

(No Model.)

2 Sheets—Sheet 1.

G. L. & E. HOXSIE.
VALVE GEAR FOR STEAM ENGINES.

No. 273,846.

Patented Mar. 13, 1883.

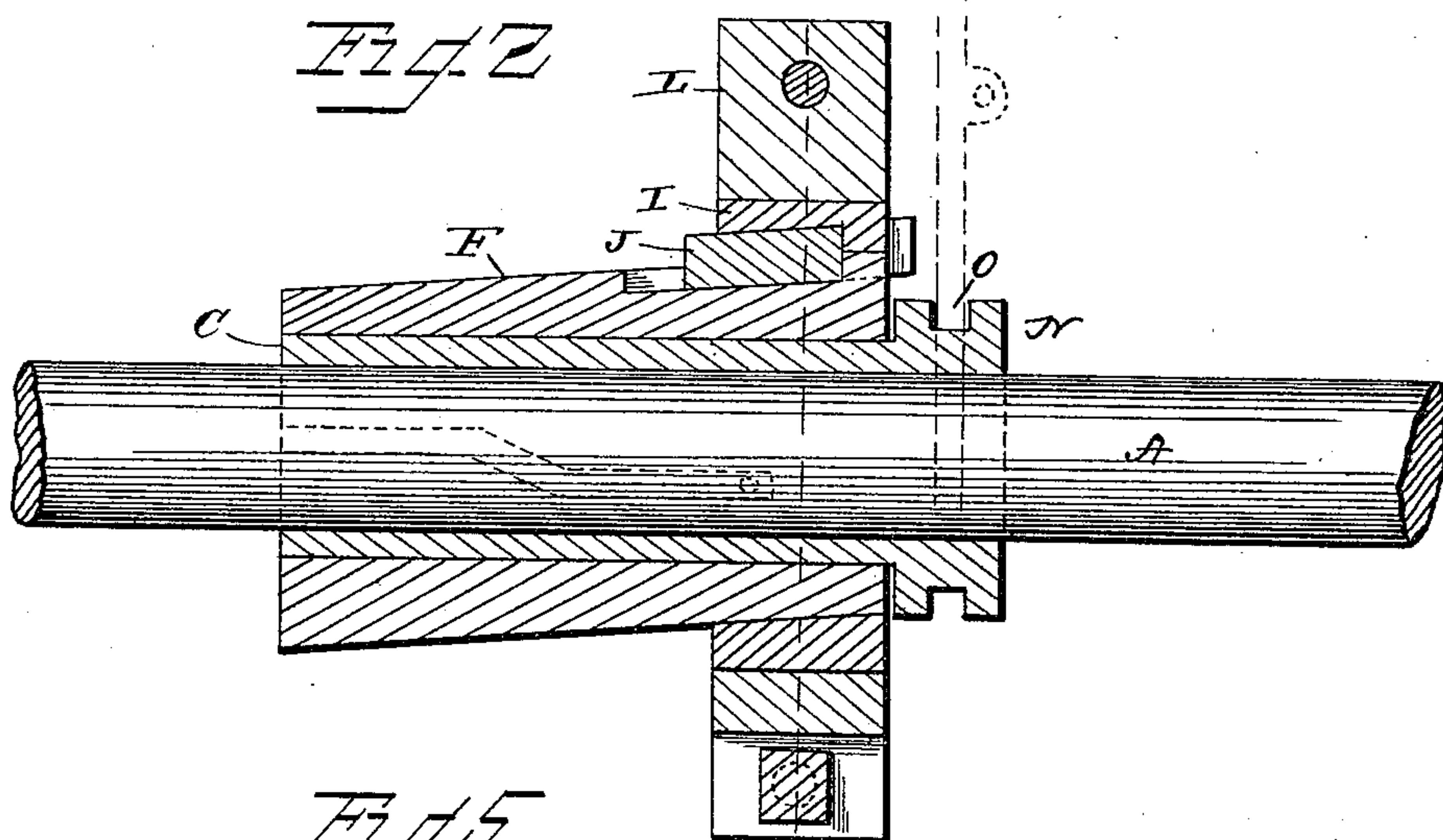
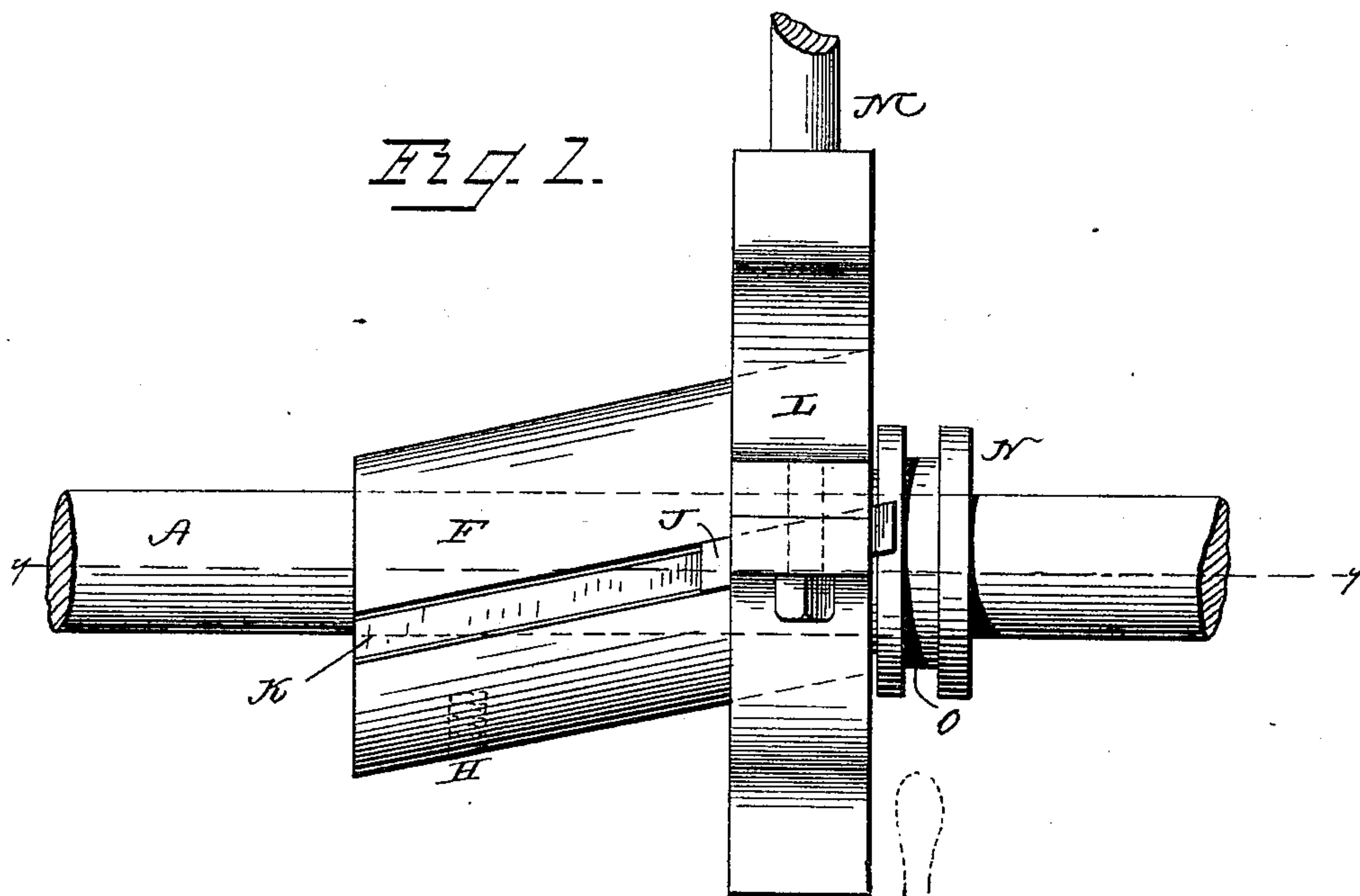
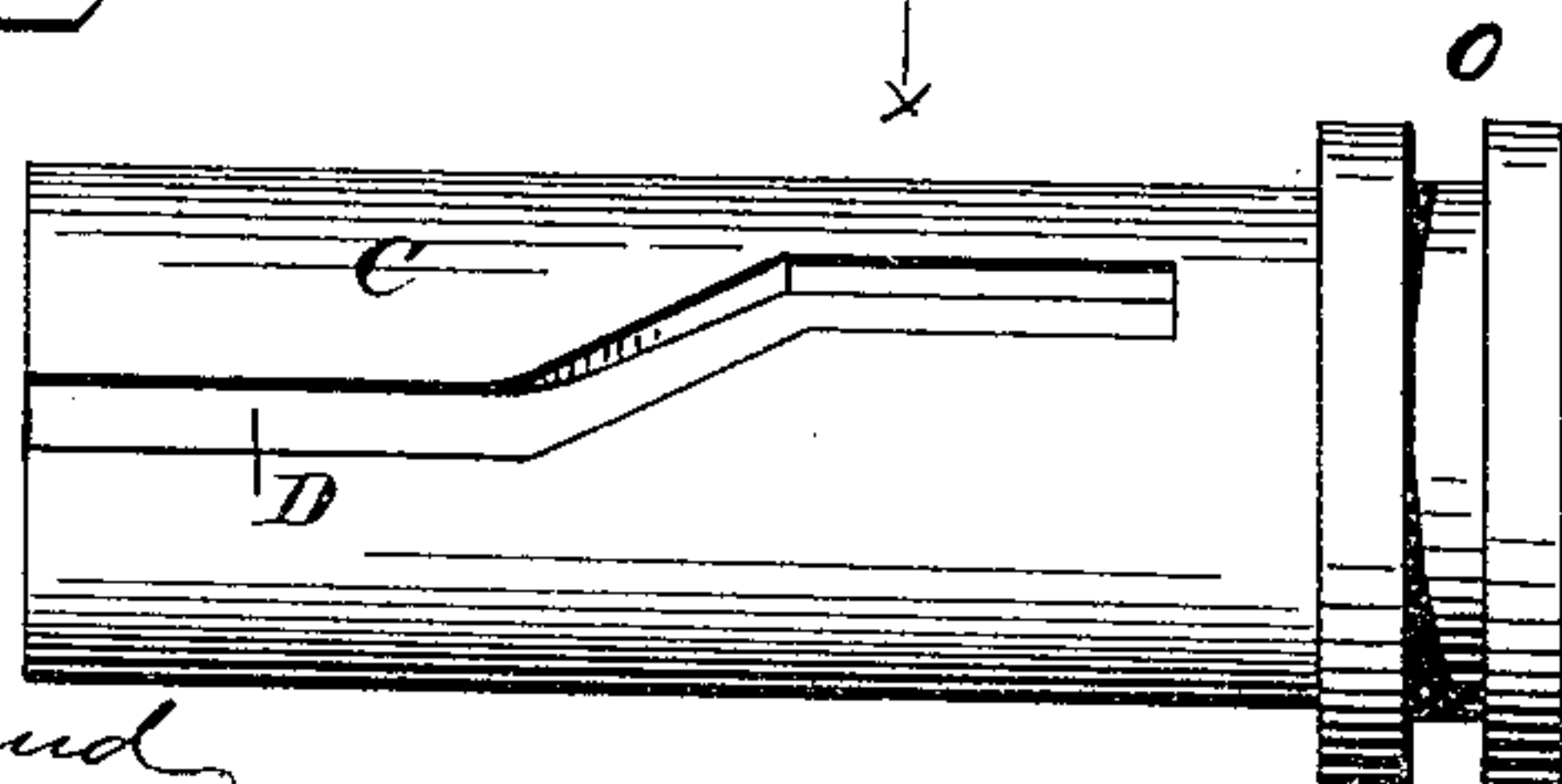


Fig. 3.



WITNESSES
Frank L. Ouraud
J. R. Little

Geo. L. Hoxsie,
Ezra Hoxsie
INVENTORS
by *Wm. Snow & Co.*
Attorneys.

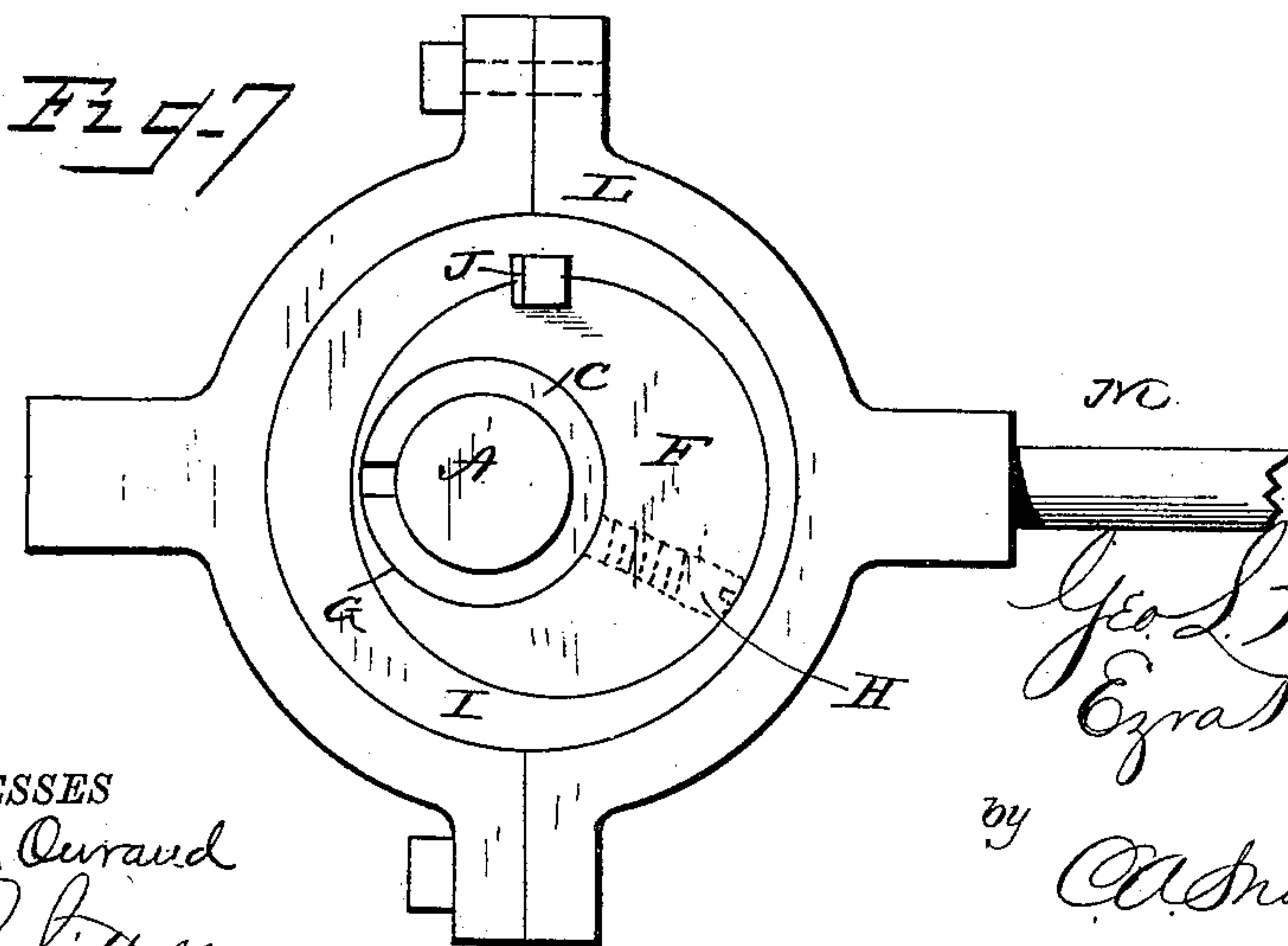
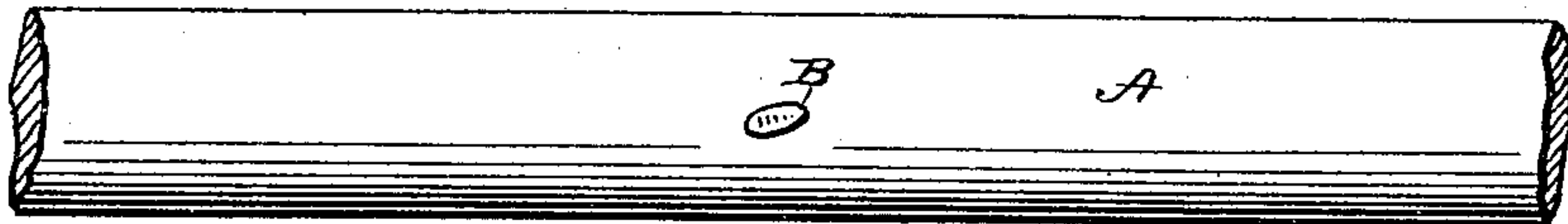
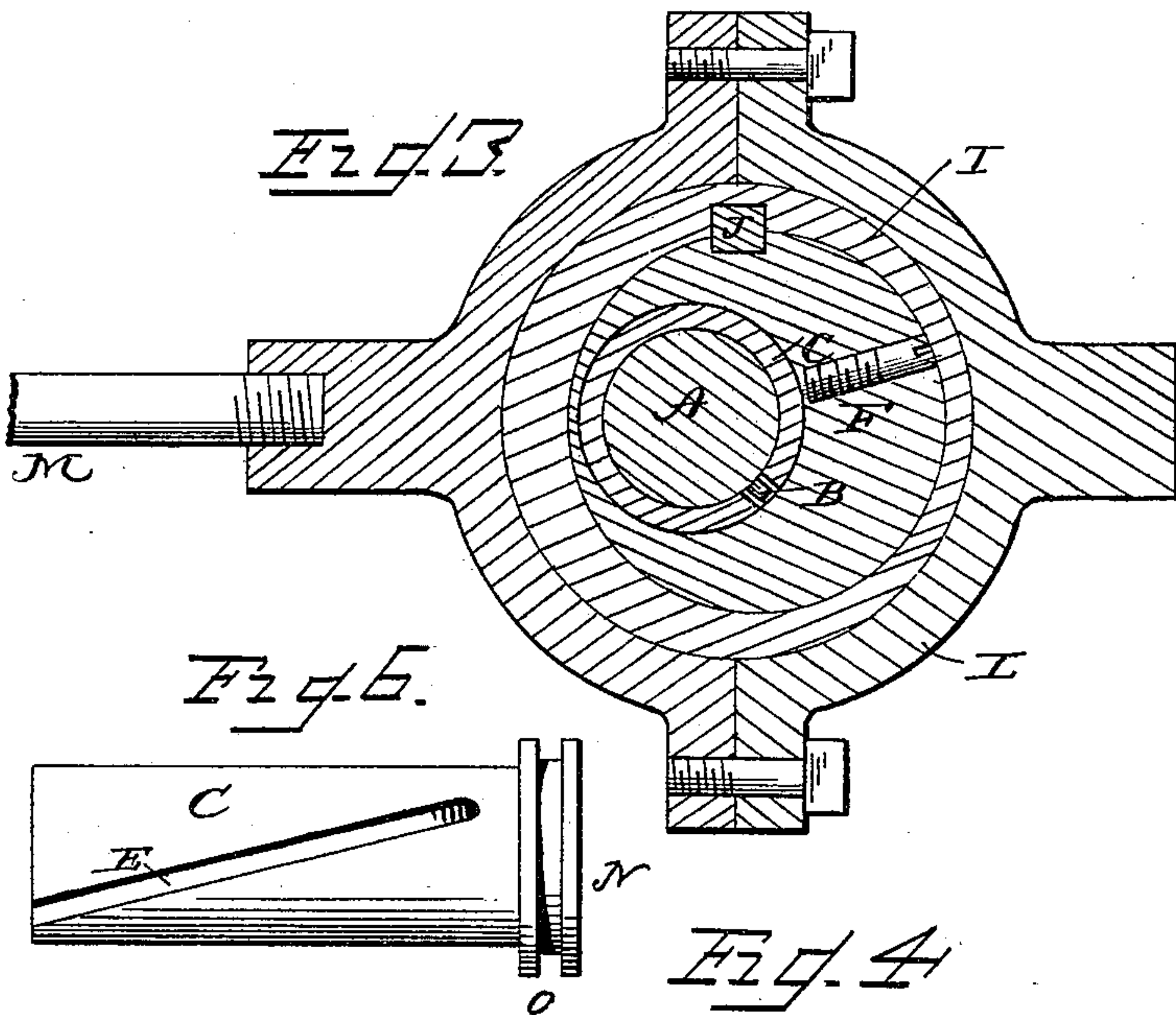
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2 Sheets—Sheet 2.

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Frank L. Curand
J. R. Little

Geo. L. Hoxsie,
Ezra Hoxsie,
INVENTORS
by
A. Snow & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE L. HOXSIE AND EZRA HOXSIE, OF HOLLOWAY, MICHIGAN.

VALVE-GEAR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 273,846, dated March 13, 1883.

Application filed January 5, 1883. (No model.)

To all whom it may concern:

Be it known that we, GEORGE L. HOXSIE and EZRA HOXSIE, citizens of the United States, residing at Holloway, in the county of Lenawee and State of Michigan, have invented a new and useful Valve-Gear for Steam-Engines, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to valve-gear for steam-engines; and it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claims.

15 In the drawings hereto annexed, Figure 1 is a plan view of our improved valve-gear. Fig. 2 is a vertical sectional view, taken longitudinally through the crank-shaft, on the line *y y* in Fig. 1. Fig. 3 is a vertical transverse sectional view on the line *x x* in Fig. 2. Fig. 4 is a side view of the crank-shaft detached. Fig. 5 is a side view of the inner slotted sleeve and its collar. Fig. 6 is a side view, showing a modification of the latter; and Fig. 7 is an end view of the device complete.

25 The same letters refer to the same parts in all the figures.

A in the drawings represents the crank-shaft of the engine, which is provided with a stud or lug, B, of an oval shape, as shown.

30 C is a sleeve fitted loosely upon the shaft A, upon which it may slide longitudinally, and provided with a slot, D, to receive the lug B, which slot may either be inclined in direction of its length, as in Fig. 6 of the drawings, or provided simply with an inclined section, E, as in Fig. 5.

40 F is a "double eccentric," consisting of a solid cylindrical sleeve of suitable dimensions, having its ends cut off diagonally, parallel to each other, and provided with a longitudinal opening which is diagonal in relation to the exterior surface, and at right angles to the cut-off ends of said cylinder. The latter is fitted, by its opening G, upon the sleeve C, upon which it is held securely by means of one or more set-screws, H, which are countersunk in the body of the said cylinder, which thus, as will be seen, forms a double eccentric pro-

jecting on diametrically-opposite sides of the crank-shaft.

I is a ring having a diagonal opening, by which it is fitted upon the eccentric F. Said ring has a key, J, which is accommodated in a longitudinal slot, K, formed in and parallel to the sides of said eccentric. The ring I is encircled by the ordinary eccentric strap, L, upon the end of the valve-rod M.

60 The end of the sleeve C is provided with a collar, N, having an annular groove, O, to receive the end of a forked lever, P, suitably fulcrumed, by means of which the said sleeve, with its attachments, may be moved upon the crank-shaft for the purpose of regulating or reversing the engine.

65 The operation of our invention will be readily understood by those skilled in the art to which it appertains from the foregoing description, taken in connection with the drawings hereto annexed. By moving the sleeve and eccentric (which slides readily within the strap-ring) to its full extent the strap-ring is thrown to the opposite side of the shaft to that which it occupied before, thus moving the valve and reversing the engine. The necessary "lead" is given to the valve by the slot D in the sleeve, which causes a slight turn of the latter and the eccentric in the desired direction. The stroke of the valve may be regulated by moving the eccentric to any desired extent; or the motion may be stopped by leaving the eccentric adjusted with its central portion encircled by the strap-ring.

75 We claim as our invention and desire to secure by Letters Patent of the United States—

85 1. The combination, in valve-gear for steam-engines, of the crank-shaft having a lug or stud, a sleeve fitted to slide upon said crank-shaft, and having an inclined slot, and a double eccentric mounted securely upon said sleeve, substantially as set forth.

90 2. The combination, in valve-gear for steam-engines, of the crank-shaft having a lug or stud, a sleeve fitted to slide upon said crank-shaft, and having an inclined slot, a double eccentric consisting of a cylindrical body having diagonally cut-off ends, and a diagonal perforation, by which it is mounted securely

upon the said sleeve, and having an exterior longitudinal slot parallel to its eccentric sides, a ring encircled by the eccentric strap, and having a diagonal opening by which it is fitted
5 upon the eccentric, and a key fitted in the groove of the latter, and means for moving the sliding sleeve and its attachments upon the crank-shaft, all arranged and operating substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

GEORGE L. HOXSIE.
EZRA HOXSIE.

Witnesses:

C. A. STACY,
J. C. HUNTER, Jr.