

No. 881,191.

PATENTED MAR. 10, 1908.

J. D. MACLACHLAN.
VALVE.

APPLICATION FILED APR. 23, 1906.

Fig. 1.

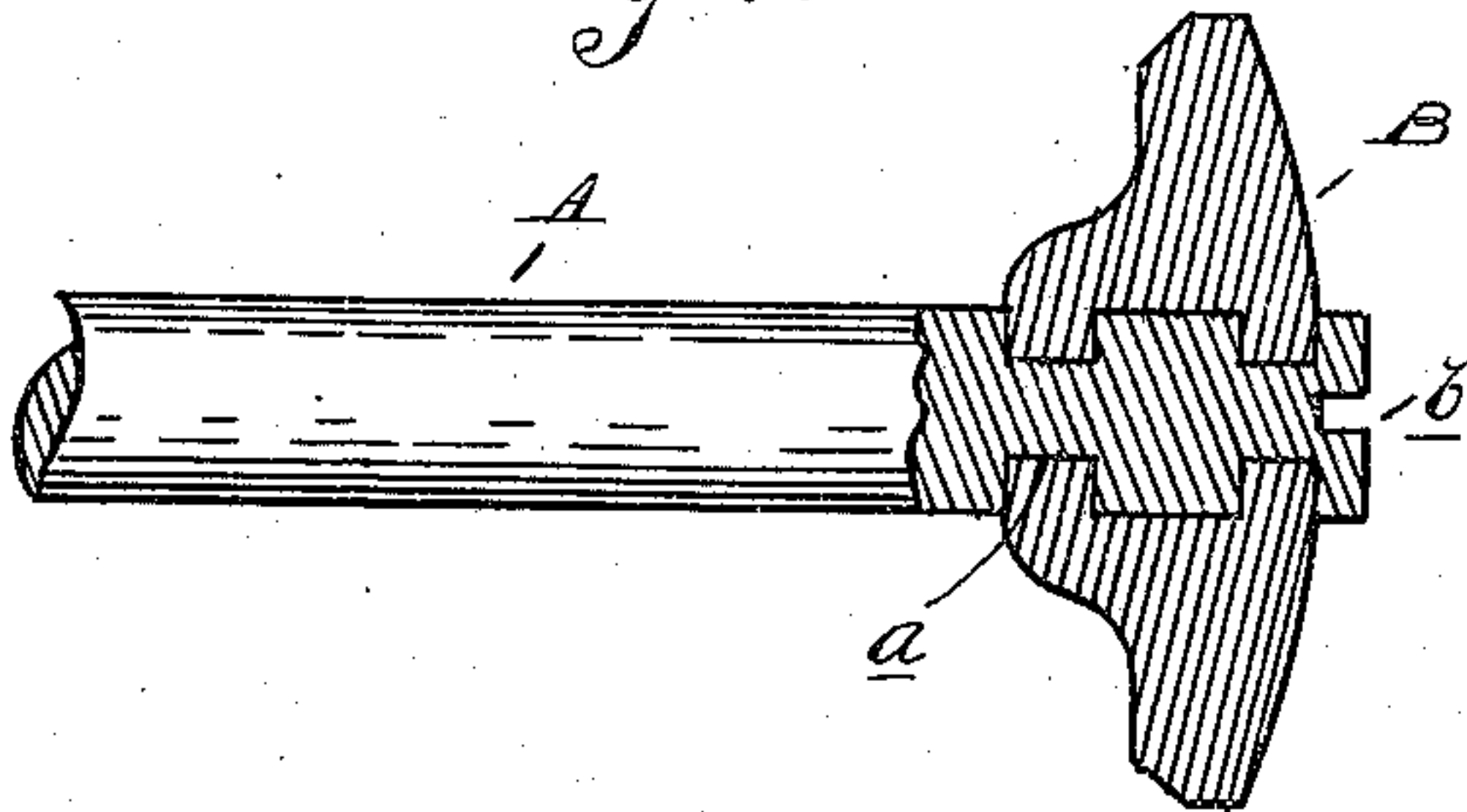


Fig. 2.

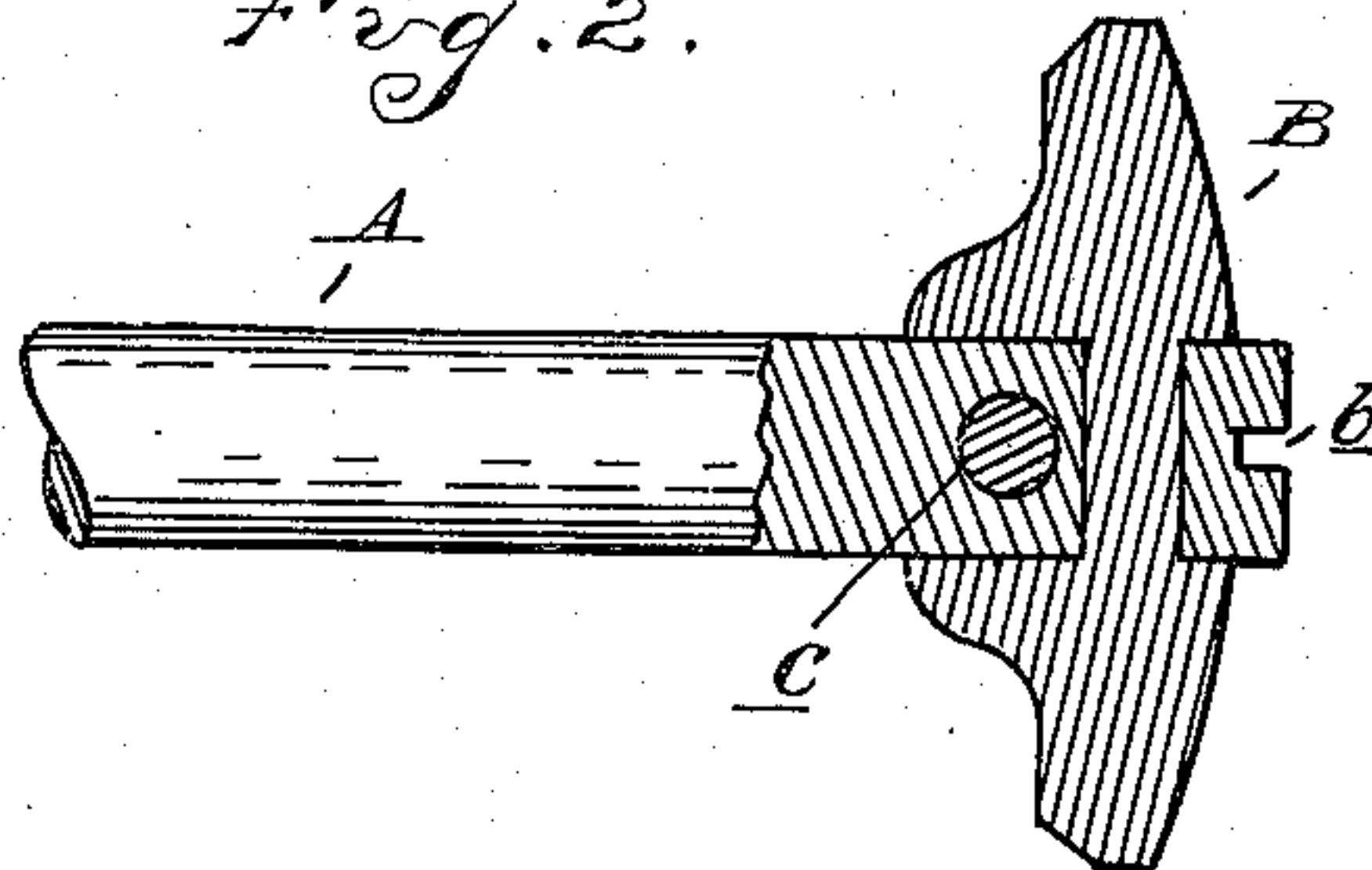


Fig. 3.

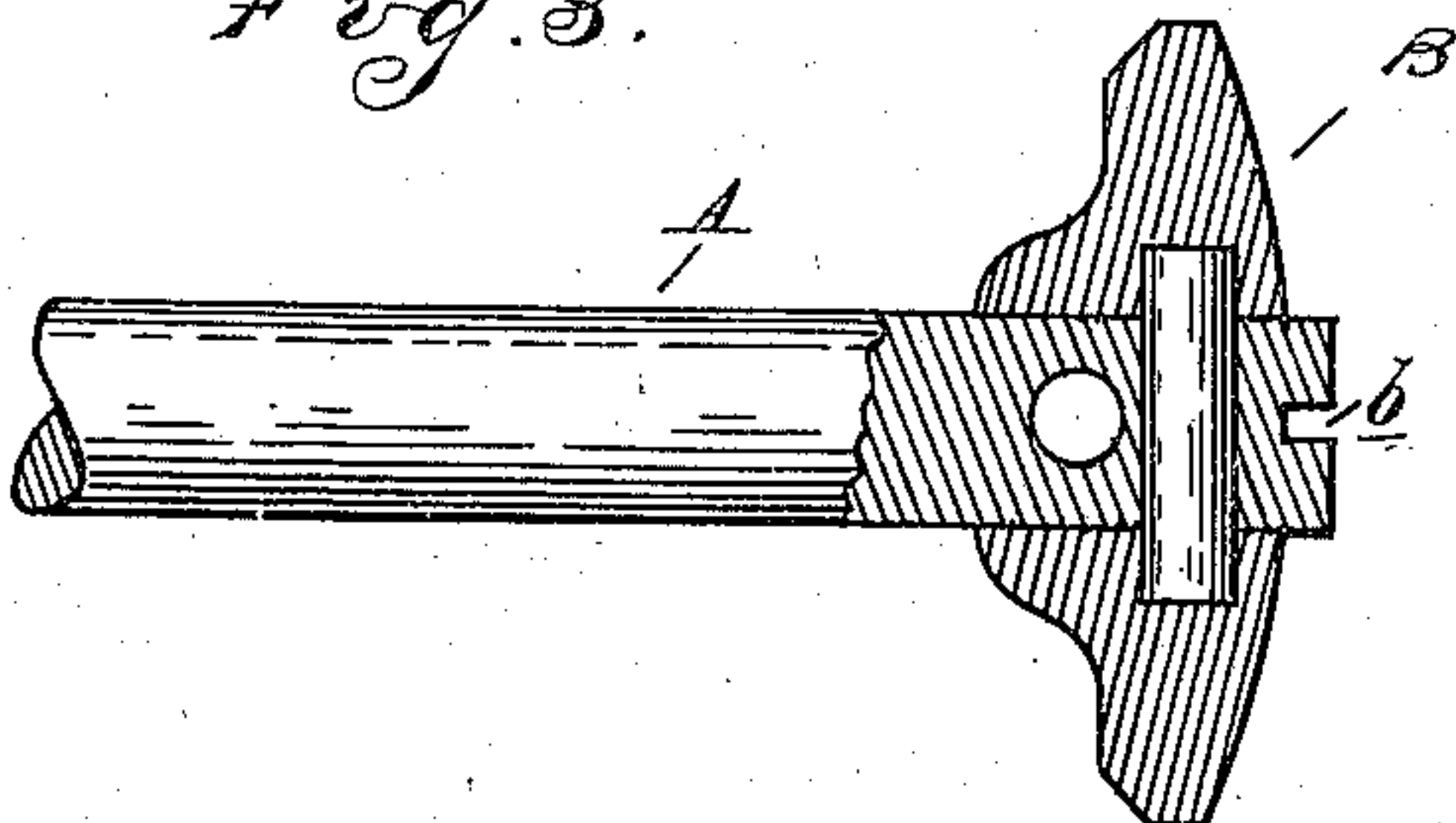


Fig. 4.

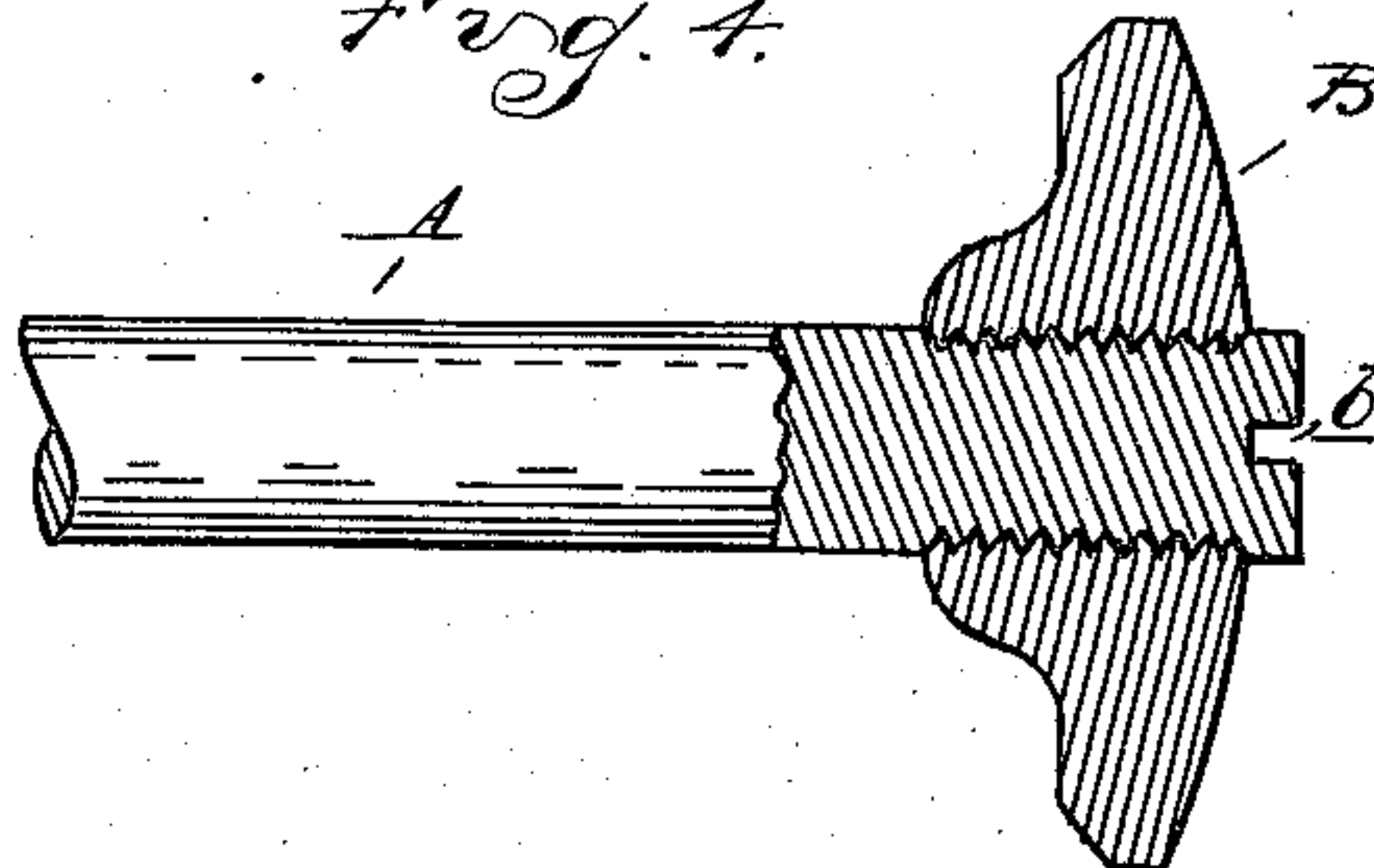
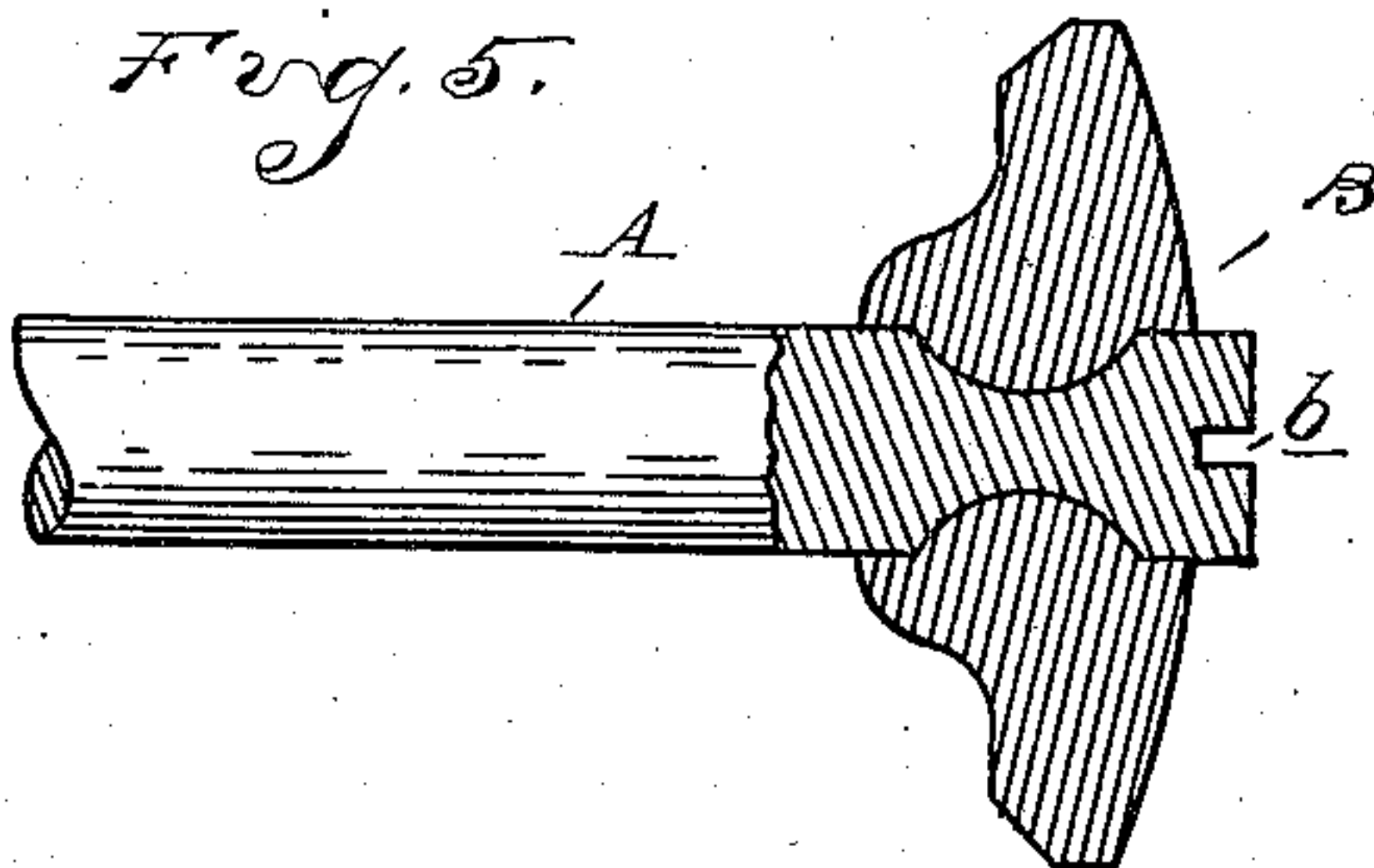


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN D. MACLACHLAN, OF DETROIT, MICHIGAN, ASSIGNOR TO DETROIT STEAM ENGINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

VALVE.

No. 881,191.

Specification of Letters Patent.

Patented March 10, 1908.

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To all whom it may concern:

Be it known that I, JOHN D. MACLACHLAN, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention relates to valves more particularly designed for use in engines.

It is the object of the invention to obtain a construction having a cast metal head, and wrought metal stem integrally united to each other.

To this end, the invention consists in the peculiar construction as hereinafter set forth.

20 In the drawings, Figure 1 is a central longitudinal section through the valve and stem. Figs. 2, 3, 4, and 5 show various modifications.

In the present state of the art, it has been found that cast metal is preferable to wrought metal for the formation of valve disks. On the other hand, the valve stems are better where formed of wrought metal. Cast metal disks have been united to wrought metal stems by mechanical joints, but this necessitates machining the parts, and adds to the cost of the construction. With the present invention, a composite construction of cast disk and wrought stem is obtained, in which the parts are united without machining, so as to be incapable of displacement.

35 As shown in Fig. 1, A is the stem and B the head, or disk of the valve. The stem A is formed of wrought metal, preferably a round bar of steel, and the head B is united to the stem by being cast thereupon. Disengagement between the parts is prevented by an interlocking joint, which, in Fig. 1 is formed by cutting the grooves *a* in the stem, which are filled by the cast metal. The other end of the stem projects slightly beyond the disk, and is provided with an end cross slot *b* for the engagement of a screw driver or other tool, by which the valve may be rotated to bring it to its seat.

45 In casting a head B about the stem, the operation may be performed so as to either chill the casting in contact with the stem, or

to "burn" it on, that is, by constructing the mold so that a considerable quantity of the molten metal is caused to flow by the stem, before solidifying. In the latter case, the metal of the stem is raised to approximately the temperature of the molten metal before it solidifies, with the result that the metal is not chilled. When the parts are united in either way above mentioned, the union is such that a head cannot be displaced without breaking.

In Figs. 2, 3, 4, and 5, other means for uniting the cast and wrought metals from that shown in Fig. 1 are illustrated. In Fig. 2 the stem is bored with one or more apertures *c*, preferably two bores at right angles to each other. This will permit the cast metal to form keys passing through the stem. In Fig. 3, pins are inserted in bores in the stem, and project out beyond the same, so as to be embedded in the cast metal. In Fig. 4, the other end of the stem is threaded, and the metal cast thereabout, while in Fig. 5 a single groove is formed in the stem, and is filled with the cast metal. Where the cast metal is "burned" upon the stem, it will remain soft, so as to permit of machining. Furthermore, this process integrates the two metals by fusion together of the contacting surfaces. Thus, the parts being in molecular contact, there is no danger of loosening through vibration, as is the case where the joint is a mechanical one.

What I claim as my invention is:

1. A valve comprising an integrated cast metal head and wrought metal stem.

2. A valve comprising a cast metal head on which the valve face is formed, and a wrought metal stem, said head being cast upon said stem and integrated therewith, and being in an unchilled condition.

3. A valve comprising a stem of wrought metal, a head cast thereabout and integral therewith the end of said stem, projecting through said head, and being fashioned for the engagement of a tool therewith, for rotating the valve.

4. A valve comprising a stem of wrought metal, having a pair of separated grooves cut therein, and a cast metal head surrounding said stem, so as to fill said grooves, and sur-

rounding the intermediate portion of the larger diameter, said head being integral with said stem.

5 5. A valve comprising a stem of wrought metal, and a head cast thereabout and "burned" thereupon substantially as and for the purpose described.

6. A valve comprising a stem of wrought metal having a portion thereof fashioned to

increase the surface, and a cast metal head 10 surrounding said fashioned portion and integrated therewith.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN D. MacLACHLAN.

Witnesses:

JAMES P. BARRY,
EDWARD A. COBB.