

No. 742,703.

PATENTED OCT. 27, 1903.

J. W. MELLING.
CUT-OFF VALVE.

APPLICATION FILED JULY 20, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

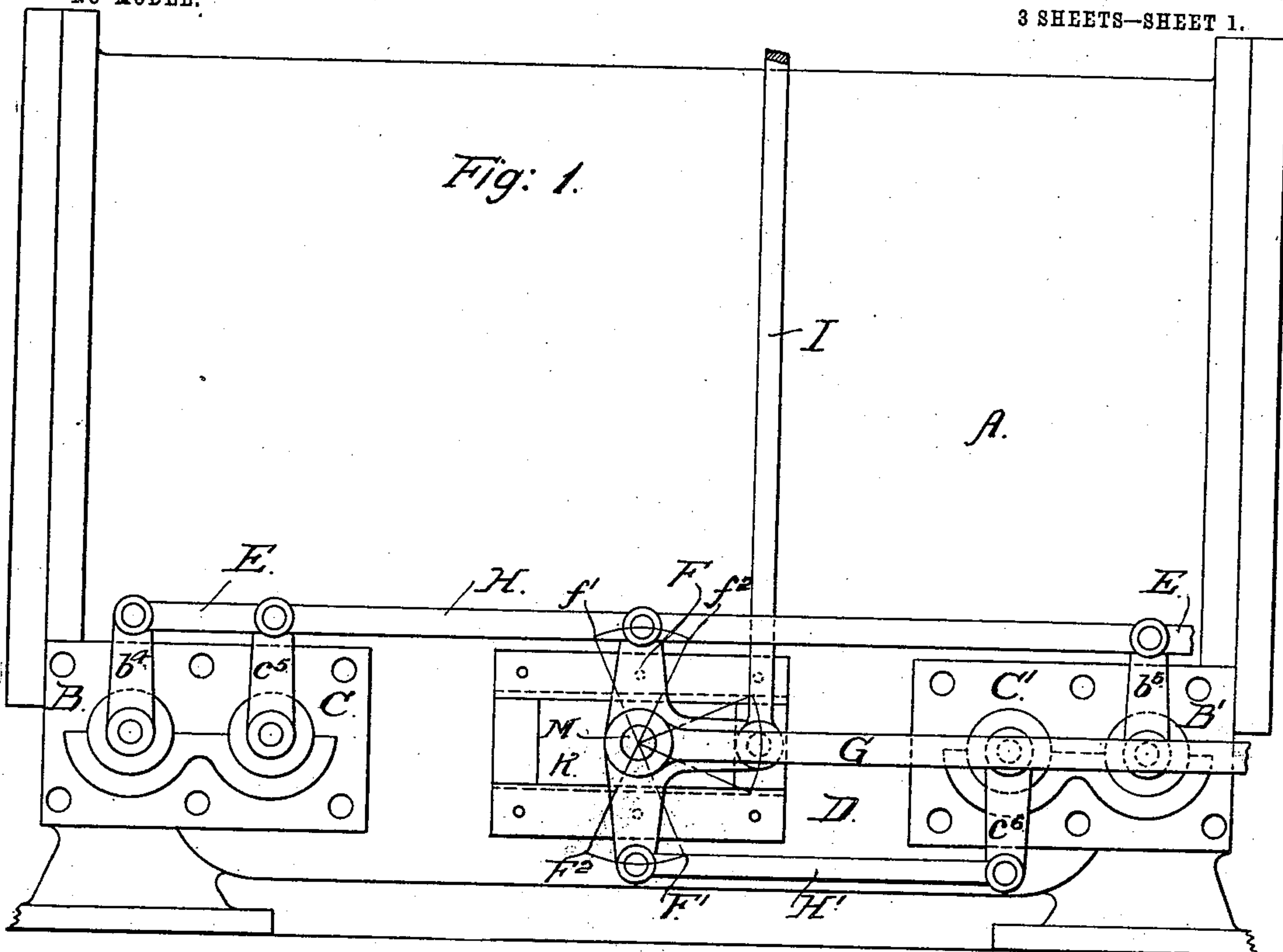
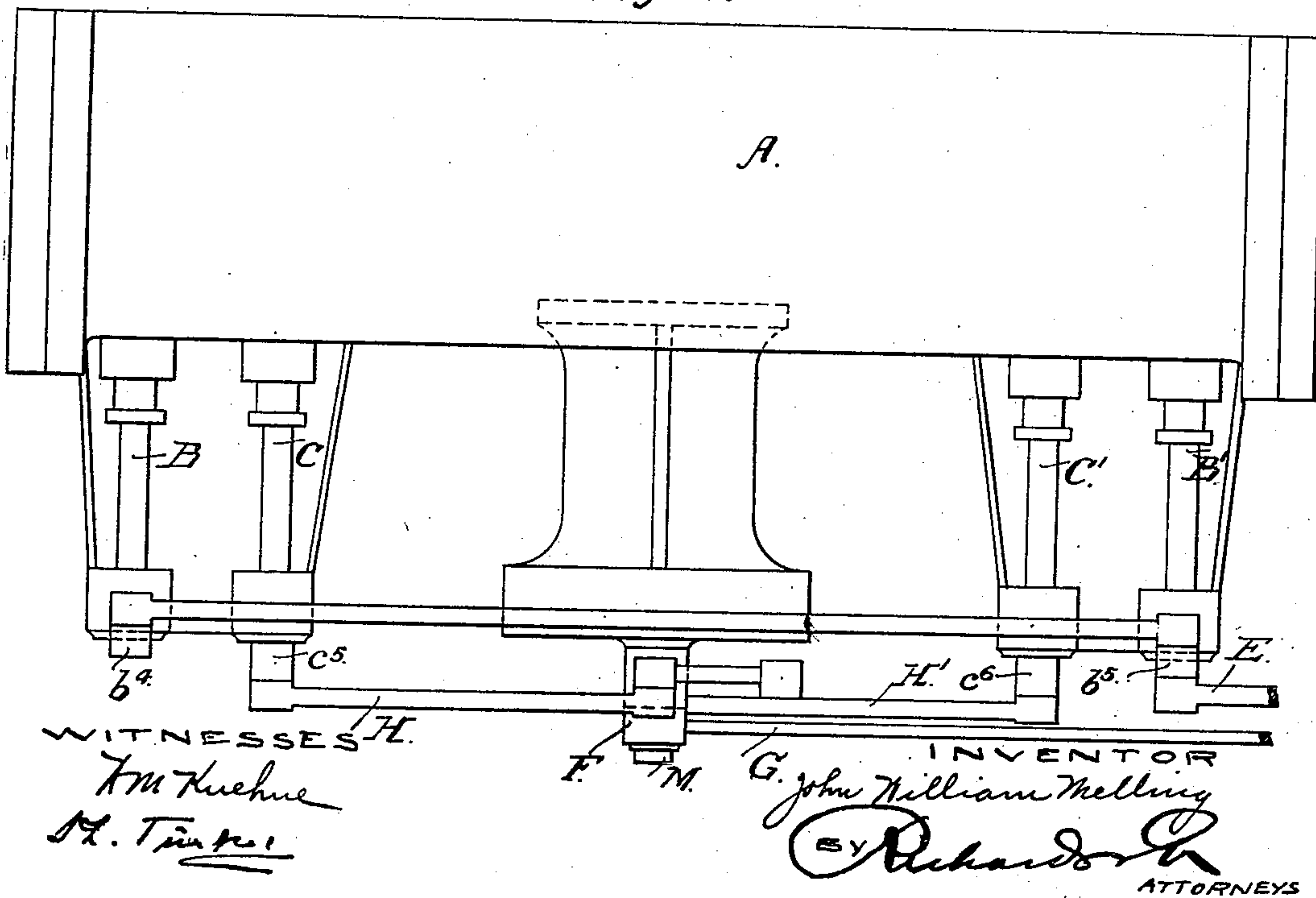


Fig. 3.



WITNESSES
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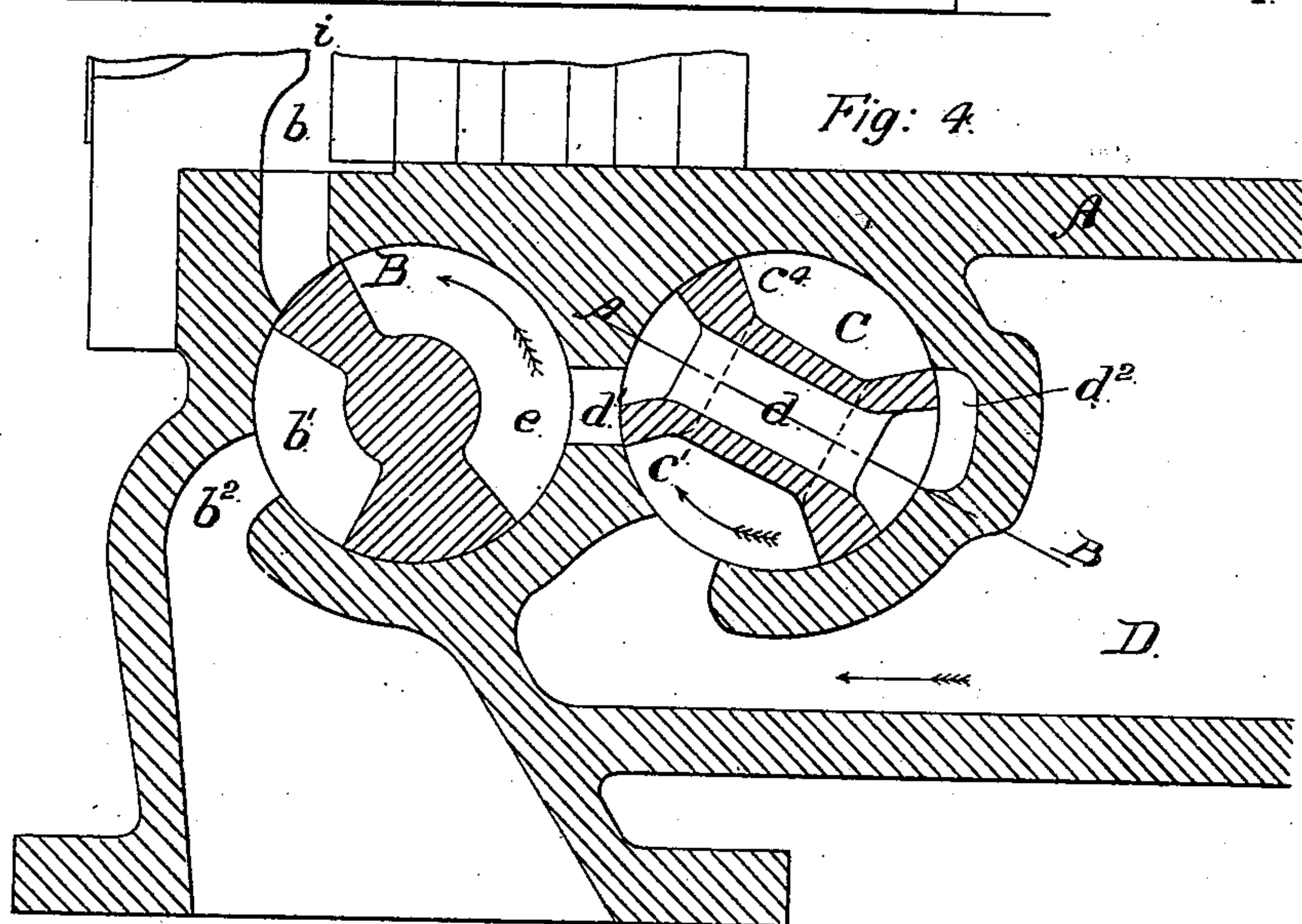
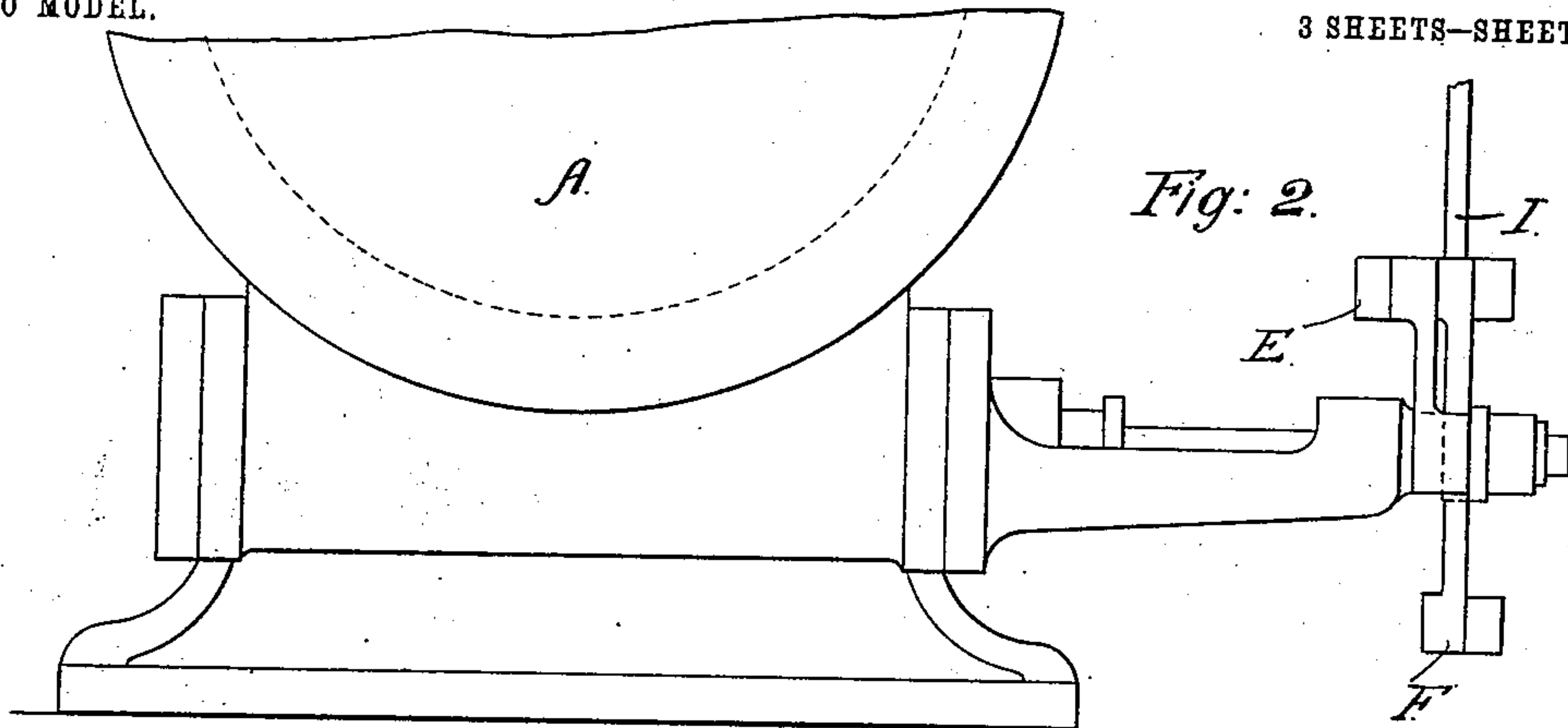
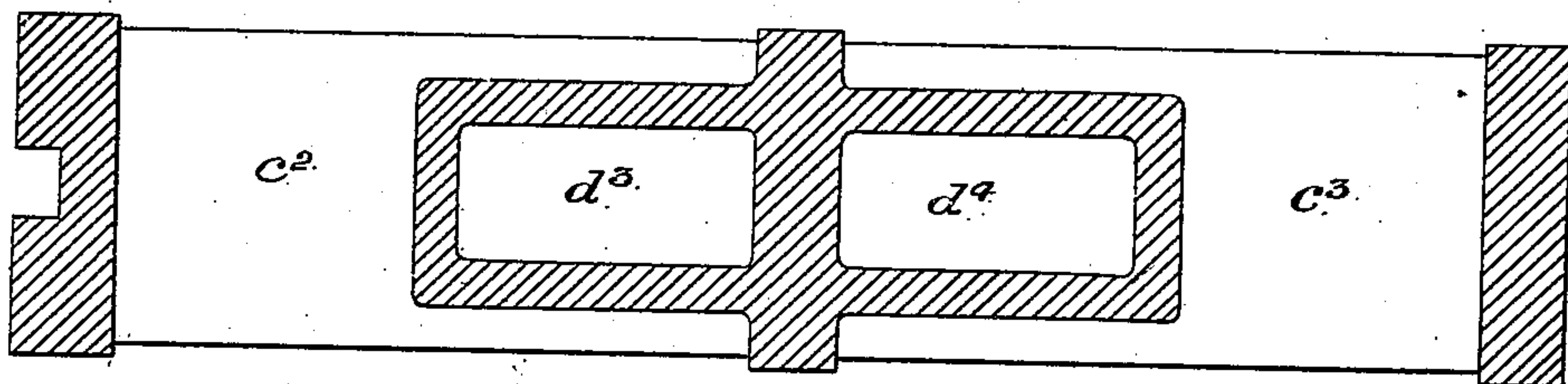


Fig. 5.



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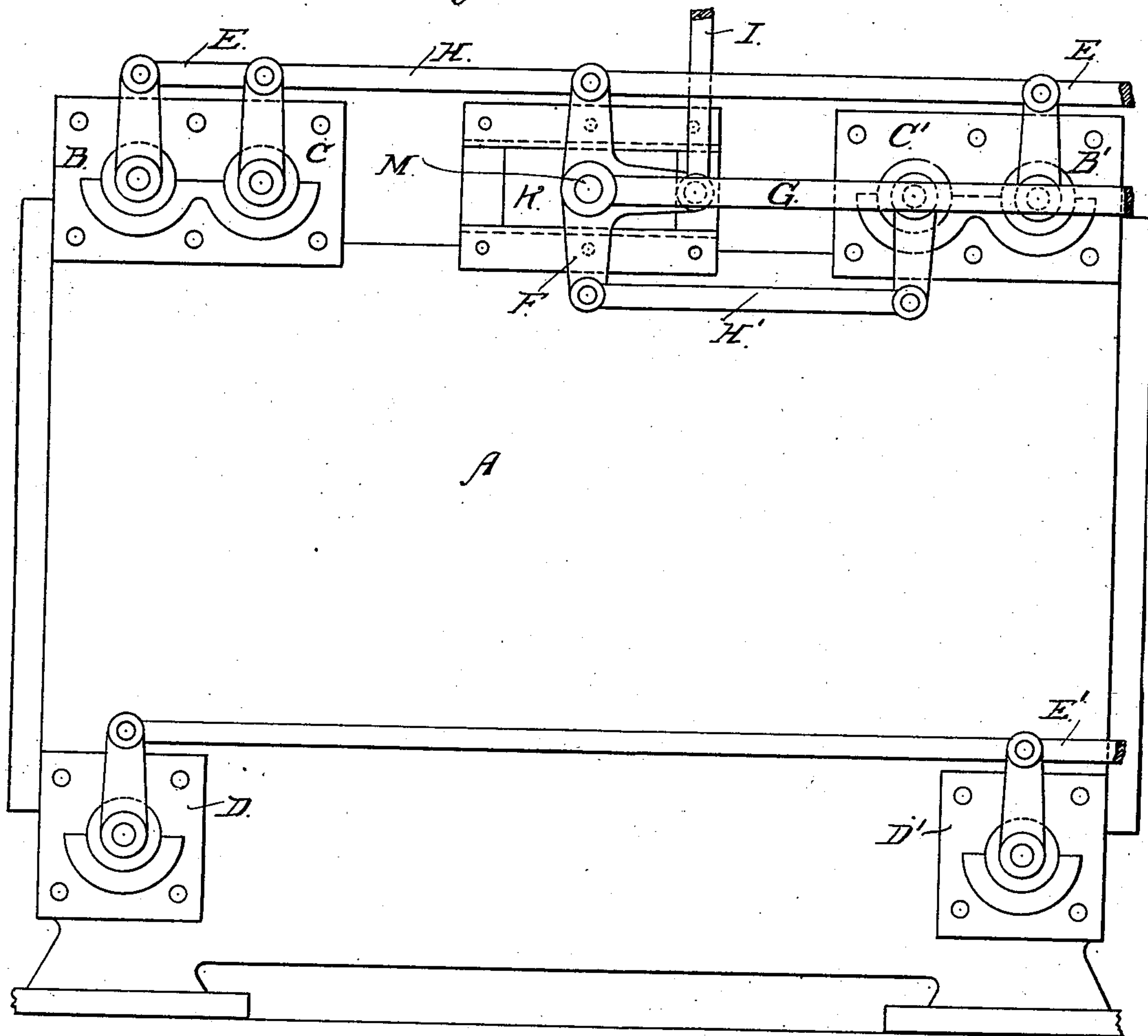
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3 SHEETS—SHEET 3.

Fig. 6.



WITNESSES

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W. H. Tinker

INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN WILLIAM MELLING, OF WIGAN, ENGLAND.

CUT-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 742,703, dated October 27, 1903.

Application filed July 20, 1903. Serial No. 166,333. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAM MELLING, engineer, of 82 Swinley road, Wigan, in the county of Lancaster, England, have invented certain new and useful Improvements in Cut-Off Valves, of which the following is a specification.

My invention relates to the valves and valve-gear of steam and other fluid-pressure engines; and it consists in combining a balanced circular or segmental cut-off valve (or valves) having an oscillating movement with a circular or segmental admission-valve (or valves) and also in means for operating the same for the purpose of working the steam or other fluid expansively and economically and also, if required, for regulating the speed of the engine, the object of my invention being to obtain greater range of control over the cut-off mechanism.

In the accompanying three sheets of drawings, Figure 1 is a side elevation of the cylinder of a steam-engine to which my improved valve-gear is applied. Fig. 2 is an end view, and Fig. 3 a plan, of part of Fig. 1. Fig. 4 is an enlarged sectional view of one of the oscillating balanced cut-off valves and its combined admission and exhaust valve. Fig. 5 is a sectional plan on the line A B, Fig. 4, placed about a quarter-turn round. Fig. 6 is a side elevation of the cylinder of a steam-engine, showing my improved valve-gear applied to an ordinary arrangement of valves.

In Figs. 1, 2, and 3 A designates the steam-cylinder; B B', the main or combined steam admission and exhaust valves; C C', the oscillating balanced cut-off valves, each admission and cut-off valve being fitted in a casing forming part of or secured to the cylinder, and D the steam pipe or box. (See Fig. 4.) On the spindles of the main valves B B' are secured arms or levers $b^4 b^5$, which are connected by a rod E to the usual eccentric, (not shown,) or in the case of a reversing-engine the rod E is connected to a rocking link or equivalent device.

To the spindles of the cut-off or expansion valves C C' are secured arms or levers $c^5 c^6$, which are connected by links H H', respectively, to the opposite ends of a three-armed

lever F, pivoted upon a stud M, secured in a slide K, or it might be upon a swinging lever. To this stud M is connected one end of a rod G, actuated by the usual cut-off eccentric or equivalent, by which the stud M is given a constant reciprocating movement. The third arm of the lever F is connected to a rod I, actuated by the engine-governor, or it might be to a hand-regulator to control the position of the lever.

As illustrated in the drawings, the lever F is in its middle position; but by raising the rod I sufficiently to move the lever into the position f' F', indicated by the line, the cut-off would take place at the earliest point, and if the rod I were lowered so as to place the lever in the position indicated by the line f^2 F² the cut-off would take place at the latest point.

Fig. 4 illustrates, on an enlarged scale, the construction of the combined admission and exhaust valve B and the cut off-valve C, the latter valve being illustrated by the sectional plan view, Fig. 5, which shows the valve lengthwise.

Steam passes from the pipe or box D into the valve-chamber c' and has free access through openings $c^2 c^3$, Fig. 5, to the other side of the valve C into the space c^4 , and thus balances the valve, as there is an equal pressure of steam on each side. When the valve C is oscillated by the movement of the rod G in the direction of the arrow, Fig. 4, the ports $d' d^2$ are simultaneously uncovered, and steam passes direct from c' through d' and indirectly through d^2 and the ports $d^3 d^4$, Figs. 4 and 5, and passage d' into the steam-space e of the valve B, and when this valve is oscillated to uncover the port b the steam passes from e into the cylinder i . The exhaust takes place when the valve B is oscillated in the opposite direction through the port b and passage b' in the valve to the port b^2 , from which it escapes.

In operation steam is admitted alternately to each end of the cylinder A through the valves B B' by the movement imparted to the rod E, by the eccentrics, or by a link-motion, and an oscillating movement is imparted by the reciprocating rod G to the three-armed lever F and through the links H H' to the

cut-off valves C C', which valves are further controlled by the governing motion through the rod I, which varies the position of the three-armed lever F in accordance with the requirements of the engine, and so causes the cut-off to take place earlier or later, as required.

In the arrangement illustrated in Fig. 6 the admission-valves B B' and the cut-off valves C C' are placed near to one another and operated, as before explained, by rods E and G, respectively; but they are fitted at the top of the cylinder, while the exhaust-valves D D' are separate valves placed at the bottom of the cylinder and worked by a separate reciprocating rod E', actuated by the ordinary wrist-plate (not shown) or otherwise, as convenient.

What I claim as my invention, and desire

to secure by Letters Patent of the United States, is—

The combination with oscillating balanced cut-off valves and oscillating admission and exhaust valves, of a slide K, a three-armed reciprocating lever secured to said slide and connections in conjunction with means for actuating and governing the position of the three-armed lever to open and close the cut-off valves at any point of the stroke in accordance with the requirements of the engine, substantially as herein set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHN WILLIAM MELLING.

Witnesses:

H. B. BARLOW,
S. W. GILLET.