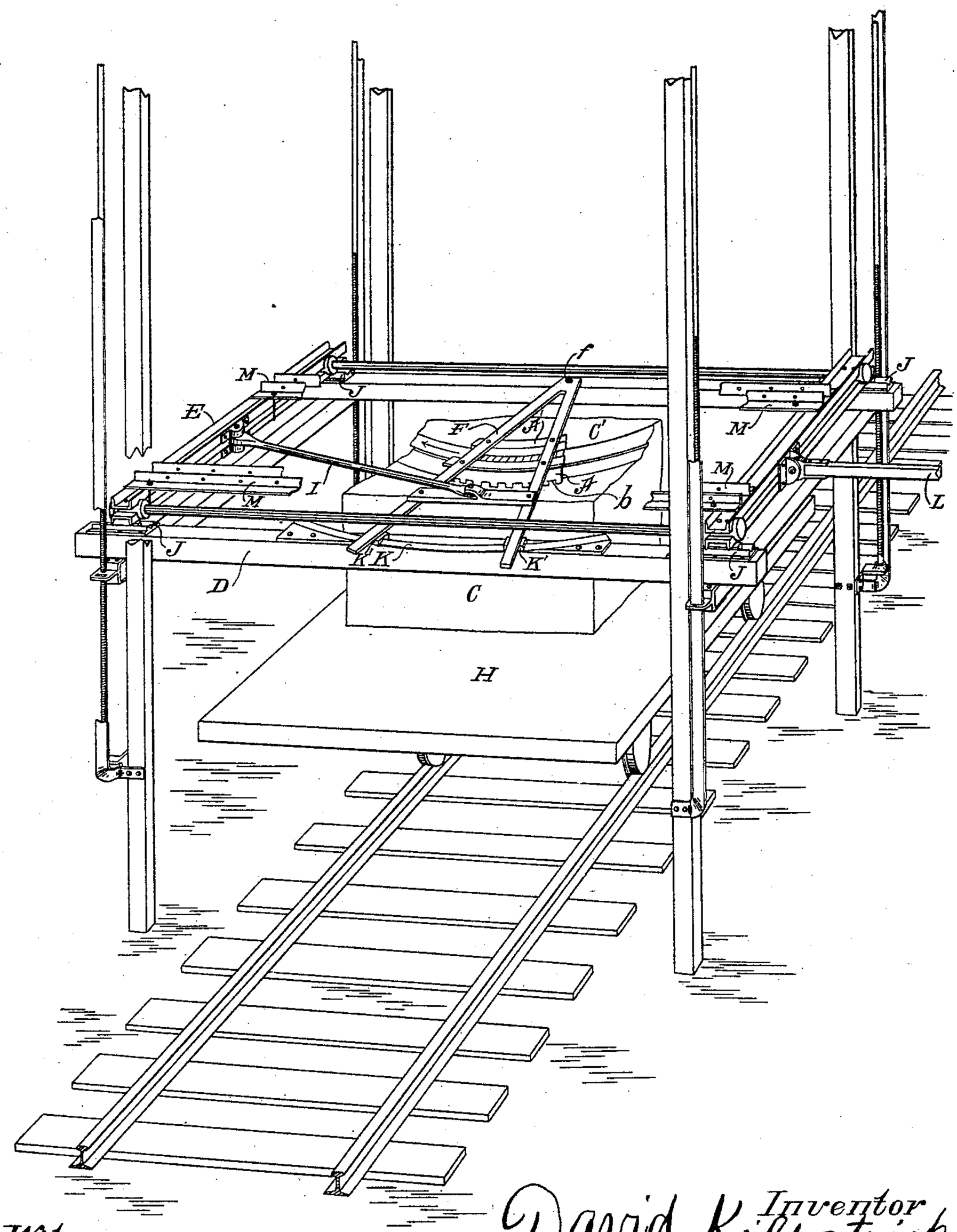
(No Model.) 2 Sheets—Sheet 1.

D. KILPATRICK.

STONE CUTTER.

No. 581,006. Patented Apr. 20, 1897.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

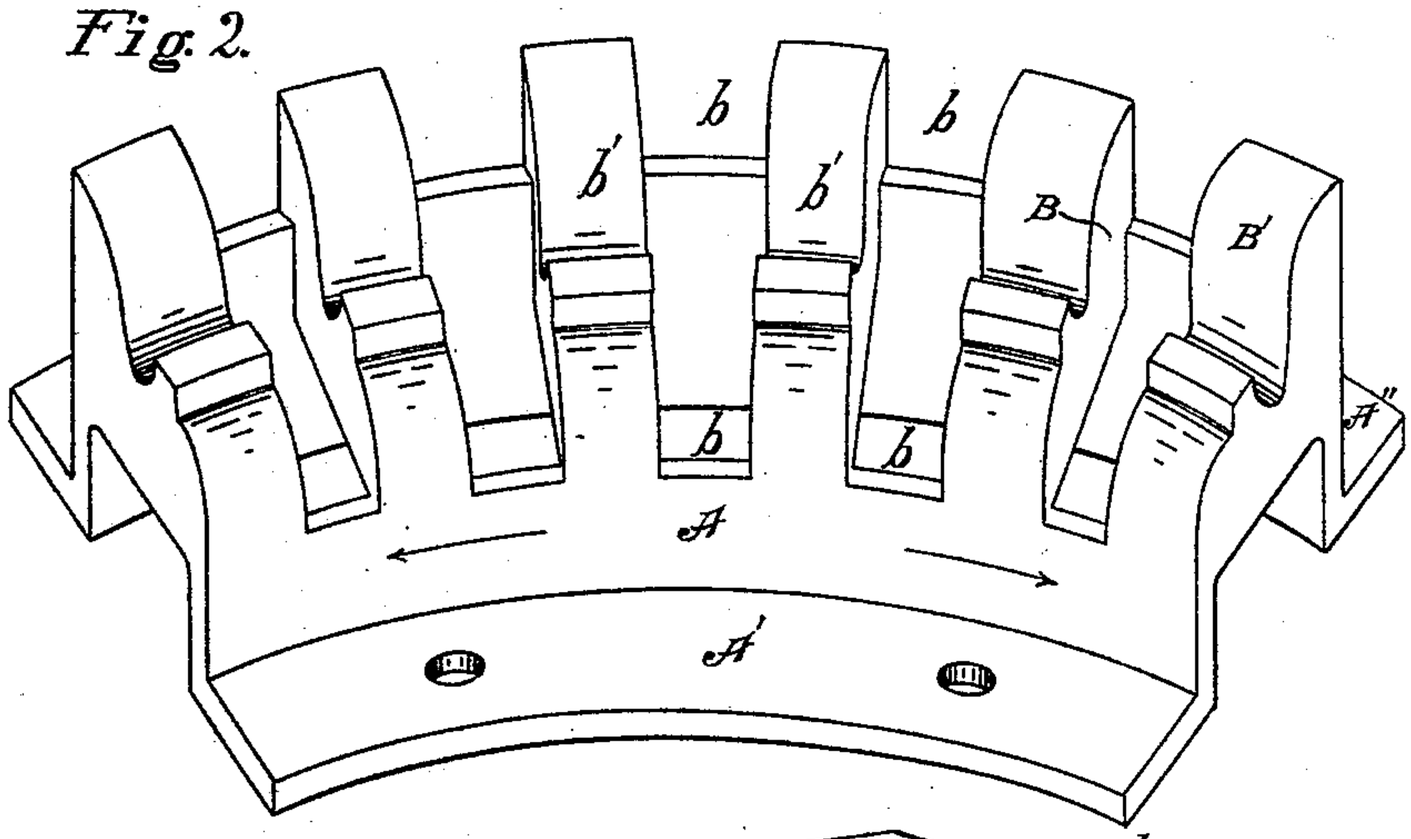


Fig. 3.

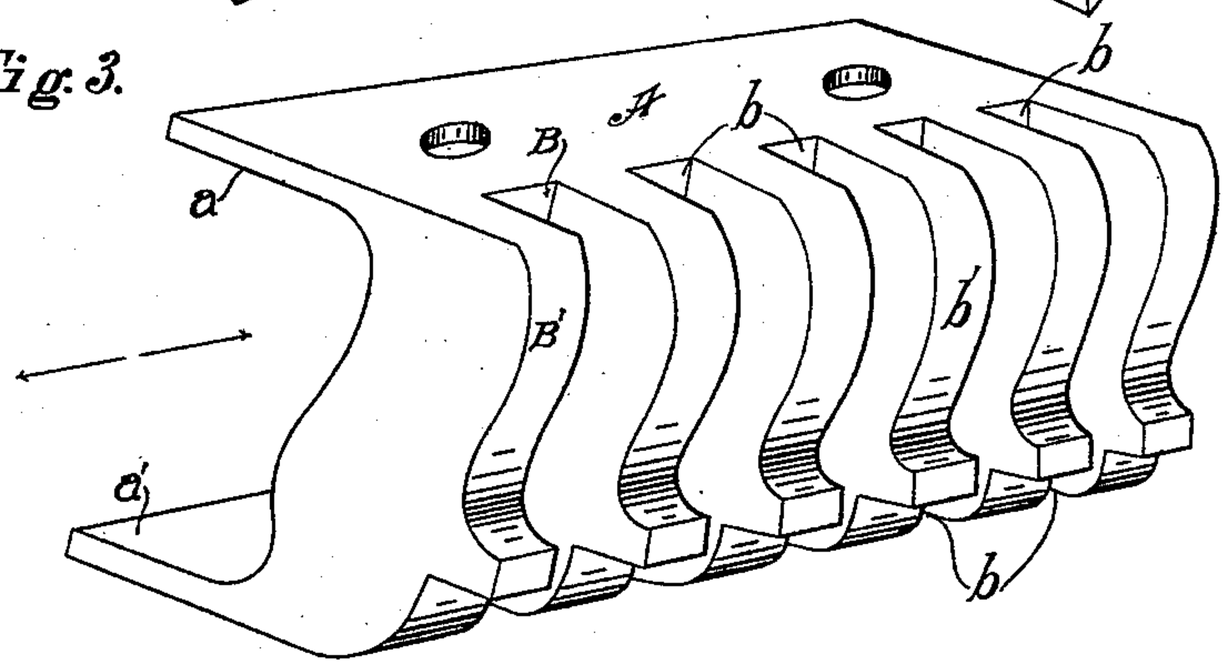
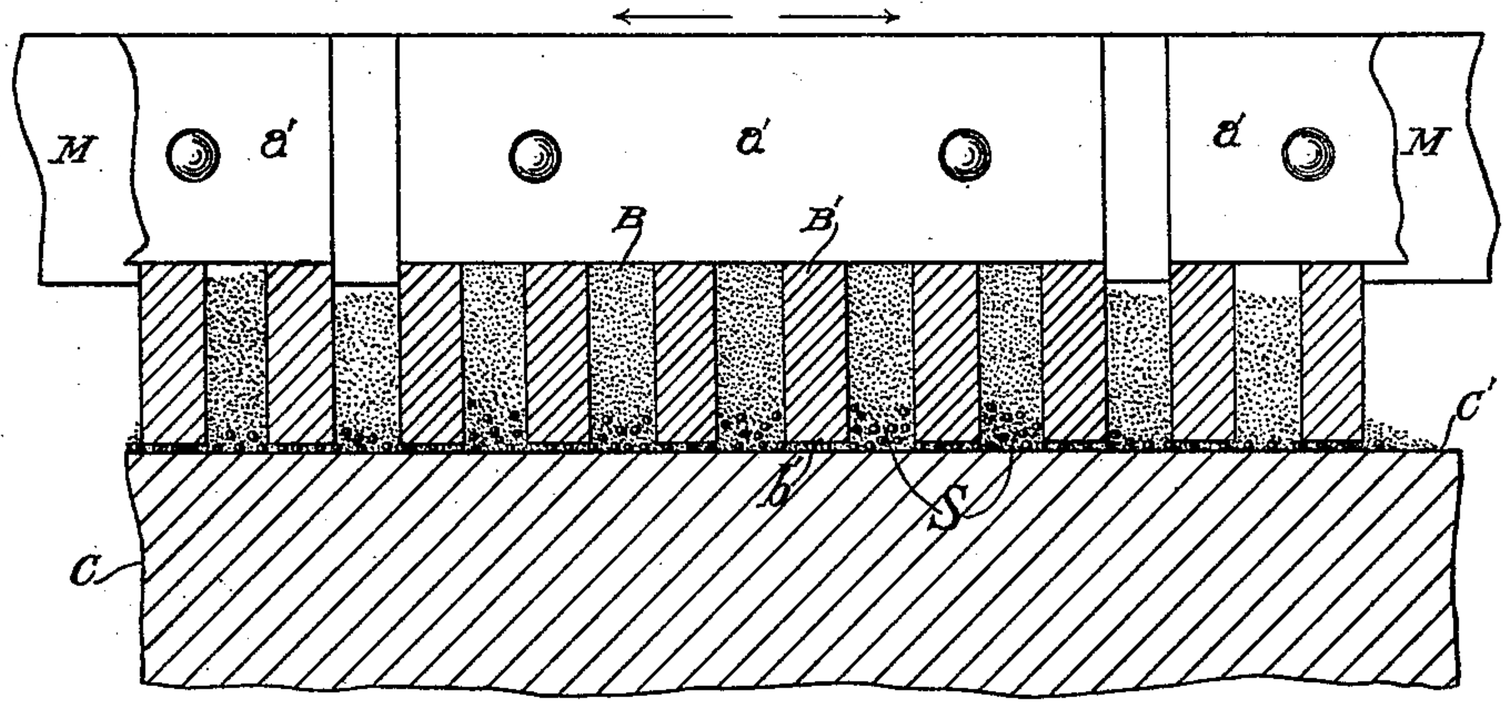


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID KILPATRICK, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO HERBERT J. GOUDGE, OF SAME PLACE.

STONE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 581,006, dated April 20, 1897.

Application filed January 11, 1896. Serial No. 575,087. (No model.)

To all whom it may concern:

Be it known that I, DAVID KILPATRICK, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Stone-Cutter, of which the following is a specification.

My invention relates to those machines designed to cut stone for building or other purposes.

The primary object of my invention is to produce a stone-cutting machine which may be operated by power and will cut the stone by the abrasion of such agents as chilled shot, sharp sand, or other abrading substances usually applied in stone-sawing or stone-polishing.

An especial object of my invention is to produce a machine whereby stone molding may be cheaply produced and finished in a thorough and perfect manner.

The especial difficulty in cutting stone molding by machinery is that the abrading material must be evenly introduced between the cutters and the face of the stone, and that such material must be allowed to escape with sufficient rapidity to carry off the abraded stone and yet must be constantly fed upon the highest point of the molding as well as upon the lowest point thereof. Otherwise the ridges or other elevated parts of the molding will become practically devoid of abrading material, the particles of which will naturally work to the lowest portion of the cutter, and the operation will come to a standstill. Without a constant and large supply of abrading material the operation of cutting the stone will be so slow that it will be more expensive than cutting the stone by hand.

My invention comprises the arrangement of the cutter, whereby I am enabled to supply a large quantity of abrading material to the cutter and to allow such material free escape from the cutter as soon as it has performed its office, thus to cause it to rapidly carry away the abraded material and prevent the grinding of such abraded material to a powder, which results where the abrading material does not have free escape from the cutters, and is a worse than useless waste of power in a stone-cutting machine.

I am aware that it has been proposed to make a stone-polishing machine consisting of a grating of parallel slats having slots therebetween and having the faces of the slats conforming to the contour of the molding to be polished and to operate to polish such molding by the use of sand or other material suitable for polishing stone. My invention differs from such machine in that with the device mentioned the bottom faces of the webs which connect the bars with each other are flush with the cutting-faces of the ends of the bars, and thus closes the slots between the ends of the bars. With my improved construction the webs which connect the bars with each other are arranged with their bottom faces at a distance above the cutting-faces of the extreme outer ends of the bars and not flush therewith, as in the device referred to.

In fact my improved cutter may be said to comprise two longitudinal supporting-bars and a series of cross-bars secured to the under face thereof, thus leaving slots extending the full width of the cutter, while the stone-polisher referred to comprises a series of cross-bars having longitudinal bars or webs secured upon the ends thereof, thus forming closures between the ends of the cross-bars and preventing that free horizontal escape of the abraded material which is essential to the successful use of my improved cutter, for the reason that when the web or the longitudinal connection between the bars has its bottom face flush with the bottom faces of the outer ends of the bars the abraded material and the chilled shot or other abrading material used with the cutter cannot escape horizontally from between the ends of the bars, and therefore the reciprocation of the cutter back and forth across the stone simply results in polishing the stone. With my improved cutter the abraded material readily escapes from the sides of the cutter and the stone is rapidly worn away, so as to make the device a practical and efficient machine which will produce molding from rough stone without preliminary dressing into shape by hand.

My invention also comprises the peculiar arrangement of mechanism which I employ for actuating my improved cutters to produce by machinery circular or curved molding of any particular radius desired.

The accompanying drawings illustrate my invention.

Figure 1 is a fragmental perspective side elevation of a stone-cutting machine arranged to produce circular or curved stone molding of any radius desired. Fig. 2 is a perspective view of the under side of one of the cutters employed in the machine shown in Fig. 1. Fig. 3 is a perspective bottom view of a cutter for producing straight molding. Fig. 4 is a fragmental sectional view showing one of my improved cutters in operation.

My improved stone-cutter consists, essentially, of a metal body A, provided with open slots extending through the cutter transverse the direction in which the cutter is designed to move when in operation.

In the drawings arrows indicate the direction in which the cutter is designed to move.

As shown in the drawings, each cutter is composed of side flanges *a a'* and metal bars B', arranged, preferably, substantially parallel with each other and having slots B provided therebetween, so that the abrading material, such as sand or shot S, (shown in Fig. 4,) can be shoveled into the cutter and will enter the slots and pass from the slots between the under faces *b'* of the bars and the upper face C' of the stone C which is to be cut. It will be seen that the flanges thus form a box for holding the abrading material in position to pass downward through the slots between the slats. I find in practice that sand alone will not produce effective results in cutting stone, but that I must use chilled shot either alone or in connection with sand in order to produce satisfactory results. The cutters are moved back and forth in the direction of the arrows and the shot or other abrading material grinds or wears away the stone by abrasion, and the shot and the material thus worn away are discharged through the open ends *b* of the slots B, and such material is again shoveled back into the cutters in the same manner in which such material is fed to the ordinary stone-saw. The flanges *a a'* serve to hold the abrading material in position to enter the slots B.

Every stone-cutting plant is provided with a machine for sawing stone, and these machines usually consist of a horizontally-stationary vertically-movable frame D (shown in Fig. 1) and a horizontally swinging or sliding frame E, to which is secured the stone-saw or gang of saws, as the case may be. I have designed means whereby I can at slight expense utilize this construction of machine for producing circular or curved molding. The means which I have devised consist of the vertically-movable support D, a lever F, pivoted by a pivot *f* to one side of such support, a molding-cutter A, rigidly attached to the lever and formed in an arc of the circle which the cutter would describe were the lever rotated, suitable means, such as the car H, arranged to support the stone C to be operated upon, and suitable means, such as the horizontally-sliding frame E, arranged by suitable means, such as the pitman I, to operate the lever to cause it to swing upon its pivot, thus to carry the cutter back and forth across the face of the stone to be cut. In adapting these stone-sawing machines for cutting circular molding I provide suitable slides J, arranged at each corner of the frames D and E to allow the horizontally-movable frame E to slide back and forth upon the frame D in a straight line. I also provide a semicircular guide K, fixed to the frame D, and a corresponding slide K', fixed to the lever, so as to support and guide the lever as it slides back and forth when the lever is actuated by means of the pitman I to swing it upon its pivot, thus to carry the cutter back and forth across the stone to be dressed.

L represents a pitman-rod, one end of which is attached to the horizontally-movable frame E, and its other end is attached to suitable power. (Not shown.)

The various guides J and K upon which the members slide are preferably made V shape in order to retain perfect alinement of the parts and to take up the wear.

In practice when straight molding is to be produced the cutters are secured in series to the angle-bars M, fragments of which are in Fig. 1 shown fixed rigidly to each end of the horizontally-movable frame E. Any suitable means may be provided for attaching the cutters to the angle-irons; but I find it most advantageous to employ bolts for this purpose. In Fig. 1 fragments of these angle-irons are shown at each end of the frame E; but the middle portions thereof are broken away in order to expose the arrangement of the circular-stone-molding-cutting mechanism. The cutters are secured to these angle-irons from one end thereof to the other with a space between each cutter and the adjacent cutter about equal in width to one of the slots B.

The cutters being secured in proper position, the sand or chilled shot, or both, are shoveled into the cutter, as shown in Fig. 4, and the machinery is started to cause the sliding frame to move the cutters back and forth across the surface of the stone, and the chilled shot and other abrading material pass through the slots and under the bars of the cutter and by abrasion wear away the stone and cause it to assume the contour of the cutter which is employed. I have found in practice that the operation is very quickly performed, and the molding which is thus produced is superior in accuracy and appearance to that produced by hand, while its cost is very much less.

To produce circular or curved molding, the cutters are cast in an arc of the circle in which

it is desired to form the molding, and by means of the flanges A′ are bolted to the lever F at the proper distance from the pivot *f*. Then the stone is placed beneath the cutter, and the sliding frame E is moved back and forth and by means of the pitman I operates the lever to carry the cutter back and forth in an arc of a circle across the stone to be dressed.

In practice I cast the face *b*′ of the cutters upon a chill, so that the cutters will not wear away so rapidly.

In the drawings I have not illustrated the means employed for adjusting the frame D vertically, for the reason that such means are well known to those versed in the art and are not of my invention.

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

1. A stone-cutter comprising metal bars arranged with slots between them and secured together by webs cast integral with such bars, the bottom faces of the webs being arranged at a distance above the extreme outer cutting-faces of the bars, so as to leave open horizontal slots between the bars at the ends thereof, the webs being also arranged to project upward above the tops of the bars to form side walls to hold the abrading material in position to feed into the slots.

2. A stone-cutter comprising a cast-metal grating consisting of bars united at each end by a web, the bottom faces of the webs between the bars being arranged at a distance above the extreme outer ends of the cutting-faces of the bars to leave between the bars at the ends thereof horizontal slots for the escape of the abraded and abrading material.

3. A stone-cutter comprising a grating of metallic bars, each bar extending from side to side of the cutter, the slots between the bars at the ends thereof being open for a sufficient distance above the extreme outer ends of the cutting-faces of the bars to allow for the ready horizontal escape of abraded and abrading material from between the ends of the bars.

4. A circular-stone-molding-dressing machine comprising a vertically-movable support; a lever pivoted by one end to such support; a molding-cutter fixed to the lever and formed in an arc of the circle which the cutter would describe were the lever rotated; a suitable support for the stone to be dressed; and suitable means for operating the lever to carry the cutter back and forth across the stone to be dressed.

5. A stone-cutting machine comprising the vertically-movable frame; the horizontally-movable frame arranged to slide upon the vertically-movable frame; the lever pivoted by one end to the vertically-movable frame, and having its other end arranged to slide upon a guideway also fixed to the vertically-movable frame; the stone-cutter fixed to the lever and formed in an arc of the circle which would be described by the cutter were the lever rotated upon its pivot; a pitman-rod pivoted at one end to the lever, and pivoted at its other end to the horizontally-movable frame; and suitable means for reciprocating the horizontally-movable frame.

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