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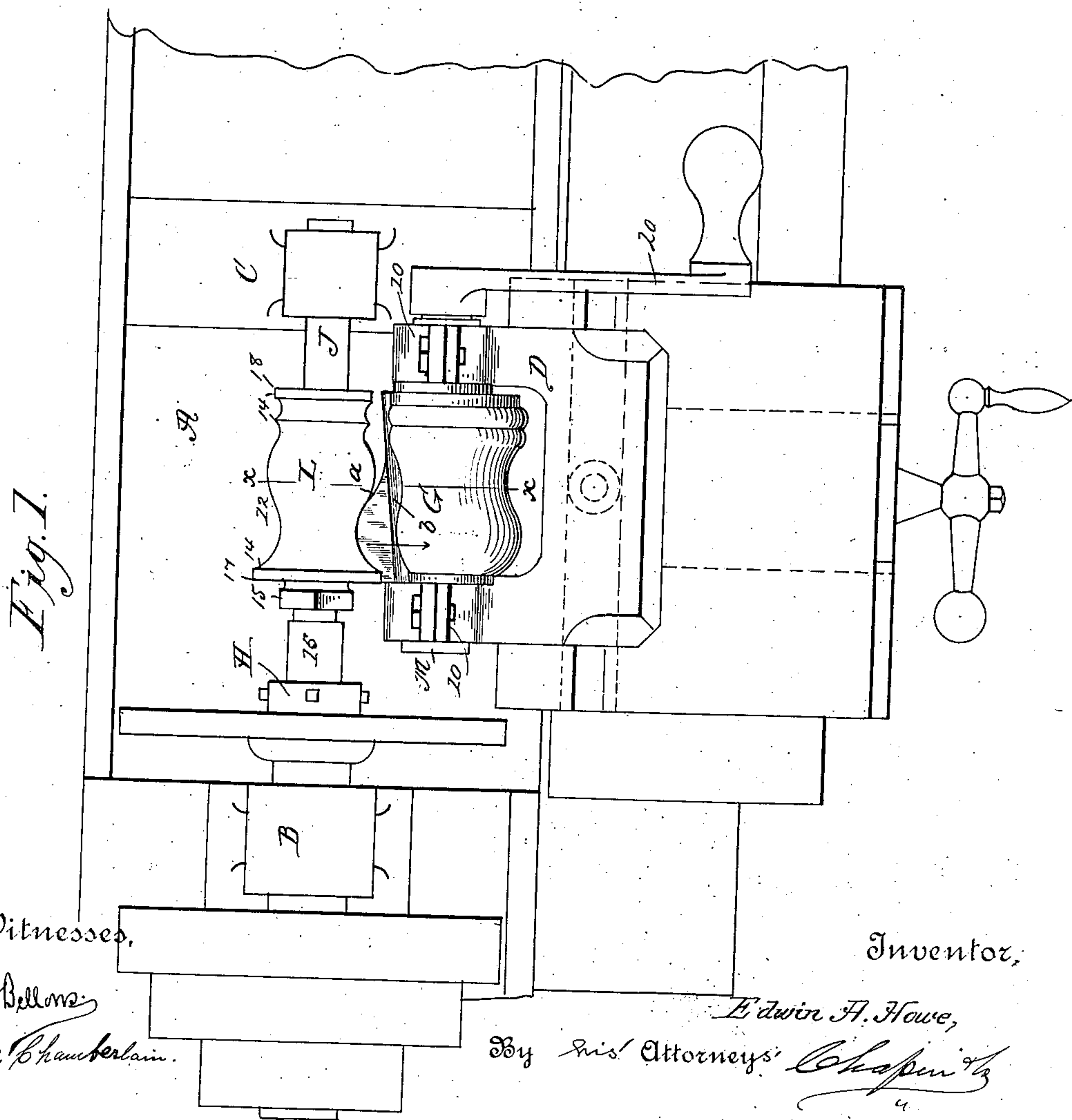
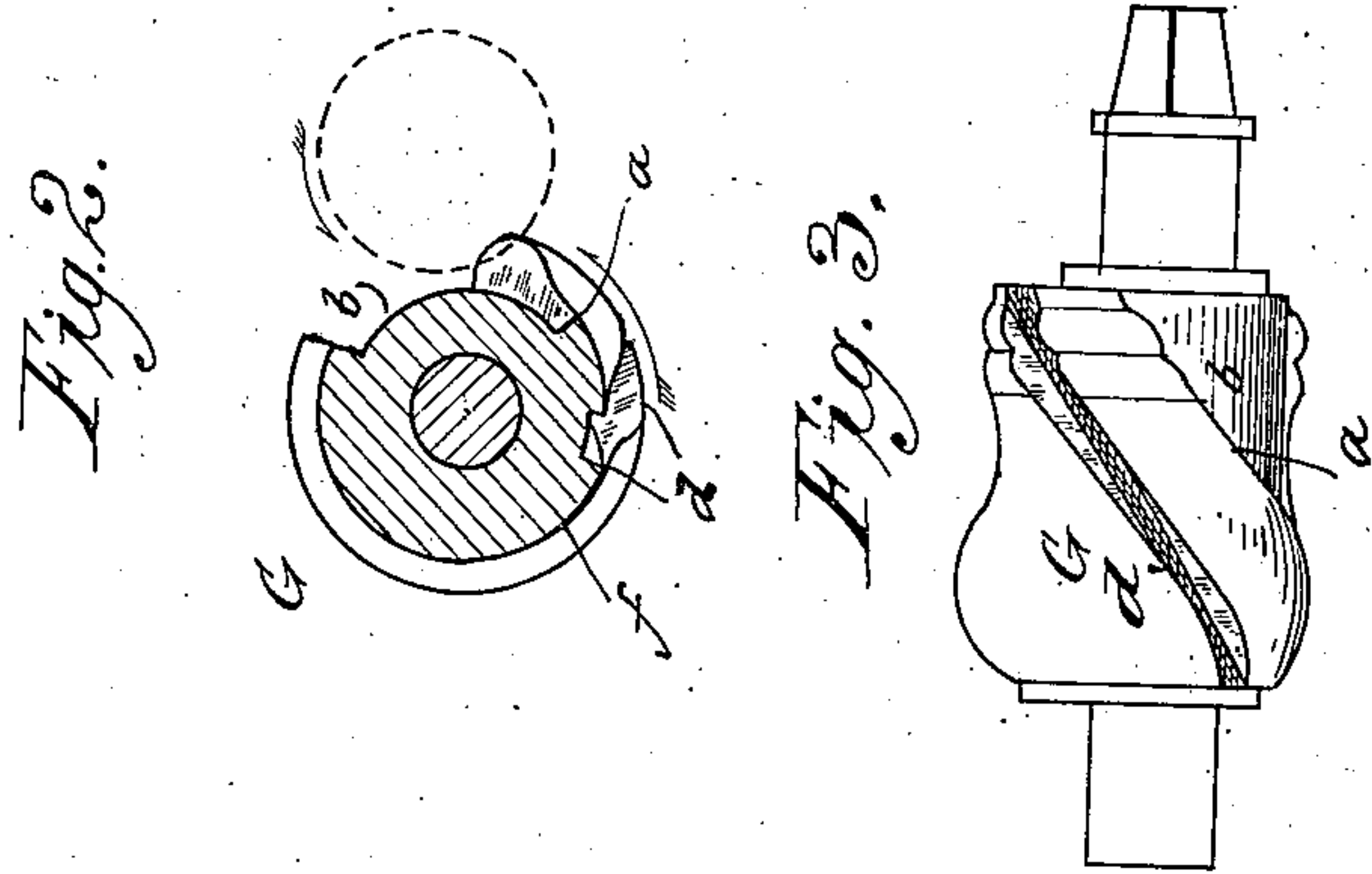
2 Sheets—Sheet 1.

E. A. HOWE.

TOOL FOR TURNING AND POLISHING METAL.

No. 386,013.

Patented July 10, 1888.



Witnesses,

*Wm. S. Bellows*

*G. M. Chamberlain*

Inventor,

*Edwin A. Howe*

By *his* Attorneys *Chapin & Co.*

(No Model.)

2 Sheets—Sheet 2.

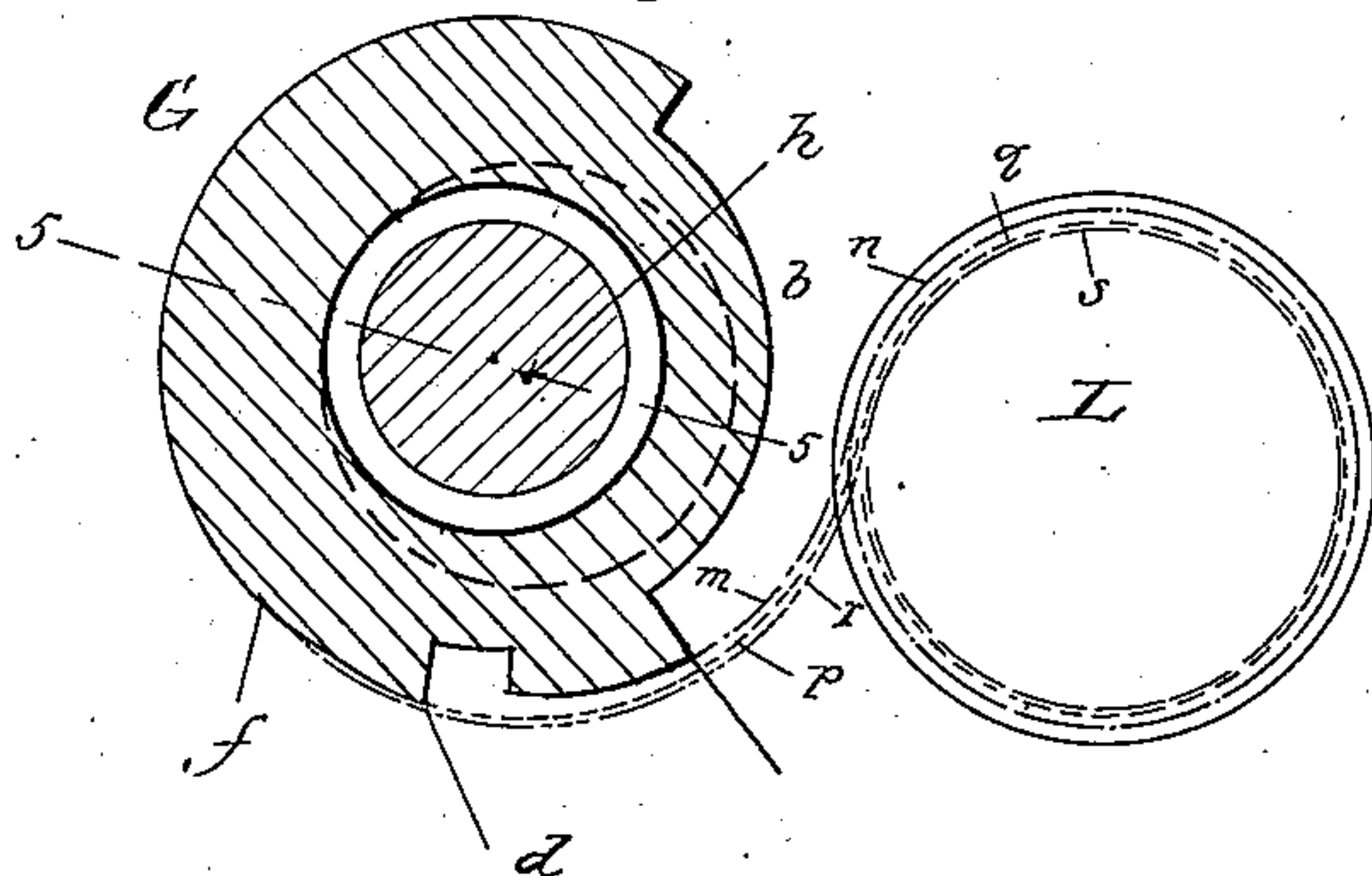
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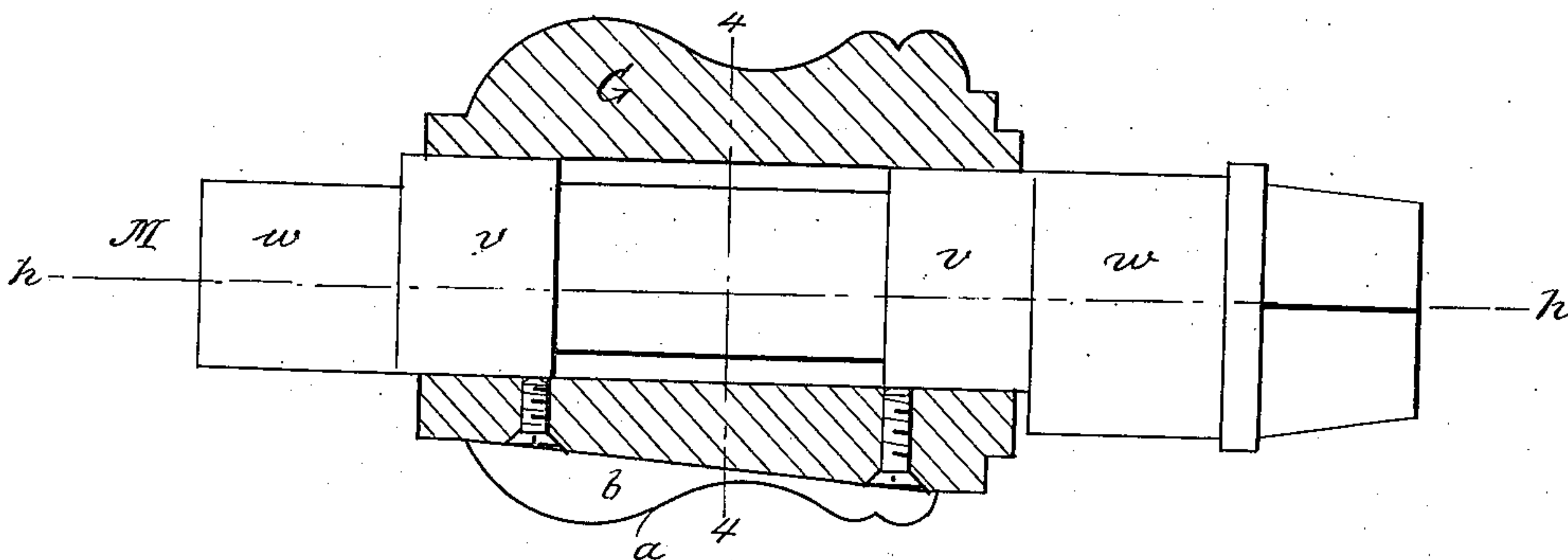
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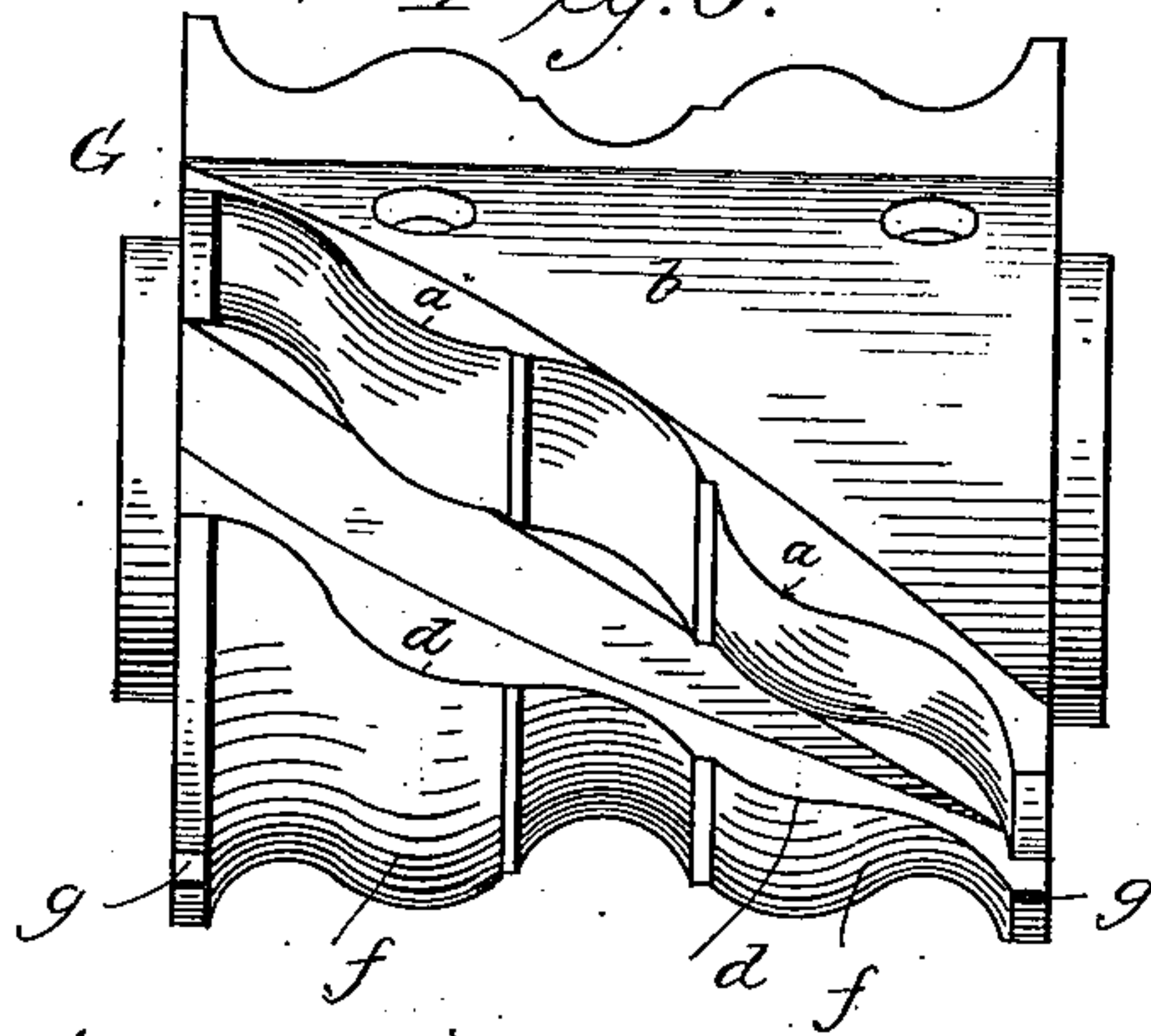
*Fig. 4.*



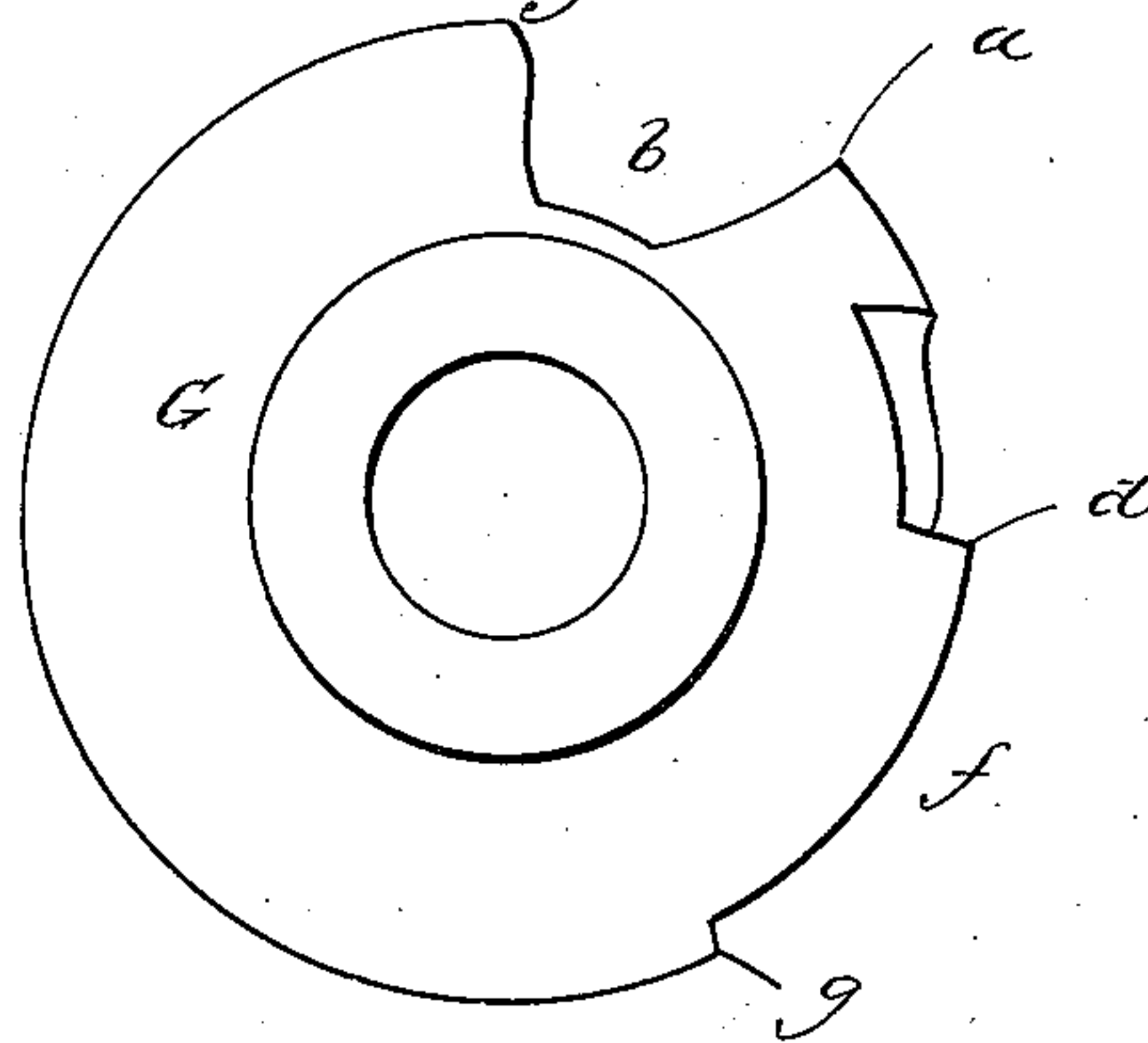
*Fig. 5.*



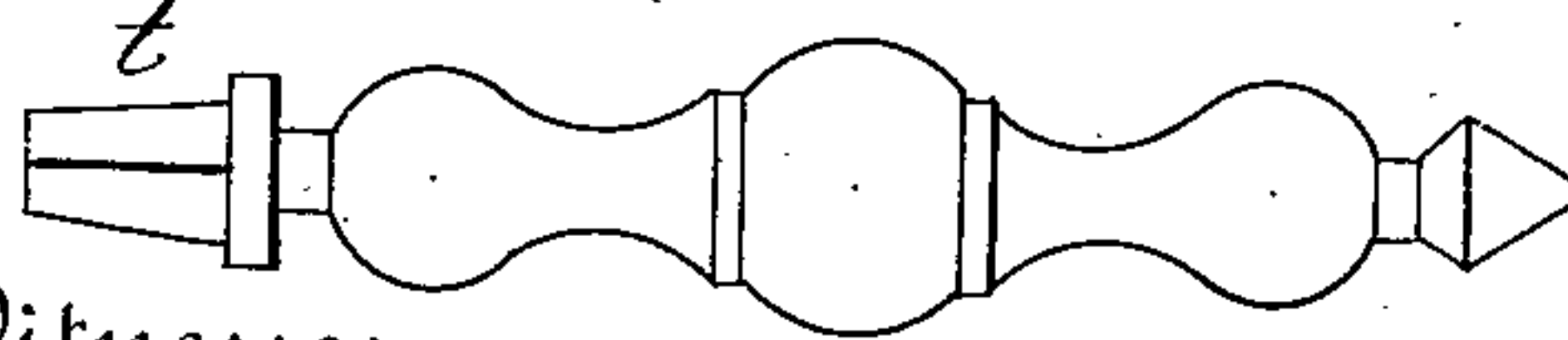
*Fig. 6.*



*Fig. 7.*



*Fig. 8.*



Witnesses,

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# UNITED STATES PATENT OFFICE.

EDWIN A. HOWE, OF SPRINGFIELD, MASSACHUSETTS.

## TOOL FOR TURNING AND POLISHING METAL.

SPECIFICATION forming part of Letters Patent No. 386,013, dated July 10, 1888.

Application filed April 11, 1888. Serial No. 270,340. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN A. HOWE, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines for Finishing Metal, of which the following is a specification.

This invention relates to improvements in machines for trimming or truing and burnishing the surfaces of metal parts or castings having a circular cross-section and of any desired longitudinal contour which are to be used for various purposes, and particularly for trimming and truing castings of brass and similar metal, such as are extensively employed in sanitary appliances; and under the present invention the capabilities of the cutter-head may be further augmented by being provided with a cutting-off part or parts, whereby a portion or portions of the casting beyond the portion to be trimmed or finished may be severed from such finished portion under a continuation of the manipulation of the cutter-head beyond that required for its finishing action; and the invention consists in the construction of cutter-heads of suitable form and the combination therewith of supporting and controlling devices whereby said cutter-heads may be presented and withdrawn from their operative positions in relation to a casting or other part, all substantially as will hereinafter more fully appear and be set forth in the claims.

In the accompanying sheets of drawings, forming part of this specification, the present invention is illustrated; in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 represents in plan view a faucet-body centered and chucked for rotation between the head and tail stocks of a lathe, and a cutter-head, constructed in accordance with the present invention, supported upon the slide-rest of the lathe, and all in their relative positions for operation. Fig. 2 is a cross-section of the cutter-head on the line  $x x$ , the position of the faucet-body being indicated in dotted lines. Fig. 3 is a side view of the cutter-head when partially rotated from its position shown in Fig. 1. Figs 4 and 5 are en-

larged views, respectively, in cross and longitudinal section of the cutter-head, illustrative of the movement of its operative portions in relation to its center of rotation, certain features thereof being shown as exaggerated to enable a clearer understanding, the relative position of the part to be operated on by said cutter-head being also indicated in Fig. 4. Fig. 6 is a side view, and Fig. 7 a view at the left-hand end, of a cutter-head adapted for operation upon a different-shaped part than that shown in the preceding figures. Fig. 8 is a faucet-handle finished by means of the cutter shown in Fig. 7.

In the drawings, Fig. 1, A represents a portion of a lathe, of which B is the head-stock, C the tail-piece, and D a slide-rest capable of a longitudinal and a lateral motion in suitable ways and having bearings 10 for the cutter-head G.

H represents a chuck secured on the head-stock spindle, or the face-plate thereof, and J represents the spindle of the tail-piece. The body of a faucet or bib is shown at L as centered in and supported by the chuck and tail-piece spindle. As shown, the said faucet-body has an ogee form, 12, with beads 14 at the ends thereof, and at one end a squared portion, 15, and tubular spindle 16, and in the present instance under illustration the cutter-head G is designed to trim the surface of the said faucet-body between the outer edges, 17 and 18, of the outer beads, and consists of a body transversely circular and of a longitudinal contour corresponding with the desired form of said body L.

The cutter-head is provided with a cutting-edge,  $a$ , arranged in a spiral or helical line from end to end of the cutter-head, the inclination of such edge to a line parallel with the axis of the cutter-head being substantially as shown in the drawings, Figs. 3 and 6, whereby on the presentation of the cutter-head with its axis parallel with that of the work to be operated upon a shearing cut will be made by such edge. In advance of said cutting-edge  $a$  the head is recessed, as at  $b$ , for a considerable depth and width, thus enabling, when the cutter-head is arranged in relation to the axis of rotation of the work, as indicated in Figs. 1, 2, and 4, a chucking or centering of the cast-



ing, &c., without hinderance by the presence of the so-adjusted cutter-head. At the rear of the cutting-edge *a* is a secondary shearing or spiral cutting-edge, *d*, extending more or less parallel with the said edge *a*, as desired, but having a radial extent in relation to the center of rotation of the cutter-head beyond that of the said edge *a*, and also at the rear of said cutting-edge *d* is a burnishing-surface, *f*, arranged eccentrically to the axis of rotation of said cutter-head.

The cutter-head is mounted upon a shaft, *M*, supported in the bearings 10 of the slide-rest, at one end of which shaft is a lever-handle, 20, for securing a partial or entire rotation of the cutter-head.

In Figs. 6 and 7 the contour of the cutter-head is modified for finishing a casting for a faucet lever or handle such as shown in Fig. 8, and at each end and to the rear of the cutting-edges and burnishing-surface the cutter-head is provided with cutting-off projections *g*.

With a casting centered and rotated and the cutter-head mounted and adjusted, as described, in relation thereto, as seen in Figs. 1, 2, and 4, and assuming the center of rotation of the cutter-head to be at *h*, under a swinging of the lever 20 in the proper direction the cutter-head is partially rotated to cause its advance cutting-edge *a* to travel through the arc course indicated by the dotted line *m* to and against the surface of the rotating casting, which by such edge will be reduced, as indicated by the dotted line *n*. On a continued swinging of the said lever the said cutting-edge *a* is carried beyond the periphery of the casting, and the cutting-edge *d*, following the arc course indicated by the dotted line *p*, is brought to action against the partially-finished periphery of the casting until the same is reduced, as indicated by the dotted line *q*. Then on a still further turning of the cutter-head, so that the eccentric burnishing-surface is made to follow the course indicated by the dotted line *r*, said burnishing-surface is brought to a bearing upon the surface of the trimmed casting, securing its compression to the extent indicated by the dotted line *s*, it of course being understood that for the purposes of clear illustration the extent of eccentricity of the burnishing-surface to the center of rotation and the cutting extent of the edges *a* & *d* have been shown as exaggerated.

As in such an article as a faucet-body casting, *L*, comprising parts integral therewith beyond or within the portion to be trimmed, as described, and as such a casting affords by essential portions of itself means whereby it may be chucked and centered for rotation, it is not of course necessary to provide extensions whereby to chuck or center such article, and therefore for its finishing or preparation for use no cutting-off of any part is required, and consequently the cutter-head for finishing such a casting is not provided with an end cutting-off projection, *g*; but for finishing a casting such, for instance, as a lever-handle

for a faucet, as seen in Fig. 8, to which extensions *tt* are provided for its support and rotation in the lathe, the cutting-off extensions *g g* are provided on the cutter-head, so that under one operation or manipulation of the cutter-head upon the casting the latter is trimmed, burnished, and the so-finished portion severed from the then superfluous projections *t t*.

In practice it is intended to have the cutting extent of the cutting-edge *a* considerably greater than that of the secondary edge *d*, the former being in substance a rough cutting and the latter a fine cutting edge. In some instances, however, the secondary edge *d* may be dispensed with—as for certain classes of work the one edge, or such edge combined with a following burnishing-surface, would be sufficient, although it is preferable to employ both edges at all times.

A means for securing the presentation of the cutting-edges and burnishing-surface to the work at a successively-increased radial distance from the center of rotation of the cutter-head may be secured in various and obvious ways, and this invention is not to be limited to any particular manner or means of deriving such; but in Figs. 4 and 5 a preferred construction has been illustrated and will be now mentioned as consisting of the cutter-head formed transversely circular and of the desired longitudinal contour, and longitudinally and concentrically bored and supported on a portion or portions, *v*, provided on the shaft *M* eccentric to the axis of rotation of the bearings *w* of said shaft. The body of the cutter is provided with screw-holes *y y*, whereby to secure the cutter-head in its properly-adjusted position on the shaft in relation to its center of rotation and to permit of a readjustment thereof when the parts have been worn away, and new cutting-edges or finishing-surfaces formed on said cutter-head; and, if desired, the cutter-head may be arranged in relation to its center of rotation, so that a greater eccentricity of one portion of any or all of its operating parts may be secured—as, for instance, so that the burnishing-surface *f* at one end of the cutter-head may be greater than at the other end.

What I claim as my invention is—

1. A rotatable cutter-head provided with a spiral and shearing cutting-edge, *a*, and an eccentric burnishing-surface in the rear of said cutting-edge, for the purpose substantially as set forth.

2. A rotatable cutter-head provided with a spiral and shearing rough cutting-edge, *a*, and a secondary cutting-edge, *d*, at the rear thereof, substantially as and for the purpose described.

3. A rotatable cutter-head provided with a spiral and shearing rough cutting-edge, *a*, a secondary cutting-edge, *d*, at the rear thereof, and an eccentric burnishing-surface at the rear of the latter edge, substantially as and for the purpose described.



4. A rotatable cutter head provided with a spiral and shearing cutting-edge, *a*, and one or more cutting-off projections, substantially as and for the purpose described.

5 5. A rotatable cutter-head provided with one or more spiral and shearing cutting-edges, an eccentric burnishing surface at the rear of said cutting-edge, and one or more cutting-off projections *g*, substantially as and for the purpose described.

10 6. The combination, with a cutter-head provided with one or more cutting-edges and a burnishing-surface at the rear thereof, of a shaft provided with concentric bearings *w w* and a supporting portion or portions, *v*, eccentric to said bearings, on which said cutter-head is mounted, substantially as and for the purpose described.

20 7. The combination, with a slide-rest of a lathe having bearings 10, of a cutter-head, and a shaft, to which said head is secured, mounted in said bearings and provided with a lever, 20, said cutter-head being provided with one or more spiral and shearing cutting-edges, substantially as and for the purpose described.

8. The combination, with a slide-rest of a lathe having bearings 10, of a cutter-head, and a shaft, to which said head is secured, mounted in said bearings and provided with a lever, 20, said cutter-head being provided with one or more spiral and shearing cutting-edges, and an eccentric burnishing-surface, substantially as and for the purpose described.

35 9. The combination, with the slide-rest of a lathe having bearings 10, of a cutter-head, and a shaft, to which said head is secured, mounted in said bearings and provided with a lever, 20, said cutter-head being provided with one or more spiral and shearing cutting-edges, an eccentric burnishing-surface at the rear of said cutting-edges, and one or more cutting-off projections, *g*, substantially as and for the purpose described.

EDWIN A. HOWE.

Witnesses:

WM. S. BELLOWS,

G. M. CHAMBERLAIN.