

F. JONAS.
Hub-Boring Machines.

No. 144,618.

Patented Nov. 18, 1873.

Fig. 1.

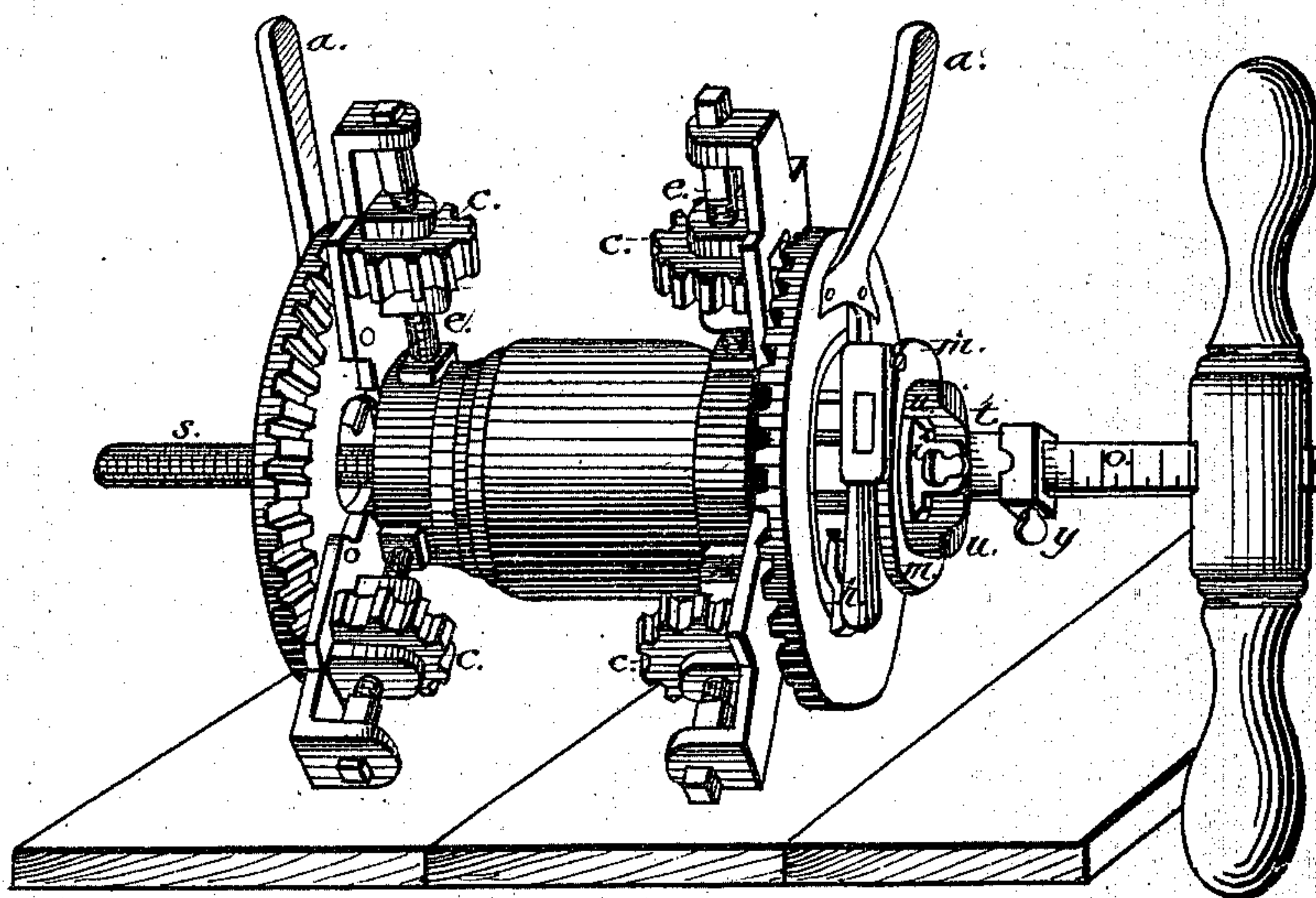


Fig. 2.

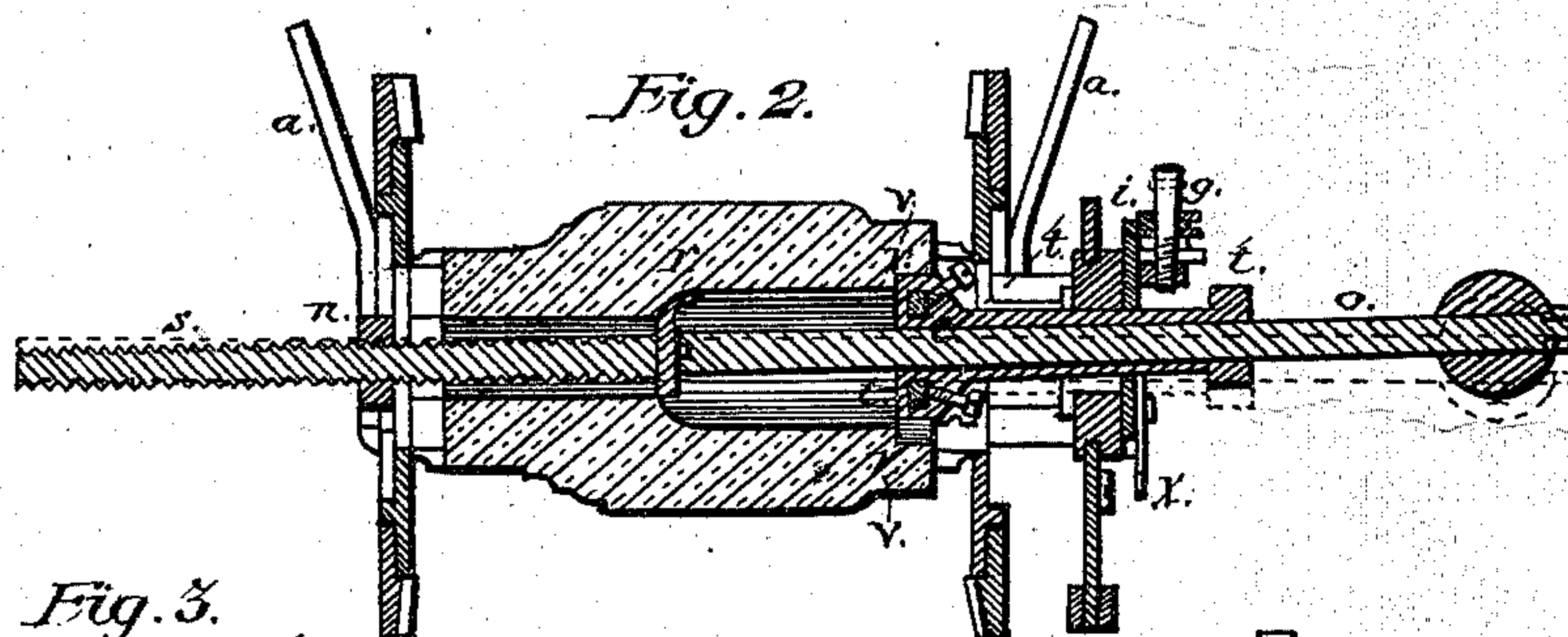


Fig. 3.

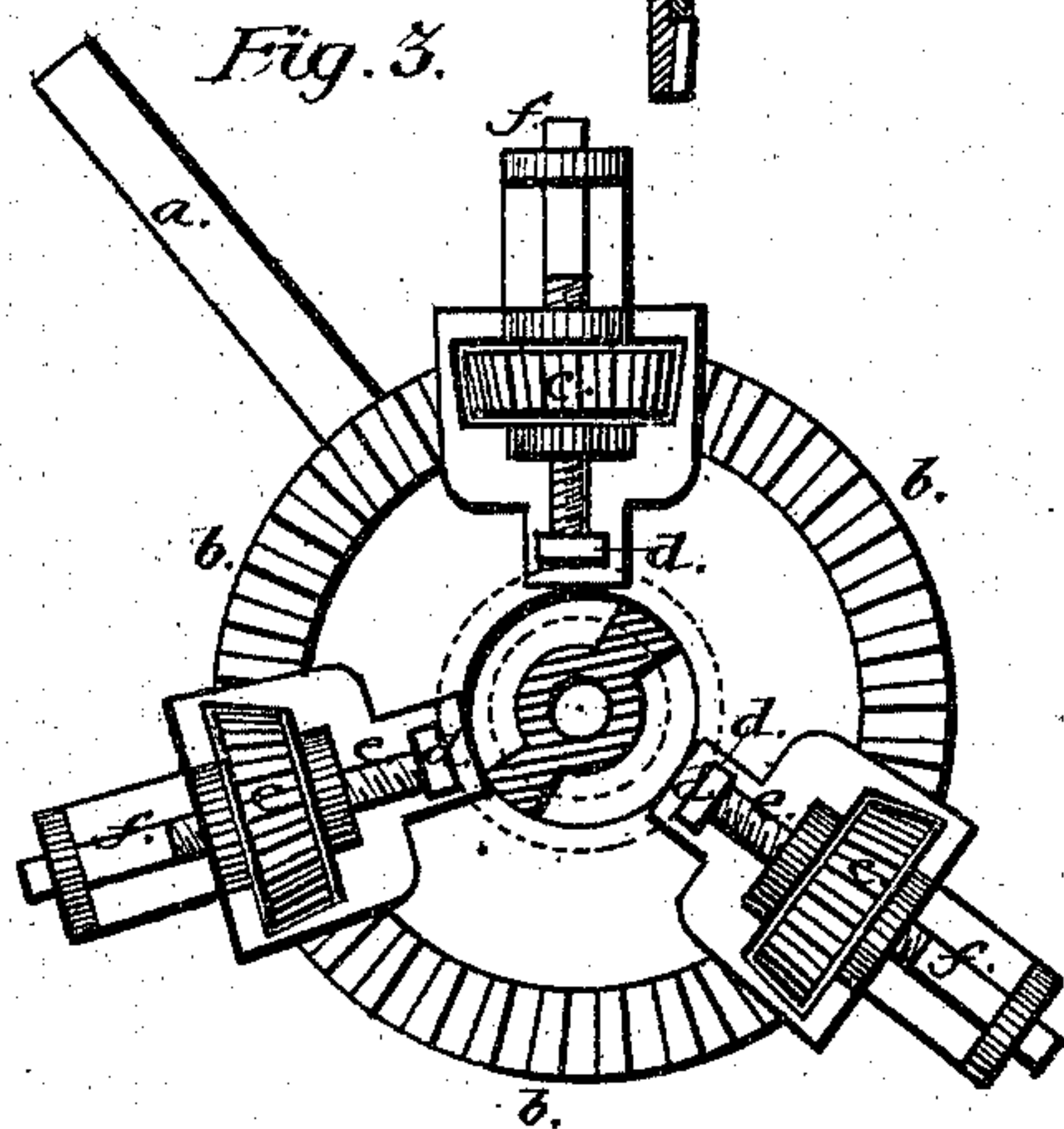
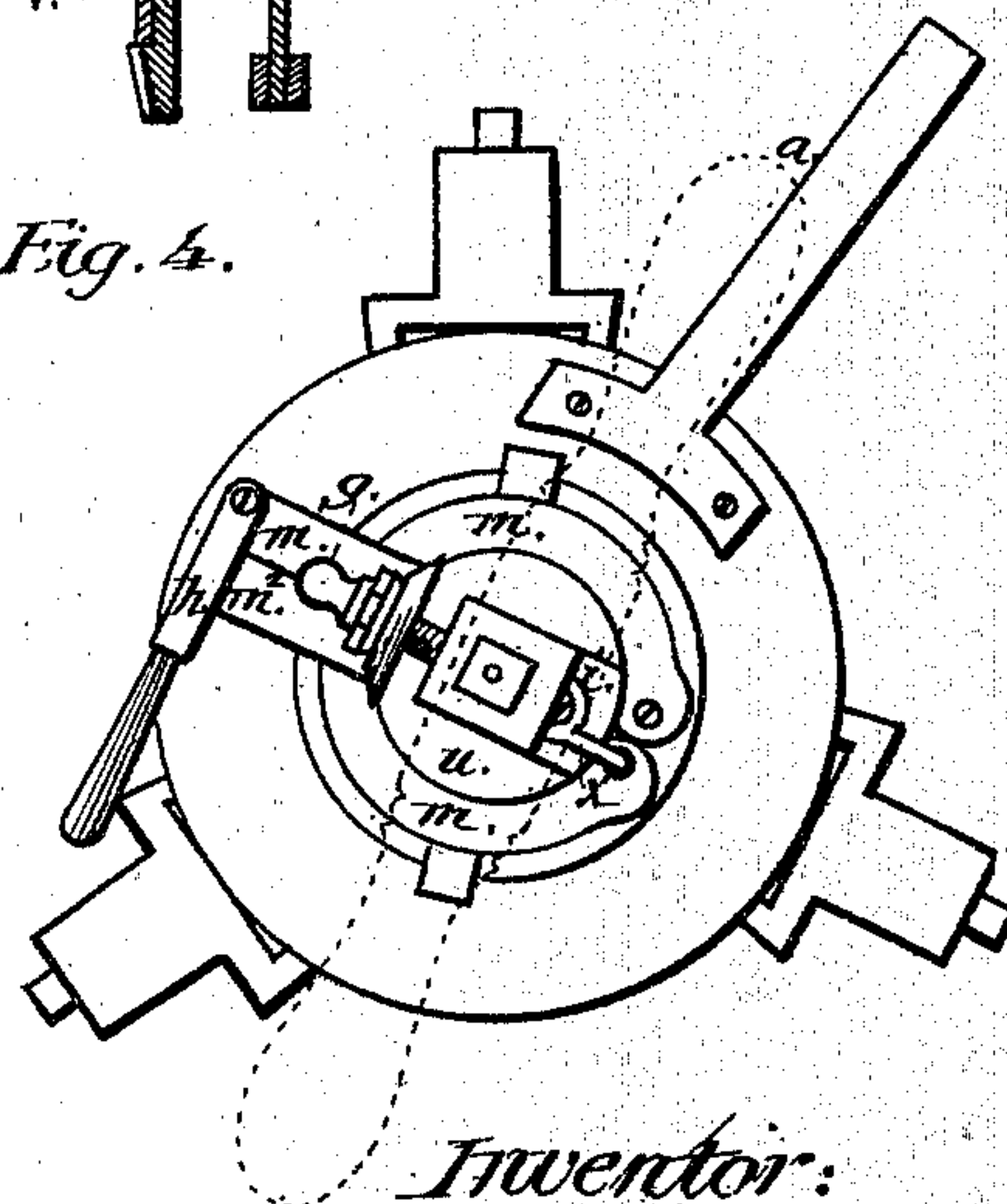


Fig. 4.



Attest:
J. E. Sprunger
Harvey Ray Jr

Inventor:
Frederick Jonas

UNITED STATES PATENT OFFICE.

FREDRICK JONAS, OF BURLINGTON, IOWA, ASSIGNOR TO HIMSELF AND
GEORGE O. RAY, OF SAME PLACE.

IMPROVEMENT IN HUB-BORING MACHINES.

Specification forming part of Letters Patent No. 144,618, dated November 18, 1873; application filed
August 31, 1872.

To all whom it may concern:

Be it known that I, FREDRICK JONAS, of Burlington, in the county of Des Moines and State of Iowa, have invented certain Improvements in Hub-Boring Machines, of which the following is a specification:

My invention relates to improvements in machines for boring the hubs of wheels for carriages and other vehicles used in land conveyance. The invention consists in a new and improved combination of devices for centering the two ends of the hub to be bored. It also consists in new and improved devices whereby the boring the hub is completed by one operation without requiring to withdraw the cutting-tool, all as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a perspective view of my improved apparatus, showing a hub in position while being bored. Fig. 2 is a longitudinal section of Fig. 1. Fig. 3 is a plan view of one of the centering-chucks. Fig. 4 is a plan view of the collar, showing the devices for controlling the direction and operation of the cutting-tools.

My improved centering-chuck is constructed with the operating mechanism arranged on its outer circumference, so as to leave a considerable opening or circular space at the center for the passage of a second or additional cutting-tool, which passes through the chuck and cuts the enlarged countersink for the end of the axle-box at the same time the other cutter is finishing the bore of the hub. In order to provide for this additional space through the center of the chuck, I use a spur-wheel, *b b*, having the teeth formed on the outer circumference or rim of the wheel, where they mesh with the pinions of the small wheels *c c c*, arranged as shown in Fig. 3 of the drawings. Each of these pinion-wheels is cut through the center with a female screw, through which works the male screws *e e e*, the latter being formed on the jaw-shanks or shafts *f f f*. The whole of this mechanism is operated by moving the handle *a* to the right or left, as desired.

By this arrangement it will be seen that the spur-wheel *b*, meshing with the pinion-wheels *c*, causes them all to revolve simultaneously in their respective places, either to the right or

left; and the screws of the shafts *f* being alike, and arranged to move radially toward or from a common center as the pinion-wheels are turned, it is obvious that a motion of the handle *a* to the right or left will cause the jaws to advance or recede by exactly the same increments, so that, being once properly centered, they will always remain so. It will also be apparent that by this arrangement the jaws impinge on the outer periphery of the hub only, thereby leaving a clear space for the operation of the enlarging-tool before referred to.

The hub to be bored is secured between two of these chucks, which are made substantially alike as far as the centering mechanism is concerned, with the exception that they are inverted, the mechanism of both facing inwardly, as shown in the drawings. By turning the handles *a*, all the jaws of each chuck press equally upon the hub, bringing it to a true center, and securely holding it in proper position for boring.

The cutting apparatus consists of a square shaft, *o*, one end of which is formed into a feeding-screw, which passes through a screw or nut, *n*, centrally secured to the chuck, through which the feed-screw is passed. By means of this screw *n*, to which I will more particularly refer hereafter, and the screw *s*, the shaft *o* is fed as the boring progresses. *r* is a cutter or knife secured to the shaft *o*, by means of which the hub is bored from end to end. *u* is a collar, which is held concentric with the axis of the hub by means of a yoke secured to the chuck opposite to that through which the screw *s* passes. This yoke is formed in two sections, *m' m''*, hinged at one end, and secured together at the other by means of a pivoted loop or catch, *h'*. By this arrangement the yoke may be readily opened or closed and the collar released or secured, as desired. *i* is a slide, attached to the collar in such manner as to permit of its being moved back and forth transversely to the axis of the collar, and held in any position to which it may be moved by means of a thumb-screw, *g*, passed through a screw or nut, which forms part of the slide, and moves with it.

The object of this collar and slide is as fol-

lows: The square portion of the boring apparatus and its sleeve passes through a suitable opening in the collar *u*; and, the latter being held concentric with the axis of the hub, it is obvious that the hole bored through the hub will be cylindrical in form so long as the shaft *o* is held in this position; but, as it is desirable to bore a portion of the hub with a hole of conical or tapering form, the boring-shaft has to be held in such position as to operate eccentrically with relation to the axis of the hub, as shown by dotted lines in Fig. 2 of the drawing. This is accomplished by means of the slide *i*, which, on being moved back and forth, carries the shaft with it to or from the center, as required, and this without requiring to alter or adjust the collar, which remains concentric with the axis of the hub. The slide *i* is provided with a graduated scale, for convenience and accuracy in adjusting the shaft to any required degree of eccentricity.

t is a sleeve fitted on the shaft *o*, so that it may be made to slide easily back and forth, and to which it may be secured, at any required point, by means of a thumb-screw, *y*, the shaft *o* being graduated to insure accuracy of adjustment. This sleeve carries a knife or cutter, *t'*, on its inner end, by means of which the countersink or enlargement of the bore with a shoulder is formed in the end of the hub, as shown at *v*, Fig. 2.

In operation, the sleeve *t* may be left loose on the shaft until required to cut the enlargement of the hub, or while the cutter is forming the tapering portion of the bore; and, when the shaft is again adjusted concentric with the axis of the hub, it may be secured thereto, and travel with it to complete the boring of the hub; or it may be secured at the proper point on the shaft, and travel with it throughout the whole operation, as found most convenient. In either case it will be observed that it passes through the sleeve and chuck, and cuts the countersink or enlargement of the bore at the same time the cutter *r* is completing the bore through the hub.

When the sleeve is left loose on the shaft, a cam-latch, *x*, pivoted to the slide *i*, prevents it from coming in contact with the end of the hub. At the proper time this latch *x* is withdrawn, and the cutter secured to the sleeve begins to operate.

The screw or nut *n*, through which the feeding-screw passes, may be hinged upon or provided with a universal joint, so as to yield freely to the eccentric motion of the shaft *o* while the conical portion of the hole through the hub is being bored; but this is not essential, as I find, in practice, that by making the thread of the screws a loose fit the operation of boring the tapering portion of the hub may be successfully accomplished with a fixed or immovable nut. This nut or screw *n* may also be made in sections, hinged upon one side, and secured on the other in manner similar to the collar-holder *m' m''*, before described. By this means the feeding-screw may be released from its position, after the boring of the hub is completed, without requiring to be unscrewed, as would otherwise be necessary.

The drawings show my improved machine arranged for operation by hand; but I do not limit myself to this manner of operation, as it is obvious that my machine may be readily adapted for operation by any motive power that may be found convenient, and that the hubs may be bored vertically or horizontally, or in any desired direction or position, with like facility.

To those skilled in the art further description of the construction and operation of my improved machine is deemed superfluous.

What I claim as my invention is—

1. The cutter *t'*, carried by the sleeve *t*, and arranged for operation substantially as and for the purpose specified.
2. The shaft *o* and sleeve *t*, with their respective cutters, operating in combination, substantially as and for the purpose specified.
3. The combination of the hinged yoke *m' m''*, collar *u*, and adjustable slide *i*, substantially as and for the purpose specified.
4. The combination of the shaft *o* and sleeve *t* with the collar *u*, slide *i*, clamp *m*, and the nut *n*, when constructed and operated in manner substantially as and for the purpose set forth.
5. The cam-latch *x*, attached to the slide *i*, for holding back the sleeve *t*, as set forth.

FREDRICK JONAS.

Witnesses:

J. E. SPRINGER,
HARVEY RAY, Jr.