

No. 790,259.

PATENTED MAY 16, 1905.

J. MILLS.  
SHAPER.

APPLICATION FILED JULY 18, 1904.

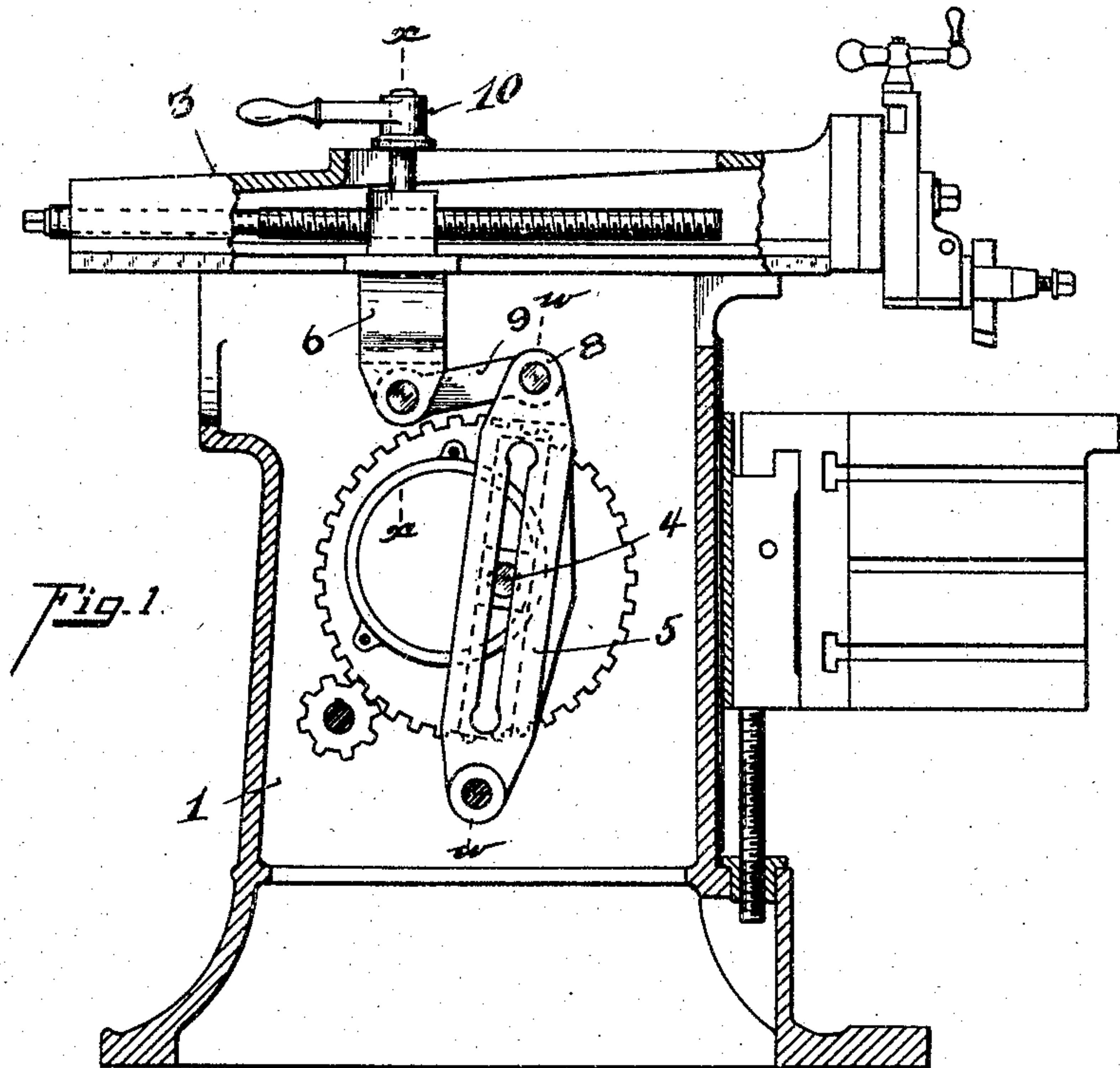


Fig. 1.

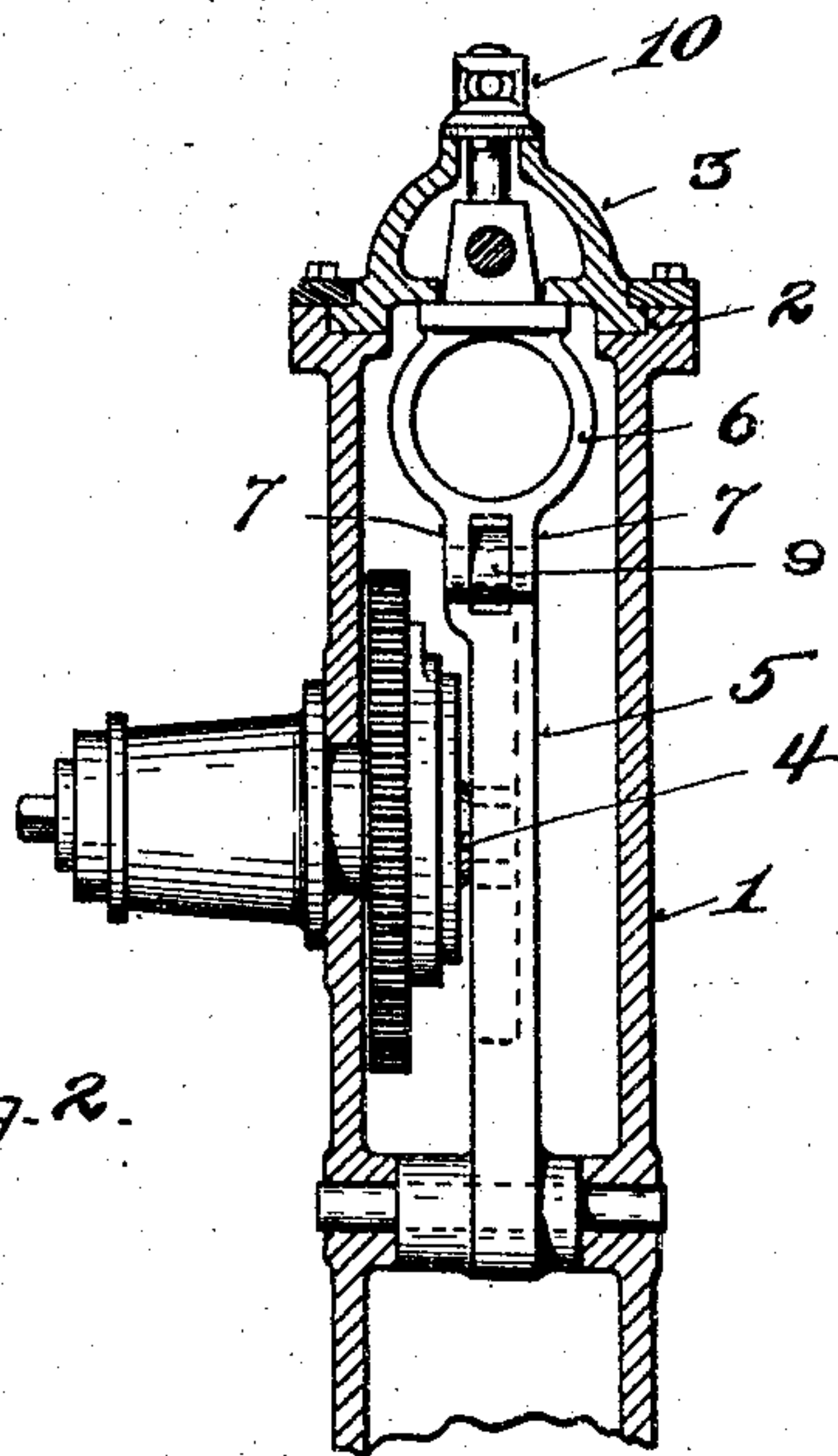


Fig. 2.

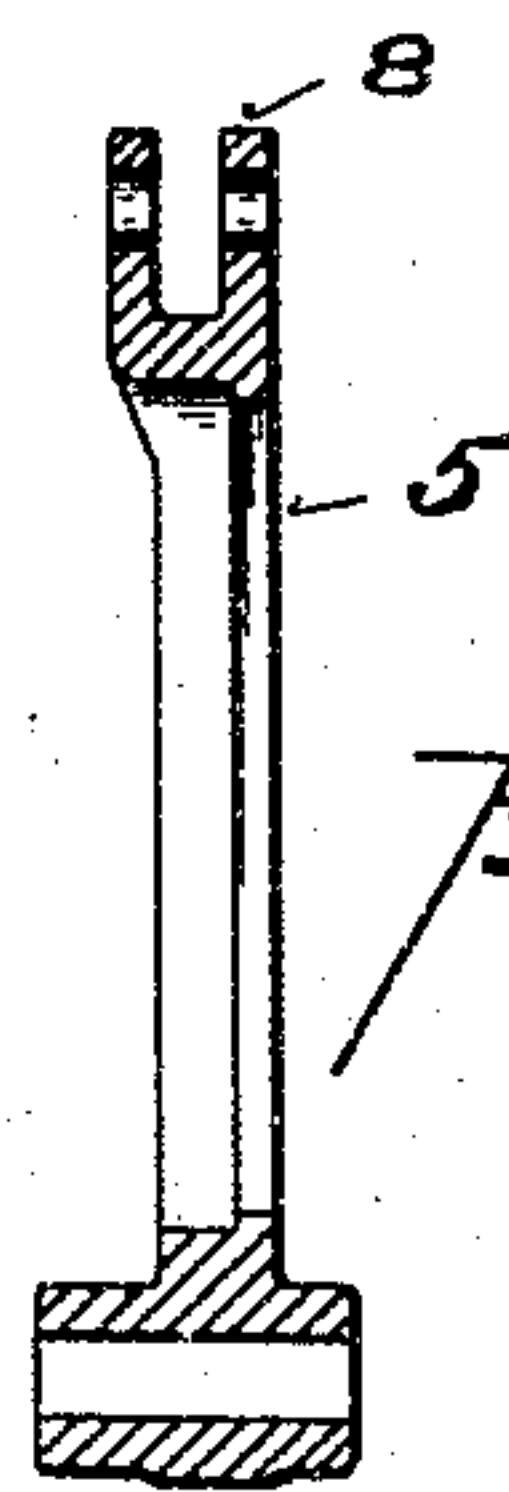


Fig. 3.

Inventor

Witnesses

*Oliver B. Kain*  
*Louis Beck*

By

*James Mills*  
*Wood & Wood*  
Attorneys



# UNITED STATES PATENT OFFICE.

JAMES MILLS, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO  
ALBERT S. SMITH, OF CINCINNATI, OHIO.

## SHAPER.

SPECIFICATION forming part of Letters Patent No. 790,259, dated May 16, 1905.

Application filed July 18, 1904. Serial No. 217,085.

*To all whom it may concern:*

Be it known that I, JAMES MILLS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Shapers, of which the following is a specification.

My invention relates to an improvement in a machine of the shaper class, and has particular reference to the provision of new and improved connections between the tool-holder, technically known as the "ram," and the actuating-pendulum or rock-arm.

The principal object of the invention is to afford increased capacity, efficiency, and convenience of the shaper in doing that class of work—as, for instance, key-seating the shaft—in which the work is inserted longitudinally through the hollow body of the machine under the ram.

The features of the invention are more fully set forth in the description of the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a central vertical section, partly in elevation, of my improved shaper. Fig. 2 is a section on line *xx*, Fig. 1. Fig. 3 is a section on line *ww*, Fig. 1, of the crank-lever.

I have illustrated the conventional shaping-machine and will describe only so much of it as need be to explain the invention.

1 represents the upright hollow body, on the top of which is formed the horizontal way 2.

3 represents the tool-holder or ram gibbed to the ways 2 and reciprocated thereon by means of a rocking arm or "reciprocating pendulum" 5, as it is technically called, which is within the body of the machine and moves in the arc of a circle longitudinal of the body of the machine and under the ram. 4 represents mechanism for reciprocating the said pendulum as described, consisting of an eccentric stud-shaft journaled in a sliding box, said box traveling in a way formed in the pendulum, said stud-shaft being adjustably fixed to a driving-gear, or any well-known method of operating a crank-lever or pendulum of a shaper may be employed. The work under opera-

tion is passed longitudinally through the body of the machine under and parallel with the ram and between the ram and the pendulum and supported in this position.

With my invention I design to adapt the machine to receive the largest-diameter work which can pass through the body of the machine longitudinally under the ram. To this end I desire that the pendulum in its arc of movement shall not intercept the lowest horizontal plane of the largest-diameter work designed to be held in a machine of a given size. Therefore it is necessary that the connection between the ram and its actuating member be such as will permit the work to pass through the body under the ram and that the horizontal plane of the work will not be intercepted by the pendulum or the connections between the pendulum and the ram. I also desire that that portion of the connection between the ram and the pendulum through which the work passes shall not rock in the arc of a circle, like the upper end of the pendulum, but shall reciprocate with the ram in the horizontal plane of the work, thus passing loosely back and forth over the work without possibility of disturbance. To accomplish these results, I form or fix on the bottom of the ram between the ways a sleeve-casting 6, the internal diameter of which is greater than the external diameter of the largest shaft or work designed to be used in a given machine. The barrel of this sleeve or longitudinal length is in the direction of the longitudinal length of the ram and the machine-body, and this sleeve fits loosely in the longitudinal hollow portion of the body at the top under the ram. From the under side of this sleeve-casting are depended the bracket-ears 7. The upper end of the pendulum is provided with the forked end 8.

9 represents a connecting-rod one end of which is pivoted between the ears 7 of the sleeve-casting and the other end of which is pivoted in the fork end 8 of the pendulum.

It is obvious that as the pendulum is reciprocated the connecting-rod 9 will transmit the proper reciprocatory motion to the ram



through the sleeve-casting and that all the operations and paths of movement of the actuating and connecting members will be below the horizontal plane of the bottom of the sleeve, and hence entirely below the work. The sleeve 6 will reciprocate with the ram in the horizontal plane in which the work is supported, passing loosely back and forth horizontally over the work without contact and without danger of being injured or displaced, at the same time affording the greatest capacity, efficiency, and convenience in this class of work. The position of the ram relative to the table may be adjusted by releasing hand-nut 10, screw-threaded on the sleeve 6, and changing the sleeve position on the ram.

It will be observed that the bolts connecting the connecting-rod 9 with the pendulum and with the casting 6 lie substantially in a horizontal plane. The slot in which the eccentric 4 works is carried well up toward the top of the pendulum, and the ram is extended downward by means of a depending casting 6 to a position substantially opposite the upper end of the pendulum in a horizontal plane. As a result of this arrangement I am enabled to keep all of the working parts for reciprocating the ram under the line of the work or shaft supported through the casting 6 without sacrificing any power. As a further result the pendulum imparts substantially horizontal strains to the ram in a plane parallel to the gibbed way, and hence there are substantially no lifting or pulling strains between the ram and its gibbed way, increasing the life and efficiency of the machine in this particular. I have also found it convenient and readily possible with this arrangement to secure a shaft or rod in the casting 6, mounting a tool-post on the rod or shaft, and so adjustably extending the tool-post, which is frequently advantageous and which could not be done without such a sleeve-casting on the base of the ram with the rocking mechanism operating below the sleeve.

Having described my invention, I claim—

1. In a shaper-machine for key-seating shafts and like work, a hollow body having openings for the reception of the work, a guideway at the top, a ram engaging said way, a rocking pendulum in the body for reciprocating the ram, means for actuating the pendulum, a sleeve-casting attached to the base of the ram and extending longitudinally into the work-receiving portion of the body, the opening of said sleeve being alined with the said work-receiving openings of the body, said sleeve being adapted to encircle the horizontally-supported work, and pivotal connections between the pendulum and the under side of the sleeve whereby the said sleeve may be horizontally reciprocated with the ram and the work supported wholly within said sleeve at a position above the said mechanism for actuating the ram, substantially as described.

2. In a machine for key-seating shafts and like work, a hollow body, a guideway at the top, a ram engaging said way, means for supporting the work longitudinally through the body under the ram, a rocking pendulum internal of the body for reciprocating the ram, means for actuating the pendulum, a sleeve-casting attached to the base of the ram and extending longitudinally into the upper portion of the body and adapted to encircle the work, the casting being provided with an ear on its under side, the pendulum extending up to a position substantially horizontally opposite the said ear, and a connecting-rod pivoted to the said ear and the pendulum, whereby the working parts are below the sleeve and the strains between the pendulum and ram are substantially horizontal, substantially as described.

In testimony whereof I have hereunto set my hand.

JAMES MILLS.

Witnesses:

OLIVER B. KAISER,  
LUISE BECK.