(No Model.) 2 Sheets—Sheet 1.

H. C. REICHARDT.

DIAMOND CUTTING MACHINE.

No. 304,858. Patented Sept. 9, 1884.

Fig. 1.

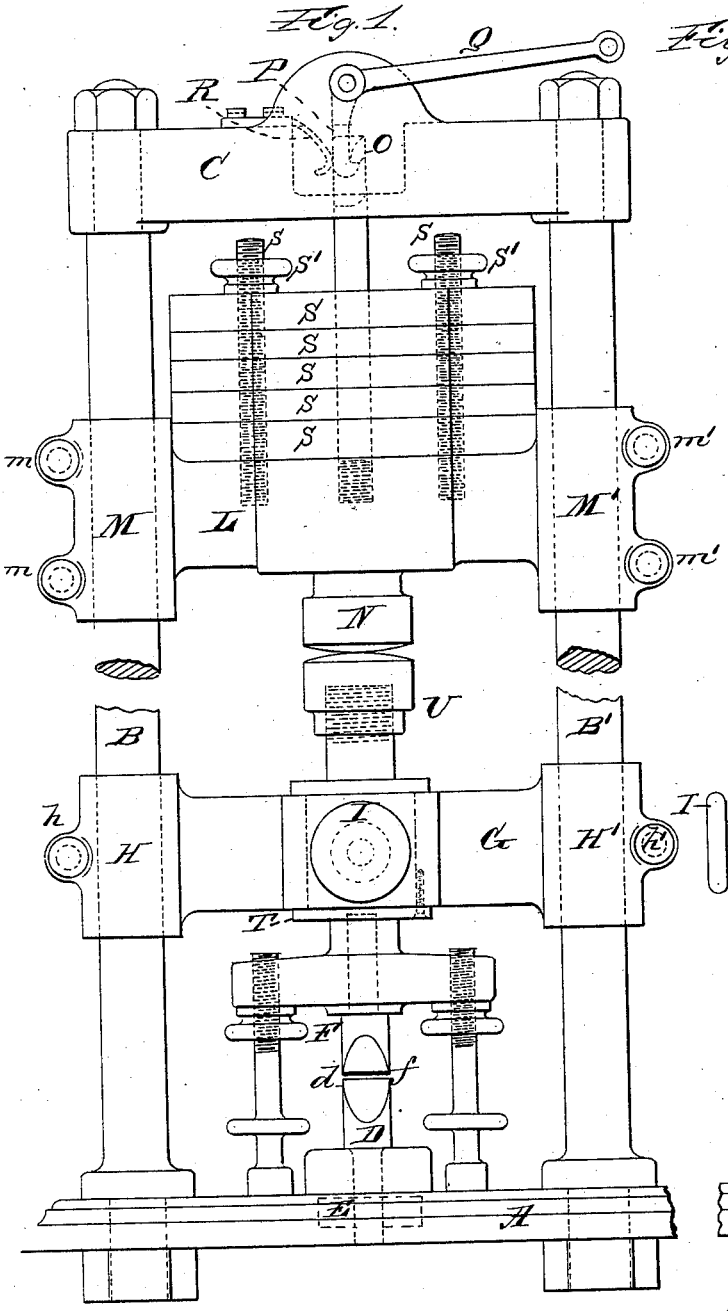
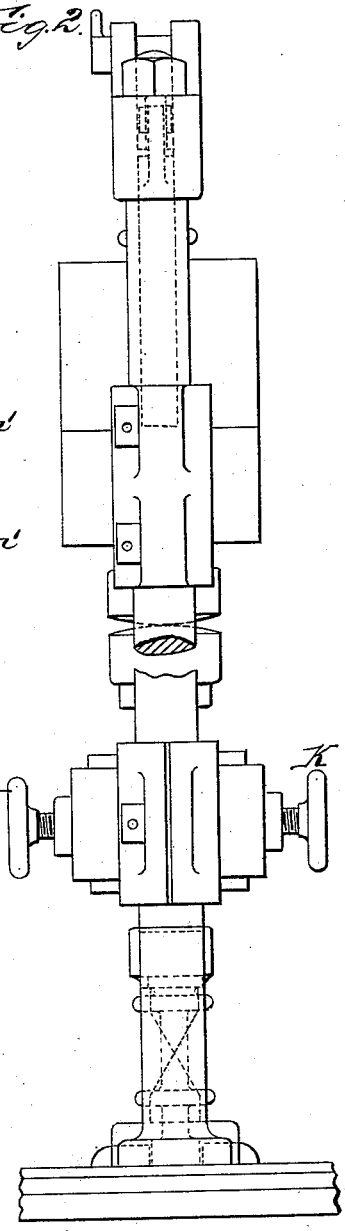


Fig. 2.



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ATTORNEY

(No Model.) 2 Sheets—Sheet 2.

H. C. REICHARDT.

DIAMOND CUTTING MACHINE.

No. 304,858. Patented Sept. 9, 1884.

Fig. 3.

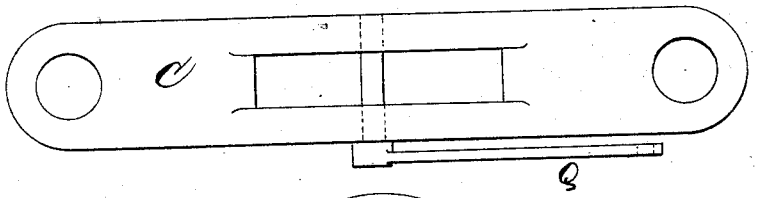


Fig. 4.

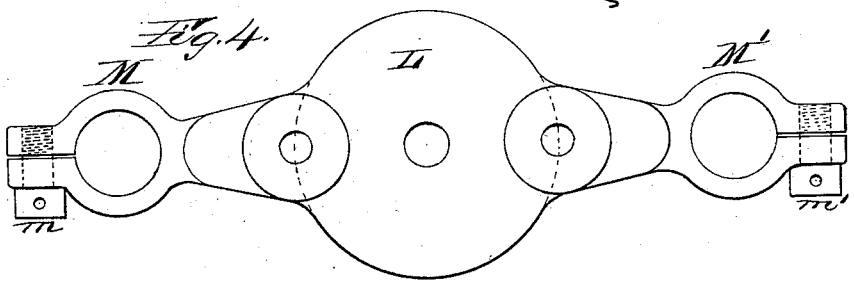


Fig. 5.

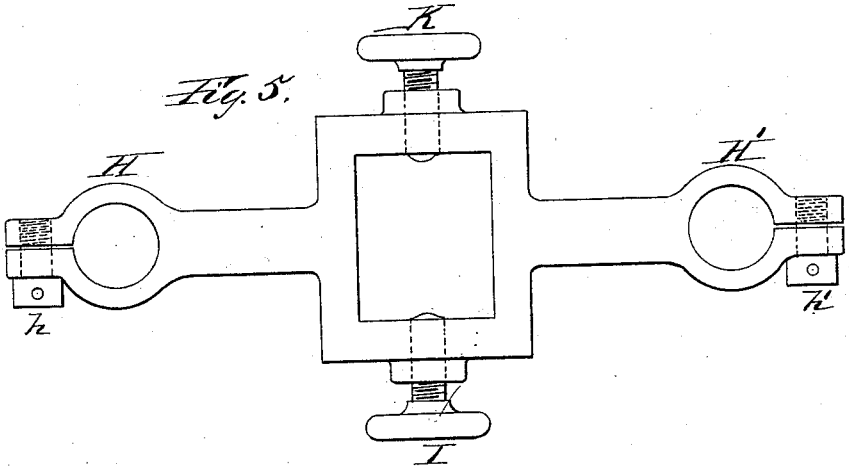


Fig. 6.

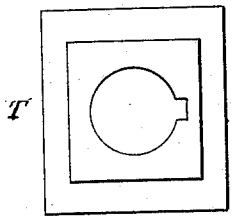
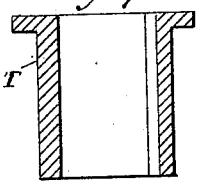


Fig. 7.



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HENRY C. REICHARDT, OF POTTSVILLE, PENNSYLVANIA, ASSIGNOR TO THE AMERICAN DIAMOND ROCK BORING COMPANY, OF NEW YORK, N. Y.

DIAMOND-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,858, dated September 9, 1884.

Application filed May 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. REICHARDT, of Pottsville, in the county of Schuylkill and State of Pennsylvania, have invented a new and useful Improvement in Diamond-Cutting Machines, of which the following is such full, clear, and exact description as will enable others skilled in the art to make and use the same, when taken in connection with the accompanying drawings, in which—

Figure 1 is a front view of my machine. Fig. 2 is a side view of the same. Fig. 3 is a detail of the cross-head. Fig. 4 is a detail of the hammer. Fig. 5 is a detail of the cross-piece in which the cutter is held. Fig. 6 is an inverted view of the block in which the cutter is carried. Fig. 7 is a vertical section of the block.

This my invention relates to machines or apparatus for cutting diamonds or other precious and hard stones; and it consists of the two knife-edges so arranged that they are maintained in a position directly opposite one another on the opposite sides of the stone to be cut, the hammer to drive them together, and the various combinations hereinafter specified and set forth.

Before this my invention great difficulty has been found in breaking diamonds (such as are used in diamond-drills) and other hard stones, as they cut into the face of anvils and hammers when they are used for that purpose.

The cutter consists of a frame, preferably made of iron, having a base, A, and two upright guides, B B′, firmly fastened to the base at the bottom and secured within a cross-head, C, at the top. At or near the center of the base is placed a cutter, D, in a socket in the base, so that it may be revolved on its center. At the upper end of this cutter is an edge, *d*, formed thereon, of steel and highly tempered. Within or on the base A is a lead cushion, on which the cutter D rests, so arranged that it will take up the jar from the blows on the cutter D. This lead cushion is shown by E of Fig. 1. Another cutter, F, having an edge, *f*, is arranged above the cutter D, so that the two edges will be directly over one another and in the same vertical plane. This cutter F passes through a hole in the block T, the side of the block-hole having a key-seat formed therein, in which fits a key formed on the side of the cutter, to prevent its turning in the hole. The cutter F is provided with a head or sleeve, U, at or near the top, to prevent it from passing entirely through the hole in the block, whereby the cutter is free to move up and down in the block, but cannot turn therein.

The cross-piece or carrier G consists of the piece G, having sleeves H H′ at each end to embrace the guides, and a hole or opening at the center, in which the block T is placed, and in which it fits in the direction of the length of the cross-piece, and in which it is adjustably secured by the set-screws I and K—one on each side of the cross-piece—so that the block may be thereby accurately adjusted and brought directly over the lower cutter, D, so that in use the two cutters will take on sides of stones directly opposite one another. The sleeves H H′ are each cut and fastened by bolts and nuts *h h′*, whereby they may be tightened and loosened to fit closely the guides B B′, or to secure them to the guides. They are used in this way, and the cross-piece is placed at such a position on the guides that the edges of the cutters cannot come in contact when the stone is cut. Another cross-piece, L, is furnished, on which there are also sleeves M M′—one at each end—each encircling one of the guides B B′. These sleeves are each cut, and fastened by bolts and nuts *m m′*, so that the sleeves may be tightened and loosened. This cross-piece L carries with it, attached to it, a hammer, N, preferably made in the form shown in the drawings, being a long bar of iron or steel, and having a head of a softer metal. This hammer is so attached to the cross-piece L that it is at all times directly over the upper cutter, F, and the head of the cutter F and head of the hammer will be in contact when the hammer is lowered.

I have described the head of the hammer as being made of a softer metal. It will answer equally well if the head of the cutter is so made, or if a soft-metal cushion is introduced between them to prevent the rebound incident to the coming together of two hard pieces of metal.

At the upper end of the hammer is a hook,

O, so arranged that it will "take" or catch in the hook P in the cross-head when they are brought together, and the hammer be thus held up in that position. The hook P is on a lever, Q, by which it can be moved and the hammer released. The hook P is forced into contact with the hook O by a spring, R, attached to the cross-head.

To the cross-piece L and hammer N are attached weights SSSS, which may be removed and replaced at will, for the purpose of making the hammer lighter or heavier. They are secured by the bolts *s s* and nuts *s' s'* to the cross-piece.

The cutters D and F may each be made in one piece, as shown and described, or cutter or tool ends may be attached to each in any appropriate manner—as by a tenon and socket and screw or other key—to keep them in place, as shown in dotted lines. By this arrangement the edges can be more easily kept in good repair. Care must be used in making the joint between the two solid.

The mode of operation is as follows: The hammer N is raised so that the hooks O and P interlock. The lower cutter, D, is then turned so that the edge of it is in the same vertical plane as the edge of the upper cutter, F. The upper cutter, F, is then adjusted by the screws I and K so that the edge of the cutter F is directly over the edge of the cutter D. The cross-piece G is adjusted to such height that the edges of the cutters will not come in contact, and the screws *h h'* tightened to fasten the cross-piece in that position. The diamond to be cut is now placed on the edge of the cutter D, and the cutter F being raised for that purpose and lowered upon it, so that the edge thereof is in contact with it, whereby the diamond will be held between them. The lever Q is now pulled and the hammer N released, which descends and gives a blow upon the head of the cutter F, and cuts in two the diamond held between the cutters.

I have described this machine as applicable to cutting diamonds. It is equally as applicable to cutting other hard stones.

By this machine the hardest stones may be cut with ease. Great care must be used in tempering the edges of the cutters.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a diamond-cutter, the combination of the frame, of the lower cutter, capable of being turned on its axis, the upper cutter, adjustably attached to the cross-piece and capable of side adjustment therein, the hammer, adapted to operate the upper cutter, and the detent-hook, constructed to engage and hold the hammer.

2. In a diamond-cutter, the combination, with the frame, a lower cutter, and an upper cutter, having their edges arranged the one above the other and in line with each other, of the cross-piece adjustably attached thereto and provided with the cutter-adjusting screws and block, and a cutter-head fitted therein and capable of an up-and-down movement.

3. In a diamond-cutter, the combination, with a frame, a lower cutter, and an upper cutter, having their edges arranged the one above the other and in line with each other, of a hammer provided with rounded striking-surfaces and detachable weights.

4. In a diamond-cutter, the combination, with the frame, a cross-piece adjustably attached thereto, an upper cutter free to move up and down in said cross-piece and capable of side adjustment therein, and a lower cutter, of the hammer provided with detachable weights, and a detent-hook constructed to engage and hold the hammer.

Signed at New York, in the county of New York and State of New York, this 28th day of April, A. D. 1884.

HENRY C. REICHARDT. [L. S.]

Witnesses:
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WILLIAM V. CARR.