No. 667,912. Patented Feb. 12, 1901.

J. D. HAZLET.

TAPER ATTACHMENT FOR METAL WORKING LATHES.

(Application filed Nov. 8, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

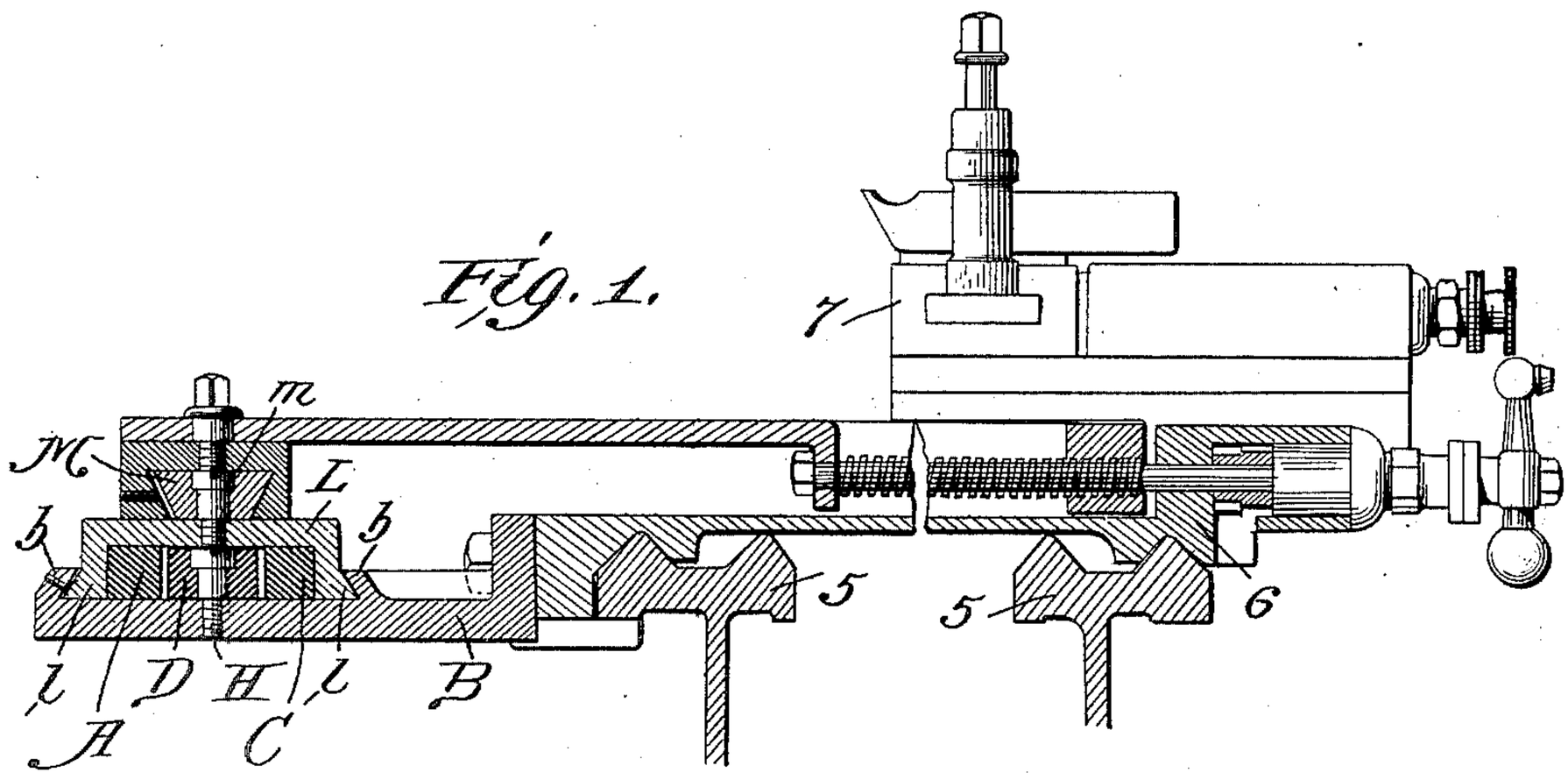

Fig. 2.

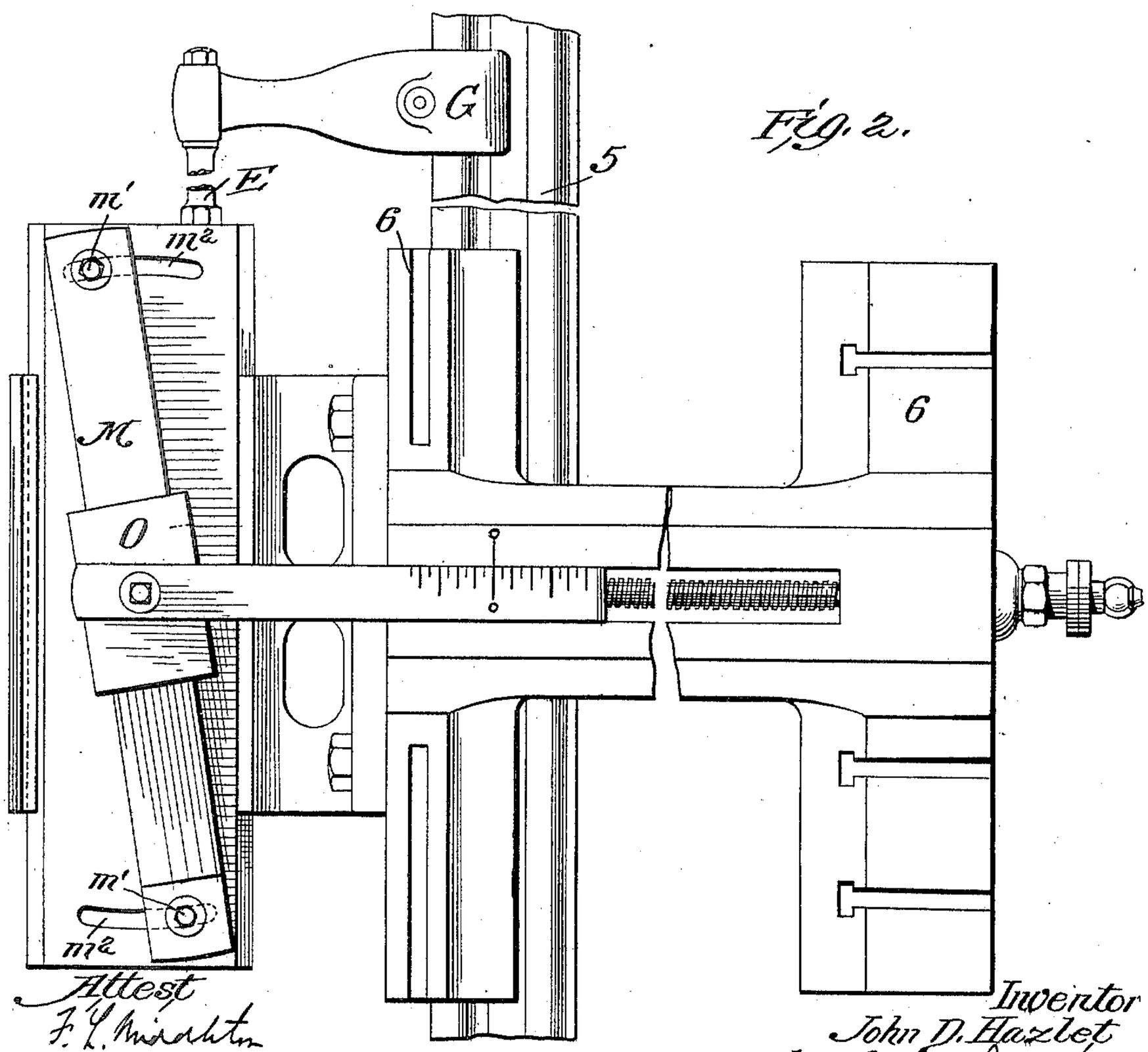

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Fig. 3.

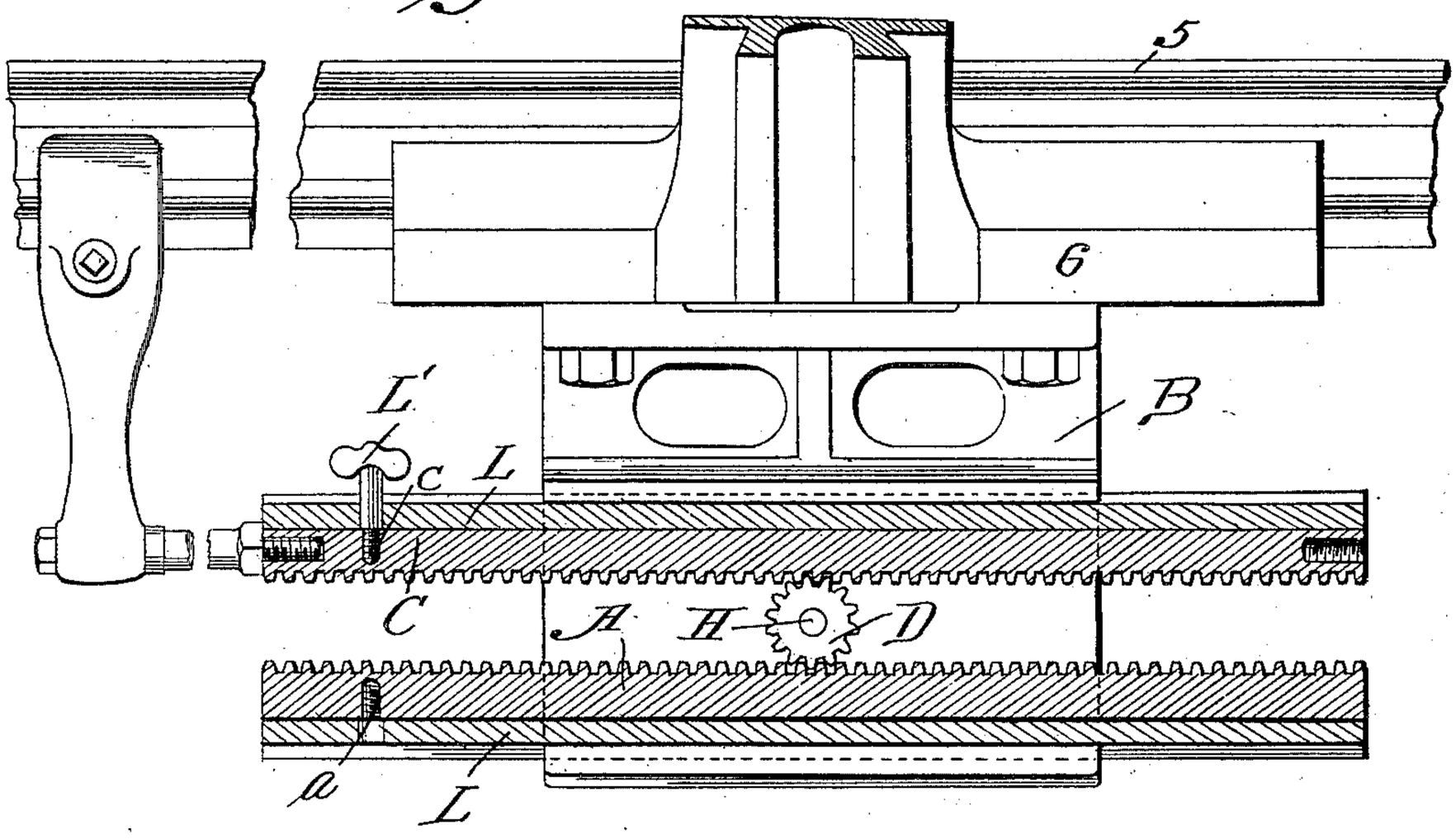
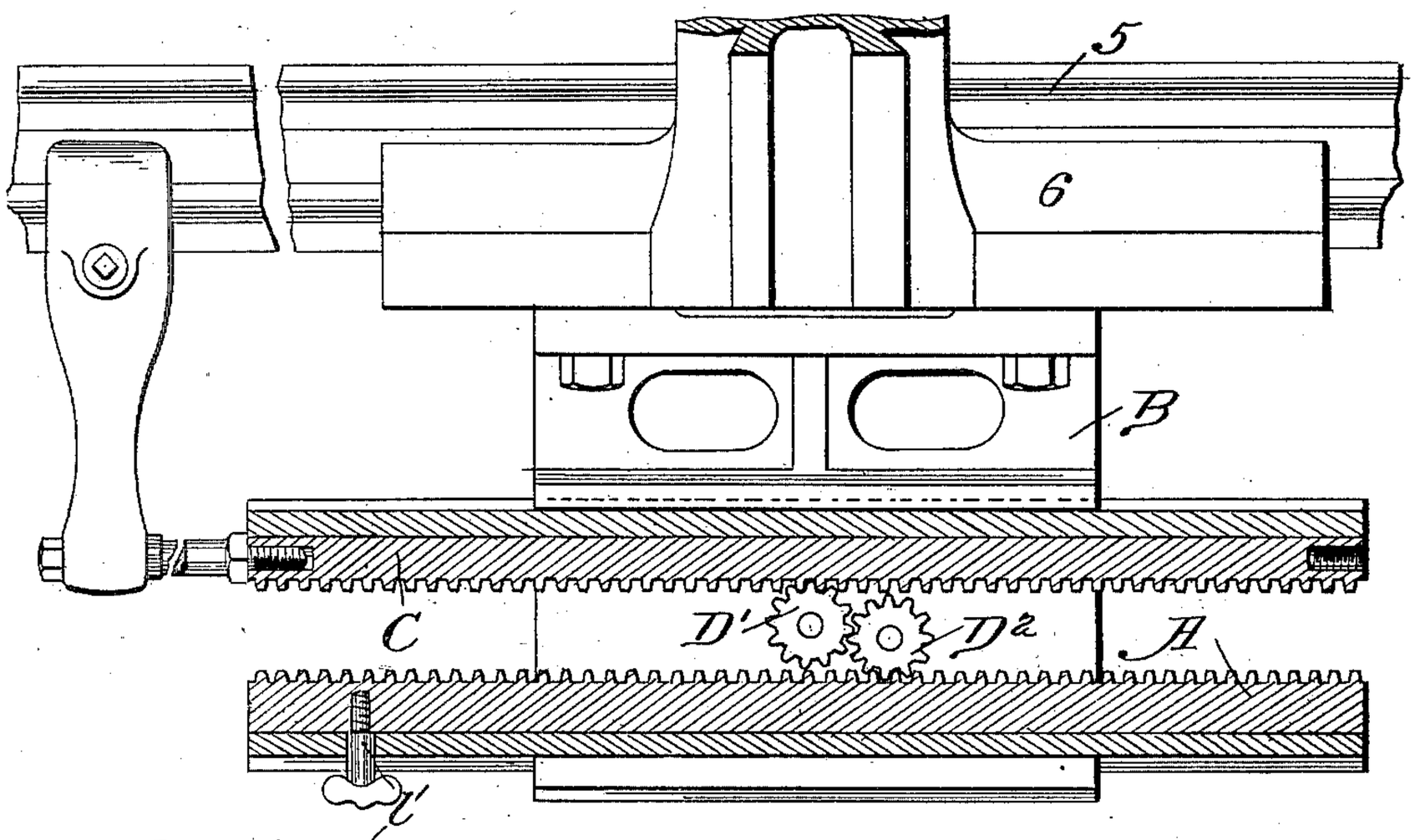


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TAPER ATTACHMENT FOR METAL-WORKING LATHES.

SPECIFICATION forming part of Letters Patent No. 667,912, dated February 12, 1901.

Application filed November 8, 1900. Serial No. 35,862. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. HAZLET, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Taper Attachment for Metal-Working Lathes, of which the following is a specification.

My invention relates to improvements in taper attachments for metal-working lathes.

One object of the invention is to provide a construction whereby reverse tapers may be cut without changing the inclination of the angle-rail.

A further object is to secure an arrangement by which a maximum transverse movement of the tool-holder is secured without the necessity of adjusting the angle-rail to such a degree as to interfere with the free movement of the slip-block thereon.

I have also aimed to improve the general construction and arrangement of the parts, as hereinafter described.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section on line x x of Fig. 2. Fig. 2 is a plan view. Fig. 3 is a sectional plan, and Fig. 4 a similar view of a modification.

Referring to the figures, the numerals 5 5 represent the shears of an ordinary metal-working lathe to which my improved taper attachment is applied, and 6 the carriage upon which is mounted the tool-rest 7 in the usual or any desired manner, but so as to be capable of movement toward and from the work. To the face or edge of the carriage I bolt or otherwise rigidly secure a bracket B, which has upon its upper face ribs b, parallel with the shears 5, between which ribs is held a guide L, having a channel in its under face. The lower edges l of the guide are preferably flared outwardly or dovetailed, and the ribs b are correspondingly inclined on their inner or opposing faces, as shown in Fig. 1. Centrally between the guide L and the bracket B is journaled a gear wheel or pinion D, mounted upon a screw H, entering the bracket, as also clearly shown in Fig. 1. Upon opposite sides of the pinion and between it and the opposing walls of the bracket are located two racks A and C, one of which is secured by a suitable rod E and clamp G with the shear or other stationary part of the lathe, whereby it is held against any longitudinal movement. Means are provided by which either rack may be rigidly connected with the guide at will, such means in the present instance comprising a thumb-screw L′, adapted to pass through an opening in either edge of the guide and to engage a threaded opening a or c in the respective rack. In Fig. 3 the screw is shown as connecting guide L and the rack C.

Upon the upper face of the guide L is pivotally mounted an angle-rail M by means of a pivot-screw m, while the opposite ends carry bolts or screws m', adjustably engaging arc shaped slots m^2 in the guide. These slots are arranged so that the angle-rail may be adjusted from a position parallel to the shears to the greatest inclination desired. Upon the angle-rail is located a slide-block O, which is connected in the usual manner with the tool-rest.

From the above description the operation will be clear, but may be briefly stated as follows: With the bar c locked to the guide, as shown in Fig. 3, it will be seen that the angle-rail will be held stationary and the slide-block will move thereon in substantially the ordinary manner. Now if it be desired to turn a reverse taper of exactly the same inclination it will be seen that all that is necessary is to disconnect the guide from rack C by removing the thumb-screw and to connect the guide with rack A. As now the carriage moves to the right the movement of the bracket will cause the pinion to drive the rack A at double the rate of speed of the carriage, and as the slide is now connected with said rack A the angle-rail will also be moved at double the rate of speed of the carriage and the slip-block will move the tool-holder in the opposite direction, thus cutting a reverse taper. It will also be understood that instead of the above operation, if desired, the reverse taper might be turned or bored in the usual manner—that is, by leaving guide L connected to rack C and reversing the inclination of the angle-rail.

In order to provide for increased transverse movement of the tool-holder without the necessity of adjusting the angle-rail to such a degree as to interfere with the free movement of the slip-block thereon, I have devised the construction illustrated in Fig. 4, in which I use two pinions D′ and D², meshing with each other, the one, D′, engaging with the rack C, while the other engages the rack A. Rack A in this case is locked to the guide L by a set-screw *l*′, and it will thus be seen that as the bracket and slip-block move forward the rack A and guide L will be driven backward at an equal rate of speed, and thus double the transverse movement will be imparted to the tool-holder with an equal inclination of the angle-rail.

Heretofore, as far as I am aware, taper attachments have been graduated at the end of the angle-rail; but I have found it advantageous to graduate the bar extending from cross feed-screw to the slip-block at rear of carriage, each graduation representing one-sixteenth inch for each foot of taper. When the angle-rail is parallel with the lathe-shears, a zero-mark is designated, and the slip-block bar (to screw) and carriage and the graduations extend to right and left of zero-mark on the bar, as this is necessary for reverse tapers. An indicator-mark one foot from the center of the angle-rail is made on the rail, to agree with a corresponding mark on the slip-block, so that when the slip-block is one foot from the center of the angle-rail these marks are even with one another. The angle-rail is then set by graduations one-sixteenth inch, one-eighth inch, one-fourth inch, one-half inch, &c., by means of graduations on the cross feed-screw bar connected to the slip-block.

Having thus described my invention, what I claim is—

1. In a taper-turning lathe, the combination with the carriage having a transversely-movable tool-holder and a slip-block connected to said holder, of an angle-rail and means for automatically moving said angle-rail longitudinally with relation both to the lathe bed or shears and the slip-block, substantially as described.

2. In a taper-turning lathe, the combination with the carriage having a transversely-movable tool-holder and a slip-block connected to said holder, of an angle-rail supported and guided by the carriage, and means for automatically moving said angle-rail longitudinally with relation both to the lathe bed or shears and the slip-block, substantially as described.

3. In a taper-turning lathe, the combination with the carriage having a transversely-movable tool-holder and slip-block connected to said holder, of a bracket on the carriage, a rack supported from said bracket and rigidly connected to a stationary part of the lathe, an angle-rail coöperating with said slip-block, and rack-and-pinion connections between said angle-rail and first-named rack, substantially as described.

4. In a taper-turning lathe, the combination with the carriage having a transversely-movable tool-holder and a slip-block connected to said holder, of an angle-rail, and means whereby said angle-rail may be either held stationary or moved faster than the tool-holder, substantially as described.

5. In a taper-turning lathe, the combination with the carriage having a transversely-movable tool-holder and a slip-block connected with said holder, of an angle-rail, means for connecting said angle-rail rigidly to the lathe-frame, and rack-and-pinion connections (normally inactive) for moving said angle-rail faster than the carriage when said first-named connections are disconnected, substantially as described.

6. In a metal-turning lathe, a rigid rack, and a movable rack with an interposed idler-gear meshing with each, an angle-rail, means whereby said angle-rail may be separately connected to either of said racks, and a tool-holder connected to said slip-block, substantially as described.

7. In a metal-turning lathe, a bracket carried by the carriage, a guide slidingly carried thereby, opposing racks within said guide, a pinion journaled in said bracket between said racks and meshing with both, means for holding one of said slides against movement, means for connecting either of said slides with said guide, an angle-rail carried by said guide, and a slip-block connected with the tool-holder of the lathe, substantially as described.

8. In a taper attachment for lathes, a bracket on the carriage having parallel ribs, a guide slidingly held by said ribs, opposing racks within said guide, one of said racks being stationary, a pinion journaled in the bracket and meshing with both of said racks, means whereby said guide may be connected with either of said racks, and an angle-rail carried by said guide, substantially as described.

9. In a taper attachment for lathes the combination with the carriage, of a fixed and a movable rack, a guide embracing the same, a pinion journaled on an axis supported from said carriage and meshing with both said racks, a set-screw for connecting said guide with either the fixed or the movable rack, and an angle-rail carried by said guide, substantially as described.

10. In a taper-turning lathe, the combination with the carriage and tool-holder, a slip-block connected with said holder, an angle-rail, a support or guide for said angle-rail, means whereby said support or guide may be held stationary or moved faster than the carriage, and means whereby said angle-rail may be adjusted from a position parallel with the line of movement of the carriage to any desired angle, substantially as described.

11. In a taper-turning lathe the combina-

tion with the carriage and tool-holder, of an angle-rail, a slip-block, means for automatically moving said angle-rail longitudinally with relation both to the lathe bed or shears and the slip-block, a bar connecting said slip-block and tool-holder, and graduating-marks on said bar and carriage, substantially as described.

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

JNO. D. HAZLET.

Witnesses:
JOHN H. COSTELLO,
GEO. F. DINSER.