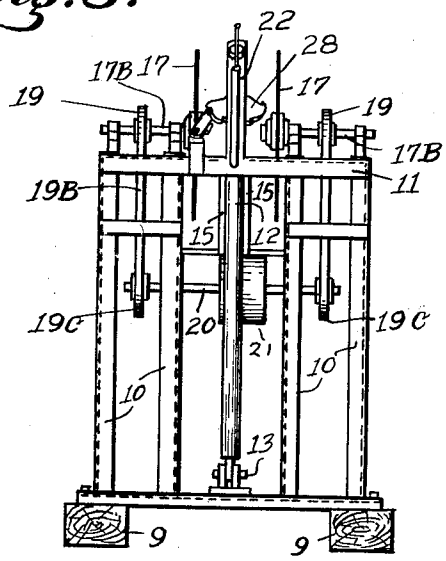
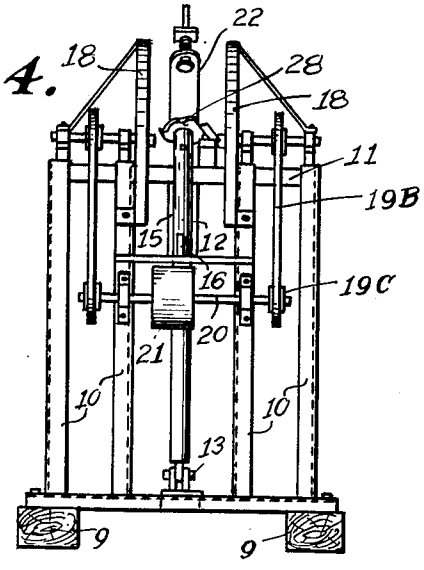


Fig. 4.



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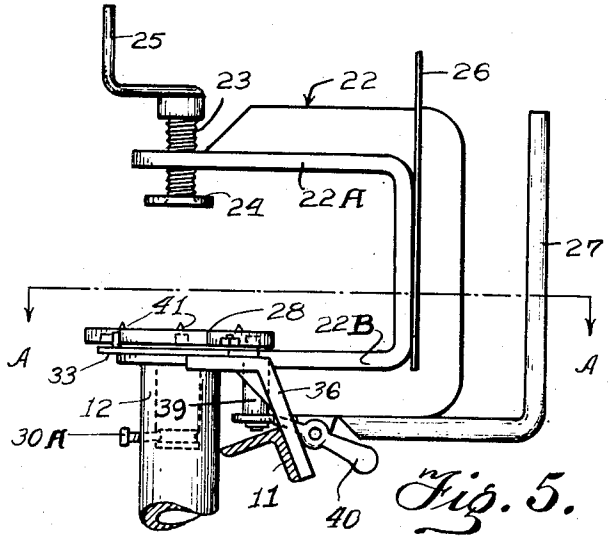


Fig. 5.

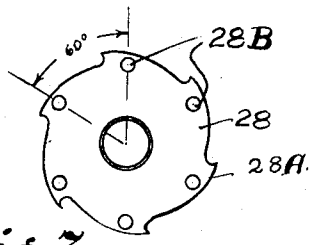


Fig. 7.

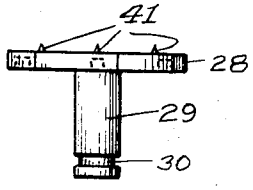


Fig. 8.

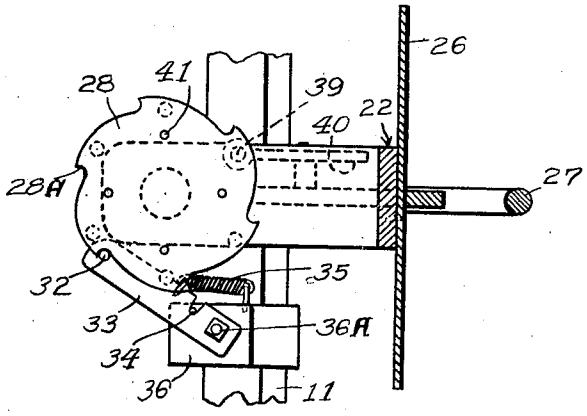


Fig. 6.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR CUTTING BODIES TO A POLYGONAL CONTOUR

Charles S. Olson, Gulfport, Miss.

Application February 19, 1947, Serial No. 729,614

3 Claims. (Cl. 143—58)

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This invention relates to a machine for cutting blocks of wood, mainly, but also blocks of other material that is suitable for building material. The machine can be constructed for any such blocks of polygonal shape but is principally intended for cutting hexagonal blocks, as used for erecting walls, roofing and flooring as described in my pending application, Serial No. 704,887, filed October 26, 1946.

This machine is very efficient and is capable of turning out above five completely finished blocks per minute for roof and walls, and ten flooring blocks per minute, as the latter are generally only half as thick as the former.

The machine is preferably fitted with twin rip-saws which may be rotated in a vertical plane as shown, or horizontally, and as a consequence, two opposite sides of a hexagonal block are cut at the same time. Upon withdrawing the block to starting position after such cutting, it is turned 60° by a rotating disk on which it is clamped down, and then fed forward again between the twin saws for cutting two more sides. The same operation is then repeated a third time to finish the block. Instead of using circular saws, it is conceivable that ordinary straight blade saws as for timber cutting may be used.

In other words, the rough block is forced three times between the twin saws before being completed.

One embodiment of the invention is shown in the accompanying drawings, wherein like numerals denote the same details in the different views.

Figure 1 is a side elevation of the machine with a wood block placed in position ready for operation;

Figure 2 is a top plan view of Figure 1;

Figure 3 is a front elevation of the machine as seen from the right side of Figure 1;

Figure 4 is a similar view in rear elevation as seen from the left side of Figure 1;

Figure 5 is a fractional side elevation in larger scale of the clamping device for holding the block during operation;

Figure 6 is a sectional plan view taken along line A—A of Figure 5;

Figure 7 shows a bottom plan view of the feeding disk or ratchet; and

Figure 8 is a side view of Figure 7.

In the drawings, the stand or support for this machine is denoted in general with numeral 10, the top of which consists of a horizontal U-shaped frame 11 preferably made of angle iron. At the base of the stand is provided a bearing 13 on which the lower end of a rocking arm 12 is pivoted for oscillation back and forth in the frame and on the upper end of the arm is placed the work piece or wooden block 14. During its rocking, the arm 12 is guided between two parallel guide rods 15 rigidly secured in said frame 11.

The arm 12 is limited in its rocking motion

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towards the twin saws 17 by means of a stop member 16 reaching out to abut against the arm 12 and being secured at the rear end of the stand 10. Runners 9 may be provided under the stand to facilitate transportation.

The two circular saws 17 are mounted in spaced, parallel relation at the inner ends of two aligned, short shafts 17B, running in suitable bearings fastened on top of the frame 11. Each of said shafts carries a pulley 19 revolved by a belt 19B from a pulley 19C on the drive shaft 20 which is actuated from a source of power through the main belt 21A and pulley 21. The shaft 20 runs in bearings on the stand 10.

Guide brackets 17A are provided for the circular saws to take care of vibrations and safety guard 18 around half of the circumference thereof, as seen in Figures 1 and 4.

In Figures 5 to 8 is shown the device for securing the work piece 14 in position during operation. This consists of a U-shaped clamp piece 22 rigidly secured with its lower jaw 22B on top of the tubular rocking arm 12. The upper jaw 22A is spaced far enough above the lower jaw 22B to accommodate any thickness of wood blocks or work piece 14, and in the end of the jaw 22A is threaded the clamp screw 23, with a head 24 revolving thereon and a fixed crank handle 25 by means of which the work piece is clamped in position. A handle 27 is secured on the lower arm or jaw 22B of the clamp piece 22 by means of which the operator, facing the work piece and saw blades 17, is able to rock the same with the arm 12, and between him and the work piece 14 is provided a shield 26 on the clamp piece 22.

On top of the rocking arm 12 is welded the lower jaw 22B of the clamp 22 and the work carrying ratchet plate 28 is mounted to revolve in the arm 12. The plate 28 has a shank 29 with a circumferential groove 30 in which engages a lock screw 30A carried radially in the arm 12 to hold the plate down in said arm. The plate 28 is shown with six ratchet teeth 28A and has adjacent to each tooth, a shallow socket 28B for a spring actuated plunger 39 which is carried on the end of a balanced rocking lever 40 beneath the lower jaw 22B and tending to force the plunger 39 upwardly in engagement with one of the sockets 28B which are all located 60° apart on the same circle, in order to lock the disk firmly during the shaping or cutting operation. This plunger 39 is timed to release its hold on the plate 28 only when the operator draws the disk towards him by pulling on the handle 27. The tail end of the plunger lever 40 then passes over the inclined top flange of the frame 11. In this manner the lever is tilted causing the withdrawal of the plunger 39 out of the socket 28B, thereby releasing the plate 28.

On the angular bar 11 is secured a bracket 36

which carries an oscillating pawl 33, pivoted thereon at 36A, and having at its free end a stud 32 in position for engagement with any one of the ratchet teeth 28A. The pawl 33 is swung inwardly towards the plate 28 by a tension spring 35 having one end fastened on the bracket 36, see Figure 6. To limit the inward swing of the finger 33, the bracket 36 is provided with an abutment member or stop 34, which is so located that the spring 35 can swing the finger inwardly to locate the ratchet stud 32 correctly for engagement with a tooth 28A.

The ratchet plate 28 is provided with a number of sharp pointed gripping elements or spikes 41, four being shown in Figures 5, 6, and 8, which are intended to pierce into the bottom surface of the blank or work piece 14. This will keep the blank from turning on the plate 28 when clamped down by tightening the screw 23. This will, however, not prevent the turning of the blank and plate together, when the machine is re-set preparatory for a second or third cut.

Needed guards or shields for protecting the operator, are, of course, provided, but as they do not form any part of the present invention they have mostly been omitted in the drawings.

It is believed that the above description gives a clear understanding of the operation. However, in addition, the following may be stated: The arm 12 carrying the rough blank or wooden block 14 clamped down against the ratchet plate, in the position as seen in Figure 1, is tilted towards the operator, who is standing on the right side in said figure. He grips the handle 27 and swings the arm with the blank 14 against the revolving saw blades 17, which are spaced to the exact width of the hexagon which has to be given the finished block.

As soon as the cut has been made, he swings the arm and block back into the position seen in Figure 1. In doing so, the heavy end of the lever 40 drags over the inclined surface of the iron bar 11. This action then pulls the plunger 39 out of the socket 28B, thus releasing the ratchet device, when the stud 32 contacts with the oncoming tooth 28A, thereby causing the plate to turn into the next setting position of the block 14. Since the lever in the meantime has passed over the angle bar 11 the plunger 39 will again enter the appropriate socket 28B thus locking the plate with the block 14.

The first operation is then repeated, so that by three settings and cuttings, a hexagonal block will be completely finished.

By using different numbers of ratchet teeth and sockets for the disk 28, the angle of turning of the latter can be modified so as to suit polygons having other numbers of flat surfaces.

It is to be understood that the invention as herein disclosed may be varied from the details described and shown without departure from the spirit of the subjoined claims.

I claim:

1. A machine for cutting the faces of a body of polygonal outline, comprising a cutting element, an arm supported for rocking movement in a vertical plane toward and away from the cutting element, the upper end of the arm being in the form of a socket, a plate having a central pivot shank rotatably engaged in said arm socket, means for clamping onto the top of the plate a body to be cut by the cutting element, a plurality of ratchet teeth around the periphery of said plate, a fixed element toward which the arm moves in its movement away from the cutting element, a pivoted pawl carried by said fixed element for engagement with a ratchet tooth upon movement of the arm toward the fixed element to effect the turning of the plate, a latching means for the plate, and means for effecting the release of the latching means from the plate in advance of the operation of the pawl in turning the plate.

2. A machine for cutting the flat sides of polygonal blocks, comprising a stand, an arm pivoted in the stand for providing rocking, feeding and retracting action, a pair of parallel spaced saw blades operable in said stand, a disk plate for carrying said block on top of said arm, the disk plate being supported for turning movement, means for automatically turning the disk plate upon movement of the arm away from the saws, the saw blades functioning upon the swinging of the arm toward the saws to simultaneously cut two opposite sides of a block supported upon the plate, said blades operating in planes parallel to that of said rocking arm and said means consisting of a plunger adapted to engage a socket in the disk plate while the blades are cutting a block thereon and to disengage from the disk plate during the retracting action of the arm from the saws, and a ratchet device inserted between the edge of said disk plate and said frame, adapted to turn and reset said plate during the retracting action, the disk plate having a toothed edge for engagement by the ratchet device.

3. A machine for cutting the flat sides of polygonal blocks, comprising a stand, an arm pivoted in the stand for feeding and retracting action, a pair of parallel spaced circular saw blades, means for revolving said blades in the direction of feeding motion of said arm, a block supporting plate rotatably supported on the arm, means for automatically imparting a step by step turning movement to the plate with the feeding and retracting movements of the arm, said blades functioning upon feeding movement of the arm to simultaneously cut two opposite sides of the block carried on the plate, said means consisting of a plunger adapted to engage a socket in said plate during the feeding action and disengage therefrom during the retracting action, said plate having a toothed edge, and a ratchet device inserted between the toothed edge of the plate and said frame adapted to turn and reset said plate during the retracting action.

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