

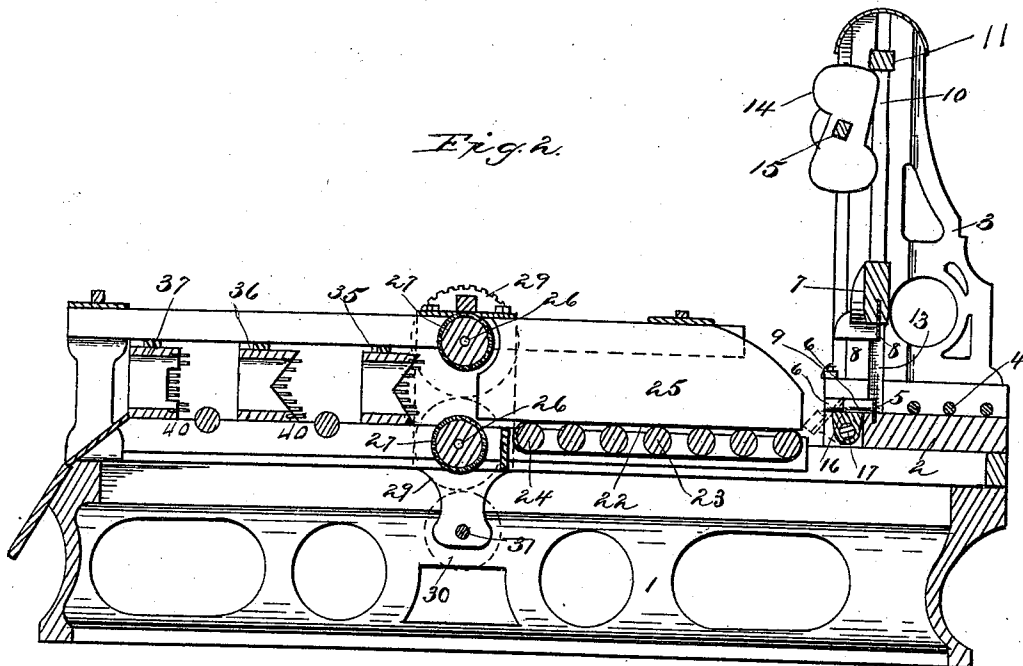
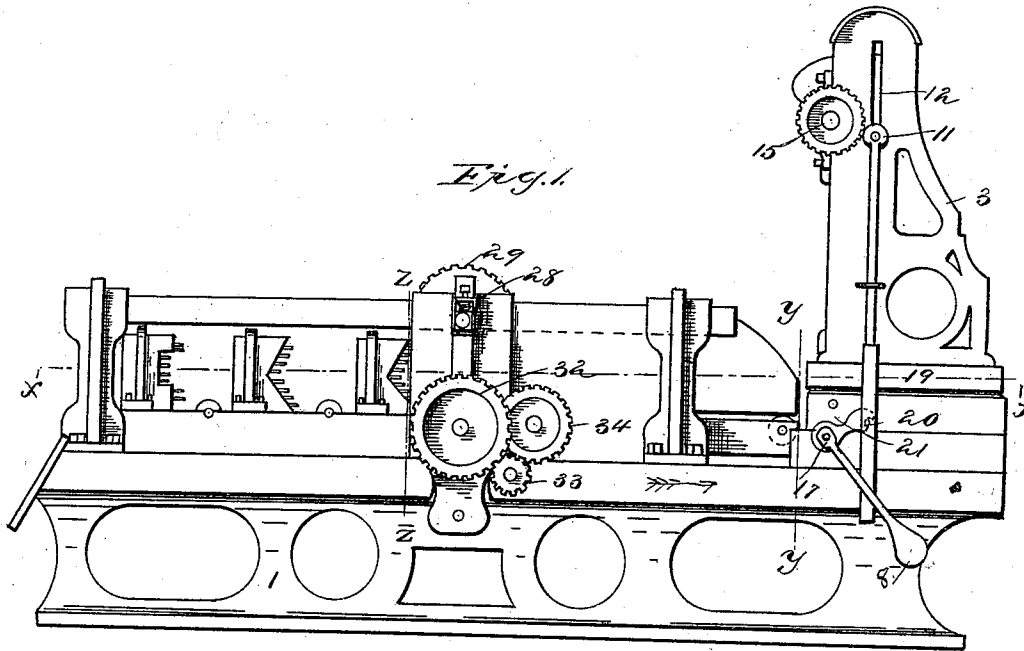
(No Model.)

2 Sheets—Sheet 1.

O. THOMAS.
STONE CUTTING MACHINE.

No. 499,152.

Patented June 6, 1893.



Witnesses;

J. J. Bates

Thomas Durant

Owen Thomas,
Inventor,
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his Att'y's

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3

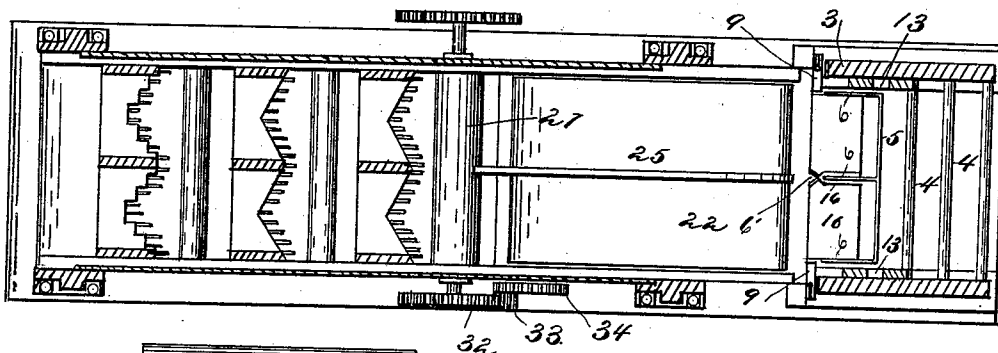


Fig. 4

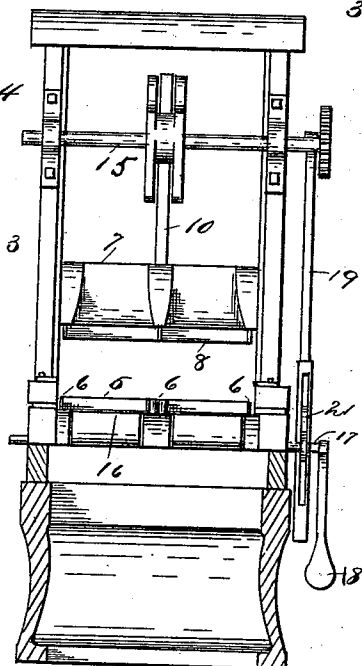


Fig. 6

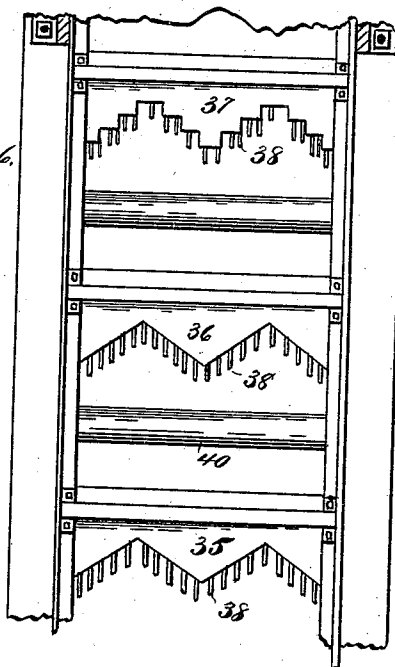


Fig. 5

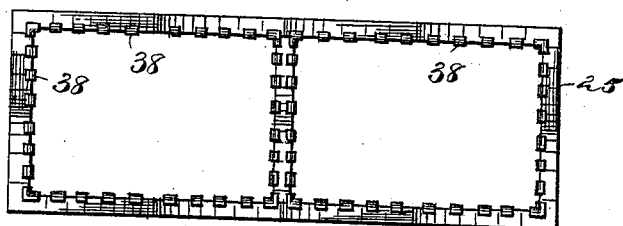


Fig. 7



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UNITED STATES PATENT OFFICE.

OWEN THOMAS, OF ROCHESTER, NEW YORK.

STONE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 499,152, dated June 6, 1893.

Application filed February 14, 1893. Serial No. 482,310. (No model.)

To all whom it may concern:

Be it known that I, OWEN THOMAS, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Stone-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference numerals marked thereon.

My present invention has for its object to provide a machine particularly adapted for cutting sandstone, or other comparatively soft stone, into suitable sizes, as that of bricks, adapted for building purposes, from large slabs or pieces of stone, and finishing such building blocks; though the machine as a whole and the various parts thereof are adapted for other uses, as will be understood, and to these and other ends it consists in certain improvements in construction and combinations of parts, all as will be hereinafter fully described and the novel features pointed out particularly in the claims at the end of this specification.

In the drawings: Figure 1 is a side elevation of a machine constructed in accordance with my invention; Fig. 2, a longitudinal sectional view of the same; Fig. 3, a horizontal section on the line $x-x$ of Fig. 1; Fig. 4, a cross section on the line $y-y$ of Fig. 1 looking in the direction of the arrow; Fig. 5, a cross-sectional view on the line $z-z$ of Fig. 1 looking toward the rear of the machine; Fig. 6, a plan view of the rear portion of the machine. Fig. 7 is a detail sectional view of one of the finishing tools.

Similar reference numerals in the several figures indicate similar parts.

In the present form of my machine, I have arranged upon a single main frame a mechanism for separating a slab or mass of stone that is reasonably soft, into pieces approximating the size and shape required, and also a mechanism for finishing and cutting said pieces, so that they are adapted for immediate use, and while I prefer this construction, it is obvious that the breaking or cutting devices could be located on a separate frame or support and the broken stone conveyed to

the finishing device by other means than those herein shown.

I will first describe the construction of the rough breaking devices, which are, in the present instance, mounted in a frame secured to one end of the main frame 1 and embodying a base or platform 2 and uprights or side-pieces 3, the latter connected at their upper ends by suitable cross bars, as shown, or otherwise.

Arranged on the table 2, and preferably constituting a slab support, are suitable rollers 4, and at the rear of these rollers and about on a level with the surface thereof is a cutting die composed in the present instance, of a steel bar or plate 5 having a beveled or cutting edge extended across the bed parallel with the rollers, and three corresponding short cutting bars 6 extending parallel with the base, with their free ends in close proximity to, or engaging the transverse bar 5; these bars 5 and 6 forming three sides of a rectangular or other shaped die in which it is desired to cut the stone, two blocks being formed at each operation in the present embodiment of my invention. Arranged above the die thus formed is a heavy plunger or slide 7 having on its lower side plates or cutting tools 8 corresponding to and arranged directly over the cutting tools 5 and 6 and adapted to co-operate with them to sever the slab on the lines of the cutters when the slide is dropped. Instead of employing continuous tools on both the plunger and bed, it is obvious that separate tools arranged a short distance apart would accomplish the result desired, and also that if the tools were arranged only on the bed, or on the plunger, some varieties of stone could be readily cut. This slide is provided with a centrally arranged upright 10 to the upper end of which is connected a cross ball 11 guided in suitable slots 12 in the side pieces 3 and the plunger itself is guided in suitable bearings 13 secured to, or formed in the side pieces 3, and is raised and dropped by suitable means, serving to crack or roughly sever a slab of stone resting on the cutters 5 and 6 (and those contained in the slide) on the lines of said cutters. In the present instance, I prefer to raise and drop the slide by means of

a double cam 14 fixed to a rotary shaft 15 and adapted to engage the under side of the cross bar 11. The heavy blow delivered on the stone by the plunger will cause its severance on the lines of the tools and the pieces cut out will drop within the space formed by the plates 5 and 6, and as both the upper and lower surfaces of the slab are smooth before its application to the machine, it is only necessary to finish the rough edges of the blocks. Inside the cutters 5 and 6 are provided plates or supports 16 adapted to receive the cut blocks upon them, which plates are connected to a rock shaft 17 adapted to turn to the position indicated in dotted lines Fig. 2, and to tip the blocks upon their edges in such position that they can be readily operated upon by the finishing or smoothing devices hereinafter described. Secured to the plates or the shaft is a cutter 6' forming preferably a continuation of the central tool 6 which prevents the cut blocks sticking and insures their positive movement when the shaft 17 is rocked. Secured to the rock shaft 17 is a weighted arm 18 adapted to return and maintain the plates in substantially horizontal position after they have tipped off the cut blocks and as one means for causing the rocking of the shaft, I pivot upon one end of the cross bar 11 a pitman 19 having at its lower end a pin 20 adapted to engage a short arm 21 on the rock shaft 17 and tilt the latter to the position in dotted lines Fig. 2, when the plunger is raised; but just before the latter reaches its highest position the pin 20 will be disengaged from said arm and allow the weighted arm to return the shaft 17 to normal position with the plates 16 horizontal, the downward motion of the plunger causing the pin 20 to re-engage the arm 21 so that the rock shaft may be operated at the next upward movement of the plunger. Other suitable means for causing this operation could readily be employed, though it is not absolutely essential that the plates be positively tipped, as if the counterweight were lighter, the weight of the blocks alone could be relied upon to cause the tilting.

In order that the slabs of stone may be fed forward properly by the operator, I provide at the sides of the bed near the rear edges of the cutting tools 5 and 6, stops or gages 9, which, however, do not project over the tools, but engage the edges of the slab beyond the edges of the cutting tools and after the blocks are severed these portions fall down at the side as chips, so that when the cut blocks are moved away the slab can be again moved forward until the edges engage the stops.

In the present embodiment of my invention the cut blocks of stone are tilted by the plates 16 edgewise directly upon a suitable traveling belt 22 resting upon rollers 23 secured in the main frame 1, or in a suitable supplemental frame, if desired, said belt being driven by a roller 24 arranged in one end and oper-

ated by suitable driving mechanism such as shown, or any other devices for accomplishing the purpose, and inasmuch as the present breaking or cutting arrangement cuts two blocks at each operation of the plunger, I arrange a central partition 25 over the belt adapted to keep the two lines of blocks separate, though they are fed simultaneously to the finishing devices beyond. This is simply one form of apparatus for conveying the roughly cut stone to the finishing devices and any other equivalent means could be employed, if desired, or the blocks could be moved directly from the cutting devices to the devices for forcing the blocks through the dies.

It is obvious that instead of employing the particular means described for tilting the cut blocks on edge so that they may be forced through the trimming dies and the rough edges trimmed, an incline could be arranged in the space inclosed by the tools 5 and 6 that would serve to tilt the blocks as they moved down to the conveying devices, as do the plates 16, but I prefer the arrangement shown, as it prevents the blocks, which have rough edges, from sticking and insures their proper movement.

The devices for finishing and smoothing the blocks roughly cut by the means just described, consists generally of one or more series of cutting or smoothing tools, each series called, for convenience of description, a die, through which they are moved by suitable feeding devices, in the present arrangement, consisting of two large rollers 26 arranged in suitable standards on the main frame having an outer covering 27 of rubber, or similar material, which will be elastic, or soft enough to readily permit the passage of the rough blocks between them and yet maintain sufficient grasp thereon to properly move the ones between them and the preceding ones, through the dies. These rolls are preferably pressed together by means of springs 28 operating on the bearings of the upper roll and are driven by intermeshing gears 29, the lower one of which meshes with a gear 30 on a shaft 31 arranged in suitable bearings in the frame. The lower roller of the pair is also provided on one end with a gear 32 meshing with an idle pinion 33 by which motion is transmitted to the shaft of the roller 24 by a gear 34 on its end, as in Fig. 1.

Other suitable means may be provided for causing the simultaneous operation of these parts, if desired, and the feeding devices consisting of the rollers 26 and the traveling belt may be entirely separate, if desired.

Arranged in rear of the rollers 26 are the finishing dies or boxes 35, 36 and 37, each being preferably double, that is, having two apertures through it for the passage of the stone and the forward edges of each die being V-shaped, as shown, and in said forward edges are arranged cutting tools 38 each hav-

ing shanks 39 entering recesses in said boxes, while the cutting edges of the tools project just inside of the boxes and a trifle forward, being arranged, as shown, so that the tools at the corners will engage the edge of the stone first and serve to chip or cut them gradually, the resistance to the movement of the blocks not being at its maximum when they first encounter the tools. The tools 38 in the second die 36 are arranged to break joints, so to say, with those in the first die 35, that is, they will operate upon the portions of the blocks that pass between the tools in said first die and will serve to remove these and bring the blocks to a substantially uniform size. The last die 37 has the tools very close together, or it may have a practically continuous surface serving merely to smooth the edges of the block. It is desirable, however, that its forward edge be arranged in substantially the form of the other dies that it may cut or trim the blocks more readily. A substantially V-shaped arrangement of the tools in the die allows the blocks an even bearing on them and insures their straight movement through the die at the same time engaging said block gradually as described. From the die 37 the blocks are discharged at the rear of the machine in condition for immediate use.

I preferably arrange rollers 40 between the various finishing dies for supporting the blocks during their movement.

As before stated, the stone, or other material which it is proposed to operate upon by means of this machine is sufficiently soft so that it may be readily cut at first by a quick blow on certain lines by means of the cutting tools 5, 6 and 8 and may also be forced through the trimming dies by suitable pressure rolls operating on the series of blocks, as described, and it will be understood that other materials than this stone may be operated upon by this machine.

Though I have described a machine in which two blocks are to be cut simultaneously and two rows of blocks are to be fed through the machine, it is obvious that single blocks cut by other means than that contained herein, could be finished by this machine, and also that the cutting mechanism could be used separate from the finishing machine if desired, but I prefer the arrangement shown as it embodies a complete apparatus for forming building blocks from a slab of stone smoothed on two sides only, or as it comes from the sawing machine.

I claim as my invention—

1. In a machine for cutting stone or similar material, the combination with co-operating tools for cutting blocks from slabs, one or more finishing dies embodying cutting tools, and mechanism for forcing the blocks through the die or dies, substantially as described.

2. The combination with the vertically arranged cutting tools for cutting the blocks from slabs, and mechanism for turning the

blocks on edge, of one or more finishing dies containing cutting tools and mechanism for forcing the blocks through the dies, substantially as described.

3. The combination with the vertically arranged cutting tools for cutting blocks from slabs, the block-turning plates receiving the blocks, and the block conveyer, of one or more finishing dies, and devices, substantially as described, for forcing the blocks through the dies.

4. The combination with the stationary cutter, the movable plunger and the cutters thereon, of the block-turning device, the finishing dies, and mechanism for forcing the block through the finishing dies, substantially as described.

5. The combination with the stationary cutter, the vertically movable plunger co-operating therewith, of the conveyer arranged in a lower plane than the cutter, the finishing dies and mechanism for forcing the cut blocks through the dies, substantially as described.

6. The combination with the stationary cutter, the vertically movable plunger co-operating therewith to sever the slabs into blocks, the stop or gage with which the slab co-operates, of the tilting plates, one or more finishing dies, and mechanism, substantially as described, for forcing the cut blocks through the dies, substantially as described.

7. The combination with the block severing devices, the block-turning devices and two or more finishing dies, each embodying a series of cutting tools, of the spring pressed rollers for forcing the blocks through the dies, substantially as described.

8. The combination with the block severing devices, the block-turning devices, and two or more finishing dies, each embodying a series of cutting tools, of the rollers for forcing the blocks through the dies having the elastic or yielding surfaces, substantially as described.

9. In a machine for finishing cut stone blocks, the combination with two or more finishing dies embodying cutting tools, of the rollers for forcing the blocks through the dies having the elastic or yielding surfaces, substantially as described.

10. In a machine for finishing cut stone blocks, the combination with two or more finishing dies embodying cutting tools, the tools of each succeeding die being arranged out of line with those of the preceding one, of feeding devices for forcing the blocks through the dies, substantially as described.

11. In a machine for finishing cut stone blocks, the combination with two or more finishing dies embodying cutting tools, the tools of each succeeding die being arranged out of line with those of the preceding one, of feeding rolls having elastic or yielding surfaces for forcing the blocks through the dies, substantially as described.

12. In a machine for finishing cut stone blocks, the die or frame having cutting tools

therein, the edges of said tools being arranged at an angle to the direction of movement of the blocks, and means for feeding the blocks through the dies, substantially as described.

- 5 13. The combination with the frame having apertures in one edge, of the cutting tools having the shanks entering said apertures, the cutting edges of the tools being arranged

inside the aperture in the frame and at an angle to the plane of said aperture, substantially as described.

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Witnesses:

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FRED. F. CHURCH.