

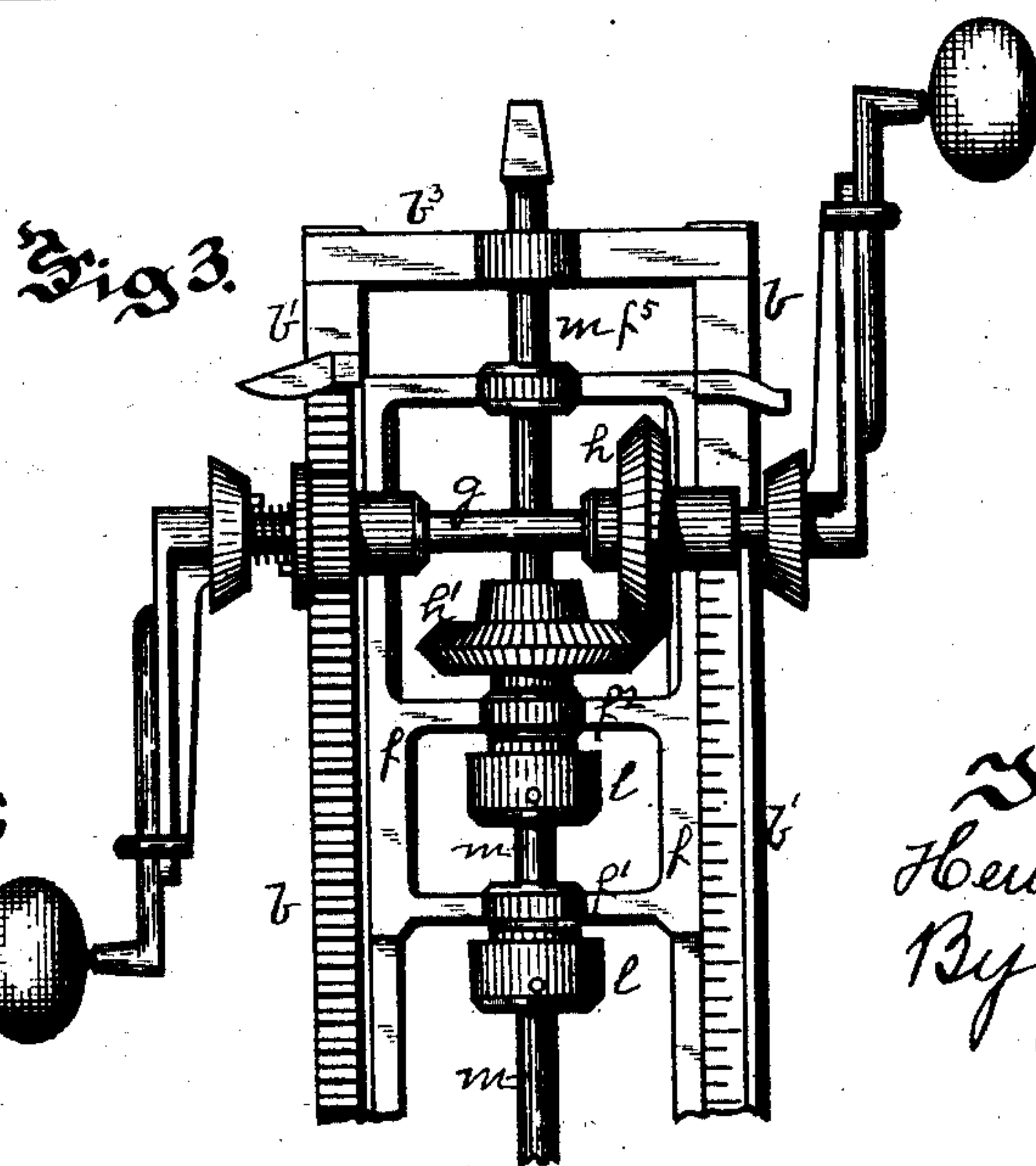
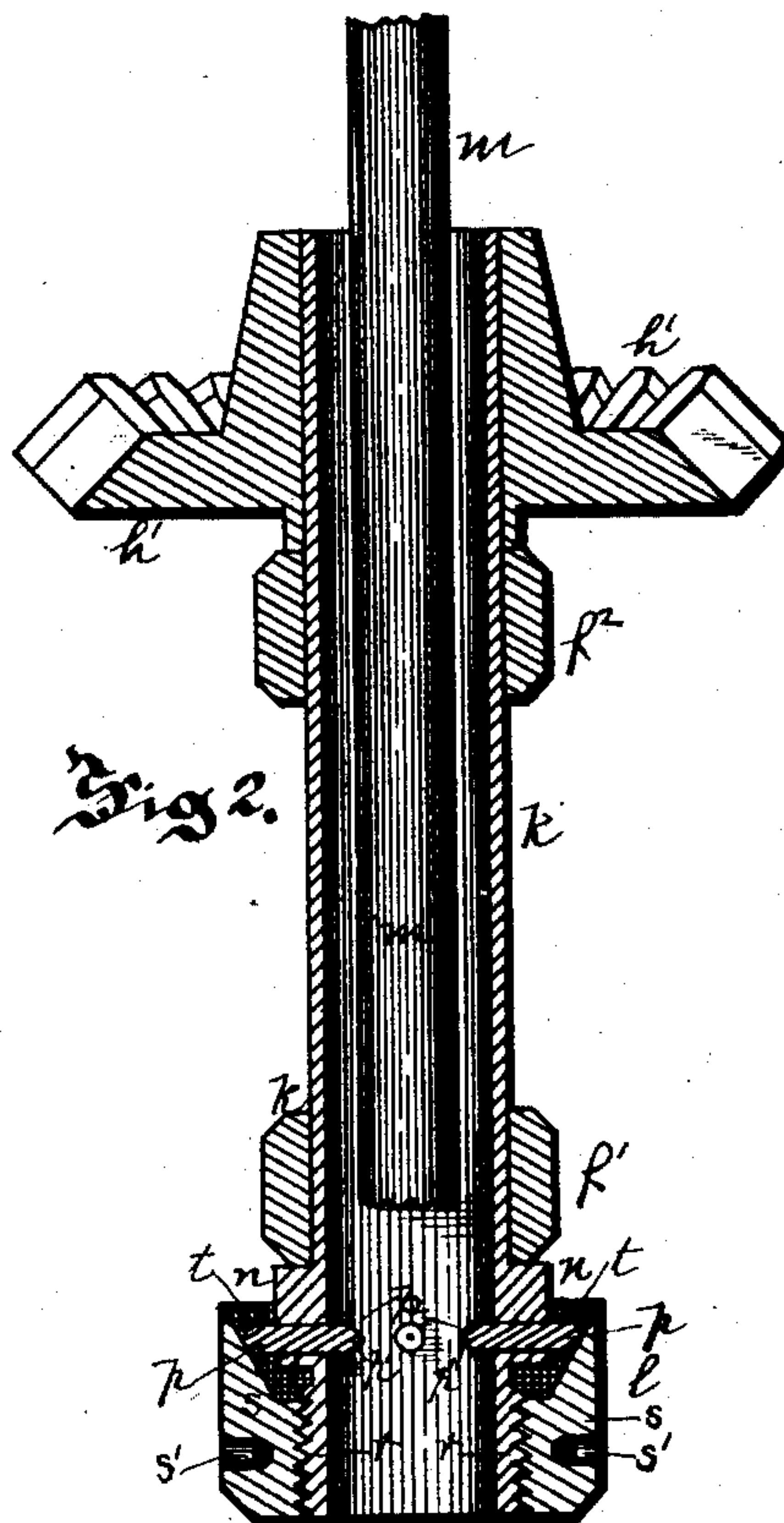
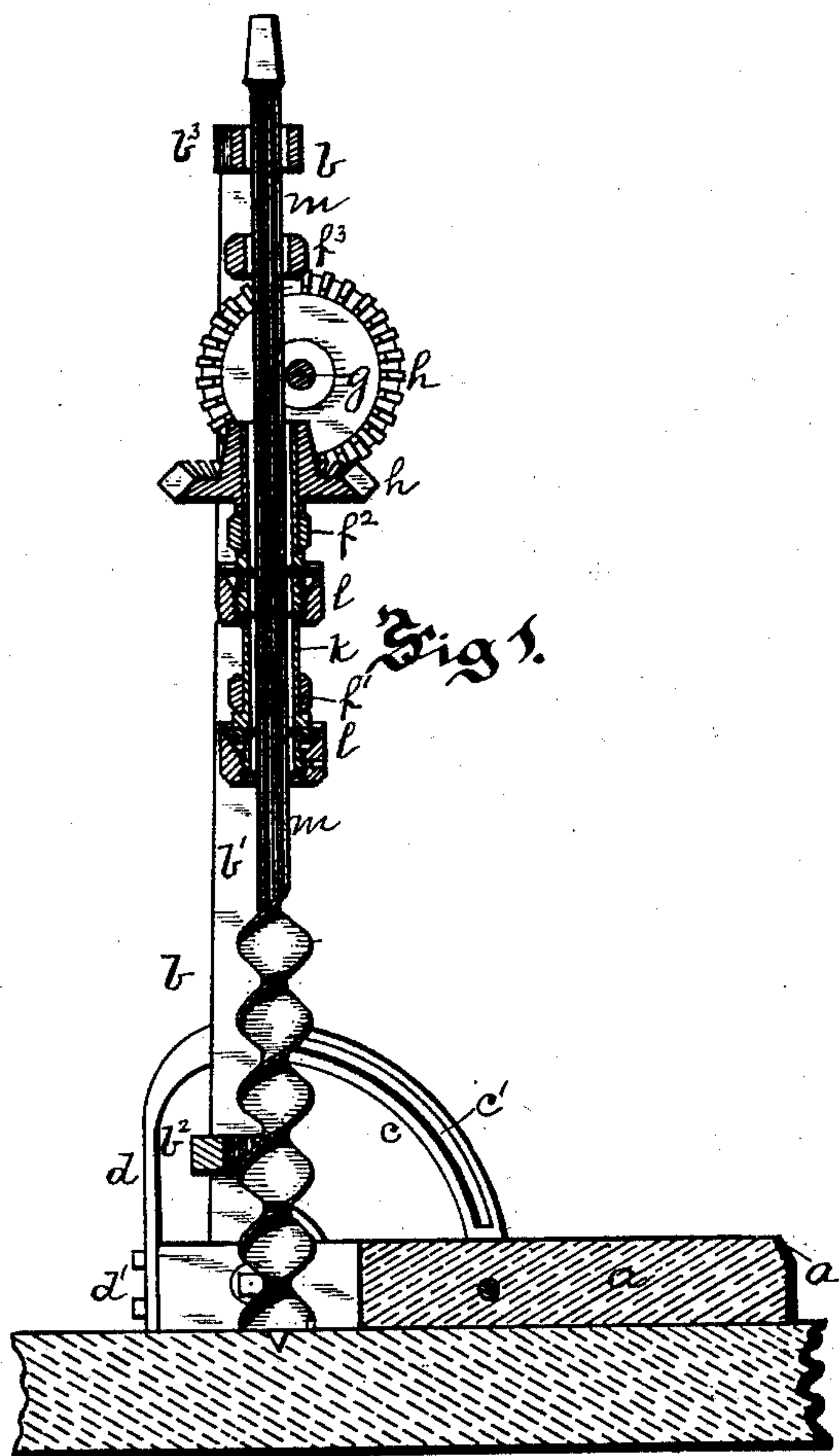
(No Model.)

H. IHSEN.

WOOD BORING MACHINE.

No. 374,363.

Patented Dec. 6, 1887.



Witnesses;  
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# UNITED STATES PATENT OFFICE.

HENRY IHSEN, OF ALLEGHENY CITY, PENNSYLVANIA.

## WOOD-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 374,363, dated December 6, 1887.

Application filed January 19, 1886. Serial No. 189,046. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY IHSEN, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Wood-Boring Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in wood-boring machines, being applicable especially to the boring-machines shown and described in Letters Patent No. 296,093, granted to Z. C. Phillips April 1, 1884, though it may be used with advantage in any of the ordinary boring-machines heretofore in use. In the Phillips patent is shown and described a hollow auger-shaft mounted within the sliding frame of the boring-machine, through which hollow shaft the shank of the ordinary auger extends, the shank being centered and held in place by set-screws which pass through the auger-shaft and engage with the cylindrical portion of the auger-shank, the boring-machine being by this means adapted to receive augers having shanks of any size or shape. This has been found a very great improvement in connection with boring-machines; but difficulty has been experienced in centering the auger-shank within the hollow shaft, a very delicate adjustment of the set-screws passing through the shaft being necessary for this purpose.

The particular object of my invention is to overcome these difficulties in connection with this class of boring-machines, as will be hereinafter more specifically set forth.

It consists, generally, in a hollow auger-shaft or spindle adapted to receive the cylindrical part of the auger-shank and provided with centering-pins projecting into said spindle through the side walls of the same, and a sleeve having inclined inner walls fitting over said spindle and bearing on the heads of the pins, by means of which the auger-shank may be centered or brought to the exact position desired within the shaft or spindle without any particular adjustment thereof, and be firmly held within said shaft or spindle when in use.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical central section thereof, showing the auger and its shank in full lines. Fig. 2 is an enlarged

longitudinal section of the chuck and hollow auger-shaft, and Fig. 3 is an enlarged view showing a portion of the body and sliding frame of the machine and illustrating the same where the hollow auger-shaft is done away with.

Like letters of reference indicate like parts in each.

In the drawings, *a* represents the ordinary bed-frame, at one end of which are pivoted the standards *b' b'* of the vertical frame or body *b* of the boring-machine, these standards being connected by any cross-braces, as at *b<sup>2</sup> b<sup>3</sup>*.

At the base of the bed-frame is secured the quadrant *c*, this quadrant being secured firmly to the bed-frame, so forming a stationary quadrant, and the quadrant having a supporting-strap extending back of the frame, as at *d*, and secured to the end of the bed-frame, as at *d'*. The quadrant *c* is provided with the slot *c'*, within which set-screws on the standards *b' b'* travel, and by means of which the frame is adjusted to the particular angle at which the hole is to be bored by the auger. By this construction the apparatus for adjusting the vertical frame is much simplified, and at the same time it is rendered strong and firm, so as to withstand any pressure or strain brought upon the vertical frame.

Sliding within the frame *b* is the sliding frame *f*, within which the power apparatus of the machine is mounted, this frame being of any desired construction suitable for the purpose and having mounted at or near the top thereof the horizontal crank-shaft *g*, by means of which power is applied to the auger-shaft, this crank-shaft carrying the beveled miter-wheel *h*, which engages with beveled miter-wheel *h'*, which in the construction preferred by me is mounted at the upper end of the hollow auger-shaft *k*, this hollow auger-shaft being mounted in suitable bearings, *f' f<sup>2</sup>*, in the center of the sliding frame. The auger-shaft *k* is preferably formed hollow throughout its length, so as to arrange the apparatus for supporting a long auger-shank, which will pass through the auger-shaft and extend above the machine, the top brace, *f<sup>3</sup>*, of the sliding frame, as well as the upper cross-piece, *b<sup>3</sup>*, of the stationary frame, having openings formed therein to receive the end of the shaft. In some cases, however, this may not be necessary and the upper end of the hollow auger-shaft may be



closed, the shaft being adapted to receive augers of the ordinary length.

At the base of the hollow auger-shaft is the centering-chuck, as at  $l$ , this chuck being adapted to engage with the cylindrical portion of the auger-shank and center the same exactly within the hollow shaft or spindle, so that after the auger-shank has been inserted within the shaft by means of the chuck it can be centered and held therein, there being no necessity for special adjustment of the set-screws in order to cause the perfect working of the auger when connected to the boring-machine. The construction of this chuck preferred by me is shown in the drawings, the hollow auger shaft or spindle having the enlarged portion  $n$ , through which are formed three or more radial holes or seats to receive the pins or bits  $p$ , these pins extending into the hollow auger shaft or spindle and some distance out beyond the enlargement thereof.

Below the enlargement on the shaft or spindle is formed the threaded portion  $r$ , on which is screwed the sleeve  $s$ , this sleeve having the annular beveled inner face or wall,  $t$ , which presses against the outer ends of the pins  $p$ , and so forces them inwardly, causing the inner ends or points,  $p'$ , of the pins to engage with the auger-shank  $m$  when inserted within the hollow shaft or spindle, the sleeve  $s$  being gradually screwed up and gradually forcing in these pins, so that they bring the auger-shank to the center of the hollow shaft or spindle and hold the same there firmly, thus centering the shank and overcoming any necessity for particular adjustment by means of such screws or bolts of the shank within the hollow shaft. The sleeve  $s$  is either formed angular on its outer face to engage with a wrench, or is provided with holes, as at  $s'$ , by means of which any suitable tool may be caused to engage with the sleeve and hold it firmly while the shaft is rotated, or turn it while the shaft is held from rotation by means of the crank-shaft.

For general purposes of the machine I find it necessary to employ only one centering-chuck at the base of the hollow shaft, the hollow shaft extending up through the bearings  $f'f''$ , and having secured at the top thereof the miter-wheel  $h'$ , before referred to, and when this hollow shaft is opened throughout its length, in order to arrange for holding augers having long shanks, I generally prefer to form the crank-shaft on a different vertical plane from the auger-shaft and make the miter-wheels  $h h'$  what are termed "screw-miters," as shown in the Phillips patent. It may be desirable to employ an additional chuck on the hollow shaft, as shown in Fig. 1, this chuck being generally located below the bearing  $f''$  of the sliding frame, and the two chucks in combination acting to hold the auger-shank from any swinging motion whatever.

Instead of the employment of the hollow auger-shaft, as shown in Figs. 1 and 2, I may employ the hollow spindles, as shown in Fig.

3, one spindle being mounted in the lower bearing,  $f'$ , on the sliding frame and having a chuck at the base thereof, and another spindle being mounted in the central cross-brace,  $f''$ , of the sliding frame and carrying the miter-wheel  $h'$ , and also having a chuck secured thereto below the bearing, and when the auger-shaft is inserted through these spindles and firmly secured thereto by means of the centering-chucks, as above described, it is evident that the motion will be imparted to the auger-shank from the bevel-gear through the upper spindle, and the necessity of employing a hollow auger-shaft is overcome, the lower spindle acting to center the lower end of the shank and prevent swinging or side movement thereof.

When my improved boring-machine is in use, the operator, by means of the stationary quadrant and set-screws above referred to, adjusts the body  $b$  to the desired angle, and he then inserts the auger intended to be used, and if this auger has a long shank, as shown, it passes up through the hollow auger-shaft  $k$ , or the spindles in the bearings, and is adjusted to its proper position with relation to the sliding frame, and the sleeve  $s$  of the chuck is then caught by means of a wrench, while the hollow shaft is turned by means of the crank-shaft and gearing, the sleeves being thus screwed up on the hollow shaft and the pins of the chuck forced in upon the cylindrical portion of the auger-shank, the pins acting, as before described, first, to center the shank within the hollow shaft, and then to bind upon the same and hold it firmly in this position. If two chucks are employed with the machine they may both be screwed up in the same manner, and the apparatus is then ready for work. It is evident that by the employment of these chucks with the boring-machine I overcome entirely all objections heretofore made on account of the adjustment required in holding shanks of different sizes within the same boring-machine and provide means for firmly securing shanks of any size without any adjustment therefor.

The form of chuck employed is simple in construction and cheap, and it may be applied to advantage to other forms of boring or turning machines than that shown.

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

In a wood-boring machine, the combination, with the sliding frame, of a hollow auger-spindle mounted thereon, centering-pins projecting loosely into said hollow spindle through the walls thereof, and a movable sleeve having annular beveled inner walls fitting over said spindle and bearing on the heads of the pins, substantially as and for the purpose set forth.

In testimony whereof I, the said HENRY IHSEN, have hereunto set my hand.

HENRY IHSEN.

Witnesses:

MASON V. DAVID,  
JAMES I. KAY.