

No. 687,786.

Patented Dec. 3, 1901.

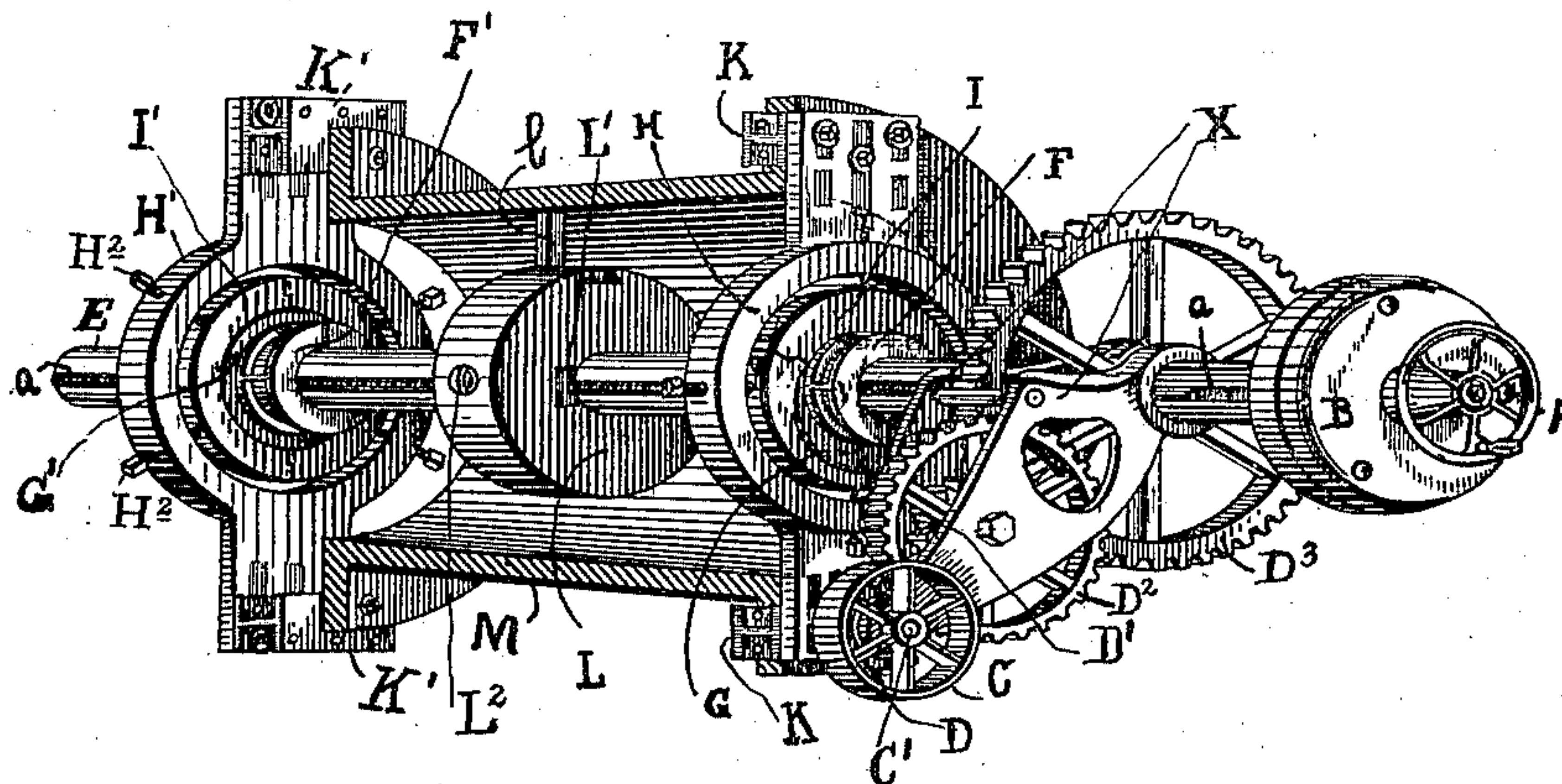
G. RENTON.  
MACHINE FOR BORING TAPER HOLES.

(Application filed Mar. 7, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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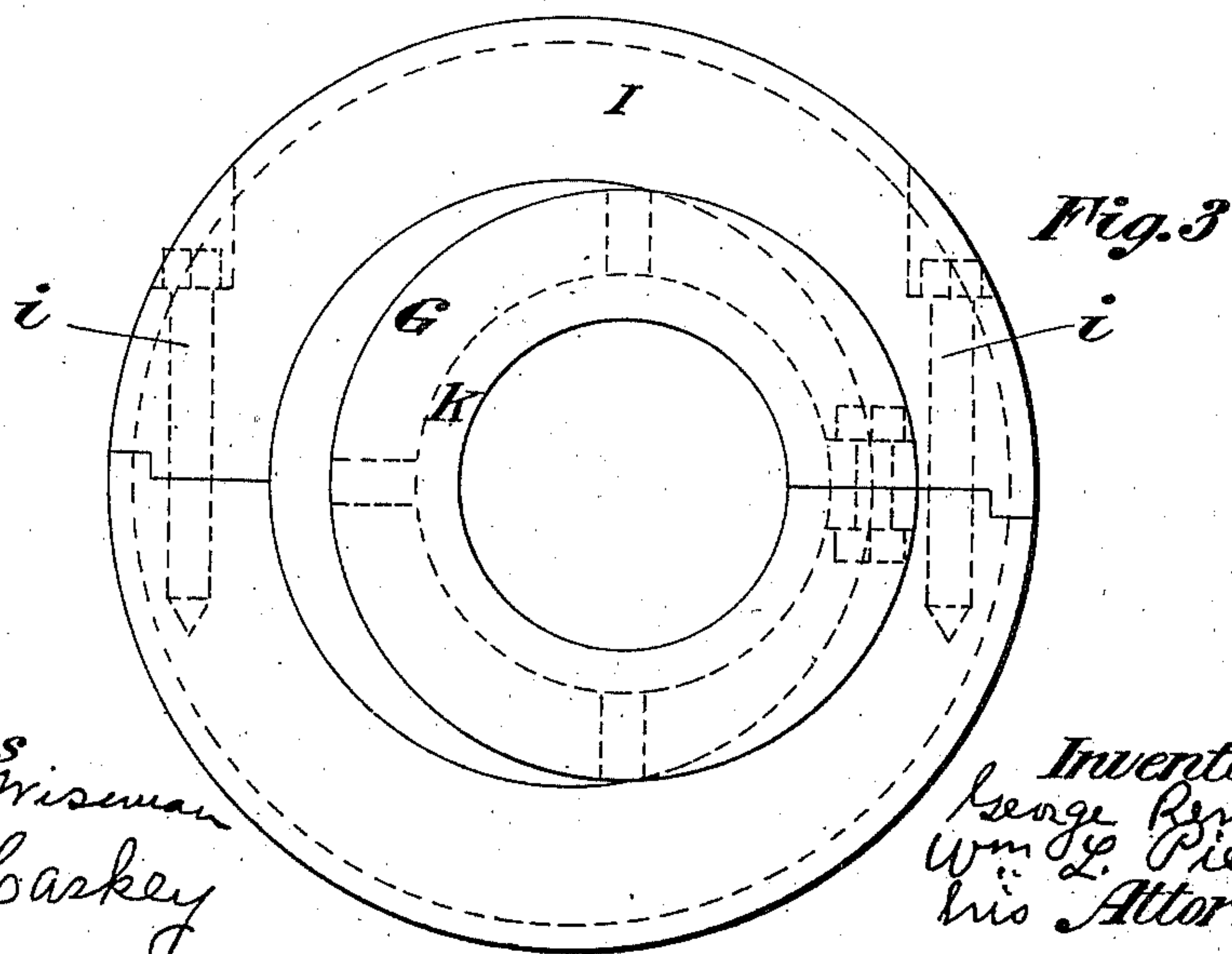
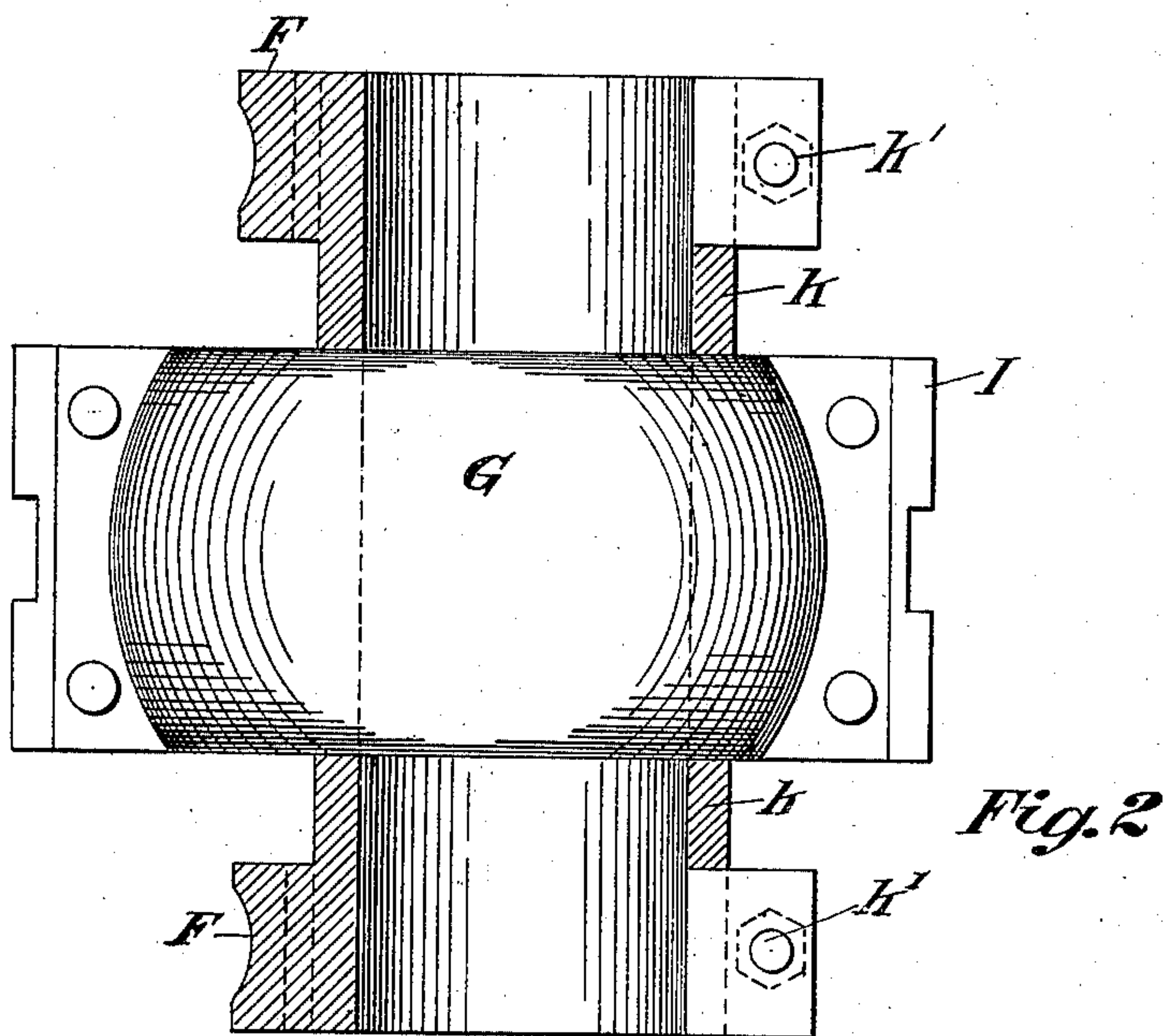
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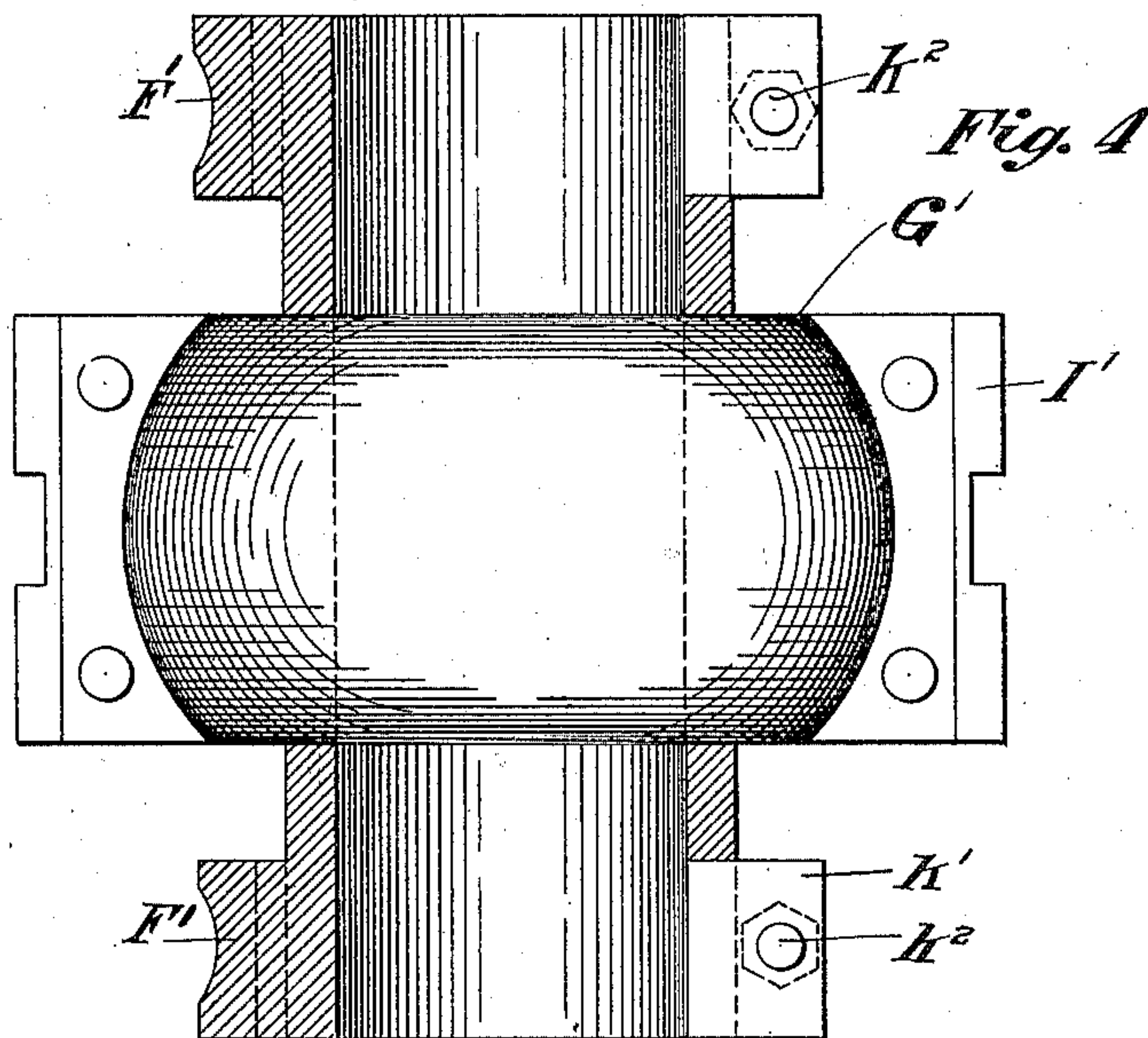
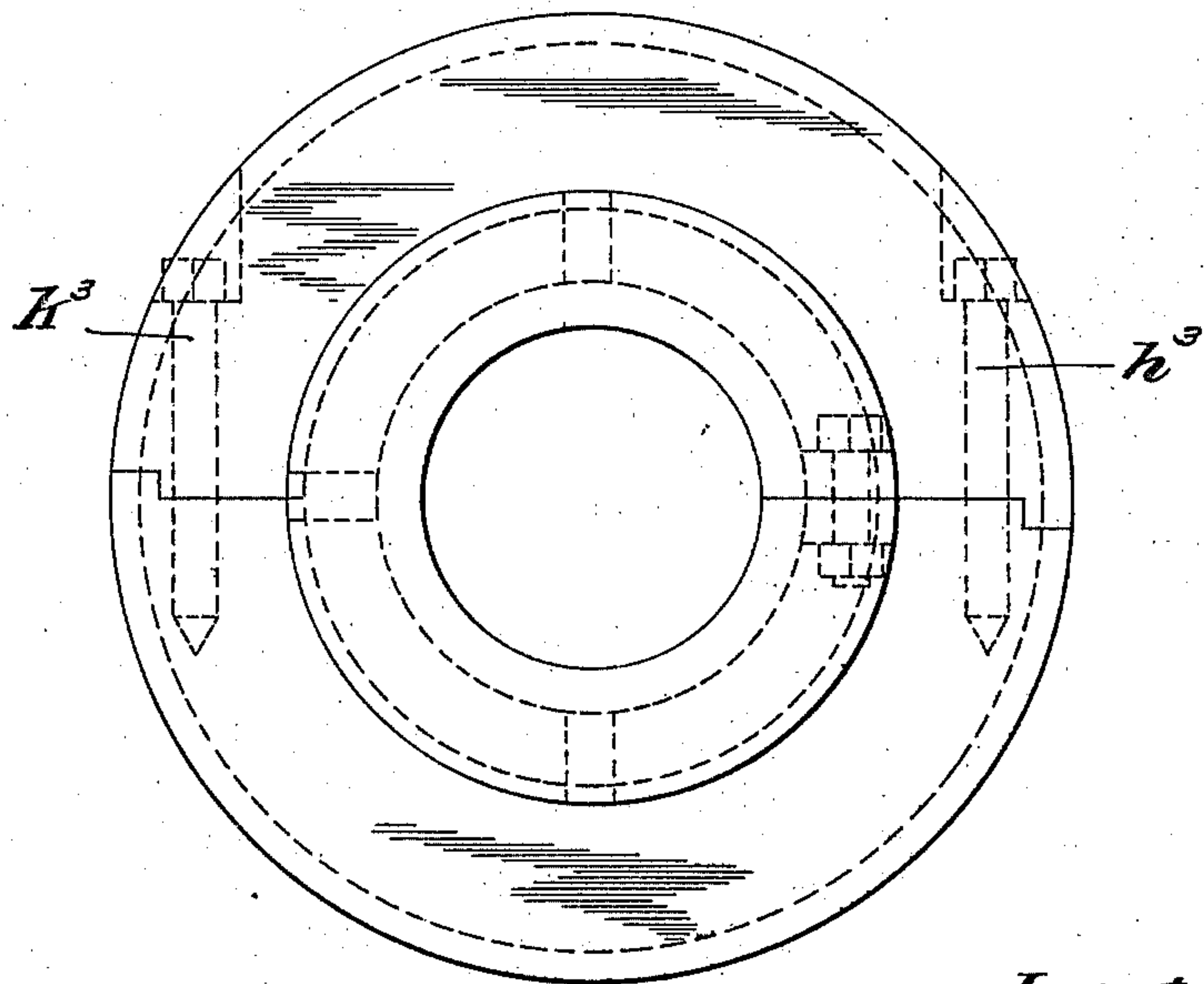


Fig. 5



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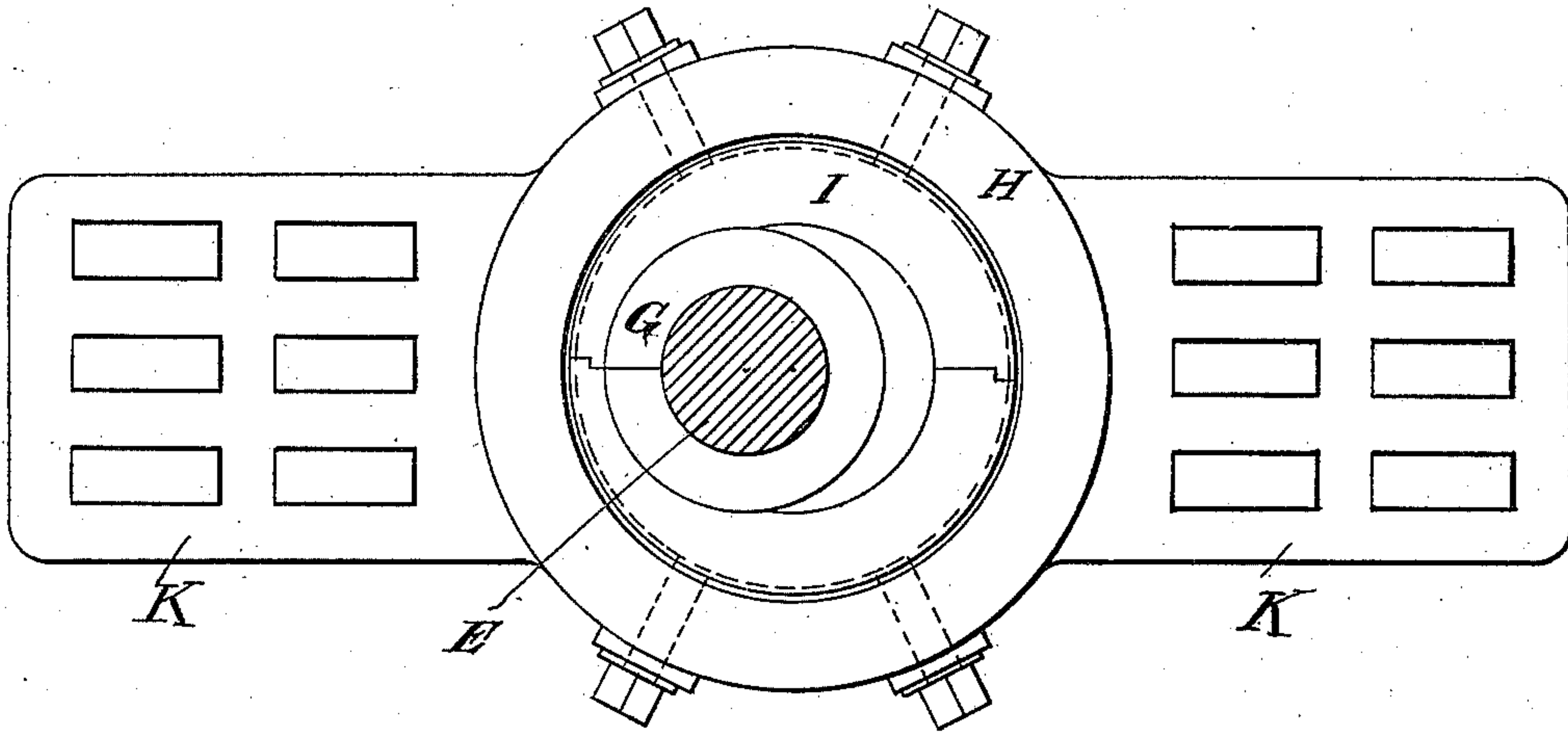


Fig. 6

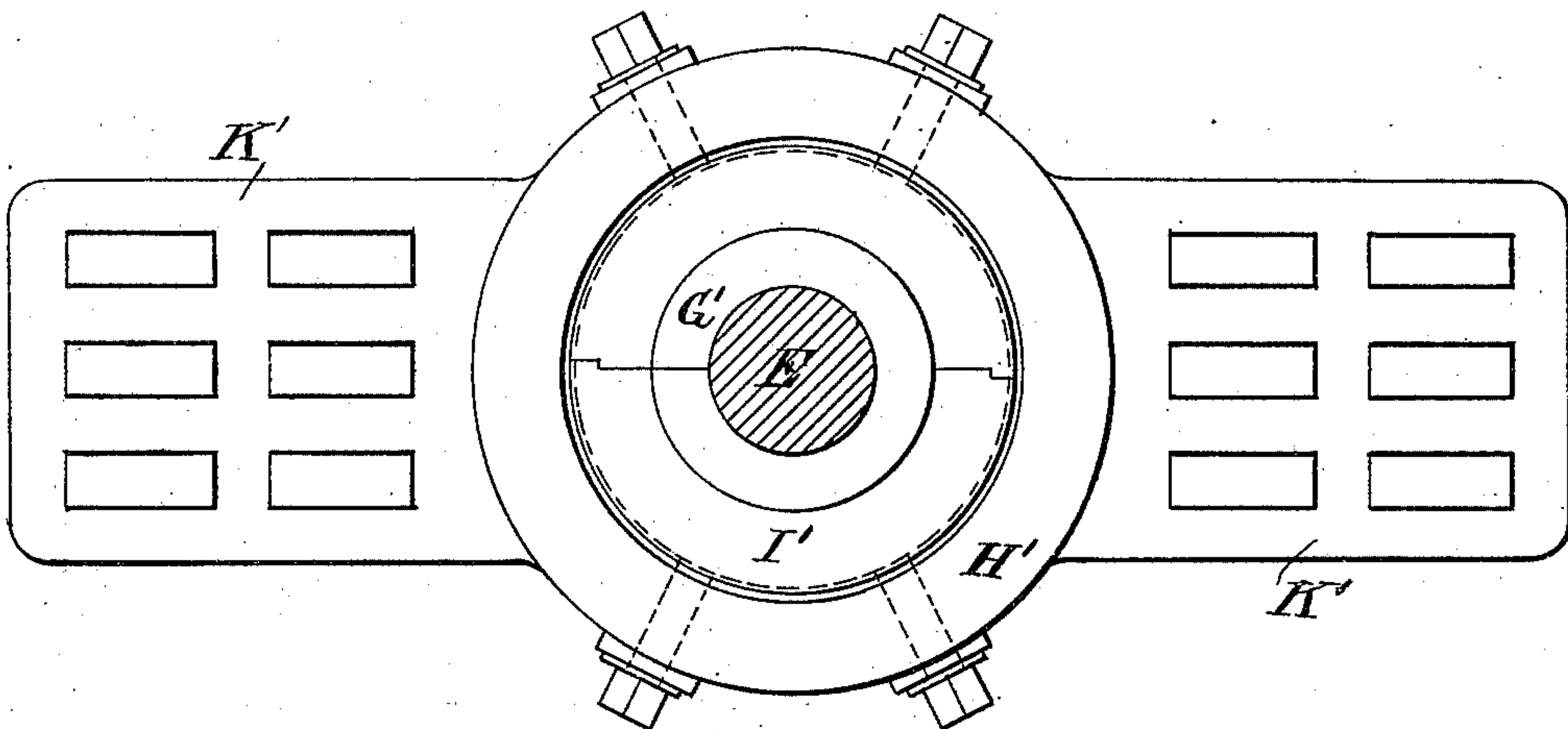


Fig. 7

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# UNITED STATES PATENT OFFICE.

GEORGE RENTON, OF PITTSBURG, PENNSYLVANIA.

## MACHINE FOR BORING TAPER HOLES.

SPECIFICATION forming part of Letters Patent No. 687,786, dated December 3, 1901.

Application filed March 7, 1900. Serial No. 7,652. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE RENTON, a citizen of the United States of America, and a resident of Pittsburg, county of Allegheny, and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Boring Taper Holes, of which the following is a specification.

Figure 1 is a perspective view of the boring-machine in position. Fig. 2 is a section of the eccentric bearing. Fig. 3 is a side view of the same. Figs. 4 and 5 are like views of the true bearing. Figs. 6 and 7 are side views of the centering cross-heads for the two bearings, respectively. Figs. 2, 3, 4, and 5 are on an enlarged scale.

The purpose of my invention is to devise modified bearing for the boring-bar of a machine for boring holes, so that the machine which has been used for many years for boring true or untapered holes may be used for boring tapered holes.

In Fig. 1 I have been obliged to illustrate the entire machine in order to show the relation of my altered bearings to the other parts of the borer; but in the following description I shall pass over briefly many features, as they are well known to those skilled in the art.

Referring now chiefly to Fig. 1, A is a hand-wheel for turning the feed-screw *a*, which extends from one end of the machine to the other to feed the cutting-head in while cutting and to draw it out when the boring is completed. B is a box for containing the gearing operated by the hand-wheel A; but as my invention does not relate to said feature further illustration or description is deemed unnecessary. C is a pulley for the power-belt to drive the gearing for turning the boring-bar E, which bar extends also for substantially the entire length of the machine. Fixedly secured to the shaft C', on which the pulley C is mounted, is a gear-wheel D, which meshes with the gear-wheel D'. Mounted on the shaft of the gear-wheel D' is a third gear-wheel D<sup>2</sup>, which meshes with the large gear-wheel D<sup>3</sup>, fixedly secured to and adapted to drive the boring-bar E. The shafts of the belt-wheel C and gear-wheel D and the gear-wheels D' and D<sup>2</sup> are mounted in arms X X, projecting from the boring-bar E and loosely encircling the same, so as not to partake of

the rotary movement of said bar. F F are clamping-collars for the eccentric G, which will be described more in detail hereinafter. H is the centering cross-head for the socket or ring I of the eccentric G. K K K' K' are spacing-blocks. L is the cutting-head, receiving motion from both the feed-screw *a* and the boring-bar E. *l* is the cutter in said head. M is a casting, which is having a taper hole cut therein from right to left. F' F' are clamping-collars for the true bearing G', which will be described more in detail hereinafter. H' is the centering cross-head for the socket or ring I' of the true bearing G'.

All the parts hereinbefore described are old in the old boring-machine except that both bearings were true, being designed to bore an untapered hole and neither bearing moved with the boring-bar, but was still.

I shall now describe my two bearings which constitute the difference between my machine and the old one.

Referring now more particularly to Figs. 2 and 3, the ball or eccentric G is preferably made in one piece with the portions *k k* of the collars F, although by keying upon the boring-bar the collars could be made in separate pieces. This would involve an inferior construction. The ends of the collars are sawed a short distance, so as to be clamped upon the boring-bar by clamping-screws *k' k'*. The eccentric-strap I is made in halves and held together by screws *i i*.

The same general construction is followed in the true bearing G', Figs. 4 and 5, the collars F' F' being clamped upon the bar by screws *k<sup>2</sup> k<sup>2</sup>* and the socket or ring halves being secured by screws *k<sup>3</sup> k<sup>3</sup>*.

The adjustment for operation and the operation of the machine after adjustment are as follows: Assuming that the machine is to be placed in the cylinder M, the cylinder being a part of a stationary framework, the clamps F' are loosened and all the parts attached to the clamps removed from the boring-bar E. The bar is then inserted into and through the cylinder, the clamps F' are slipped over the bar again, and the spacing-blocks K K and K' K' connected to the cylinder-flanges by means of bolts or otherwise. The true bearing is now held in position from horizontal movement by the clamps F', attached



to the bar E, and the attachment of the spacing-blocks K' to the cylinder-flange. The next step is to true the center of the bar to the bore of the cylinder at that end. The screw-bolts H<sup>2</sup>, passing through the cross-head II', are used to adjust the ring I' by loosening the same on one side and tightening them on the other. This completes the adjustment at this end of the boring-bar. The operator, having ascertained the desired taper required in the bore of the cylinder M, turns the hand-wheel A, which causes the feed-screw *a* to revolve and to draw the boring-head L forward to the end of the cylinder by means of the segmental nut L', held in position in the head by means of the screw L<sup>2</sup>. The next step is to adjust the eccentric bearing G to suit the desired taper of the bore to be given to the interior of the cylinder. To effect this, the clamping-blocks F F are partly revolved on the bar E until the tool *l* bears upon the inner diameter of the cylinder at the end thereof. The clamps F F are then tightened to the bar and the bar is ready to be revolved. A driving-belt (not shown) is now passed around the pulley C from a similar pulley over a convenient power-shaft. The weight of the supporting-arms X X, the gear-wheels, and the pulley C hung thereon tends to keep the belt tight and to allow for the eccentric movement of the gear-wheel D<sup>3</sup>, fixed on the

boring-bar E. Power being applied, the bar E is revolved, carrying the feed-screw *a*, cutting-head, and tool *l*. The operator slowly turns the hand-wheel A, causing the feed-screw *a* to revolve, and through the nut L' the cutter-head is slowly advanced, while still revolving with the bar E. As the head L advances away from the eccentric bearing it will feel less and less the throw of the eccentric, and the radius of its path will consequently grow smaller and smaller, resulting in a diminishing taper hole.

Various changes may be made in the putting together and fashioning of my bearings, while still securing the same result.

I claim—

In a machine for boring taper holes, the combination of a boring-bar; an eccentric ball-bearing having an adjustable partible collar encircling and adapted to be clamped upon said bar; a socket or ring for said eccentric; a true bearing for said bar; and a boring-head adapted to be advanced on said boring-bar between said true and eccentric bearings.

Signed by me at Pittsburg this 2d day of March, A. D. 1900.

GEORGE RENTON.

Witnesses:

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