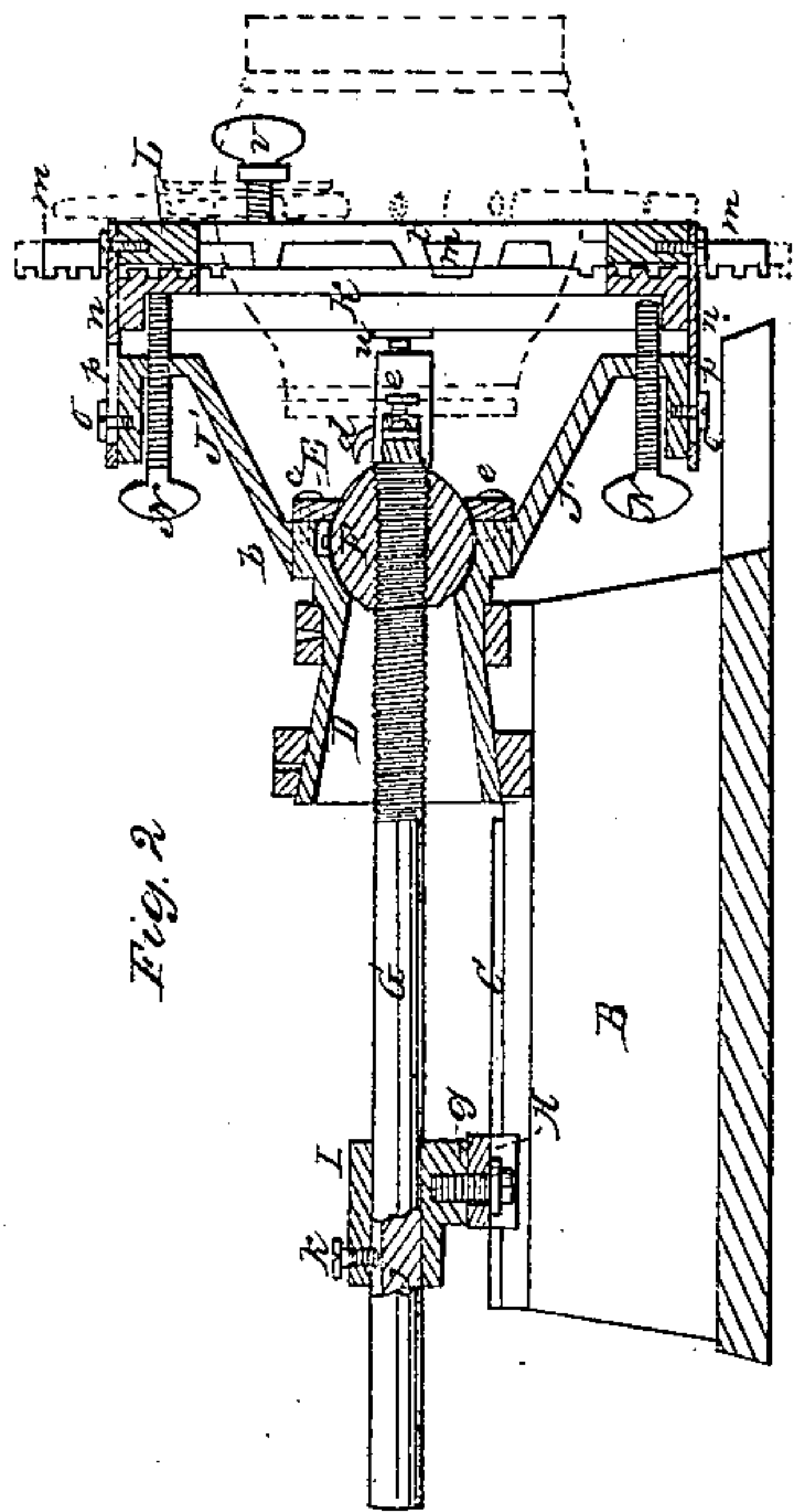


*D.C. Breed,*

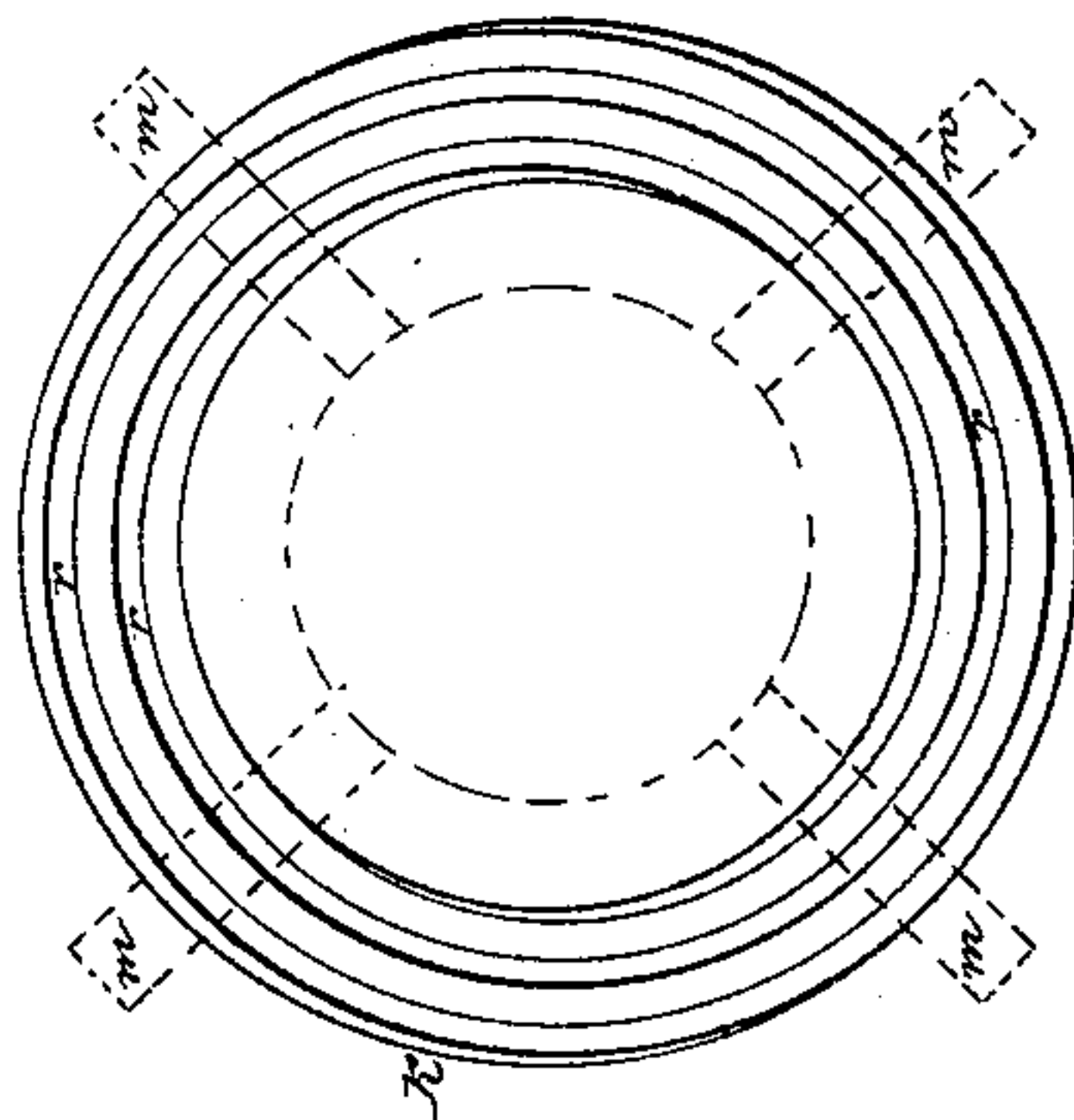
*Boring Hubs,*

*No 53,400.*

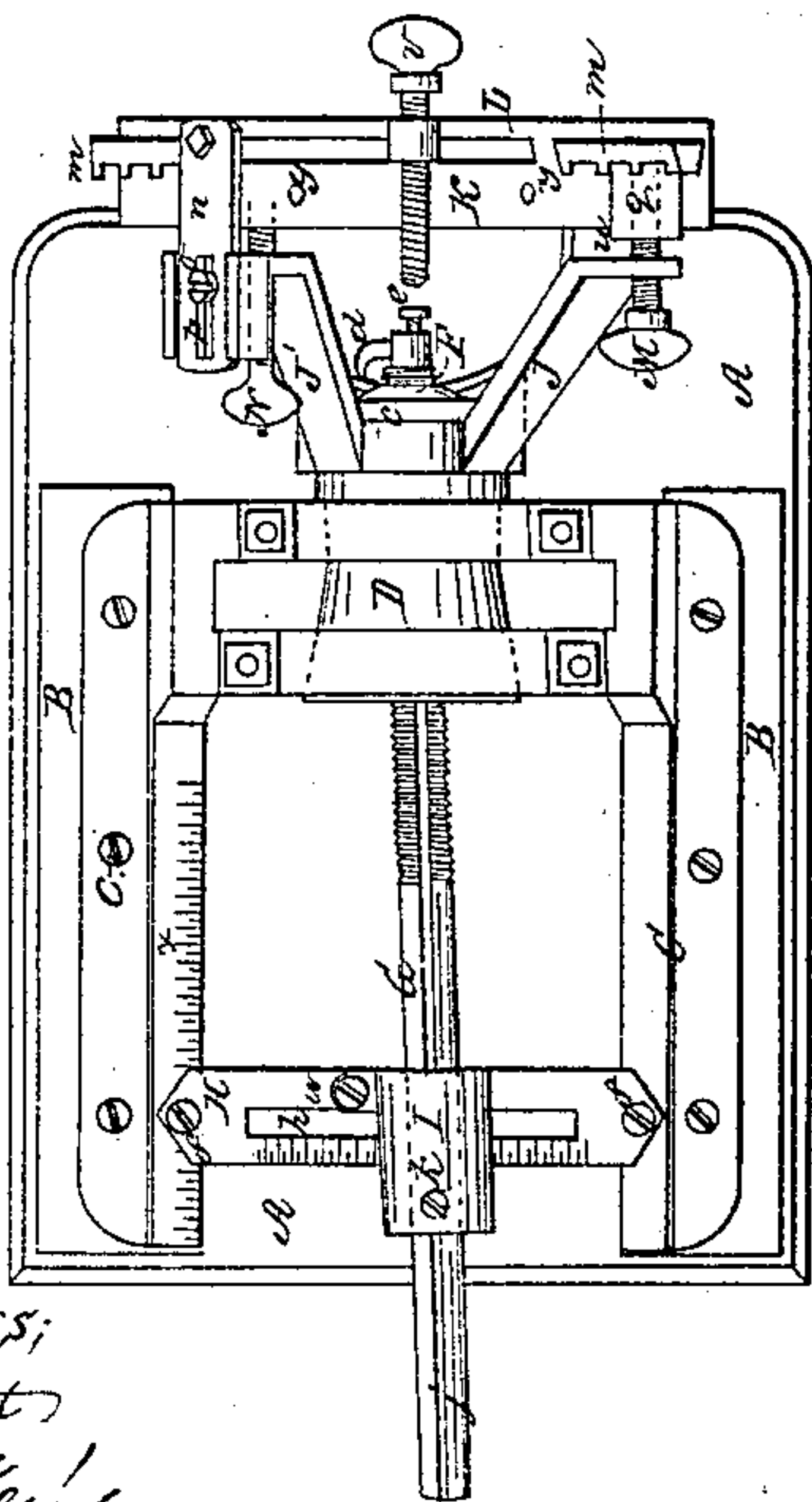
*Patented Mar. 27, 1866.*



*Fig. 2*



*Fig. 3*



*Fig. 1*

*Witnesses;*  
*Gay Kuyatt*  
*L. P. McKee's*

*Inventor;*  
*D.C. Breed*  
*by J. Orser & Co.*  
*his attorneys*



# UNITED STATES PATENT OFFICE.

D. C. BREED, OF LYNDONVILLE, NEW YORK.

## IMPROVEMENT IN MACHINES FOR BORING HUBS.

Specification forming part of Letters Patent No. 53,400, dated March 27, 1866.

*To all whom it may concern:*

Be it known that I, D. C. BREED, of Lyndonville, in the county of Orleans and State of New York, have invented a certain new and Improved Machine for Boring Hubs; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a plan of my improved machine; Fig. 2, a central longitudinal vertical section thereof; Fig. 3, an enlarged view of the annular grooved wheel for operating the cog-bars.

Like letters of reference indicate corresponding parts in all the figures.

My invention consists of the combination of a spiral-grooved annular plate with cog-bars and other parts, hereinafter specified, for the purpose of centering the hub to be bored; in the peculiar manner of adjusting the inclination of the mandrel-cutter which regulates the taper of the hole; also, in an arrangement by which the chuck that holds the wheel may be adjusted by means of slotted plates, set and thumb screws, &c., to adapt the machine to hubs of different lengths; and in the special construction of the mandrel, arranged with a ball-nut, hollow conical bearing, and other necessary parts, substantially as hereinafter set forth.

In the drawings, A A represent a platform-frame, and B B two longitudinal pieces or supports, upon which are secured, in any suitable manner, the frame C C, upon which are mounted the operating parts of my machine. This frame C C is preferably made of cast metal, and consists of two longitudinal plates or bars, connected at their front ends by a raised transverse portion, which forms the journals of the hollow conical revolving bearing D, to which is attached the chuck for holding the wheel and centering the hub, as will presently be described.

In the forward end of the bearing D is made a socket, E, in which fits the ball-nut F, through the latter of which screws the cutter-mandrel G. This ball-nut and socket are employed so as to allow the necessary adjustment of the cutter-mandrel for obtaining the required taper to the hole in the hub. The nut is prevented from revolving in the socket by means of the pin-projection *a* on the former, which fits in a recess, *b*, in the socket, but so

loosely as to allow the necessary change in the position of the ball-nut caused by the adjustment of the mandrel. The nut is secured and kept in position by means of the annular plate *c*, which is screwed or otherwise fastened to the bearing D.

The mandrel is provided at its forward end with a curved cutter, *d*, of the ordinary construction, which may be secured in the same by means of a screw, *e*, as most clearly shown in Fig. 2. The mandrel is threaded a sufficient distance to allow the necessary longitudinal movement of the cutter in boring through the hub, and is supported at its rear end by the cross-bar guide H, which is adjusted longitudinally on the frame C by means of a scale, *x*, and set-screws *f f*.

Fitting around the mandrel is the bearing I, which is also adjustable on the bar H, and is secured to the same by a screw-bolt, *g*, Fig. 2, from beneath, which slides as the bearing is adjusted in the slot *h* in the cross-bar guide. A set-screw, *w*, fastens the bearing in place after it has been properly adjusted, which is done by means of a scale, *i*, on the bar H, by which the required taper or inclination of the hole to be bored is attained.

The mandrel is prevented from turning with the revolution of the ball-nut by means of a screw, *k*, which enters a groove, *j*, cut in the mandrel a sufficient distance to allow the necessary advance of the same in boring.

The conical bearing D is provided with arms J J', (four only being represented, but more may be employed, if desired,) for properly supporting and adjusting the chuck for centering and securing the hub. This chuck consists of two annular plates, K L, and cog-bars *m m*. L is attached to the arms J' by means of plates *n n*, rigidly fastened to the former by screw-bolts or other means, and secured to the latter by means of set-screws *o o*, which adjust in slots *p p* in the said plates, for the purpose of adapting the machine to hubs of different lengths, or for those unusually long or short, slight variations in the lengths of the hubs requiring no change of adjustment.

At right angles to the arms J' J' (when only four are employed) are the two arms J J, through the ends of which loosely pass thumb-screws M, which screw into lug-projections *q* from the annular plate L.

The annular ring or plate K is provided, on



its outer face, or that next to L, with spiral grooves  $r r$ , Fig. 3, in which fit the teeth of a number of cog-bars,  $m m$ , four only being represented, for properly centering the hub preparatory to boring, as hereinafter described. These cog-bars fit so as to slide in dovetailed radial grooves in projections from the contiguous face of the plate L. (Most clearly shown at  $t$  in Fig. 2.) The grooved plate K is kept in position and engaged with the said cog-bars by means of flanges  $u$  on the lug-projections  $q$ , and by the plates  $n n$ , at right angles to the former, and by the two long thumb-screws N N.

The wheel whose hub is to be bored is secured to the outer face of the ring or plate L by its spokes by means of clamps and the thumb-screws  $v v$ , two only being shown, as represented in red lines, Fig. 2. If the spokes are not set true in the hub, the four screws M N may be turned in or out till the axis of the hub is adjusted to coincide with the axial line of the bearing D, when the hub may be accurately centered by turning the ring or annular plate K, which moves the cog-bars  $m m$  simultaneously and equally toward the center till they come in contact with and gripe the hub, as shown in red lines, Figs. 2 and 3.

The operation of my machine thus constructed is simple and obvious. The wheel is first clamped to the chuck and centered by turning the grooved plate K, as above described. The cross-bar H is then adjusted by means of the scale  $x$  at a distance from the ball-nut equal to that of the farther end of the hub from the same. Next the mandrel is adjusted on the cross-bar H by means of the scale  $i$  thereon at a distance from the center of said cross-bar equal to the required taper or inclination of the hole to be bored. The wheel is now revolved by the rim, and with it the conical bearing D and ball-nut, when the mandrel, being prevented from turning by the screw  $k$ , advances with the cutter  $d$ , and the operation of boring commences. After the cutter has bored through the hub the cutter may be reversed, and then, by turning the wheel in an opposite direction, the cutter will

retrograde, boring in as perfect a manner as when advancing. This process may be repeated till the hole is bored of the required size and taper, and also for cutting the recess for the shoulder of the box when required. The annular plate K may be turned by inserting a bar or wrench in the holes  $y y$  for removing or inserting a hub. By means of this device the hub is always centered accurately without the attention of the operator and with no delay.

The advantages of my improvements are, the perfect and rapid manner in which my machine performs its work, the simple and easy manner of adjusting the machine for boring a hole of any required taper, its easy adaptation to hubs of different sizes, the facility with which the hub is truly centered, and the simplicity, economy, and durability of its construction.

I do not claim a centering-chuck nor scales of adjustment as applied to hub-boring machines; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the annular plate L, adjustable connecting-plates  $n n$ , supporting-arms J J', and adjusting-screws M N, in connection with the spiral-grooved chuck-plate K and cog-bars  $m m$ , substantially as herein specified, whereby the centralizing longitudinal and angular adjustments of the hub are effected together, as set forth.

2. The combination of the adjustment of the cross-bar H by the longitudinal scale  $x$  and the transverse adjustment of the mandrel-bearing I by the scale  $i$ , with the adjustment of the chuck-plates K L to suit hubs of different lengths, for the purpose of directly determining the required taper of the holes to be bored in the hubs, substantially as herein described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

D. C. BREED.

Witnesses:

J. FRASER,  
JAY HYATT.