

No. 724,536.

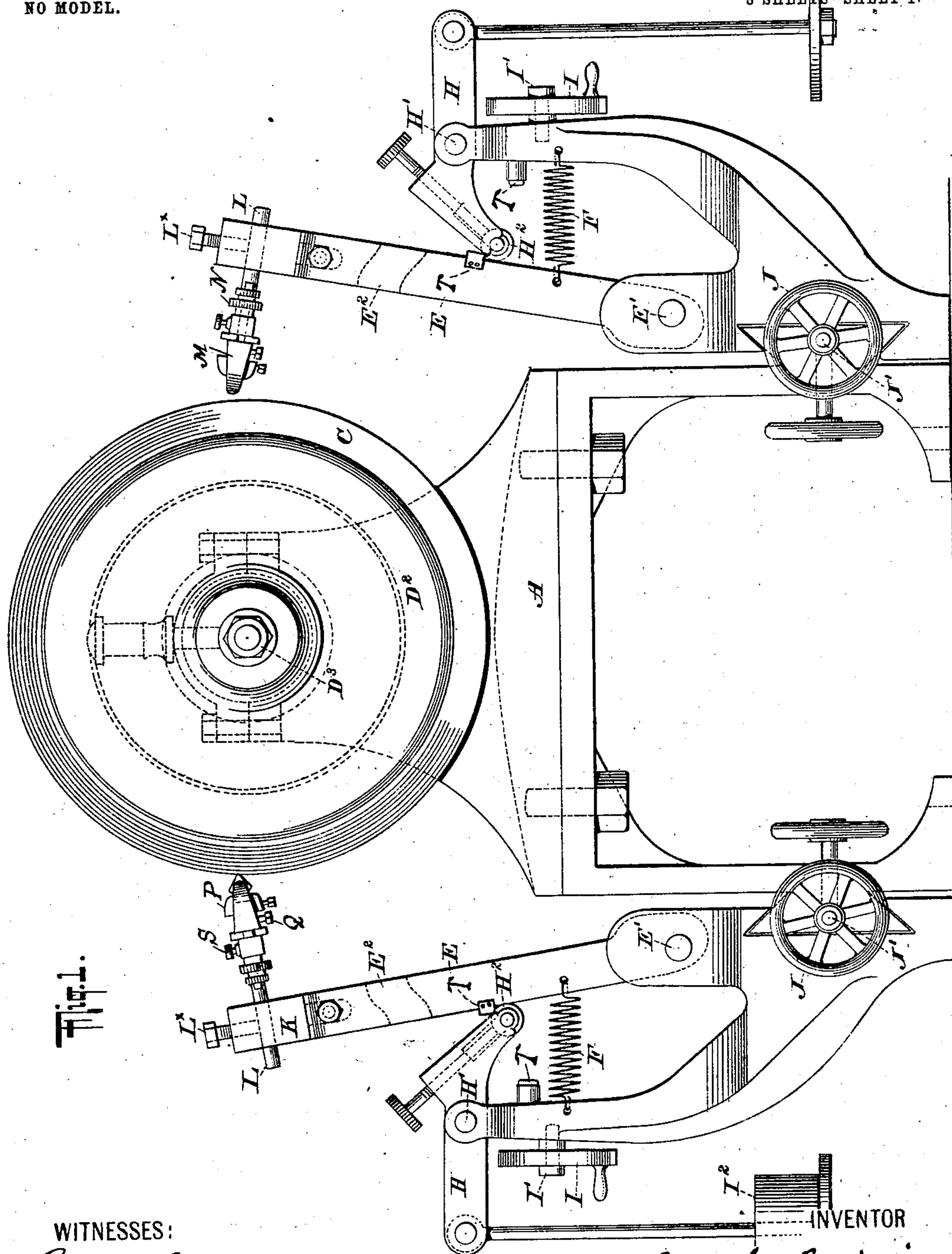
PATENTED APR. 7, 1903.

A. J. BENJAMINS.
DIAMOND SPLITTING MACHINE.

APPLICATION FILED AUG. 8, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

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John Lotka.

INVENTOR

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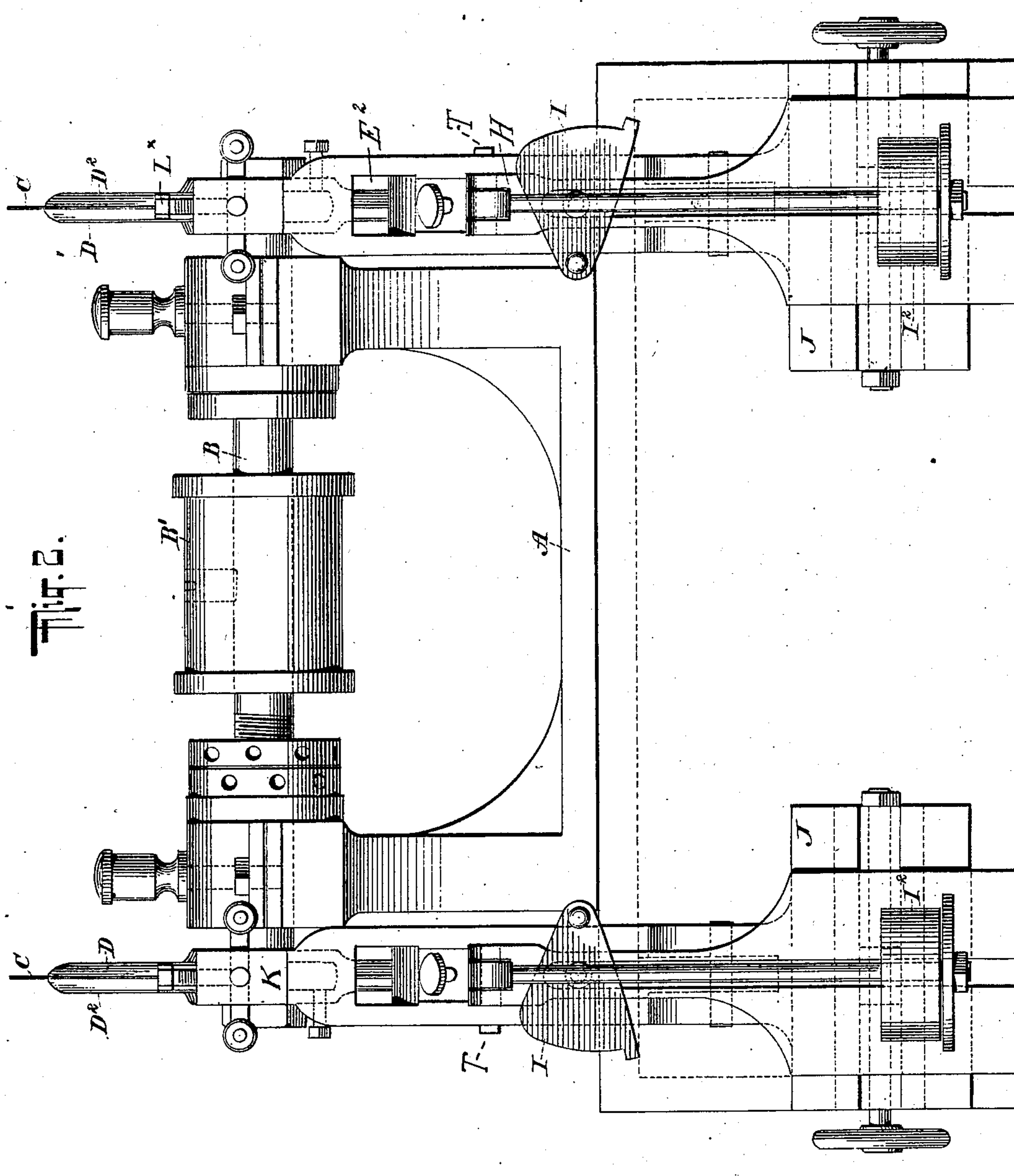
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3 SHEETS—SHEET 2.



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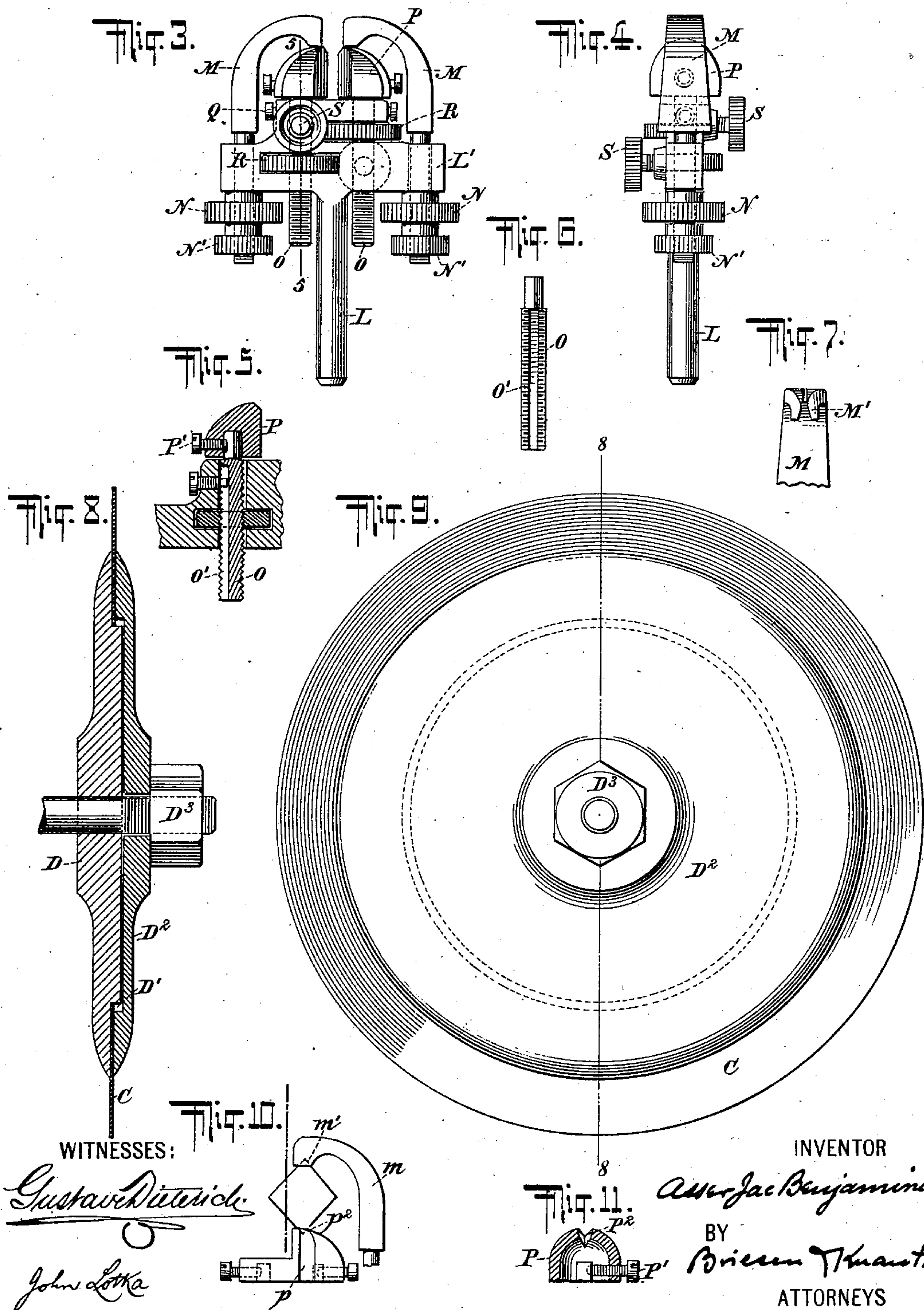
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

ASSER JAC BENJAMINS, OF BROOKLYN, NEW YORK.

DIAMOND-SPLITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 724,536, dated April 7, 1903.

Application filed August 8, 1901. Serial No. 71,283. (No model.)

To all whom it may concern:

Be it known that I, ASSER JAC BENJAMINS, a citizen of the United States of America, and a resident of the city of New York, borough of Brooklyn, State of New York, have invented certain new and useful Improvements in Diamond-Splitting Machines, of which the following is a specification.

My invention relates to diamond-splitting machines, and has for its object to provide a machine of this class which will enable stones to be split in such a manner as to reduce waste to the minimum and to avoid the tedious process of grinding down.

Another object of my invention is to hold the stone firmly in position, so as to render the operation of the cutter positive and certain.

A third feature of my invention has reference to the cutter and aims at preventing any interference and buckling of the cutter.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is an end elevation thereof. Fig. 3 is a front elevation of the stone-holder. Fig. 4 is a side elevation thereof. Fig. 5 is a section on line 5 5 of Fig. 3. Fig. 6 is a detail view of an adjusting-screw. Fig. 7 is a detail view of one of the jaws for holding the stone. Fig. 8 is a section on line 8 8 of Fig. 9. Fig. 9 is a face view of the cutter. Fig. 10 is an elevation of another form of stone-holder, and Fig. 11 is a section on line 11 11 of Fig. 10.

The machine comprises a frame A, in which is journaled the cutter-shaft B, driven in any suitable manner—for instance, by a belt engaging the pulley B'. The drawings illustrate a double machine, the sections of which are alike, so that the description of one of them will suffice. The cutter C is preferably a thin ring of steel or other good conductor of heat, the inner edge of the said ring, as shown in Fig. 8, resting against a shoulder D' upon a clamp member D, said ring being held firmly between the two clamp members D D', from which it projects peripherally, by means of a nut D³ or other suitable device.

The diamond to be split or cut is placed in a holder of the particular construction described hereinafter. This holder is carried at the upper end of an arm E, pivoted at E' to the frame A. A spring F, secured to the arm E, has a tendency to draw it away from the cutter C. To move the arm inward, so as to carry the stone against the cutter, I provide an arm H, fulcrumed at H' and carrying at its inner end an adjustable roller H², which engages the arm E. The outer end of the arm H is weighted, as indicated at I². It will be understood that as the cutter C progresses in its action the arm E gradually swings inward on its fulcrum E' and the roller H² moves upward along the outer face of the said arm E. There finally comes a moment when the said roller will register with an aperture E² in the arm E, and at this moment the spring F will suddenly swing the arm E outward and carry the split stone out of the path of the cutter. A manually-operated cam I, pivoted at I', permits of holding the arm H in an inactive position. To adjust the arm E lengthwise of the cutter-shaft, so as to be able to bring the exact desired point or plane of the stone in alinement with the cutter, I may mount the arms E and H, together with the cam I, upon a slide J, adapted to be moved lengthwise by the well-known feed-screw J' or by any other approved mechanism. At the top of each arm is located, as previously stated, a diamond-holder. I prefer to provide an adjustable socket K, which may be moved up and down on the arm E, and said socket receives the stem L of the diamond-holder properly, the stem being adjustable transversely of the socket and held in position by means of a set-screw L^x.

As shown in Figs. 3 to 7, the holder comprises a body L', from which the stem L projects, and in said body are adjustably mounted two outer members or jaws M, which are adjustable in and out by means of nuts N, held in position by check-nuts N'. Through the body L' extend loosely screws O, the upper ends of which carry the inner clamp members P, preferably secured by means of set-screws P'. The screws O are slotted lengthwise, as shown at O', and the slots or grooves are engaged by the points of screws Q, which are set in the body L'. By this means the

screws O are held against turning to the body, while allowed to slide therein. In order to adjust the said screws and with them the inner clamp members, I provide nuts R, engaging the said screws and projecting from the body L' through apertures thereof. It will be understood that by turning these nuts R the inner clamp members P may be suitably adjusted. To hold these clamp members after adjustment, I provide set-screws S, engaging the screws O. The clamp members M and P are preferably made with angular seats M' and P², so as to properly receive the edges of the stone. The inner clamp members P may be solid, as shown in Fig. 5, or hollow, as shown in Fig. 11.

Instead of providing two separate inner and outer clamp members I may, as shown in Fig. 10, employ a single inner clamp member p, having a socket p² for the stone, and a single outer clamp member m, having a corresponding socket m'. In any event the stone is held between opposing clamp members, of which at least one is adjustable, so that the distance between the clamp members may be varied.

It may be desirable that a signal should be given when the arm E swings outward under the influence of the spring F, and for this purpose any suitable arrangement may be employed, as a bell rung mechanically upon the outward swing of said arm, or a circuit may be closed, as indicated at T, and an electric gong included in said circuit will be sounded.

I desire to call particular attention to the fact that the clamping action or movement of the work-holder sections is in a plane parallel to that in which the cutter moves. If the clamping action were toward the plane of the cutter, there would be a tendency to break the stone, inasmuch as the clamping action would be toward the kerf. When, however, the clamping action is parallel to the plane of the cutter movement, no strain comes upon the kerf and the stone is held just as securely at the end of the cutting operation as before.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a work-holder comprising spaced opposing members adapted to hold the article between them and one adjustable relatively to the other to clamp said article, with a cutter arranged to move in a plane which passes between the members of the holder and which is parallel to the direction in which the clamping movement of the holder takes place.

2. The combination of a rotary cutter, a work-holder mounted to swing about an axis parallel to that of the cutter, means acting to normally press the work-holder toward the cutter, and means operative when the holder has reached a predetermined point in its travel toward the cutter, for swinging the work-holder away from the cutter.

3. The combination of a rotary cutter, a work-holder movable toward and from the cutter, a movable pressing mechanism which tends to throw the work-holder toward the cutter, and a stop device movable into the path of said mechanism to arrest the same and render it inactive.

4. In a diamond-splitting machine, a stone-holder having a body, two independently-adjustable outer sections carried by said body, and two independently-adjustable inner sections each arranged in line with one of the outer sections and movable in the same direction.

5. In a diamond-splitting machine, a stone-holder comprising a body having parallel through-openings and recesses adjacent thereto, stone-holding sections provided with shanks extending through said openings, sundry of said shanks being screw-threaded at the said recesses, and adjusting-nuts mounted on said shanks in said recesses so as to be held against longitudinal movement by engagement with the walls of the recesses.

6. The combination of a rotary cutter, a work-holder pivoted to swing about an axis parallel to that of a cutter, a spring having a tendency to swing the work-holder away from the cutter and a pressing-arm arranged to engage and to travel on the work-holder as the latter swings inward under the action of the pressing-arm, the work-holder being provided with an aperture or clearance at a predetermined point so that when the pressure device registers with said clearance the work-holder will be released from the action of the pressure device and will be swung outward by the spring.

7. The combination of a rotary cutter, a work-holder movable toward and from the cutter, mechanism for normally pressing the work-holder toward the cutter and for releasing the work-holder at a predetermined point of its inward travel, and mechanism for moving the work-holder away from the cutter upon the release of the work-holder from the first-mentioned mechanism.

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Witnesses:

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