

(No Model.)

2 Sheets—Sheet 1.

J. WITHINGTON.

HAMMER DIE.

No. 292,608.

Patented Jan. 29, 1884.

Fig. 1.

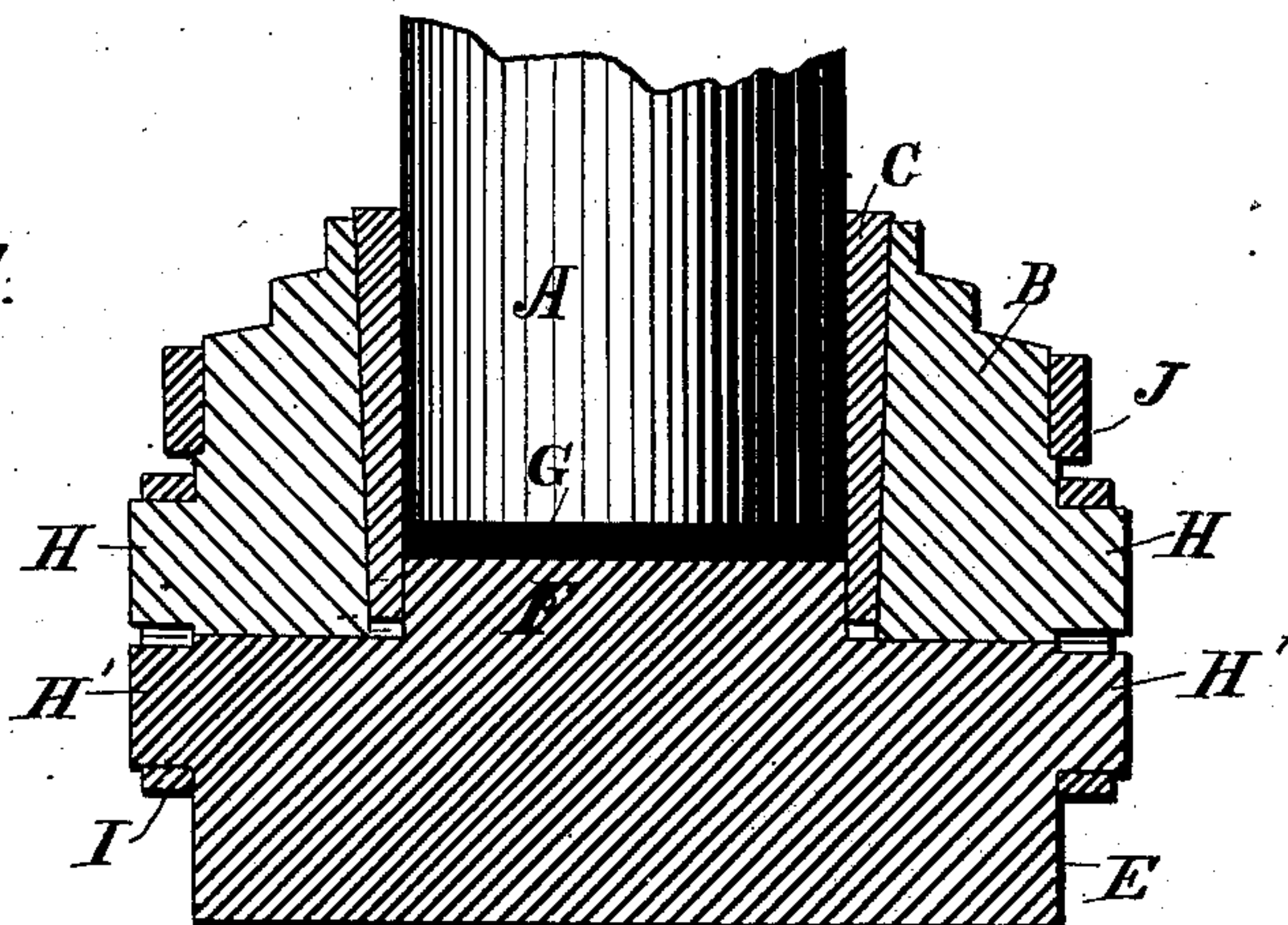


Fig. 2.

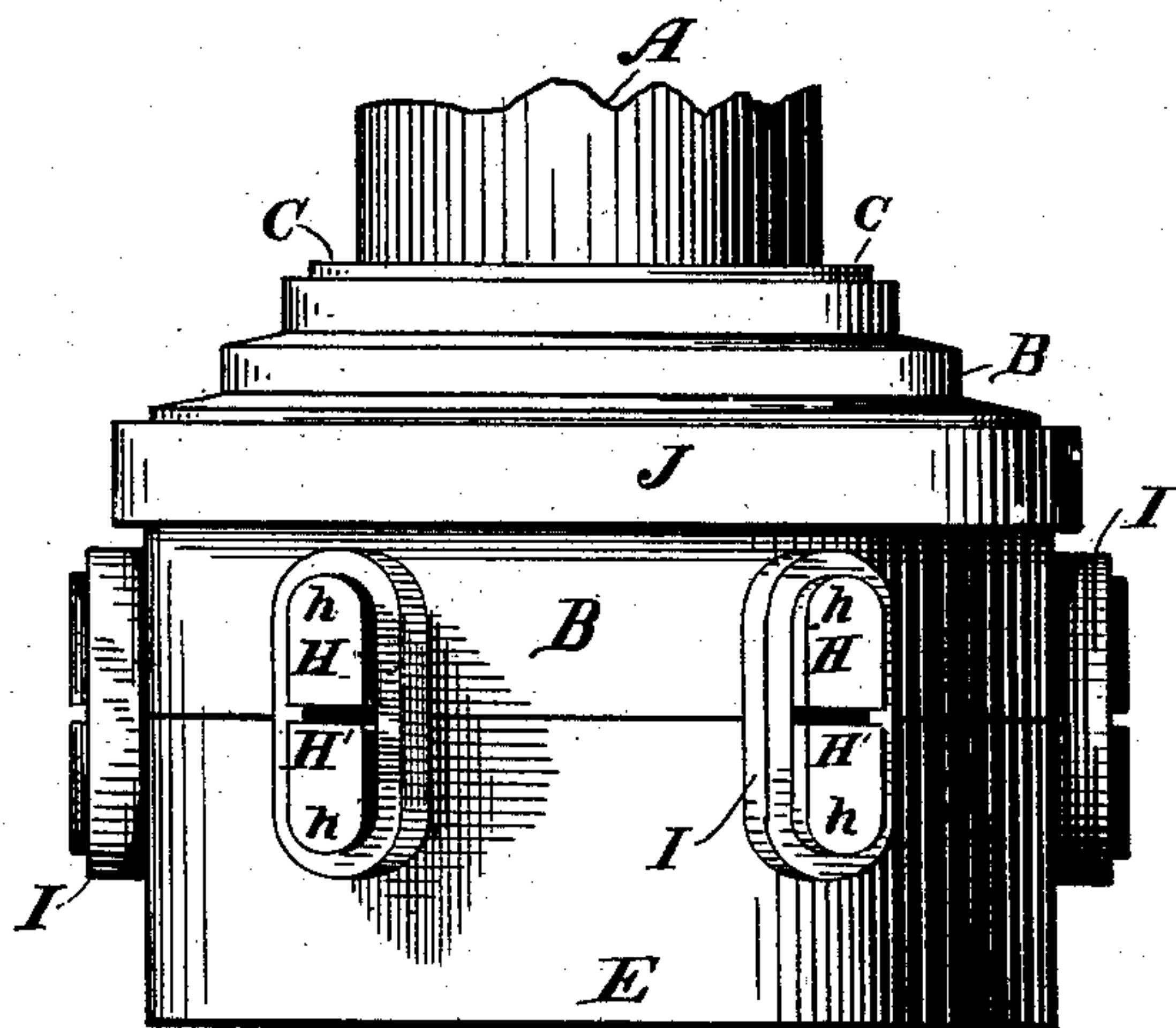
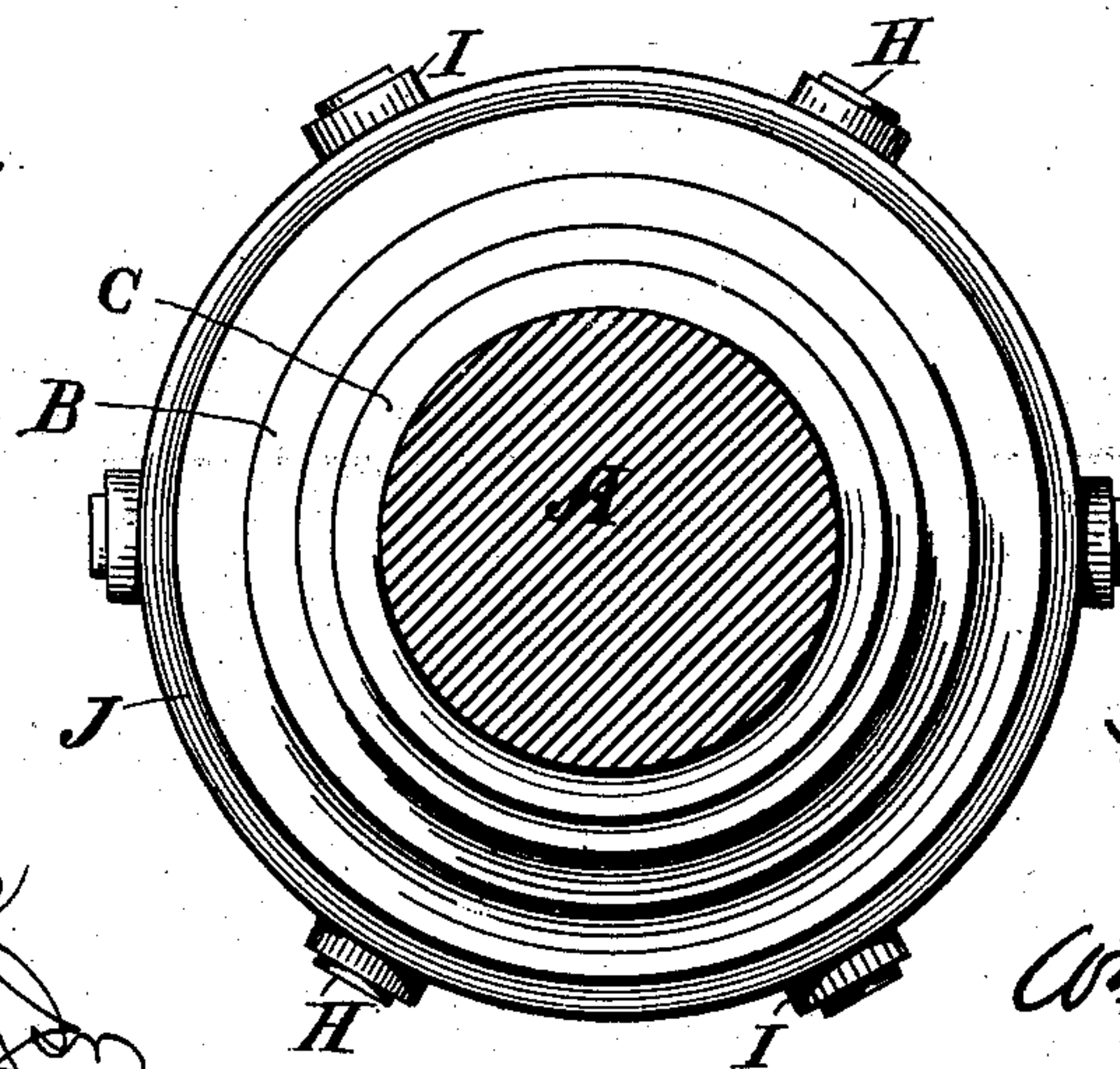


Fig. 3.



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Fig. 4.

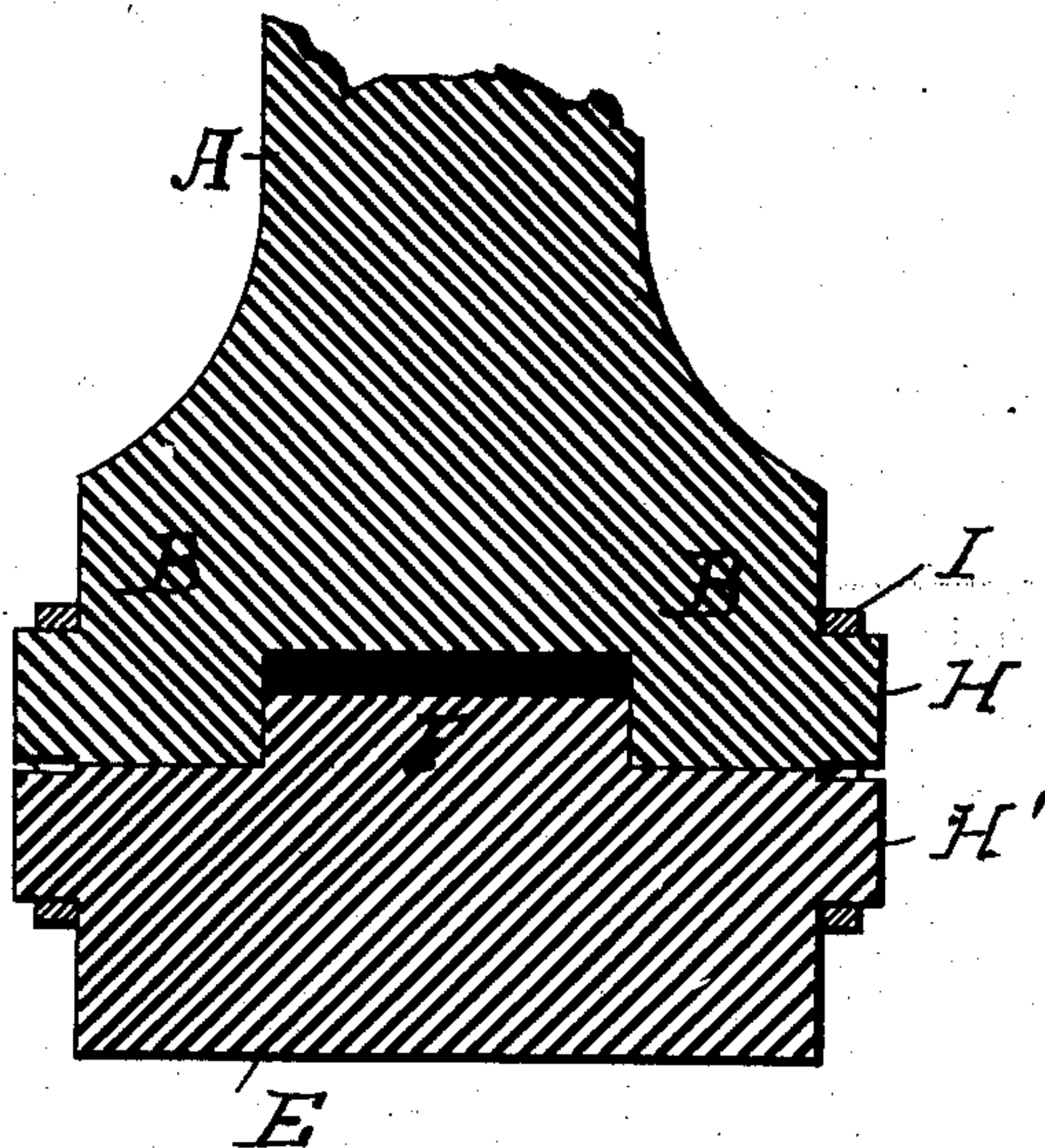
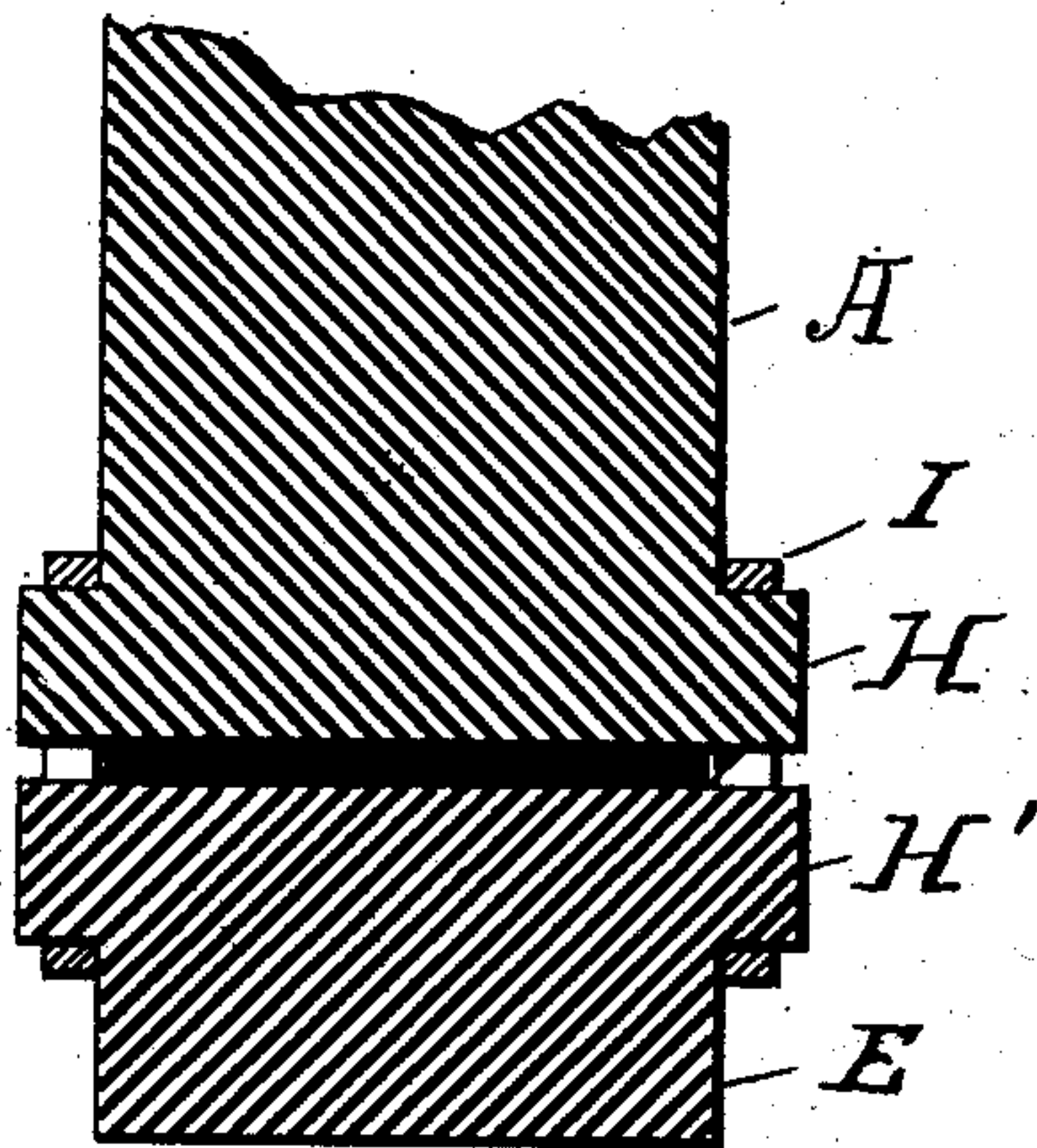


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES WITHINGTON, OF CHAMBERSBURG, ASSIGNOR TO THE TRENTON
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HAMMER-DIE.

SPECIFICATION forming part of Letters Patent No. 292,608, dated January 29, 1884.

Application filed July 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES WITHINGTON, of Chambersburg, in the county of Mercer and State of New Jersey, have invented an Improvement in Hammer-Dies, of which the following is a specification.

My invention is of especial applicability to the dies or striking-pieces of steam or other power hammers. Heretofore in hammers of this class the striking-dies have usually been held in place by a dovetailed joint between the head on the end of the piston-rod and the die, and by a key driven into the crevice of the joint. The objection to this connection has, however, been that the die has continually, owing to the unequal expansion and contraction of both the head and die, shaken loose, so that frequent stoppage for tightening up has been required.

The fundamental idea of my invention is in contradistinction to attaching the striking-die to the piston-rod or its head and holding it in place by a dovetailed joint between the head on the end of the rod and the die, and, by a key driven into the crevice of the joint, to attach the striking-die to the rod or its head by bands encircling lugs or projections from the die portion and from the rod portion, each lug or projection on each portion corresponding with a lug or projection on the other portion, and the bands encircling corresponding lugs and clamping the two portions together.

In the accompanying drawings, the several figures of which represent preferred forms of construction alike embodying my invention, Figure 1 is a vertical central sectional elevation of a construction in which the piston-rod is provided with a head made as a separate member, but rigidly connected to it. Fig. 2 is a side elevation, and Fig. 3 a top plan view with the piston-rod in section, of the construction represented in Fig. 1. Fig. 4 is a vertical central sectional elevation of a construction in which the piston-rod is provided with a head made integral with it, and Fig. 5 a similar view of a construction in which the piston-rod is devoid of any enlarged head portion, and in which the lugs are radial projec-

tions formed out of the metal of said rod and directly upon it.

Similar letters of reference indicate corresponding parts.

Referring now to the first three figures of the drawings, which illustrate the construction, which, although not the simplest mechanically, yet is that in which I find it most economical in practice to carry out my invention, A is the piston-rod or handle of a steam or other hammer, and B a cap or head secured to the lower extremity of the piston-rod by means of a tapering sleeve or split ring, C, and a circumscribing-band, J, substantially as represented in the drawings. These parts are secured together in the following manner: The wrought-iron band J is first shrunk upon the head B to keep it from fracturing, and the head, with the band shrunk upon it, is then heated to a dull-red heat. The tapering sleeve C, which is split like a piston-ring, is then slipped over the end of the piston-rod, the head B, while red-hot, placed around said sleeve, and the die placed, as shown in the drawings, in such manner that its lugs H', hereinafter mentioned, register in vertical alignment with the lugs H, formed on the head B. The tapering sleeve C is then driven down tightly with a sledge and the head left to cool. The head B, on cooling, shrinks sufficiently, as practice has proved, to prevent the tapering sleeve C from slipping or shaking loose. The tendency of the blows, it is obvious, is to drive the tapering sleeve in tighter, and the force thus exerted outwardly against the head is so great that the latter would break were it not for the band J, which effectually prevents such tendency. The head and die are preferably made of cast-iron. If, however, the head be made of wrought-iron or soft steel, the band J would not be necessary. The set of the head upon the piston-rod is such, both head and rod being cylindrical, as to form a cylindriform cavity at the base of the piston-rod.

E is the striking-die, preferably cylindrical form, provided with a boss or projection, F, adapted to the cylindriform cavity, within which, between the lower extremity of the pis-

ton-rod and the upper face of the boss, is interposed a washer or packing, G, of leather or other suitable substance.

H are a series of lugs or kindred projections 5 radially projected from the exterior side face of the lowermost portion of the head, and H' are a corresponding series of lugs similarly projected from the exterior side face of the uppermost portion of the die. The two series of 10 lugs in the set of the parts are so disposed as to be vertically aligned in corresponding pairs. The opposing faces of the lugs are faced off in the turning up of the striking-die and of the head, so that the lugs in the contact of the die 15 with the sleeve do not touch, but are apart. The opposing faces may, if desired, be angled or beveled, so as to slightly diverge, in the manner of open jaws. The ends of the lugs, which are indicated by the letter *h*, are preferably 20 semi-cylindric.

I are bands or links of wrought-iron, which respectively embrace respective lugs, and are conveniently shrunk around said lugs, being 25 slipped on while hot, so that in cooling they shrink and draw the die up tightly against the head. These bands in shrinking are of course subjected to an enormous tension, which retains them fixedly in position and holds the die immovably in place until it is worn out, 30 when it is removed by cutting the bands and replaced by a new die. The facing off or beveling of the opposing faces of the lugs provides against the possibility of their receiving or sustaining any portion of the shock from 35 the blows of the hammer, which otherwise would break or destroy them.

Having now described the best method of carrying my invention into practice, it is proper for me to add that while I have in- 40 stanced the above as the best method now known to me for carrying out the invention, the gist of which resides in the union of the striking-die with the piston-rod, which carries it through the medium of opposing series of 45 lugs formed, respectively, on the striking-die, and on or in practically-integral connection with the piston-rod, and of bands shrunk around the lugs in pairs, it is manifestly possible to effectuate the above-named union 50 and relationship of parts in other ways than through the instrumentality of a cap or head applied as a separate member to the piston-rod in the manner already described. Thus, for instance, in Fig. 4 I have represented the 55 piston-rod as integral with a head or cap substantially similar to that of Fig. 1, the parts

having been forged and turned up out of one piece of metal, and the series of lugs designated H having been formed directly upon the forged head of the piston-rod. In Fig. 5, 60 again, I have shown the upper series of lugs as integral with a piston-rod which is unprovided with the head, the said lugs being formed out of the metal of said rod and directly upon it.

Both of the above-described methods of carrying out my invention are practical, but more expensive than the method first above described.

Having thus described my invention, I 70 claim—

1. In a steam or other power hammer, the combination of a striking-die provided with a series of lugs or projections, a piston-rod plunger or handle provided, substantially as here- 75 inbefore set forth, with a corresponding series of lugs or projections, and bands encircling opposing lugs, substantially as set forth.

2. In a steam or other power hammer, the combination of a piston-rod, a circumscribing 80 cap or head having a series of lugs, means for securing the cap or head rigidly to the piston-rod, a hammer-die having a corresponding series of lugs, and bands fitted to opposing lugs, substantially as set forth. 85

3. In a steam or other power hammer, the combination of a piston-rod, a circumscribing cap or head having a series of lugs, means for securing the cap or head rigidly to the piston-rod in such manner as to create a cavity at the 90 base of said piston-rod, a hammer-die provided with a boss conformed to said cavity, and having a corresponding series of lugs, and bands fitted to opposing lugs, substantially as set forth. 95

4. In a steam or other power hammer, in which both the die portion and the piston-rod portion are provided with corresponding series of lugs or projections, and are united by means of bands fitted around opposing pairs 100 of lugs, faced-off portions or bevels upon the opposing faces of the lugs, substantially as and for the purposes set forth.

5. The combination of the cap or head, the tapering sleeve, the piston-rod, and the cir- 105 cumscribing-band, substantially as set forth.

In testimony whereof I have hereunto signed my name this 19th day of March, A. D. 1883.

JAMES WITHINGTON.

In presence of—

F. W. MICHTEL,
JOHN A. STEEN.