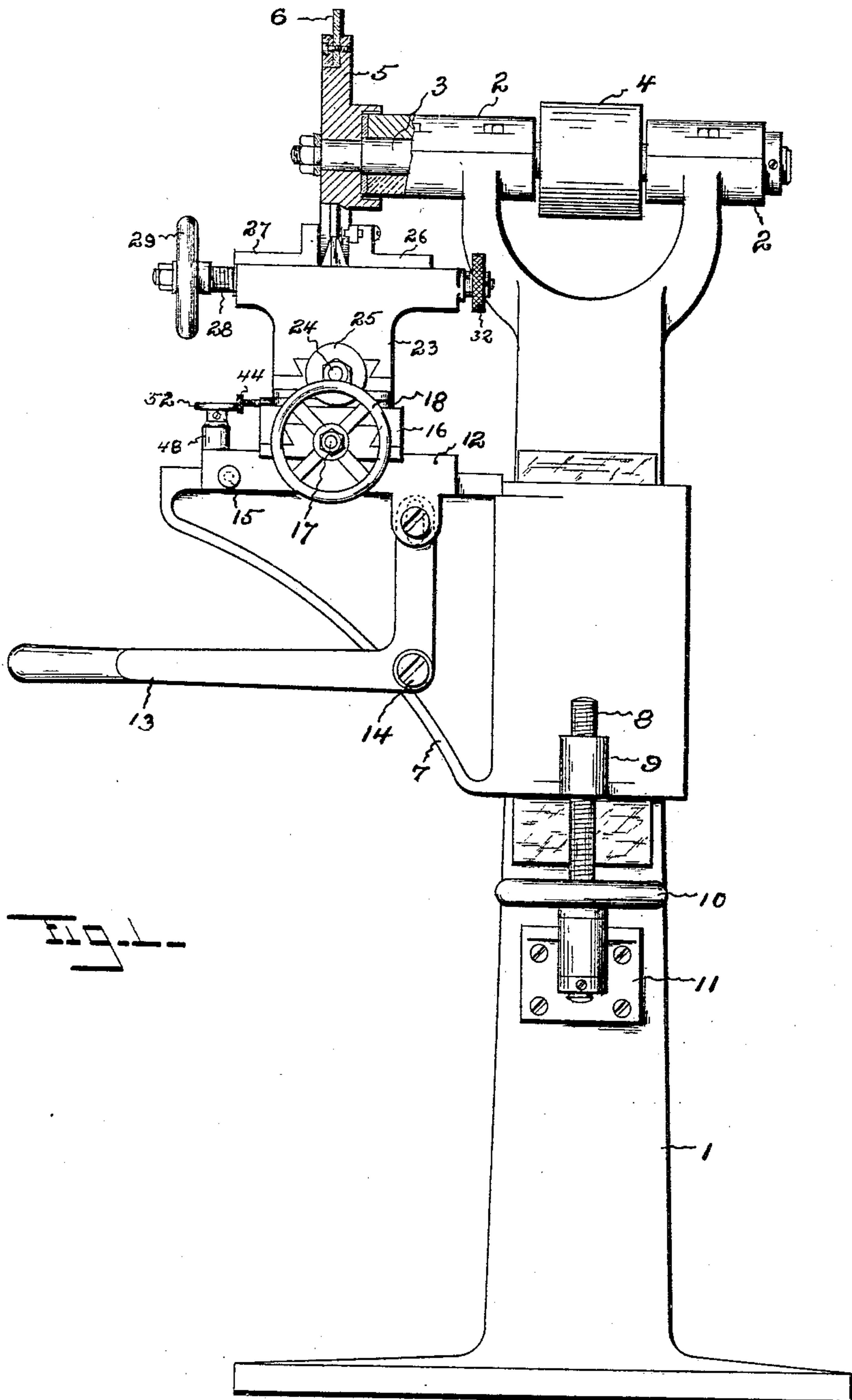


W. A. LEONARD.
DIE GRINDER.
APPLICATION FILED JAN. 10, 1910.

976,270.

Patented Nov. 22, 1910.

4 SHEETS—SHEET 1.



WITNESSES:
Florence H. Monk.
Wallace S. Doyle

INVENTOR
Wilbur A. Leonard
BY *George E. Hall*
ATTORNEY

W. A. LEONARD.
DIE GRINDER.
APPLICATION FILED JAN. 10, 1910.

976,270.

Patented Nov. 22, 1910.

4 SHEETS—SHEET 2.

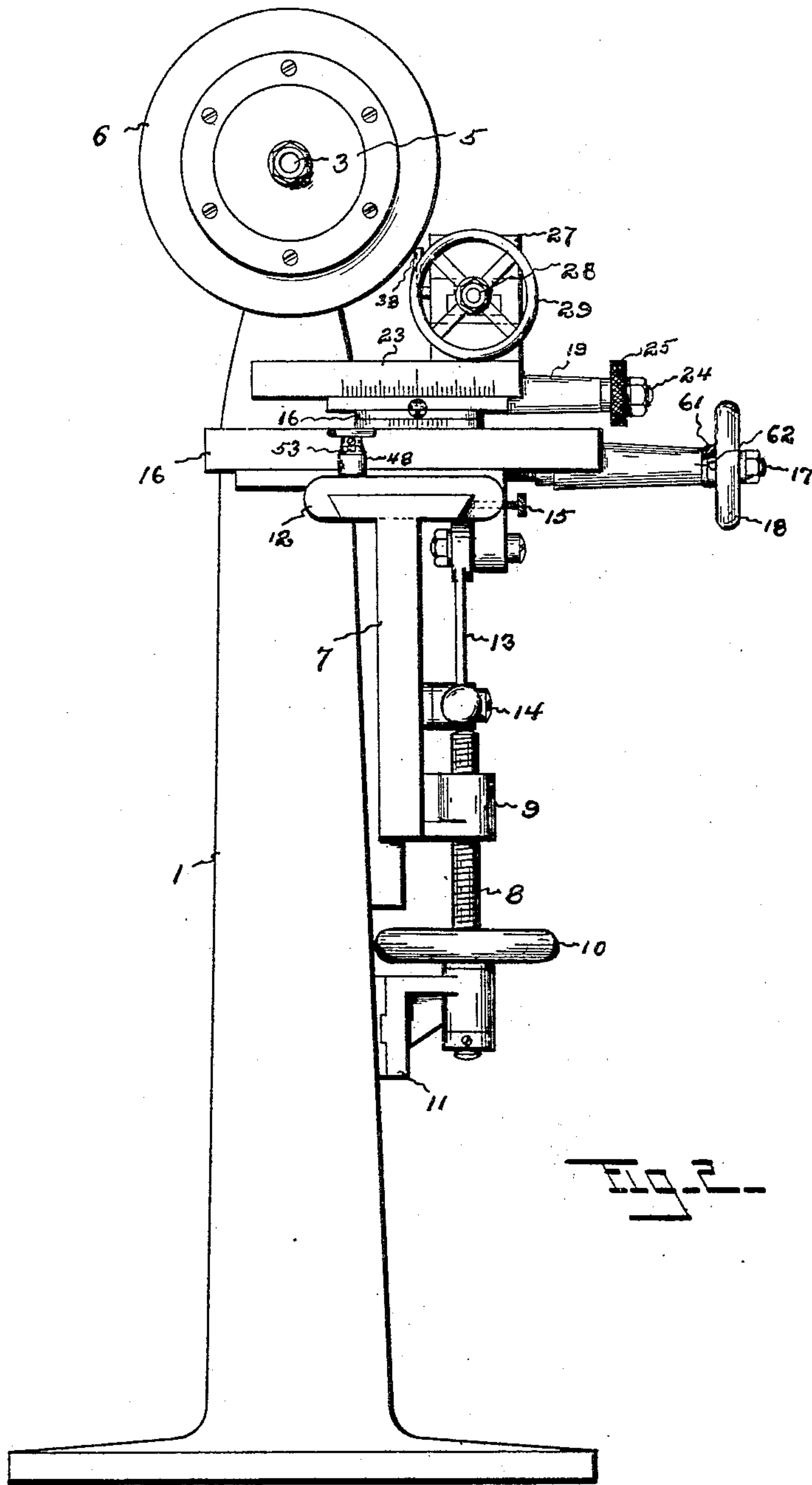


Fig. 2

WITNESSES:

Florence H. Monk
Wallace S. Wolfe

INVENTOR

Walter A. Leonard

BY

George C. Hall

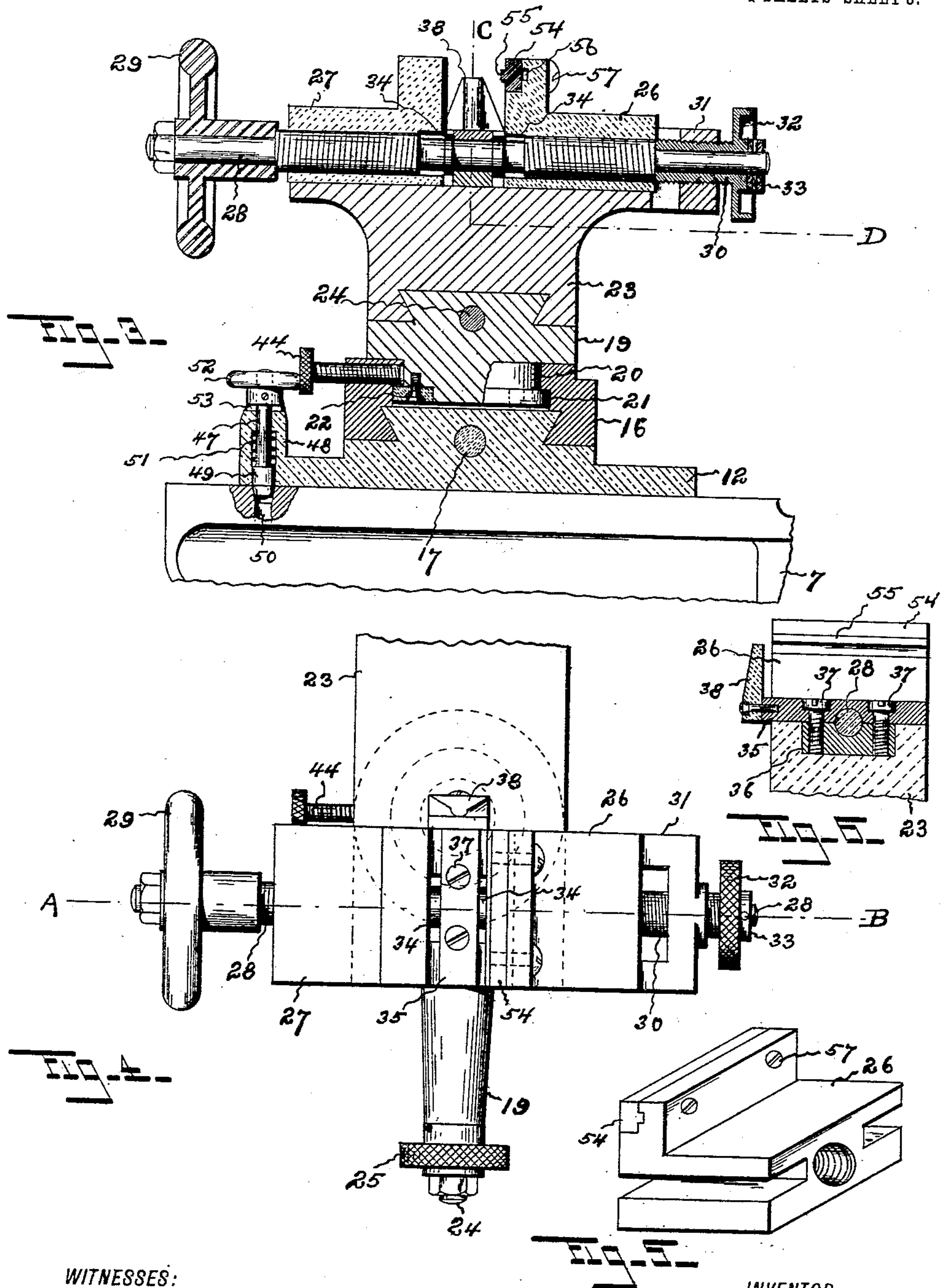
ATTORNEY

W. A. LEONARD.
DIE GRINDER.
APPLICATION FILED JAN. 10, 1910.

976,270.

Patented Nov. 22, 1910.

4 SHEETS—SHEET 3.



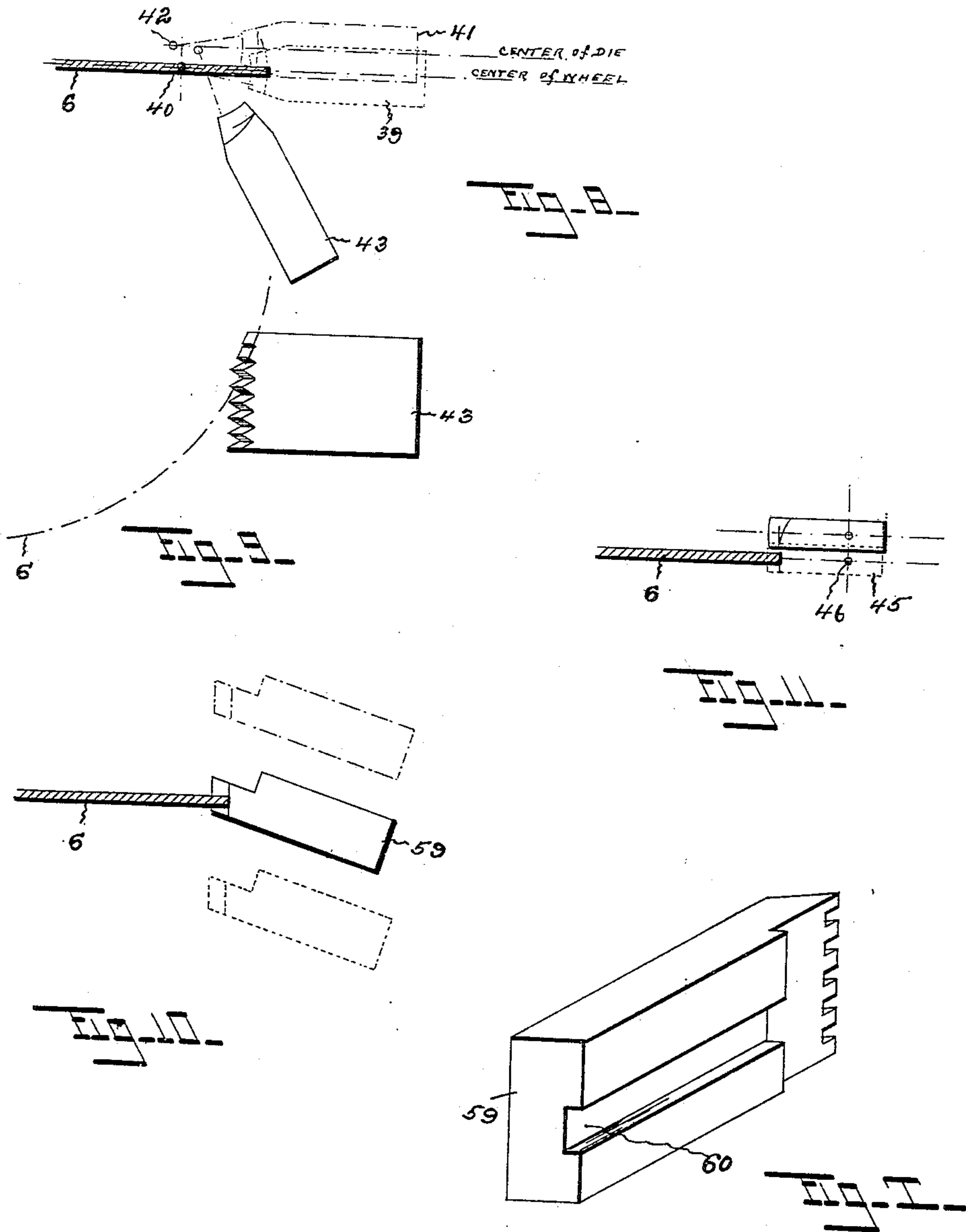
WITNESSES:
Florence H. Monk.
Wallace J. Woyle

INVENTOR
Wilbur A. Leonard
BY George C. Hall
ATTORNEY

W. A. LEONARD.
DIE GRINDER.
APPLICATION FILED JAN. 10, 1910.

976,270.

Patented Nov. 22, 1910.
4 SHEETS-SHEET 4.



WITNESSES:

Florence H. Monk
Wallace P. Murphy

INVENTOR

Walter A. Leonard

BY *George E. Hall*
ATTORNEY

UNITED STATES PATENT OFFICE.

WILBUR A. LEONARD, OF NEW HAVEN, CONNECTICUT, ASSIGNOR OF ONE-HALF TO
HOWARD E. ADT, OF NEW HAVEN, CONNECTICUT.

DIE-GRINDER.

976,270.

Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed January 10, 1910. Serial No. 537,312.

To all whom it may concern:

Be it known that I, WILBUR A. LEONARD, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Die-Grinders, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to new and useful improvements in die grinders, having for its object, among other things, to provide a machine that will grind a threading die or chaser, having either a concaved, convexed or flat face, so as to give the cutting edge a proper clearance; to perform this operation quickly and economically; and to construct the machine with the fewest possible parts, so designed as to be produced at the minimum cost and readily assembled.

To these, and other ends, my invention consists in the die grinder, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures; Figure 1 is a front elevation of my improved die grinder; Fig. 2 is a side elevation thereof; Fig. 3 is an enlarged sectional view thereof upon line A—B of Fig. 4; Fig. 4 is a plan view of the jaws and the mechanism immediately adjacent thereto; Fig. 5 is an isometrical view of one of the jaws; Fig. 6 is a sectional view of the jaw block and stop mechanism upon line C—D of Fig. 3; Fig. 7 is an isometrical view of one of the dies; Fig. 8 is a fragmentary plan view of a portion of the grinding wheel and a tap die, the latter being shown in three of the positions occupied by it in relation to the said wheel during the grinding operation; Fig. 9 is a side view of a tap die; Fig. 10 is a fragmentary plan view of a portion of the grinding wheel, and a mill die, the latter being shown in three of the positions occupied by it during the grinding operation; and Fig. 11 is a view similar to Figs. 9 and 10, a tap chaser being substituted for the die.

In the practice of my invention I provide a pedestal 1, terminating at its upper end in the companion bearings 2, within which the spindle 3, having the wheel disk 5 and grinding wheel 6 thereon, is rotatable by

means of the pulley 4. Movably mounted upon said pedestal is a bracket 7 that is adjustable thereon through a screw 8, having a hand wheel 10 fixed thereto, that is threaded through the lug 9, and rotatable within the fixed lug bracket 11.

Upon the bracket 7 is a slide 12, that is actuated by the hand lever 13, mounted upon the stud 14, and held against movement, when desired, by the thumb screw 15. Movable transversely on said slide, through the screw 17 and hand wheel 18 is the carriage 16 having a circular opening there-through and into which projects the stud 20 upon the rotary carriage 19, said stud being capped at the bottom end by a plate 21 secured by the screws 22.

The jaw block 23 is mounted upon the rotary carriage 19, and movable thereon through the screw 24, having the knurled hand wheel 25 fixed thereto. Slidable in the jaw block 23 are the jaws 26 and 27, connected with each other by the screw 28 that is journaled at one end in the sleeve 30, and having a right and left hand thread thereon. The sleeve 30 is threaded through the lug 31, and is provided with a head member 32, by which it is rotated, a collar 33 preventing an endwise movement of said sleeve on said screw. By rotation of the hand wheel 29, the jaws are moved toward and away from each other and moved as a unit with the screw in the direction of the axis thereof through the rotation of the sleeve 30.

The stop mechanism comprises a plate 35, a block 36 secured to said plate by screws 37, and held against lateral movement in relation to the screws 28 by the integral collar 34, and a stop plate 38 fixed to the overhanging end of the plate 35. Either or both of the jaws, as desired, are provided with a supporting plate 54 that is flat upon one side with a lip 55 upon the opposite side, and held in position by the screws 57, either with the lip projecting beyond the face of the jaw, as shown in Figs. 1, 3, 4 and 6, or into the recess 56, as shown in Fig. 5. During the grinding operation the die or chaser 59 is held between the jaws 26 and 27 with either the bottom thereof resting upon the plate 35 or the side of the recess 60 upon the lip 55 and the threaded face contacting with the stop plate 38.

In grinding a tap die it is first placed between the jaws, as above described, and

then moved to the position in relation to the grinding wheel 6, shown by the broken lines 39 in Fig. 8, wherein the center, designated 40, of the arc of the threaded end of the die is just below the vertical center of the wheel, and coincident with the center of the stud 20. If the die is now moved about this center, the grinding wheel will cut the die concentric with the threaded arc and provide no clearance, but so that it may grind one side of the die slightly more than the other, the die is moved laterally in the jaw block and toward the axis of the wheel until it occupies the position shown by the broken lines 41; wherein the center of the threaded arc is designated by the numeral 42. Now by swinging the jaw block upon the center 40, the position of which has not been changed, the die is ground slightly more upon one side than the other, so that when the grinding operation is completed, the die will have the desired clearance, as shown by the full lines 43 in said Fig. 8, and in side elevation in Fig. 9. The length of the chamfer upon the die can, of course, be varied by raising or lowering the die through the hand wheel 10 and screw 8.

In grinding mill dies the jaw block 23 is moved about its axis so that the threaded end of said die will be parallel with the face of the grinding wheel and then held in this position by the thumb screw 44, the jaw block and die being moved in a plane parallel with the face of the wheel through the lever 13 (see Fig. 10).

The threaded face of a tap chaser is convex and not concaved as in a tap die, hence in the first position, shown by the dotted lines 45 in Fig. 11, the center of the threaded arc, coincident with the center of the stud 20, is moved to the point designated 46, after which the chaser is moved laterally to the position shown by the full lines in said figure. The center of the stud 20 should always be coincident with the vertical center of the wheel 6, and to insure its proper alinement in this position I have provided means whereby this relative position will be automatically determined, said mechanism comprising a pin 47 which is mounted in a lug 48 upon the slide 12, having a head 49 thereon with a tapered end which automatically enters a hole 50 in the bracket 7 through the action of the spring 51, when said pin is brought into register therewith. A thumb button 52 fixed to the end of the pin 48 provides means for lifting the pin and withdrawing the head thereof from the hole 50, and by a rotation of the pin the lips 53 on said button 52 rest upon the top of the lug 48 and hold the head 49 above the top of the slide.

Graduations are provided upon the jaw block, and carriage 16 to insure the proper relative position of the parts for successive

grinding operations, and a graduated collar 61, held by the thumb screw 62 upon the screw 17 adjacent to the hand wheel 18, is utilized to indicate the inward position of the jaw block. All of the dies and chasers shown in Figs. 8, 9, 10 and 11, are right-hand, and the operation of grinding left-hand dies and chasers is exactly the same as herein described for right-hand, with the exception that they are moved to the opposite side of the center of the grinding wheel.

There are minor changes and alterations that can be made within my invention, aside from those herein suggested, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but claim all that falls fairly within the spirit and scope of my invention.

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

1. In a die grinder, the combination with die holding means, comprising a block, jaws mounted therein, means for moving said jaws separately within said block, and means for moving said jaws within said block without changing their positions in relation to each other; of means for moving said die holding means as a unit in either a rotary or straight path; and means for moving the same in a path at substantially a right angle to said rotary or straight path.

2. In a die grinder, the combination with a jaw holding member; of jaws slidably mounted therein; means for moving said jaws toward and away from each other; means for moving said jaws within said holding member without changing their position in relation to each other; and means whereby said jaw holding member, jaws and moving means are actuated as a unit.

3. In a die grinder, the combination with a jaw holding member; of jaws slidably mounted therein; threaded means for moving said jaws toward and away from each other; threaded means for moving said jaws and the aforesaid threaded means as a unit within said holding member whether the same be at rest or in motion.

4. In a die grinder, the combination with a jaw holding member; of jaws slidably mounted therein; means for moving said jaws within said holding member, either separately, so as to vary the space therebetween, or as a unit so as to maintain the same space therebetween, both means being operative if the jaw holding member be stationary or in motion, and comprising a sleeve threaded in said holding member and threaded means rotatable in said sleeve and having a threaded engagement with said jaws.

5. In a die grinder, the combination with a rotarily mounted jaw block; means for

moving the same toward and away from the rotary center of said jaw block; jaws movably mounted in said jaw block; means for moving said jaws toward and away from each other; and means for moving said jaws within said jaw block without varying the width of the space therebetween.

6. In a die grinder, the combination with a jaw block; of jaws slidably mounted therein; means for moving the same toward and away from each other; stop mechanism for locating the position of pieces held by said jaws; means whereby said jaws, moving means and stop mechanism will move as a unit within said jaw block.

7. In a die grinder, the combination with a grinding wheel; an adjustable bracket; a slide movable therein; a carriage movable transversely upon said slide; a carriage rotarily mounted upon the aforesaid car-

riage; means for automatically holding said slide and carriage against movement when the center about which said rotary carriage moves is brought into a predetermined position in relation to the said grinding wheel; a jaw block having a lengthwise movement upon said rotary carriage; jaws mounted therein; means for moving said jaws separately within said block; and means for moving said jaws within said block without changing their positions in relation to each other, said jaw moving means being operative whether the said jaw block is stationary or in motion.

In testimony whereof I affix my signature in presence of two witnesses.

WILBUR A. LEONARD.

Witnesses:

GEORGE E. HALL,
HOWARD E. ADT.