

No. 689,666.

Patented Dec. 24, 1901.

W. C. ANDERSON.
EXPANDING REAMER AND TAP.

(Application filed Dec. 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. I.

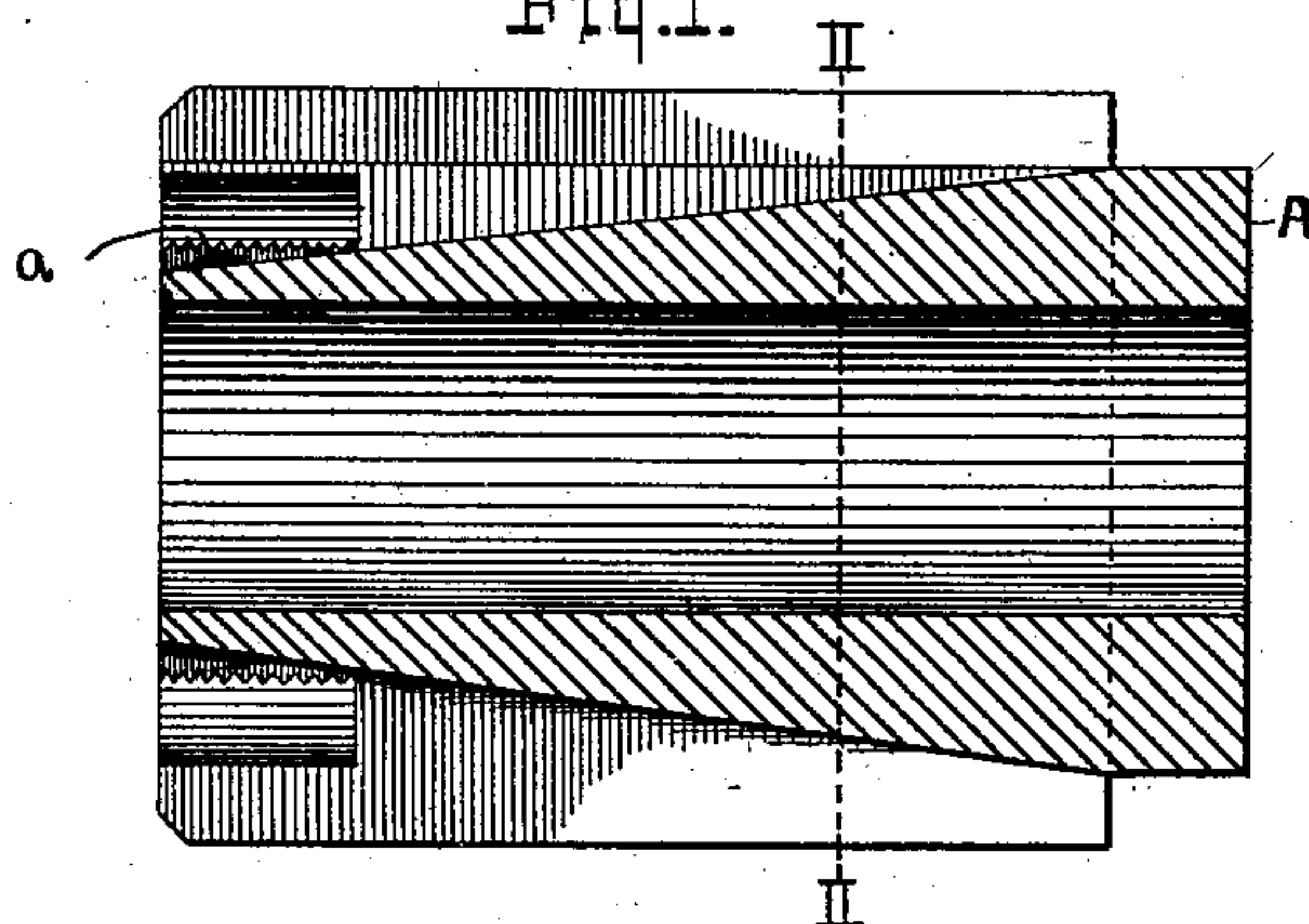


Fig. II.

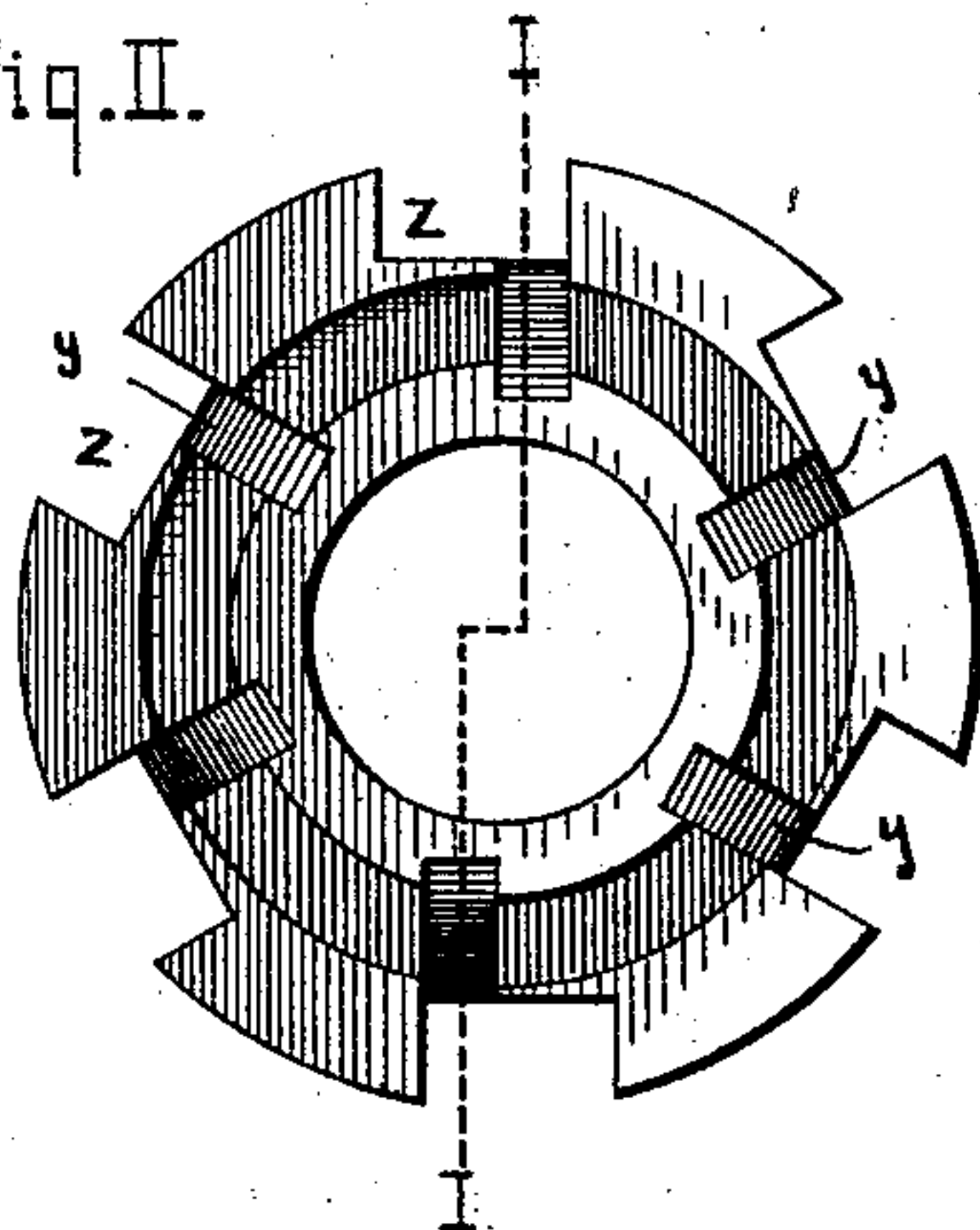


Fig. III.

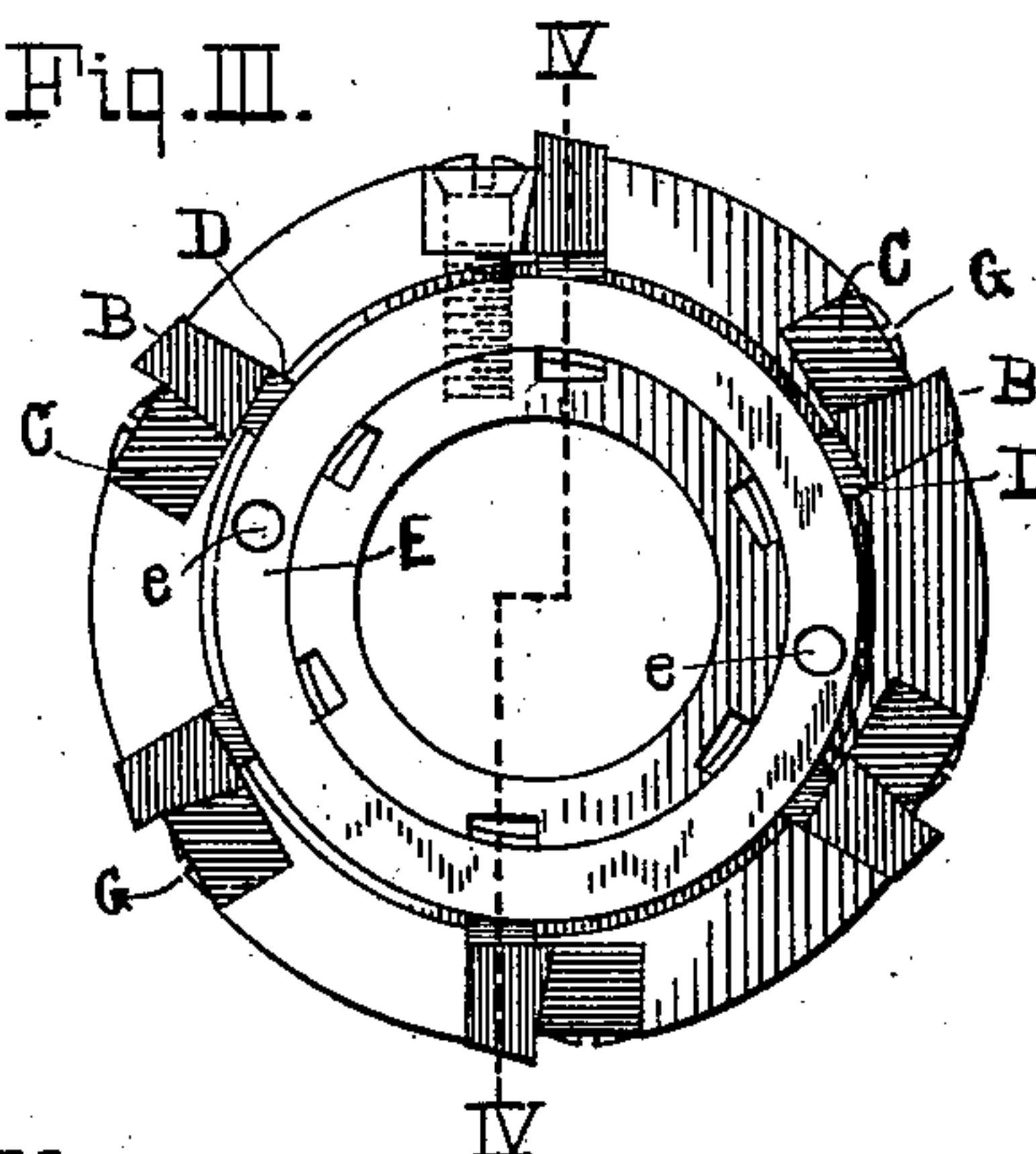
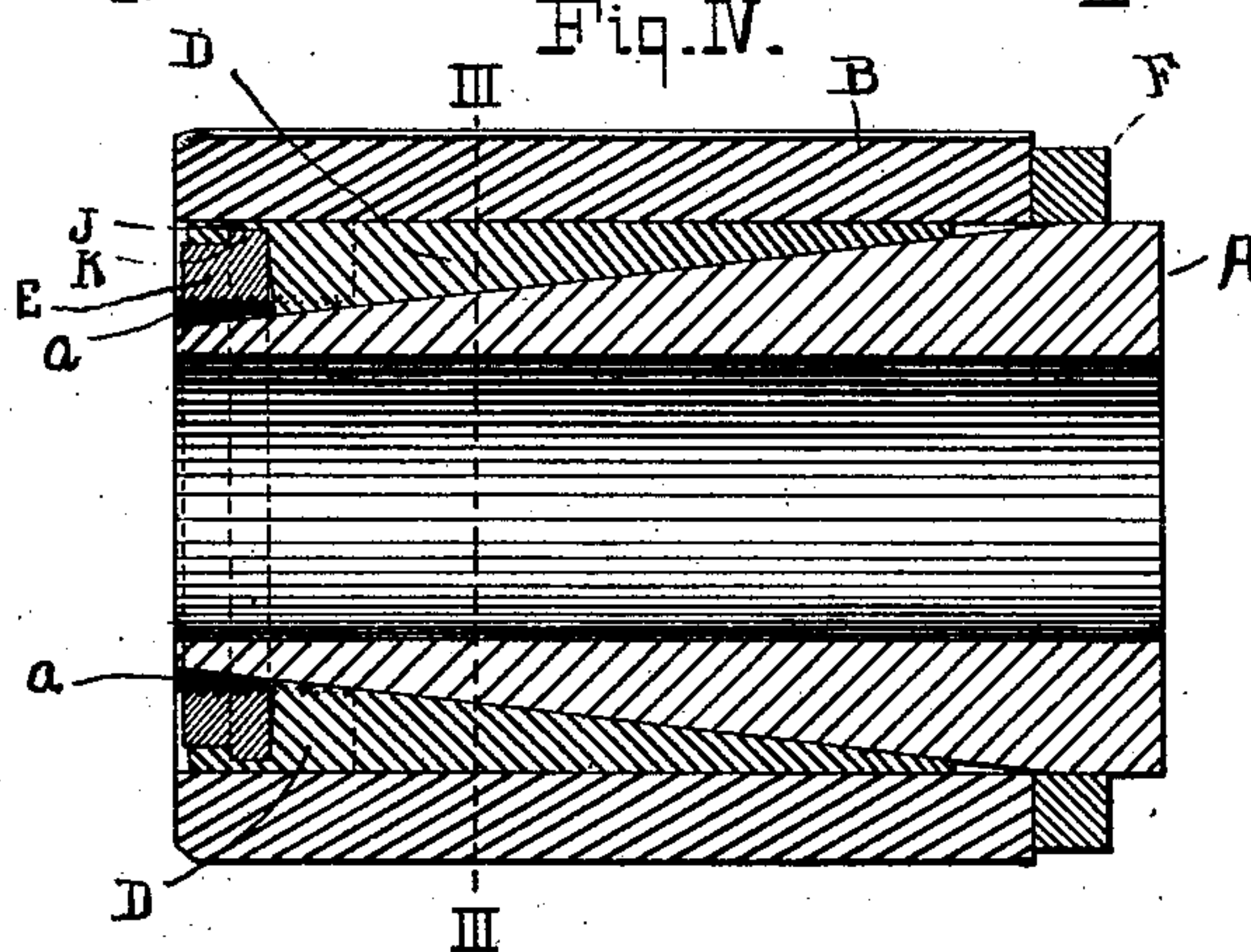


Fig. IV.



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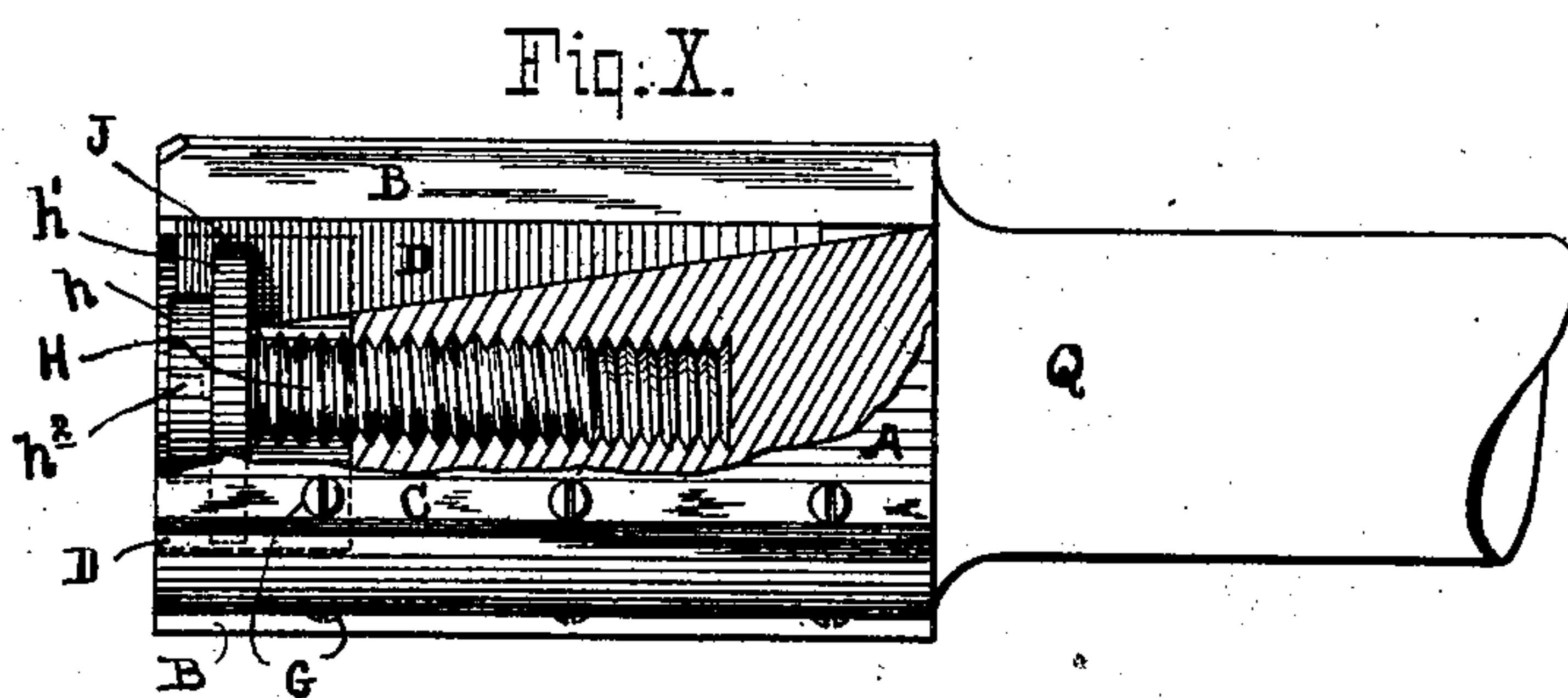
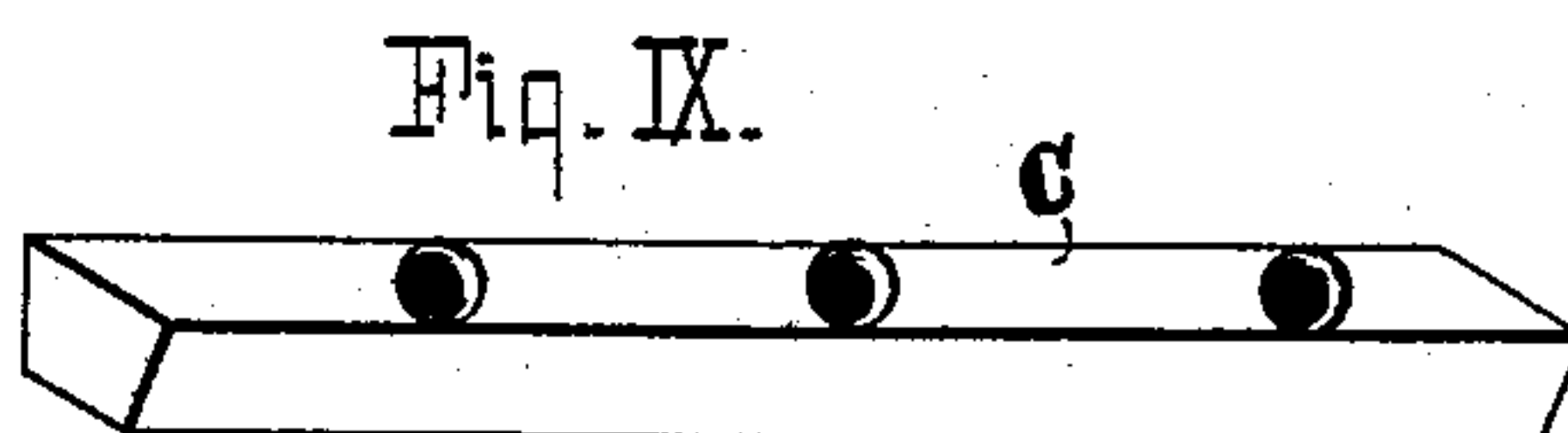
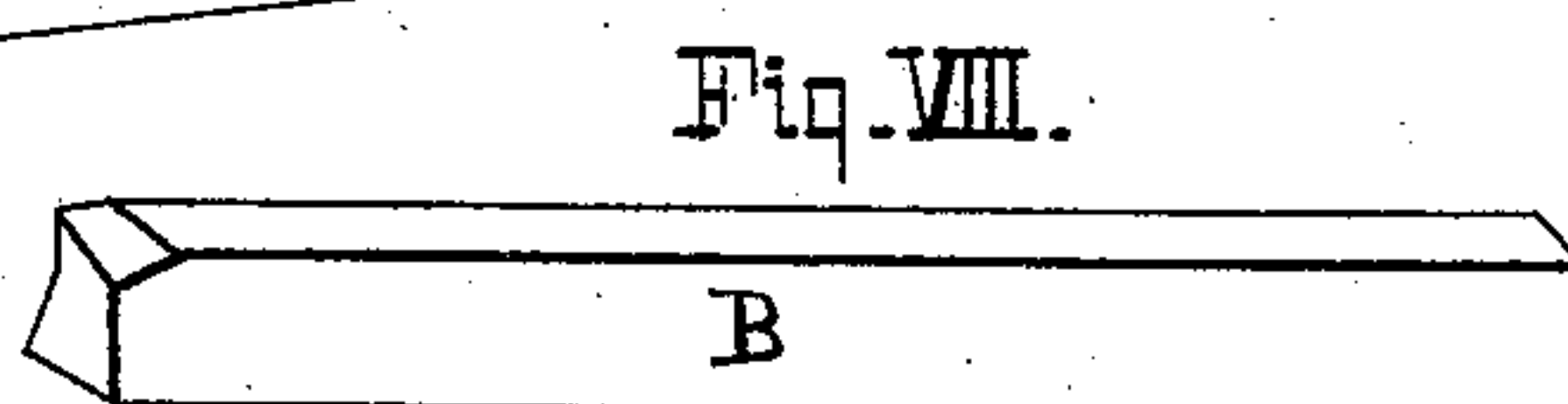
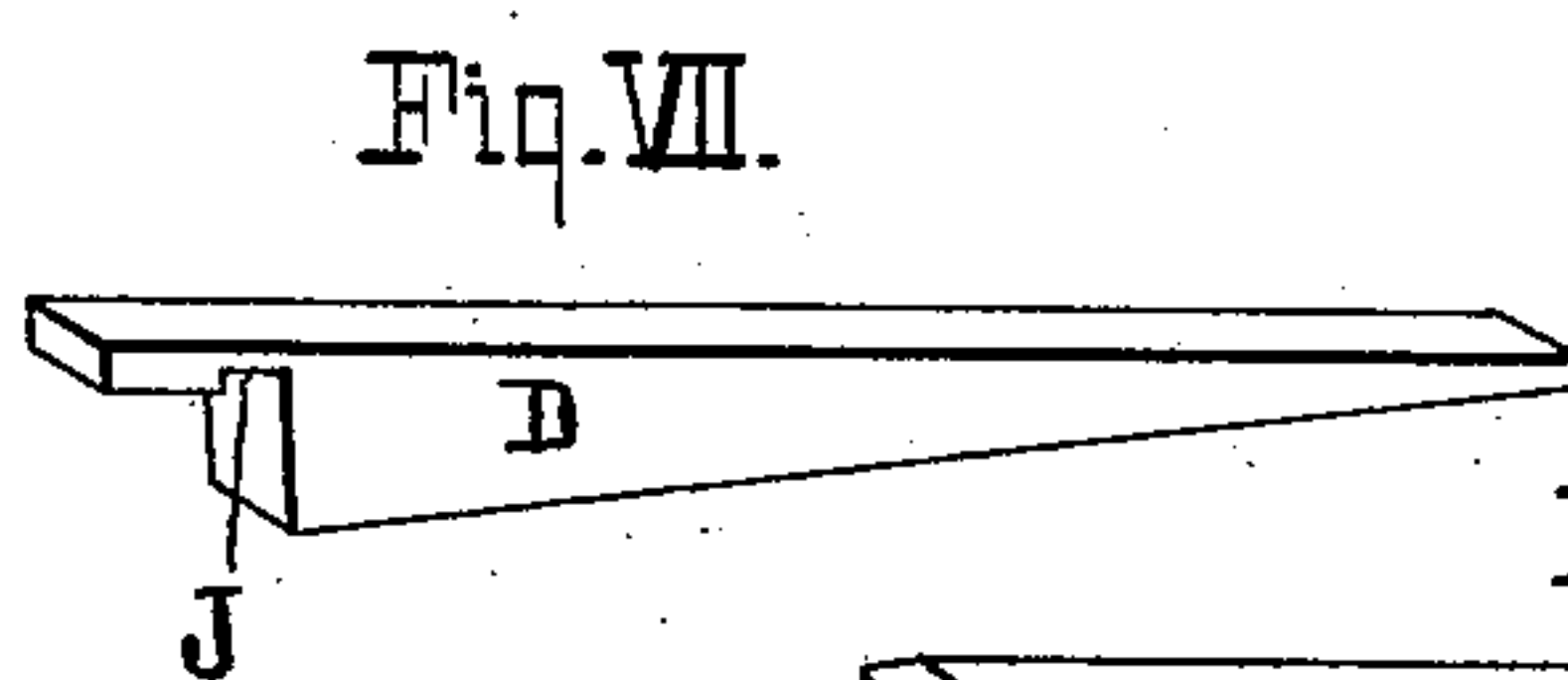
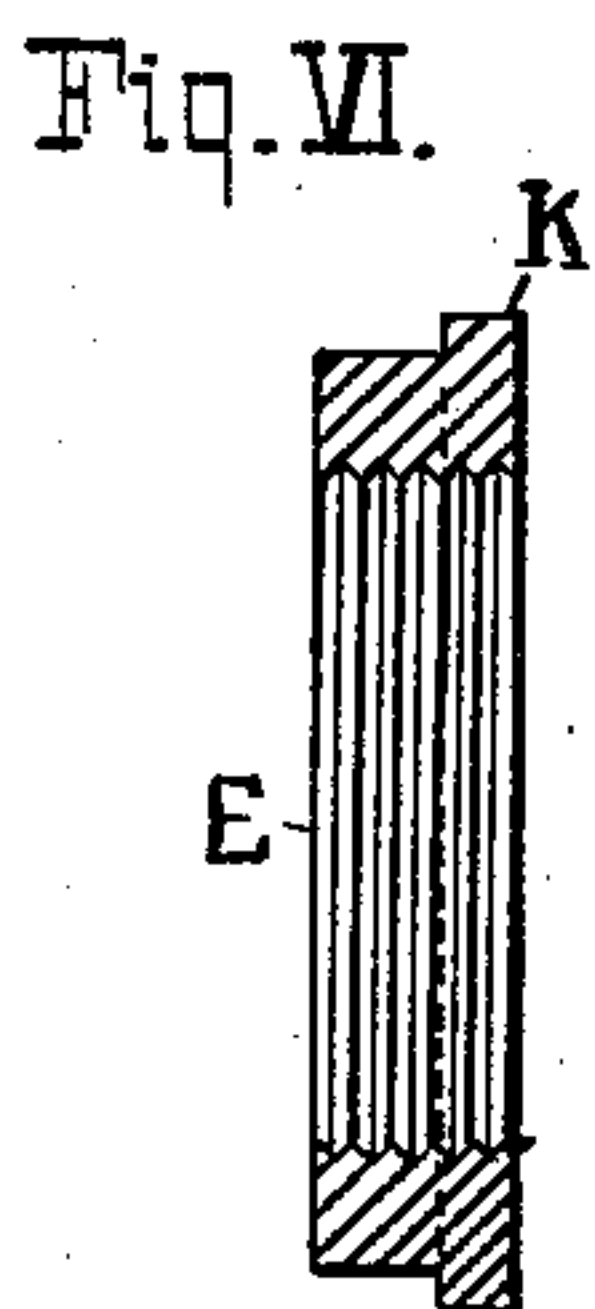
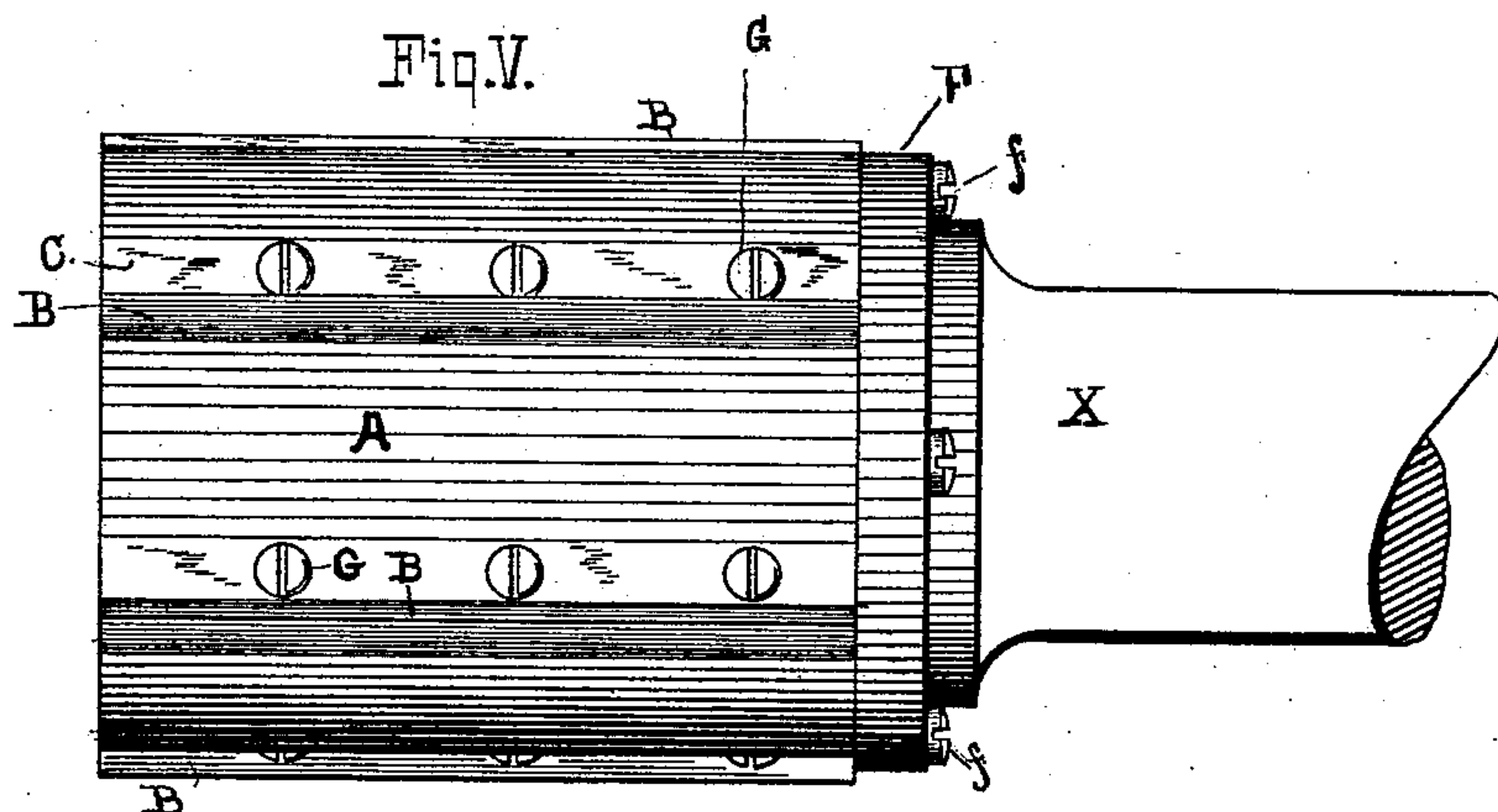
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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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EXPANDING REAMER AND TAP.

SPECIFICATION forming part of Letters Patent No. 689,666, dated December 24, 1901.

Application filed December 24, 1900. Serial No. 41,007. (No model.)

To all whom it may concern:

Be it known that I, WILBUR C. ANDERSON, a citizen of the United States, residing at Mishawaka, in the county of St. Joseph and State of Indiana, have invented or discovered new and useful Improvements in Expanding Reamers and Taps, of which the following is a specification.

In the accompanying drawings, which make part of this specification, Figure I is a longitudinal section on line I I of Fig. II. Fig. II is a cross-section on line II II of Fig. I, these two views showing the skeleton body of the reamer without the wedges and cutters. Fig. III is a cross-section on line III III of Fig. IV, and Fig. IV a longitudinal section on line IV IV of Fig. III, these two views showing the body of the reamer with the wedges, cutters, and female nut for drawing up the wedges. Fig. V is a side elevation of the reamer; Fig. VI, a section of the female nut for drawing up the wedges. Fig. VII is a perspective of the wedge. Fig. VIII is a perspective of the cutter. Fig. IX is a perspective of the clamp; and Fig. X, a side elevation, partly in section, showing a "chucking-reamer" employing a male collar-screw in place of hollow nut for drawing up the wedges.

My invention, generally stated, relates to tools of the class known as "expanding" or "adjustable" reamers and taps, which are capable of being enlarged or reduced in size to ream or tap holes of varying sizes within certain limits or enlarged to compensate for wear and sharpening. The general objections to prior tools of this class has been, first, lack of rigidity and solidity; second, inability to ream or tap to the extreme bottom or shoulder of a hole, and, third, expensive to manufacture and too expensive and delicate a tool to put into the hands of inexperienced workmen.

The tool consists of reamer or tap body A, cutters B B, clamps C C, wedges D D, nut E, collar F, and clamping-screws G G, all of which are shown separately and assembled.

The body A has a hole bored longitudinally through its center for the reception of arbor X, which may be of various lengths to suit

the work being reamed or tapped. Likewise on the periphery of body A are a suitable number of slots or grooves $z z$ lengthwise of the same for the reception of the cutters B B and clamps C C, the contacting surfaces of B B and C C being beveled to conform with one another, thereby giving a perfect clamping contact the full length of cutter. Under such cutter B B is a taper slot y for the reception of the wedges D D, which may be of such depth as the diameter of the body A will allow and running out to zero, thereby giving an inclined plane for the travel of the wedges D D.

Body A is recessed to and threaded at a to receive the hollow nut E, whose shoulder-collar K engages with the transverse grooves J J in the wedges D D, providing means for moving said wedges in and out.

The nut E is provided with two holes $e e$ for a spanner-wrench. The body A is turned smaller at its back end for a collar F, thus allowing the grooves $z z$ for cutters B B and clamps C C to be cut through to end of A. The collar F is held in place by screws $f f$. The collar F thus gives a square end backing for the cutters and prevents slipping back of cutters or when being used as a tap, and cutters of different threads are used, allowing the user to replace the cutters in proper position without danger of changing the lead of thread.

To expand the reamer or tap to larger size, I loosen the screws G G in clamps C C, screw in the nut E, which forces the wedges D D up the inclined plane against the bottom of cutters B B, expanding them to the desired diameter, then tighten the screws G G, which forces the bevel of clamps C C against the bevel of the cutters B B, and then screw in the nut E slightly, which forces the wedges D D firmly against the cutters B B, thereby giving an absolutely firm seat to the cutters. To reduce in size, I slightly loosen the screws G G and screw out nut E, which withdraws the wedges D D, and then tighten the screws G G, which forces cutters B B against the wedges, thereby reducing the cutting diameter of the reamer or tap.

Fig. X represents what is commonly known

as a "chucking-reamer," which also may be used as a tap by having threads cut upon the cutters B B. This differs from "shell" reamer and tap previously described only in that
 5 the body A is solid and having shank Q of convenient length; also, in the operation of the wedges D D by a collar-screw H in place of nut E, which permits of the reamer or tap being of smaller diameter than is possible
 10 with the shell, reamer, and grooves; also, gives a greater incline to the plane for the travel of the wedges.

In the chucking reamer or tap the body A is drilled and tapped for the screw H and recessed to receive the collar h' of the screw.
 15 The collar h' on the screw H engages in the transverse grooves J J in wedges D D and operates the same as heretofore described. The head of the screw H is slotted at h^2 for
 20 a screw-driver.

Some of the advantages of my reamer are these: There are no screws in the cutters; but the same are held in position by clamps. The cutters can be rapidly withdrawn and
 25 exchanged by unscrewing the clamps. The tool will ream or tap to the shoulder or bottom of the hole, there being no projections of any description beyond the forward cutting ends of the cutters. By a single and rapid
 30 movement the diameter may be increased or diminished, and the same size and style of cutters, clamps, and wedges may be used for different diameters. The construction is rigid and solid and comparatively inexpensive to
 35 manufacture, for the reason that all the parts can be machined in numbers and quickly assembled and are not likely to be injured by inexperienced workmen. The collar which acts as a backing end for the cutters presents
 40 a square face against the butt-end of each cutter, permitting the replacing of thread-cutting cutters to their exact position after removal. This backing-collar also permits the peripheral grooves for the cutters to be
 45 cut clear through from end to end of the body. There is a broad contact between the wedges and the hollow nut in the shell design and between the wedges and the screw in the chucking design, which gives a positive and

sure movement to the wedges without danger 50 of breaking or springing the parts.

In the appended claims by "cutters" I mean either threaded or non-threaded.

Having described my improvement, I claim— 51

1. In expanding reamers or taps, the combination of a body having longitudinal grooves on its periphery, a series of cutters and clamps seated in said grooves, a series of wedges located in said body beneath the cutters, grooves 60 in said wedges and a hollow nut screwing upon a projection in a recess in the forward end of said body and provided with a flange to engage said grooves in said wedges.

2. A body for an expansible reamer or tap, 65 said body having a larger diameter at its forward than at its rear end, grooves in the periphery of said body extending longitudinally through the portion of larger diameter, tapering slots below said grooves, a recess in the 70 forward end of said body, and a screw-threaded projection in said recess.

3. A hollow body for an expansible reamer or tap, said body having a larger diameter at its forward than at its rear end, grooves in 75 the periphery of said body extending longitudinally through the portion of larger diameter, tapering slots below said grooves, a recess in the forward end of said body, and a screw-threaded projection in said recess. 80

4. In expanding reamers or taps, the combination of a body, a series of longitudinal grooves on the periphery of said body, a recess in the forward end of said body, a projecting portion of said body in said recess, 85 screw-threads on said projection, a nut engaging the screw portion of said projection, the rim of said nut engaging in grooves in the forward ends of a series of wedges, said wedges seated in said longitudinal grooves and adapted 90 to radially adjust a series of cutters seated upon said wedges.

Signed at Mishawaka this 11th day of December, 1900.

WILBUR C. ANDERSON.

Witnesses:

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