

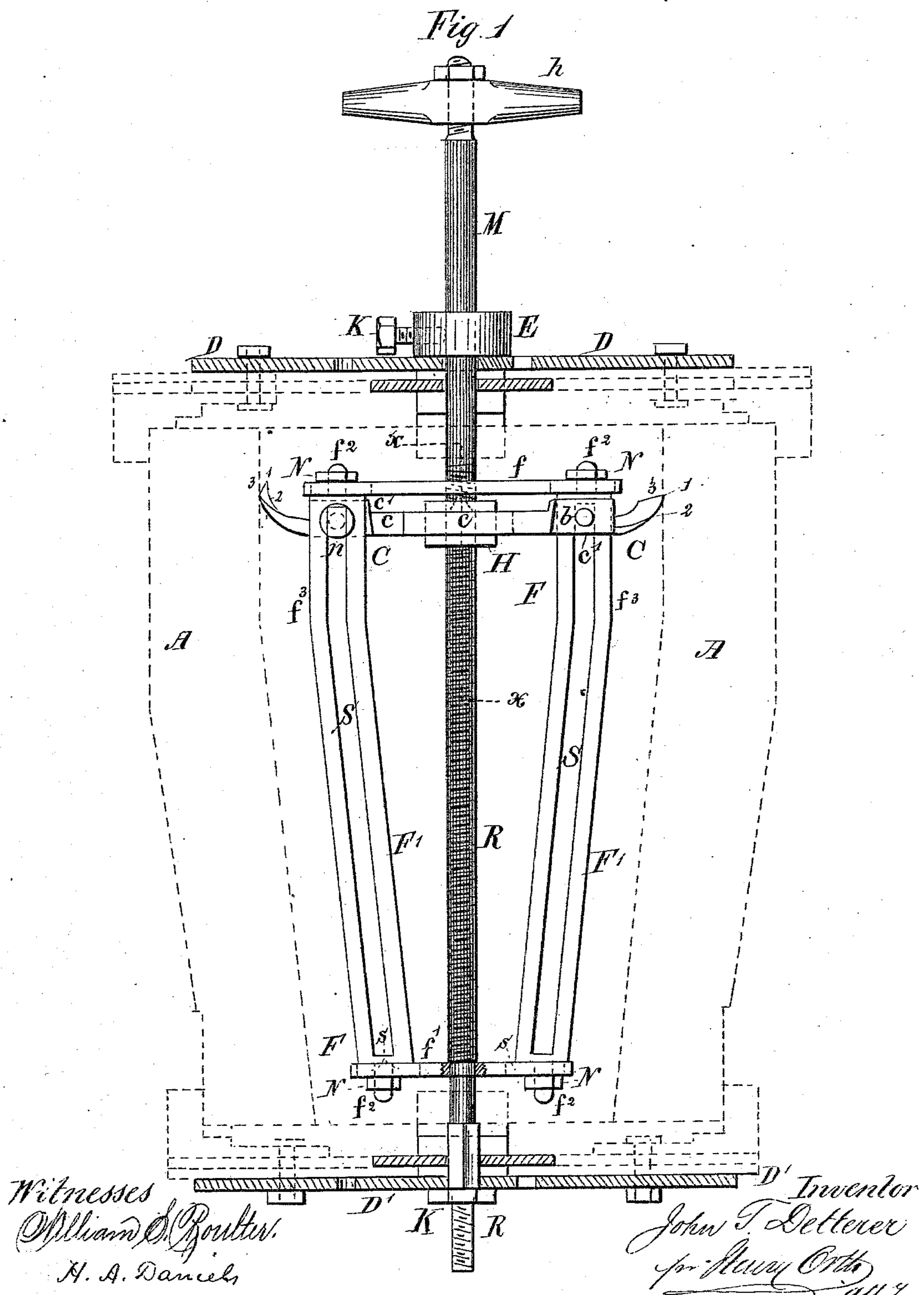
(No Model.)

2 Sheets—Sheet 1.

J. T. DETTERER.  
HUB BORING MACHINE.

No. 274,470.

Patented Mar. 27, 1883.



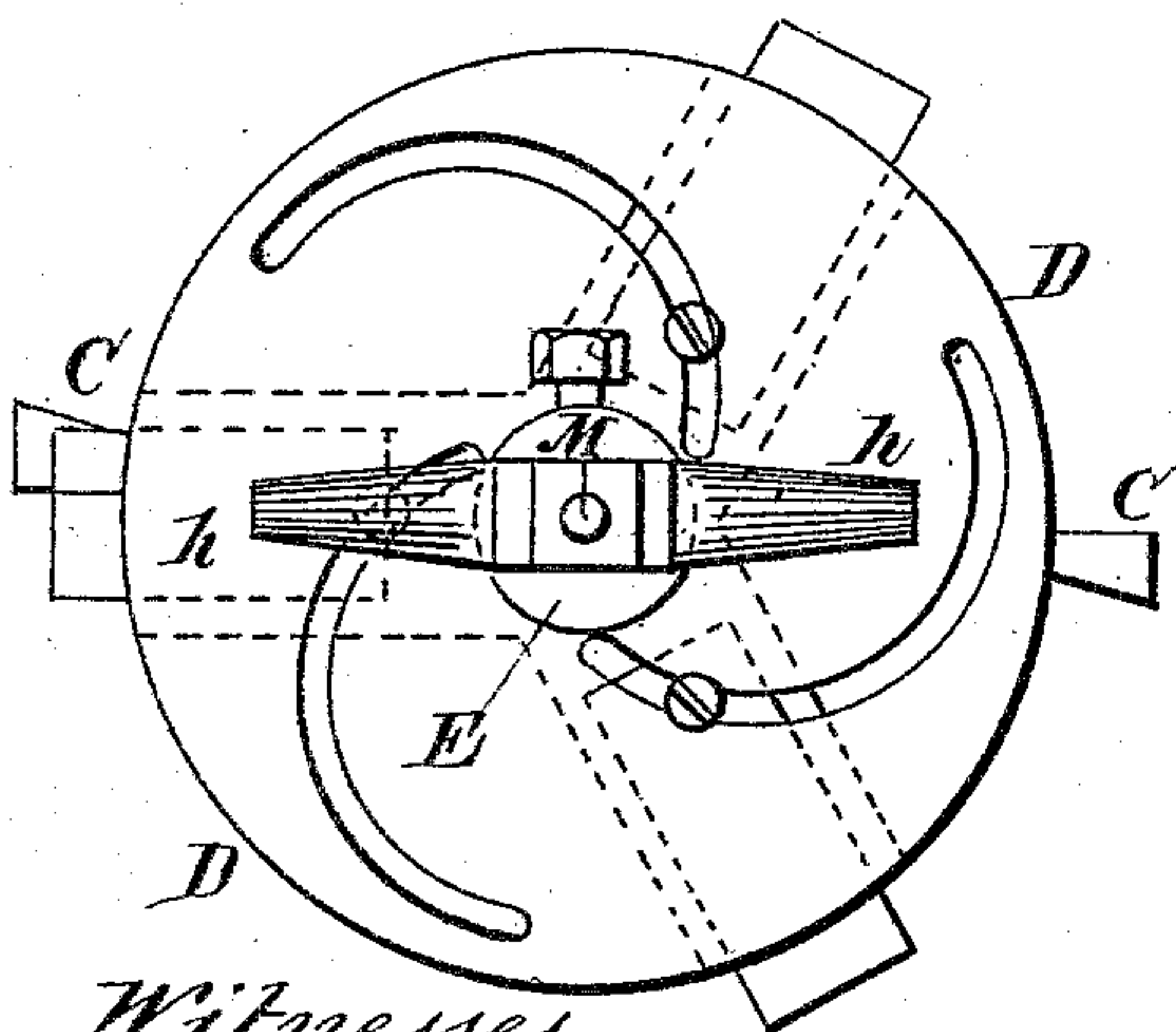
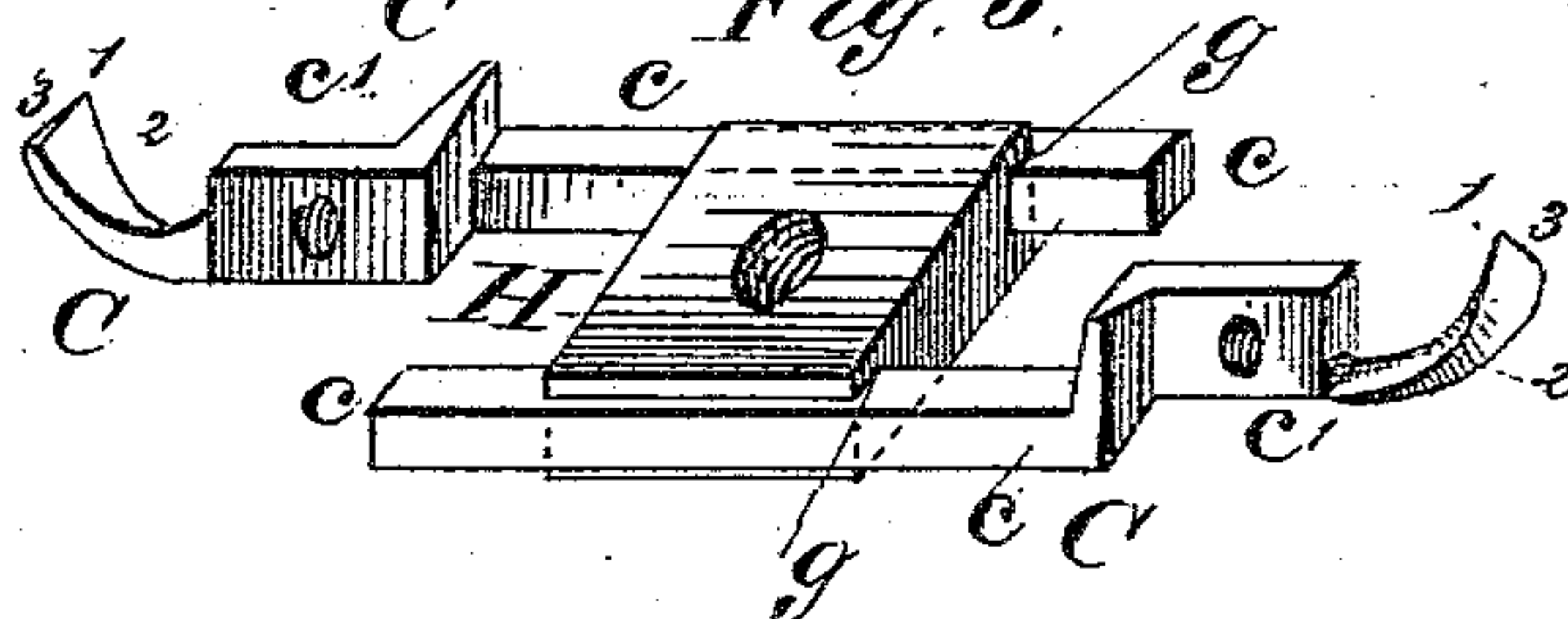
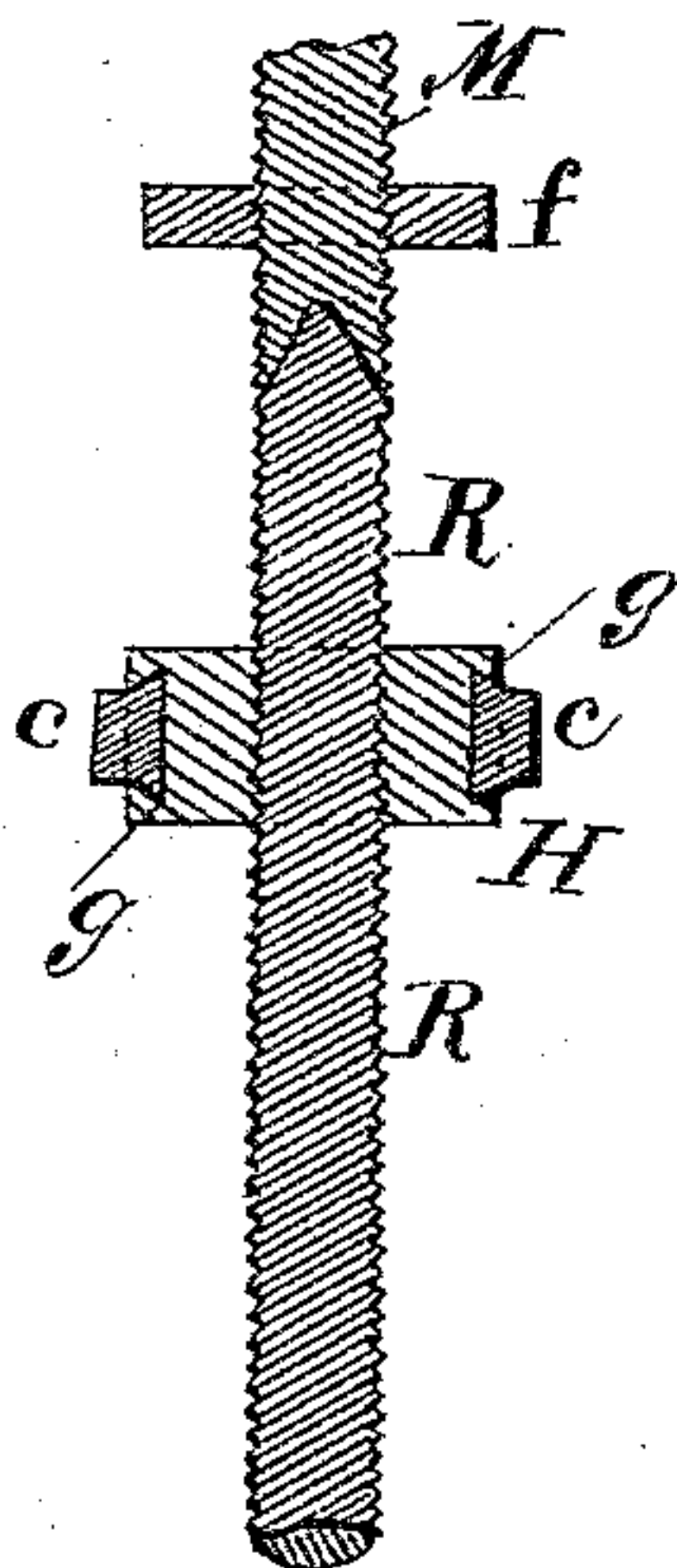
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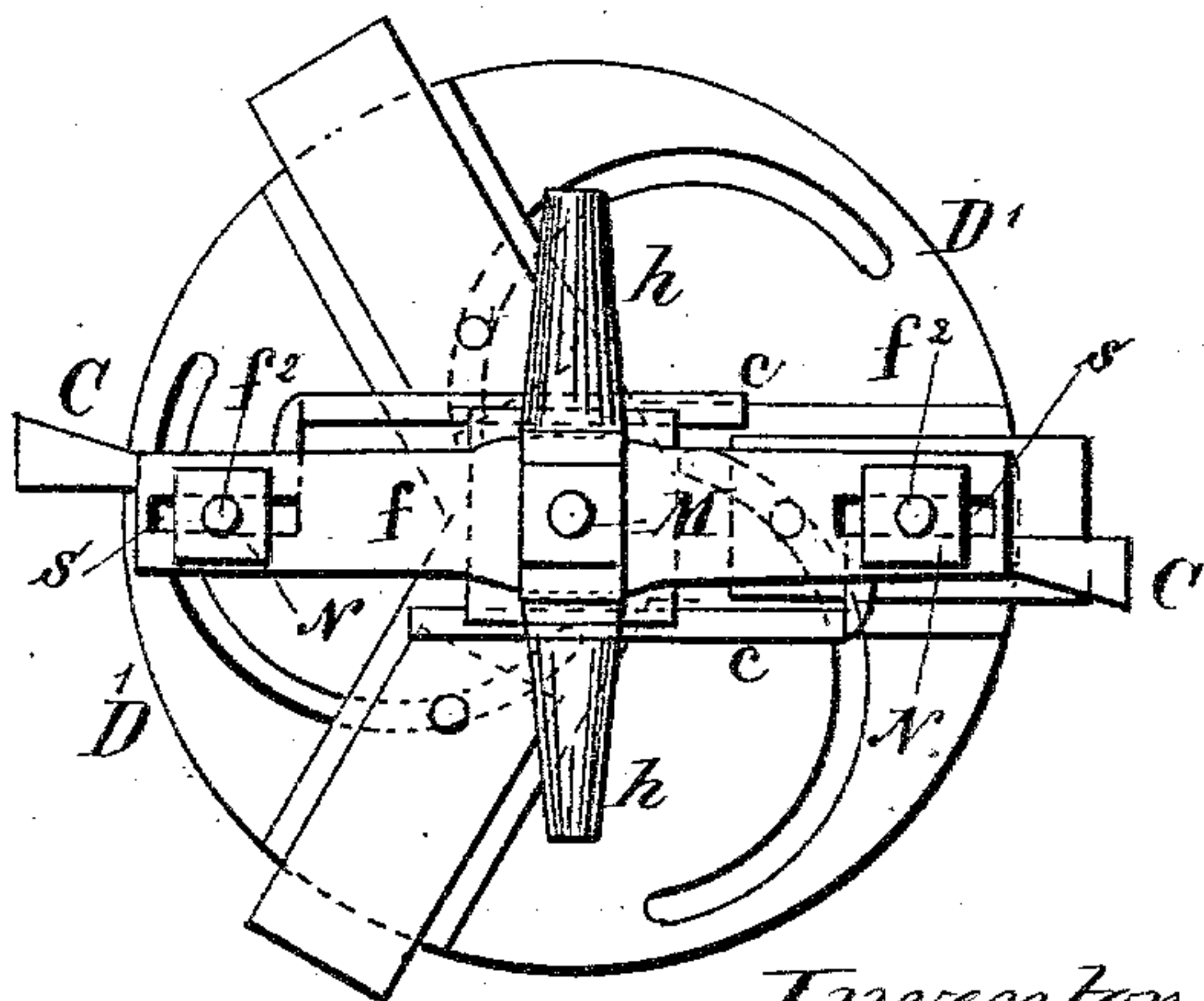
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Witnesses  
William C. Butler.  
H. A. Daniels



Inventor  
John T. Dettmer  
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# UNITED STATES PATENT OFFICE.

JOHN T. DETTERER, OF WILLSHIRE, OHIO.

## HUB-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 274,470, dated March 27, 1883.

Application filed January 23, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN T. DETTERER, a citizen of the United States, residing at Willshire, in the county of Van Wert and State of Ohio, have invented certain new and useful Improvements in Hub-Boring Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

In the accompanying drawings, Figure 1 is an elevation of the apparatus. Fig. 2 is a top plan view of the same. Fig. 3 is a like view, the chuck and adjusting-sleeve being removed. Fig. 4 is a section on line *xx* of Fig. 1, and Fig. 5 is a perspective view of the cutter-head and cutters.

Like letters of reference indicate like parts in the above-described figures of drawings.

The object of my invention is to provide means for accurately boring or boxing hubs, and for boring holes of varying diameter, or for boring holes that are tapering from end to end, or that gradually increase in diameter from one end of the hub to a point near the opposite end, and are of uniform diameter from the latter point to the opposite end of the hub.

The invention has for its further object to provide means whereby a clean cut and smooth bore is obtained with less power than is usually required in such machines.

To these ends the invention consists in the construction and combination of devices, substantially as hereinafter fully described.

In the drawings, *F* indicates the cutter-frame, composed of cross-bars *f f'* and longitudinal slotted guide-bars *F' F'*. The guide-bars *F' F'* are provided at opposite ends with screw-threaded lugs or tenons *f<sup>2</sup> f<sup>2</sup>*, by means of which and the nuts *N N* the said guide-bars are secured to the cross-bars.

In order to adapt the apparatus to cut a hole of any desired diameter, the guide-bars *F' F'* are made adjustable laterally on the cross-bars *f f'*, which latter are provided with slots *s s*, through which the tenons of the guide-bars *F' F'* pass, so that on loosening the nuts *n* the said

bars may be moved in and out on the cross-bars to adapt the cutters to cut a hole of the desired diameter.

*R* is a screw-threaded rod, that serves to move or feed the cutter-head and cutters along the guide-bars. The rod is centered in a mandrel or actuating-rod, *M*, that serves to rotate the cutter-frame and cutters. To this end the upper cross-bar, *f*, has a central screw-threaded aperture, into which screws the operating-rod or mandrel *M*, its lower end having a conical seat for the reception of the conical bearing formed on the upper end of the screw-rod *R*, said rod passing loosely through a central opening in the lower cross-bar, *f'*. It is obvious that if the rod *M* is rotated, either by pulley and belt from a suitable motor or by hand through the medium of a crank or the handle *h*, the frame will rotate with it, while the screw-rod *R* will remain stationary.

The cutter-head *H* consists of a square block, in the opposite sides of which are formed dovetailed or other grooves *g*, for the reception of the shanks *c* of the cutters *C*. The cutting-edge 2 of these cutters is slightly rounded and made to incline inwardly from the cutting-point 1 to the enlarged bearing-surface *c'* of the shank, the cutter being broadest at its outer horizontal edge, 3, said edge being also made to incline rearwardly from the cutting-point 1. By means of this construction the cutters will cut across the grain of the wood—that is to say, they will cut nearly at right angles to the grain—and not only make a clean cut and smooth bore, but it will also require much less power to operate the cutters.

The shank *c* of the cutters *C* have a flat bearing-surface, *c'*, provided with an aperture for the reception of a set-screw or equivalent device, such as a bolt, *B*, and nut *n*, said bolts passing loosely through the slots *S* of the guide-bars *F'*, and serve to guide the cutters along the slots. The shank *c* of the cutters *C* is dovetailed and fits into the like groove of the cutter-head, wherein it is held against lateral motion, said cutters being held against tangential motion by the bolts *B*.

*D D'* are two adjustable chucks, of usual construction, to which the hub is secured and on which it is centered.

*E* is an adjustable collar, that serves as a



bearing for the chuck D, and K is a tightening-nut, that serves to tighten up the chuck D'.

When the hub is properly centered on the apparatus, as shown in Fig. 1, the cutter-frame 5 may be rotated by hand and the hole in the hub reamed out to the proper diameter or taper; or the apparatus as constituted may be mounted in suitable supports and the cutter-frame rotated by hand or other suitable power.

10 If it is desired to bore a hole of uniform diameter, a cutter-frame having parallel slotted guide-bars is employed, and for boring holes of gradually-increasing diameter a cutter-frame having straight guide-bars arranged accordingly is employed.

As shown in Fig. 1 of the drawings, the apparatus is adapted to ream out a hole of uniform diameter for a portion of the length of the hub A, and from that point said hole is of 20 a uniform taper to the opposite end of said hub A. To produce such a hole the side bars of the frame and the guide-slots therein are of the desired form, said bars and slots being parallel to each other for a certain distance of 25 their length, as at  $f^3$ , from which point to the cross-bar  $f'$  the bars and slots gradually approach each other.

Having now described my invention, what I claim is—

30 1. In a hub-boring machine, a rotating cutter-frame composed of guide-bars for guiding the cutters, and cross-bars, with which said guide-bars are connected and on which they are laterally adjustable, in combination with 35 a screw-rod and adjustable cutters having a combined rotary and rectilinear movement on said rod with and along said frame, substantially as and for the purposes specified.

40 2. In a hub-boring machine, the combination of screw-rod and a rotating cutter-frame with a cutter-head and cutters having a combined rotary and rectilinear movement with

and along said frame on said screw-rod, substantially as and for the purposes specified.

3. In a hub-boring machine, the combination 45 of an expansible cutter-frame, correspondingly adjustable cutters, a screw-feed for imparting rectilinear motion to the cutters along the frame, and means, substantially such as described, for rotating the cutter-frame and 50 cutters, substantially as and for the purposes specified.

4. The combination, in a hub-boring machine, with the cutter-frame F, composed of the slotted side bars, F F', and slotted cross-bars  $f f'$ , the cutter-head H, and cutters C, 55 adjustable thereon, of the screw-rod R, operating-rod M, and chucks D D', substantially as described, for the purposes specified.

5. The combination of the slotted side bars, 60 F', of the frame F and the rod R with the cutter-head H, having dovetailed grooves  $g$ , the cutters C, having dovetailed shanks, and the set-screws or bolts B, substantially as described, for the purposes specified. 65

6. The combination, with the frame F, the cutter-head and cutters, the chucks D D', and rods R M, of the adjustable collar E and nut K, all arranged for co-operation substantially 70 as and for the purposes specified.

7. The frame F, composed of side bars, F', having slots S and tenons  $f^2$ , the cross-bars  $f f'$ , having slots  $s$ , and the nuts N, in combination with the rod R, the cutter-head H, 75 having dovetailed grooves  $g$ , the cutters C, having dovetailed shanks, and the bolts B and nuts  $n$ , all arranged for operation substantially as and for the purpose specified.

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

JOHN T. DETTERER.

Witnesses:

J. H. SIMS,

ISRAEL REMPP.