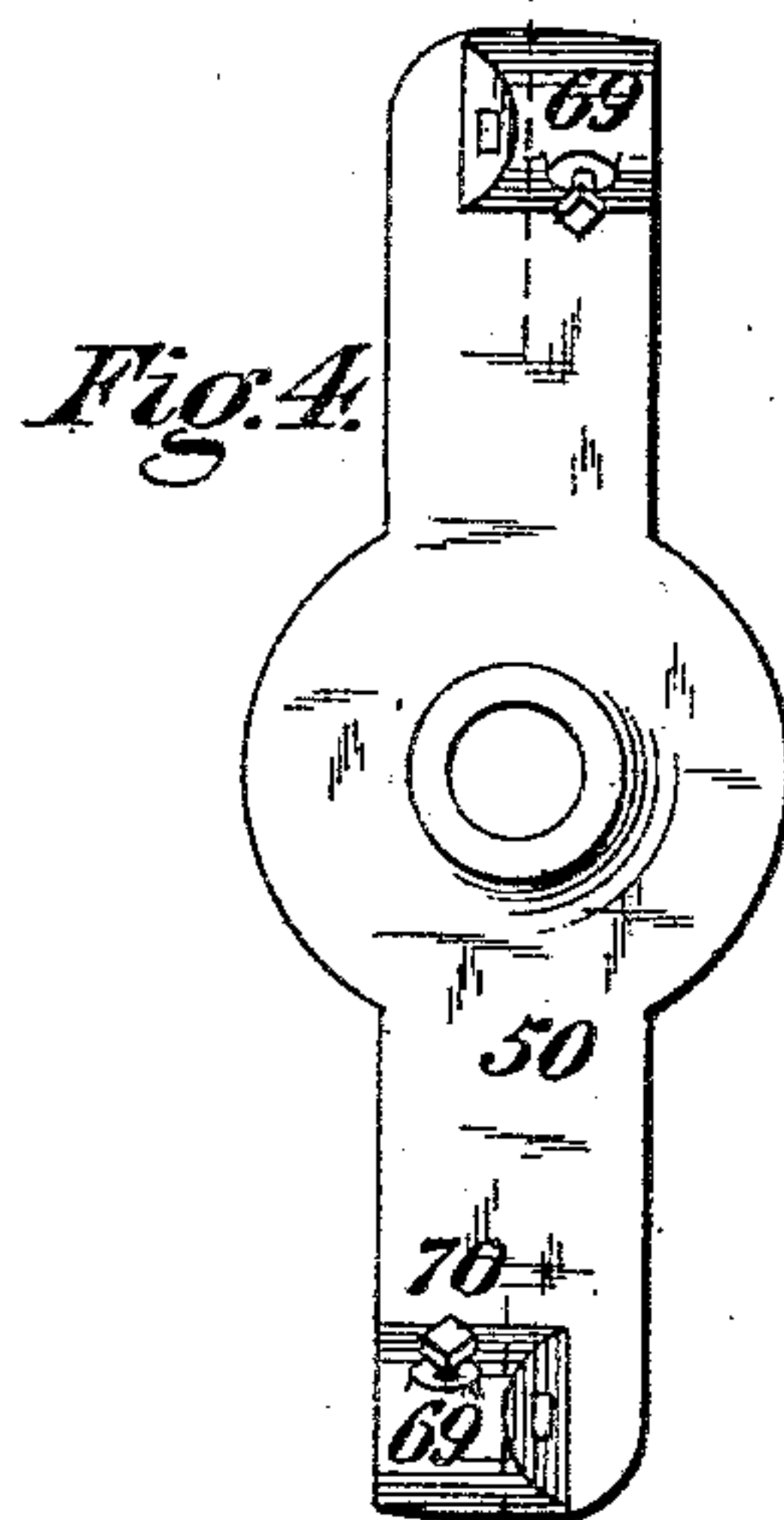
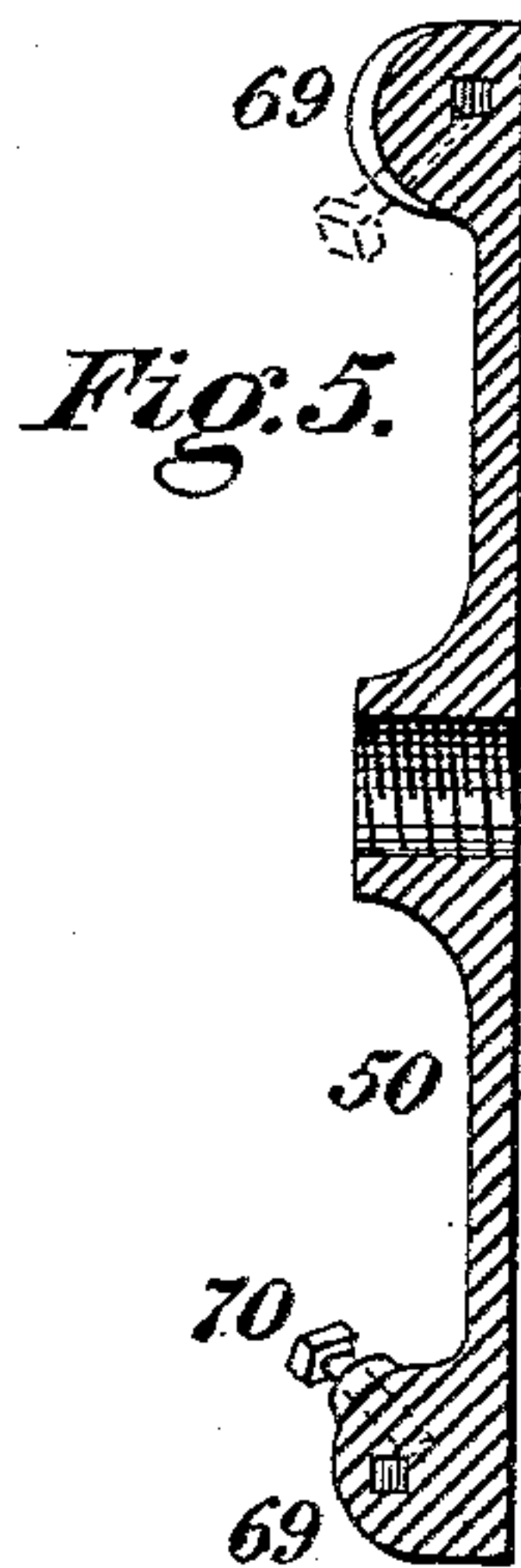
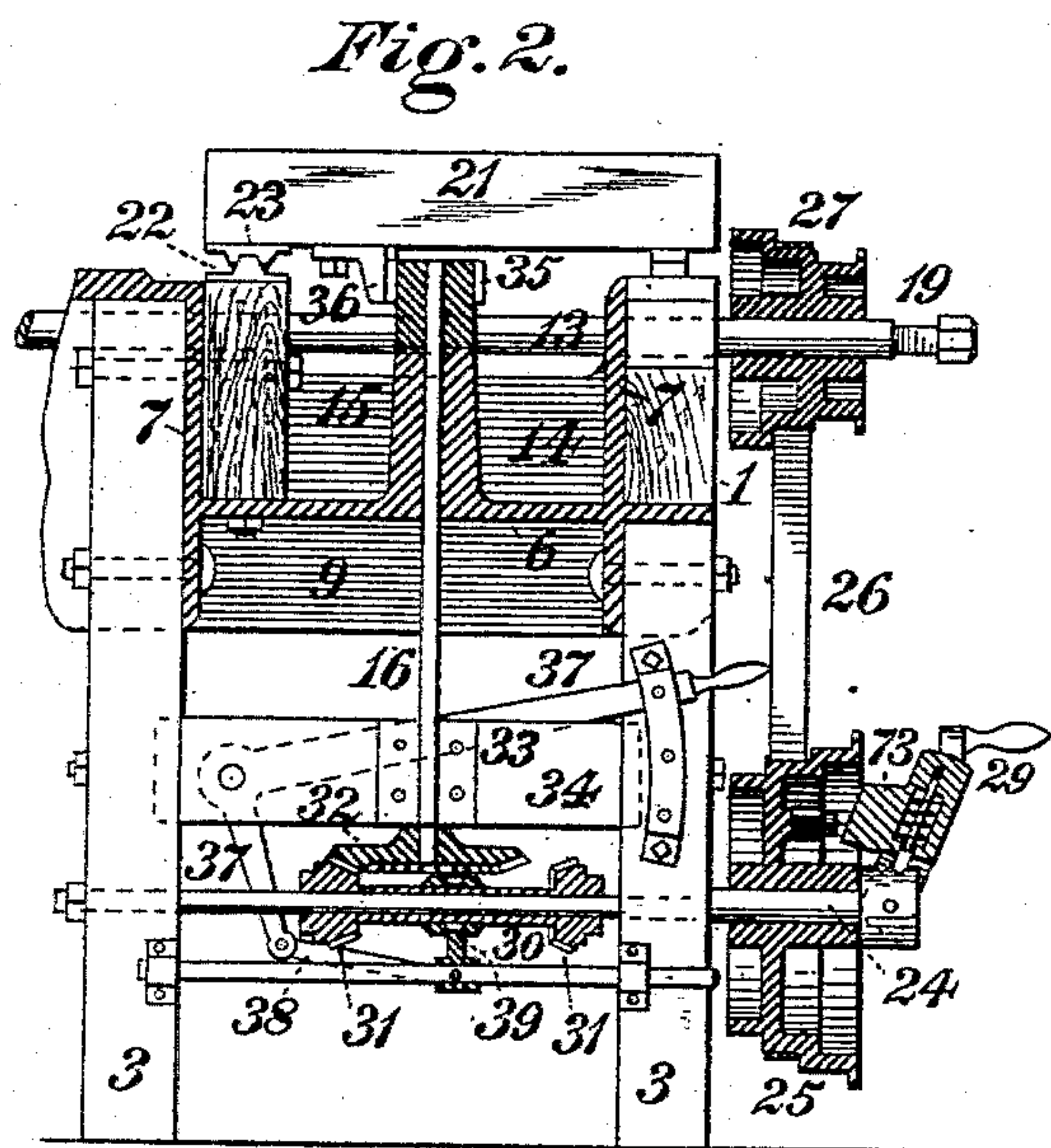
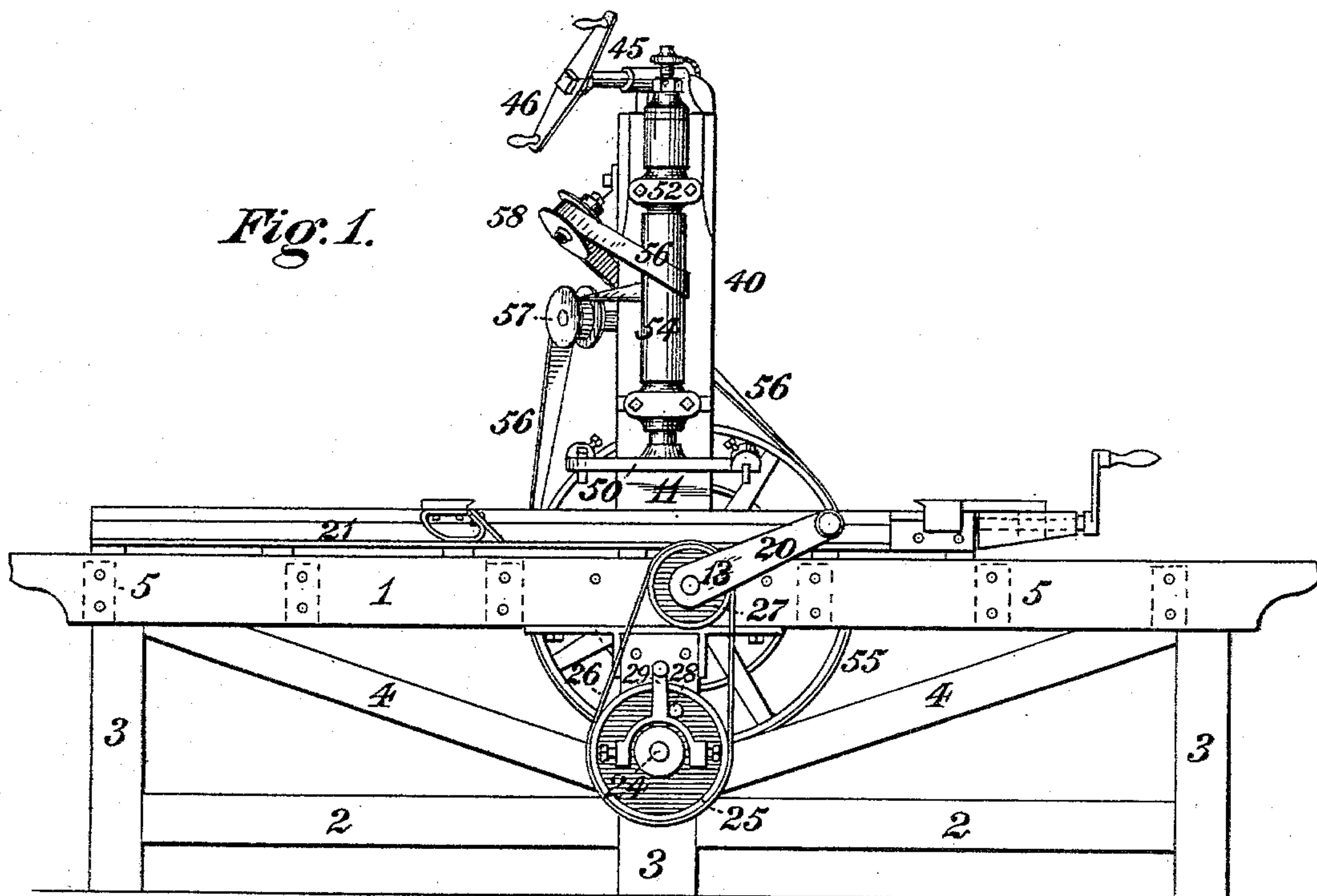


J. BAILLIE.
WOOD PLANING MACHINE.

No. 387,757.

Patented Aug. 14, 1888.



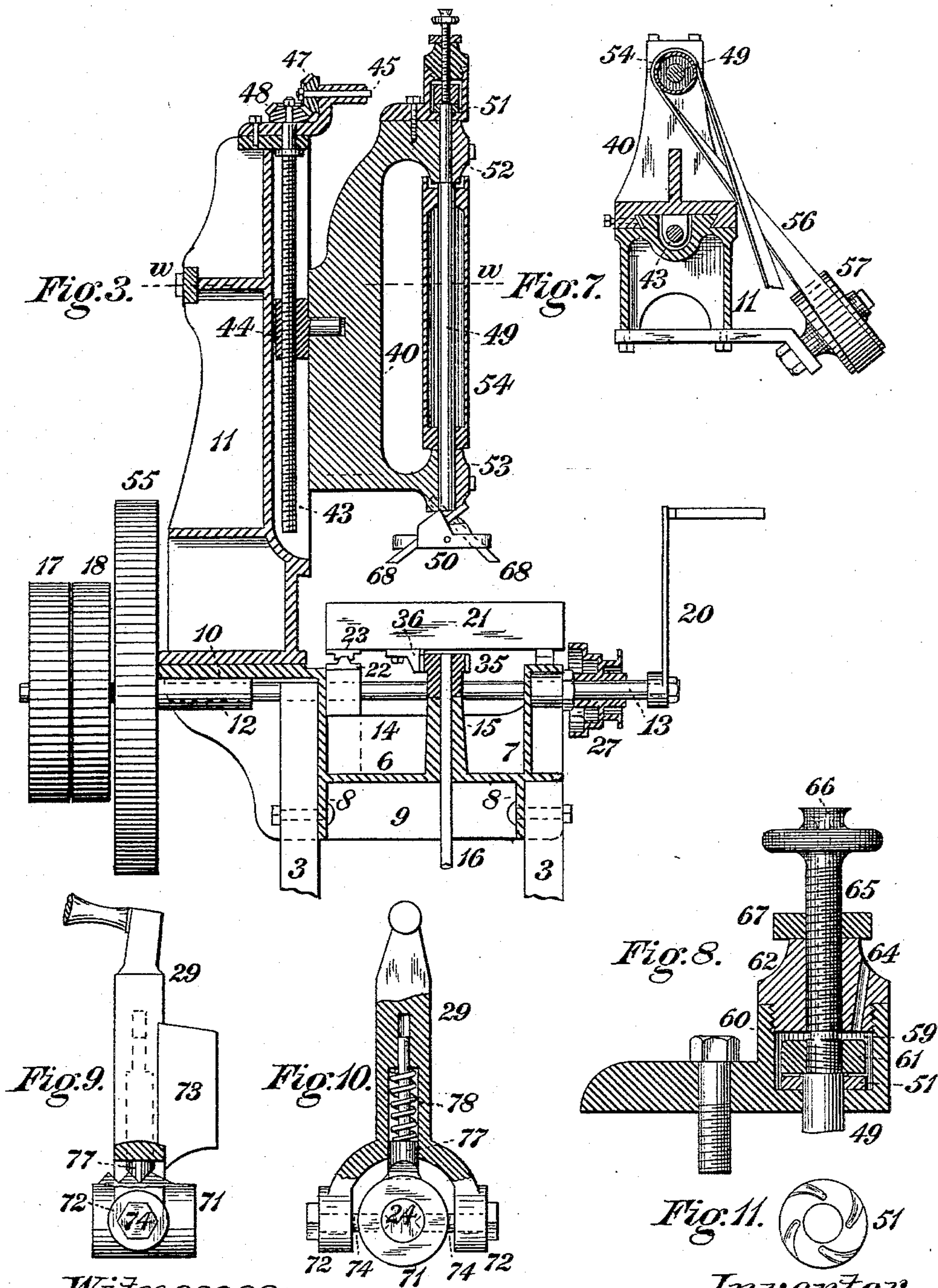
Witnesses:
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C. M. Clarke.

Inventor:
John Baillie,
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UNITED STATES PATENT OFFICE.

JOHN BAILLIE, OF SALEM, OHIO, ASSIGNOR TO EDWIN BAILLIE, OF SAME PLACE.

WOOD-PLANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 387,757, dated August 14, 1888.

Application filed March 9, 1886. Serial No. 194,515. (No model.)

To all whom it may concern:

Be it known that I, JOHN BAILLIE, of Salem, in the county of Columbiana and State of Ohio, have invented certain new and useful Improvements in Wood-Planing Machines, of which improvements the following is a specification.

My invention relates to that class of wood-planing machines known as "Daniels" or "traverse" planers, in which the material to be worked traverses with and upon a reciprocating carriage below a series of rotating cutters which operate transversely to the grain of the wood.

The object of my invention is to provide a planing-machine of such character, which shall be of simple and inexpensive construction, and which may be operated either by hand or by power, as desired.

To this end my invention, generally stated, consists in a traverse planing-machine in which are combined a bed-piece acting as a transverse brace and connection for the frame members, and having bearings for a driving-shaft and a feed-shaft, a driving-shaft journaled in the bed-piece and having a driving-pulley on one end and a seat or bearing for a hand-crank on the other, a cutter-head fixed upon a shaft suspended upon a bearing located within an oil-chamber fixed to a vertically sliding head or carrier, a driving-pulley, and a pair of idler or guide pulleys carrying a belt for rotating the cutter-shaft, a sliding table for carrying the work or stock to be planed, and a feed mechanism adapted to be actuated either from the driving-shaft or independently thereof.

The improvements claimed are hereinafter fully set forth.

In the accompanying drawings, Figure 1 is front view, in elevation, of a traverse planing-machine embodying my invention; Fig. 2, a transverse section at the center of the vertical shaft of the feed mechanism; Fig. 3, a vertical section, on an enlarged scale, through the upper portion of the feed-shaft carrier and its supporting post or standard; Fig. 4, a plan or top view, on an enlarged scale, of the cutter-head; Fig. 5, a vertical section through the same at the line *x x* of Fig. 4; Fig. 6, a view in perspective of one of the cutters detached; Fig. 7, a horizontal section through the cut-

ter-shaft carrier and its standard at the line *w w* of Fig. 3; Fig. 8, a vertical central section, on an enlarged scale, through the step and oil-reservoir of the cutter-shaft; Figs. 9 and 10, side and front views, respectively, of the swinging crank by which the cone-pulley of the horizontal feed-shaft is made fast or loose thereon, as desired; and Fig. 11, a plan or top view of the step or bearing of the cutter-shaft.

In the practice of my invention I provide a frame composed of upper and lower longitudinal beams or stringers, 1 2, vertical posts 3, diagonal braces 4, and transverse end pieces, 5. The frame is firmly braced and tied together at or near its center by a cast-metal bed-piece, which also serves to support the bearings of the driving and vertical feed-shafts and the post of the cutter-shaft carrier, as presently to be described. The bed-piece is composed of a horizontal transverse plate, 6, having vertical end flanges, 7, on its ends and on its upper side, which fit against the sides of the frame-stringers 1, lower vertical end flanges, 8, fitting against the inner longitudinal sides of the center vertical frame-posts, 3, vertical transverse ribs 9, fitting against the transverse sides of said posts, and a projecting horizontal plate, 10, covering one of the stringers 1, and supporting on its upper side the vertical post or standard 11 of the cutter-shaft, and on its lower side one of the bearings 12 of a horizontal main or driving shaft, 13. A vertical rib or plate, 14, extends across the bed-piece between the end flanges, 7, said plate having a central bearing, 15, for a feed-shaft, 16. The frame-posts and stringers are firmly secured by bolts to the adjacent flanges of the bed-piece.

The main or driving shaft 13 is mounted transversely to the frame in the bearing 12 of the bed-piece, and in a suitable bearing upon the opposite end of the bed-piece, and carries upon one of its ends fast and loose pulleys 17 18, for the reception of a belt for transmitting power from a suitable prime mover when it is desired to so operate the machine, and has formed upon its opposite end a squared shank or seat, 19, adapted to receive the hub of a hand-crank, 20, by means of which the ma-

chine may be operated by hand. A bed or table, 21, for the reception of the stock to be planed, and provided with suitable clamps of any well-known and approved construction for holding the same, is adapted to traverse longitudinally on guides or ways 22 on the upper sides of the frame-stringers 1, suitable shoes or bearing pieces 23 being fixed to the lower side of the table.

Rectilineal movement upon the guides 22 is imparted to the table by means of feed gearing of the following construction. A horizontal feed-shaft, 24, is journaled in bearings on the lower frame-stringers, and carries a cone-pulley, 25, which may be made either fast or loose thereon, according as the shaft 24 is to be rotated from the driving-shaft 13, or independently thereof by hand, said pulley receiving a belt, 26, which passes around another cone-pulley, 27, on the driving-shaft, the relative speeds of the driving and feed shafts depending upon the diameters of the two cone-pulleys on which the belt 26 may be placed. The feed-shaft cone-pulley 25 is mounted loosely upon its shaft, and has a stop or projection, 28, on its outer side. A crank, 29, is pivoted to the feed-shaft 24, exterior to the cone-pulley 25, and when swung outwardly, so as to clear the stop 28, permits the shaft to be rotated independently of the pulley; but when moved inwardly upon its pivots makes the pulley fast upon the shaft, admitting, in the former position, of the rotation of the shaft by hand-power applied to the crank, and in the latter of its rotation through the belt 26 from the driving-shaft. The crank 29 is pivoted by a pair of eyes or bosses, 72, upon set-screws 74, forming trunnions and engaging a collar, 71, fixed upon the outer end of the shaft 24, adjoining the hub or boss of its cone-pulley 25.

A tappet, 77, fitting in a recess in the crank 29, engages notches or recesses on the collar 71, being pressed thereinto by a spring, 78, and holds the crank either in position for a dog or projection, 73, on its inner face to engage the stop 28 of the cone-pulley, or for said stop to be clear thereof when the shaft 24 is to be rotated by hand. The handle of the crank is set at an angle therewith, so as to be parallel with the shaft 24 when the crank is swung into position for hand rotation. A sleeve, 30, having a bevel-pinion, 31, upon each of its ends, is adapted to slide longitudinally on a key or feather on the feed-shaft, so that either of said pinions may, as desired, be engaged with a corresponding gear, 32, fixed upon the lower end of a vertical feed-shaft, 16, journaled in a lower bearing, 33, fixed to a cross-bar, 34, of the frame, and in the bearing 15 of the bed-piece. A spur-pinion, 35, fixed upon the upper end of the shaft 16, engages a rack, 36, on the lower side of the table 21, and thereby imparts rectilineal movement thereto in one or the other direction, respectively, according to the direction of rotation of the shaft 16, as determined by the pinion 31 of the shaft 24, which may be engaged with its lower gear, 32.

The sleeve 30 is shifted in position, so that either of its pinions 31 may be engaged with the gear 32 by a bell-crank-shifting lever, 37, pivoted to the cross-bar 34, and having its lower arm coupled by links 38 to pins on a ring, 39, fitting freely around the sleeve 30.

A vertically-traversing head or carrier, 40, is fitted to slide on guides or ways in a vertical post or standard, 11, which is secured at its base to the projecting horizontal plate 10 of the bed-piece. The carrier is moved upon the guides toward and from the upper surface of the stock upon the table 21 by an adjusting-screw, 43, journaled in bearings in the post 11 and engaging a nut, 44, in the carrier. The screw 43 is rotated by a horizontal shaft, 45, mounted in bearings on the top of the post and provided with crank-arms 46, said shaft carrying a bevel-pinion, 47, engaging a similar pinion, 48, on the adjusting-screw.

A cutter-shaft, 49, upon the lower end of which is screwed a cutter-head, 50, is suspended upon a step or bearing, 51, at the top of the carrier 40, and is maintained in normal axial position by guide-bearings 52 53 at the upper and lower ends of the carrier, between which guide-bearings a long cylindrical pulley, 54, is secured upon the cutter-shaft. A driving-pulley, 55, fixed upon the driving-shaft 13, adjacent to its fast and loose pulleys 17 18, carries a belt, 56, which passes vertically to and around a guide-pulley or idler, 57, journaled on one side of the post 11, and thence horizontally and forwardly to and around the cutter-shaft pulley 54, from which it is led upwardly and rearwardly to and around another guide-pulley or idler, 58, which is journaled with its axis at an angle to that of the idler 57 on the post 11, (both the idlers 57 58 being located on the same side of the axis of the cutter-shaft 49, so that the belt 56 shall be crossed between said idlers and the cutter-shaft pulley 54,) and thence to the driving-pulley 55. The cutter-shaft pulley 54 is made of sufficient length to admit of the determined vertical traverse provided for the head 40 and the cutter-shaft carried therein to accommodate stock of different thicknesses, so that the belt 56 may have its full bearing upon the pulley 54 at all points in such traverse; and it will be seen further that the belt, which in all vertical adjustments of the position of the head and shaft embraces the largest practicable segment of the surface of the cutter-shaft pulley, passes to said pulley perpendicularly to its axis and leaves it at an angle to its axis, so as to exert its traction most effectively upon it.

The upper step or bearing, 51, upon which the cutter-shaft 49 is hung and upon which it rotates, is of annular form and grooved upon its upper face for the reception of oil, and is fitted in an oil-chamber, 59, formed within a casting, 60, bolted to the top of the carrier 40. The cutter-shaft 49 bears upon the step 51 through a hardened steel collar, 61, screwed upon the end of the cutter-shaft. The oil-chamber is closed by a cap, 62, having a hole,

64, for the supply of oil. End-play of the cutter-shaft is prevented by a set-screw, 65, which may have a central oil-hole, 66, and is screwed centrally into the cap 62, so as to bear upon the end of the cutter-shaft, being locked in adjusted position in the cap by a jam-nut, 67.

The planing of the stock on the table 21 is effected by two or more gouge-shaped cutters, 68, each of which is secured in a socket, 69, at the outer end of one of the arms of the rotating cutter-head 50. The cutters 68 are formed of square steel, properly ground off at their ends, and are fitted in sockets of similar section, in which they are clamped by set-screws 70, bearing upon one of their angles and holding them firmly against the two opposite faces of their sockets. Such construction is not herein claimed, as it will constitute the subject-matter of a separate application by me.

My improvements provide a planing-machine of comparatively low cost of construction, which will effectively perform its function of planing lumber so as to be perfectly square and out of wind, and which, being susceptible of operation by hand or by power, as may be found most suitable, is desirably applicable as a labor-saver in the shops of wagon and carriage makers and general workers in hard wood, particularly where the use of power is not convenient or practicable.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of a frame formed of separable longitudinal stringers and vertical posts, a bed-piece connecting said stringers and posts and forming the base of a cutter-head post or standard, and a cutter-shaft and cutters mounted in bearings on a standard fixed upon said bed-piece, substantially as set forth.

2. The combination of a frame, a bed-piece connecting the stringers thereof, a driving-shaft mounted in a bearing in the bed-piece and carrying upon one end a driving-pulley and upon the other a seat or bearing for a hand-crank, a vertical standard fixed upon the bed-piece, and a cutter-shaft and cutters mounted in bearings in said standard, substantially as set forth.

3. The combination of a frame, a bed-piece connecting the stringers thereof, a driving-shaft mounted in a bearing in the bed-piece, a

horizontal feed-shaft adapted to be rotated either by a belt from the driving-shaft or independently thereof, and a vertical feed-shaft gearing with said horizontal feed-shaft, said vertical shaft being journaled in a bearing in the bed-piece, and carrying a gear meshing with a rack on a table adapted to traverse on ways upon the frame-stringers, substantially as set forth.

4. The combination of a frame, a driving-shaft carrying a pulley and mounted in bearings transversely to the frame, a vertical post or standard located upon one side of the frame, a carrier adapted to travel vertically on said post, a cutter-shaft carrying a head and cutters and a long pulley and journaled in said carrier, and a pair of idlers or guide-pulleys journaled on the cutter-head standard, said idlers being arranged in approximately the same vertical plane and having their axes inclined one to the other and located on the same side of the cutter-shaft, substantially as set forth.

5. The combination of a frame formed of longitudinal stringers and vertical posts, a bed-piece connecting said stringers and posts and provided with a lateral extension, a vertical post or standard fixed upon said lateral extension, a carrier adapted to traverse vertically on said post, a cutter-shaft carrying a head and cutters and journaled in said carrier, a driving-shaft journaled in the bed-piece, and a pair of idlers or guide-pulleys journaled on the cutter-head standard and adapted to carry a belt from a pulley on the driving-shaft to a pulley on the cutter-shaft, substantially as set forth.

6. The combination of a cutter-shaft carrier having an upper and a lower guide-bearing, an oil-chamber secured to the top of said carrier, a step or bearing fitted in said chamber, a cutter-shaft passing through the guide-bearings and having a cutter-head and cutters on its lower end, a collar fixed upon the cutter-shaft and resting upon the step, and a set-screw engaging the cap of the oil-chamber and bearing against the upper end of the cutter-shaft, substantially as set forth.

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Witnesses:

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