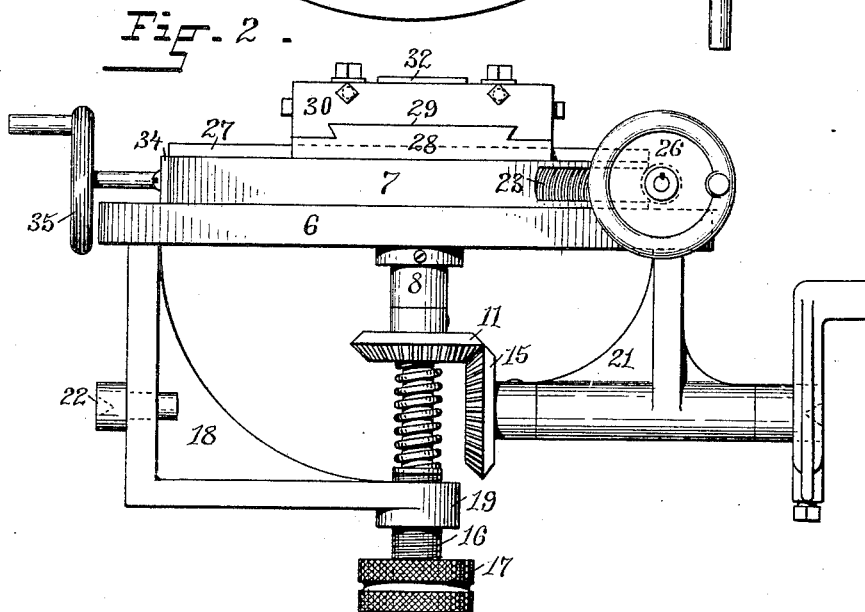
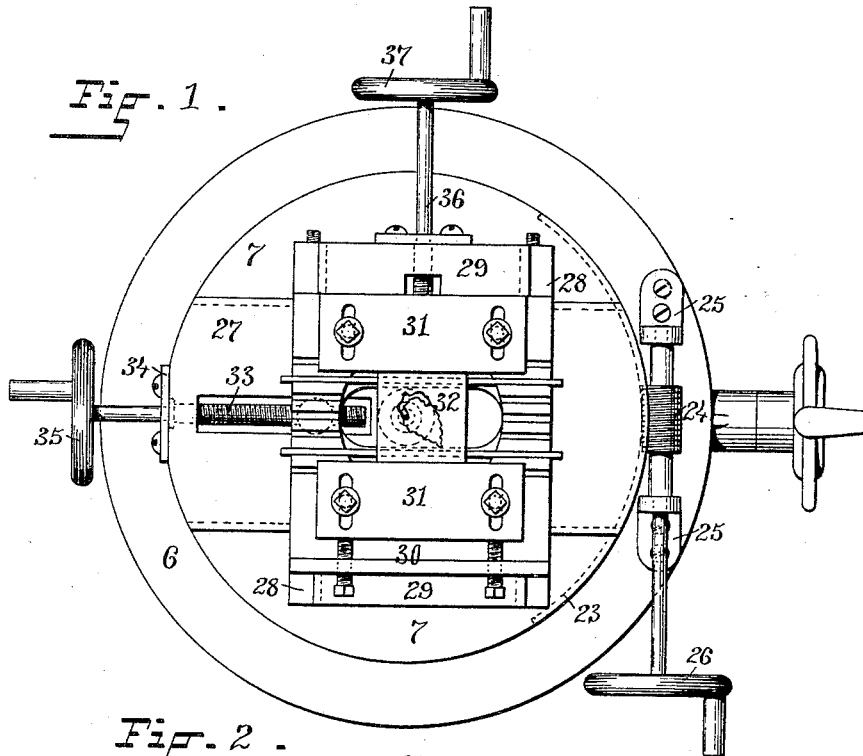


H. THURSTON.  
MACHINE FOR CUTTING DIES.

No. 432,959.

Patented July 22, 1890.



WITNESSES:

*Char. H. Luther Jr.*  
*William R. Blair.*

INVENTOR:

*Horace Thurston*  
*by Joseph A. Miller & Co*  
*attys*

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

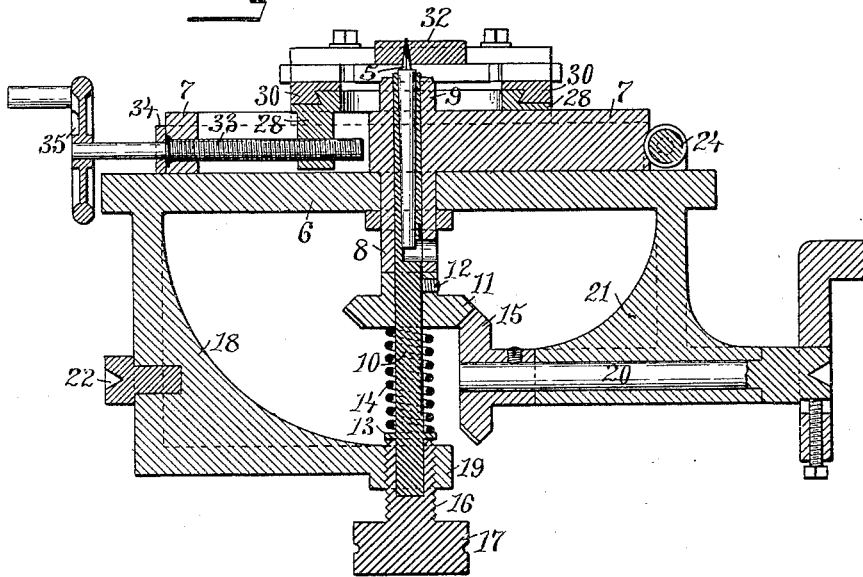
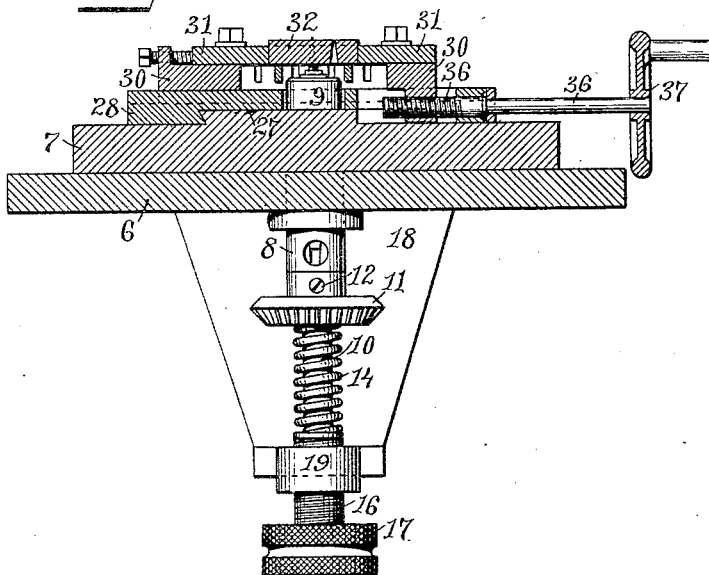


Fig. 4.



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# UNITED STATES PATENT OFFICE.

HORACE THURSTON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO JOHN C. SCHOTT, OF SAME PLACE.

## MACHINE FOR CUTTING DIES.

**SPECIFICATION** forming part of Letters Patent No. 432,959, dated July 22, 1890.

Application filed December 24, 1889. Serial No. 334,854. (No model.)

### *To all whom it may concern:*

Be it known that I, HORACE THURSTON, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Machines for Cutting Dies; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in machines for cutting the dies used by jewelers for cutting ornamental forms out of sheet-metal stock.

The object of the invention is to produce a die-cutter machine in which the die is cut and undercut by a milling-head while the face of the die is held in a horizontal plane, so that the outlines can be readily followed by the operative.

The invention consists in the peculiar and novel construction of the machine, consisting in a die-blank holder and means for moving the die-blank in all directions on a horizontal plane, and a conical milling-cutter secured to and turning with a vertical spindle, as will be more fully set forth hereinafter.

Figure 1 is a top or plan view of my improved machine for cutting dies. Fig. 2 is a side view of the same. Fig. 3 is a vertical sectional view of the machine, and Fig. 4 is a vertical sectional view at right angles to Fig. 3.

Similar numbers of reference indicate corresponding parts throughout.

In the drawings, the number 6 indicates the bed or table, which is provided with a circular hole. The circular disk 7 is mounted on the upper surface of the plate 6 and is provided with the downward-extending tubular projection or shaft 8, which passes through the hole in the plate 6 and forms the pivotal bearing on which the disk 7 turns. The cylindrical projection 9 extends upward in the center of the disk 7 and forms a bearing near the cutter of the vertical shaft 10, in which the mandrel of the cutter 5 is secured. The beveled gear 11 is provided with a sleeve which bears against the end of the projection 8, and is secured to the vertical shaft 10 by the screw 12, which enters a longitudinal

groove in the shaft 10, so that while the shaft 10 is turned by the beveled gear 11 the shaft may be vertically adjusted. The shaft 10 is provided with the annular projection 13 near its lower or step end, and the spiral spring 14, surrounding the shaft 10, bearing on the annular projection and on the bevel-gear 11, holds the bevel-gear 11 in contact with the end of the extension 8 and in the proper position to gear with the beveled gear 15. The shaft 10 is stepped or vertically supported in the cupped screw 16, provided with the thumb-piece 17, so that the shaft 10, and with the same the cutter 5, may be adjusted vertically. The bracket 18 extends downward and inward from the bed or table 6 and has the nut 19 formed so that the center of the same is exactly in line with the vertical center of the shaft 10. The bevel-gear 15 is secured to and turns with the shaft 20, which shaft is journaled in the bracket 21, and which, like the bracket 18, extends down below the bed or table 6.

To the shaft 20, supported in the bracket 21, pulleys or gears may be secured so as to transmit motion from any prime motor to the shaft, and by the same through the beveled gears 15 and 11 to the vertical shaft 10 and cutter 5. In the drawings, a lathe-dog is shown secured to the end of the shaft, and this end is countersunk to receive the center of the lathe-spindle, while in the bracket 8 the center bearing 22 is secured, so that this machine may be used on a lathe when properly secured to the lathe-bed, and the dog is connected with the face-plate or with any other device turning with the lathe-spindle in front of the head-stock of the lathe. The disk 7 is provided with the worm-gear 23 on part of its periphery, as is indicated in broken lines in Fig. 1. The worm 24 meshes with the worm-gear. The shaft of the worm is supported in the two truss-bearings 25, the end of the shaft being provided with the hand-wheel 26. By this construction the disk 7 can be turned on the tubular shaft 8 around the vertical shaft 10. The disk 7 is provided with the raised way 27, having two edges undercut to receive the bed 28, which bed 28 is also provided with the way 29, on which the work-holder 30 is supported and slides. The

clamp-plates 31 are provided with and operated by the usual clamping-screws and firmly hold the die-blank 32. The bed 28 is provided with a downward projection, in which the screw 33 is threaded. This screw 33 is held in the disk 7 against longitudinal motion by the plate 34, secured to the edge of the disk. The plate 34 has an opening in the form of the inverted letter U, and straddles the shaft of the screw between two projecting shoulders. The end of the screw-shaft is provided with the hand-wheel 35. The downward projection on the bed 28 and the screw 33 move in a slot formed in the disk 7, as is shown in Figs. 1 and 3. The work-holder 30 is in like manner provided with a downward projection in which the screw 36 is threaded, this screw being held against longitudinal motion by a plate secured to the bed 28 in the same manner as is the screw 33 to the disk 7. The end of the screw-shaft 36 is provided with the hand-wheel 37.

From the above description and the drawings it will be seen that the disk 7 can be turned on the horizontal surface of the table 6 by the hand-wheel 26, operating through the worm 24 and worm-gear 23; that the bed 28 can be moved laterally on the disk 7 by the hand-wheel 35, operating the screw 33, and that the work-holder 30 can be moved laterally at right angles to the way on the bed 28 by the hand-wheel 37 turning the screw 36, so that the die-blank while being cut can be moved in any desired direction on a horizontal plane, while it is at all times in clear sight of the operator and is firmly held in the clamp-plates.

The chips and cuttings fall by the force of gravity down below the blank. The cutter is therefore always clear of all chips or cuttings, and as none of these can reach the face of the blank the outlines are therefore always clean and in sight. The cutter is conical, and therefore the die when cut is sufficiently undercut to clear the male die and form a sharp cutting-edge on the die.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A machine for cutting dies, consisting of a frame supporting a vertical shaft carrying a rotating cutter, and a horizontal work-holder provided with a device for clamping and holding the die-blank, said horizontal work-holder

being mounted in ways on a bed having capacity of lateral motion at right angles to the work-holder, and provided with hand operating-screws constructed to move the bed and die in all directions on a horizontal plane, as and for the purpose described.

2. The combination, in a machine for cutting dies, with the table 6 and the disk 7 pivotally mounted on the table and provided with a worm-gear, of the worm 24, mounted on a shaft and supported in bearings, the hand-wheel 26, secured to the end of the worm-shaft, the bed 28, mounted on the disk 7, and the work-holder 30, the bed and work-holder having capacity of lateral motion at right angles to each other, constructed to hold the die-blank and move the same on a horizontal plane, as and for the purpose described.

3. In a die-cutting machine, the combination, with the vertical shaft 10, the cutter 5, and mechanism for rotating the shaft and cutter, of the work-holder 30, provided with the clamping-plates 31, the bed 28, the disk 7, pivotally mounted on a horizontal plate or table, and mechanism for moving the work-holder on a horizontal plane around the cutter to cut the die, as described.

4. The combination, with the table 6 and the disk 7, provided with the tubular extension 8, of the vertical shaft 10, the cutter 5, secured to and rotating with the shaft 10, the beveled gear 11, the annular projection 13, and spring 14, the nut 19, and screw-threaded step-bearing 16, the shaft 20, and beveled gear 15, and a work-carrier constructed to firmly hold the die-blank and permit the same to be moved horizontally in all directions, as described.

5. The combination, with the table 6, the brackets 18 and 21, the vertical shaft 10, the beveled gears 11 and 15, the shaft 20, and mechanism for rotating the same, of the disk 7, the worm-gear 23, worm 24, and hand-wheel 26, secured to the shaft of the worm, the ways 27, the bed 28, screw 33, and hand-wheel 35, the work-holder 30, and screw 36, and the clamp-plates 31, constructed to hold the die-blank and move the same on a horizontal plane to cut the die, as described.

HORACE THURSTON.

Witnesses:

J. A. MILLER, Jr.,  
M. F. BLIGH.