

(No Model.)

2 Sheets—Sheet 1.

M. G. LEWIS.

ROTARY ENGINE.

No. 272,964.

Patented Feb. 27, 1883.

Fig. 1.

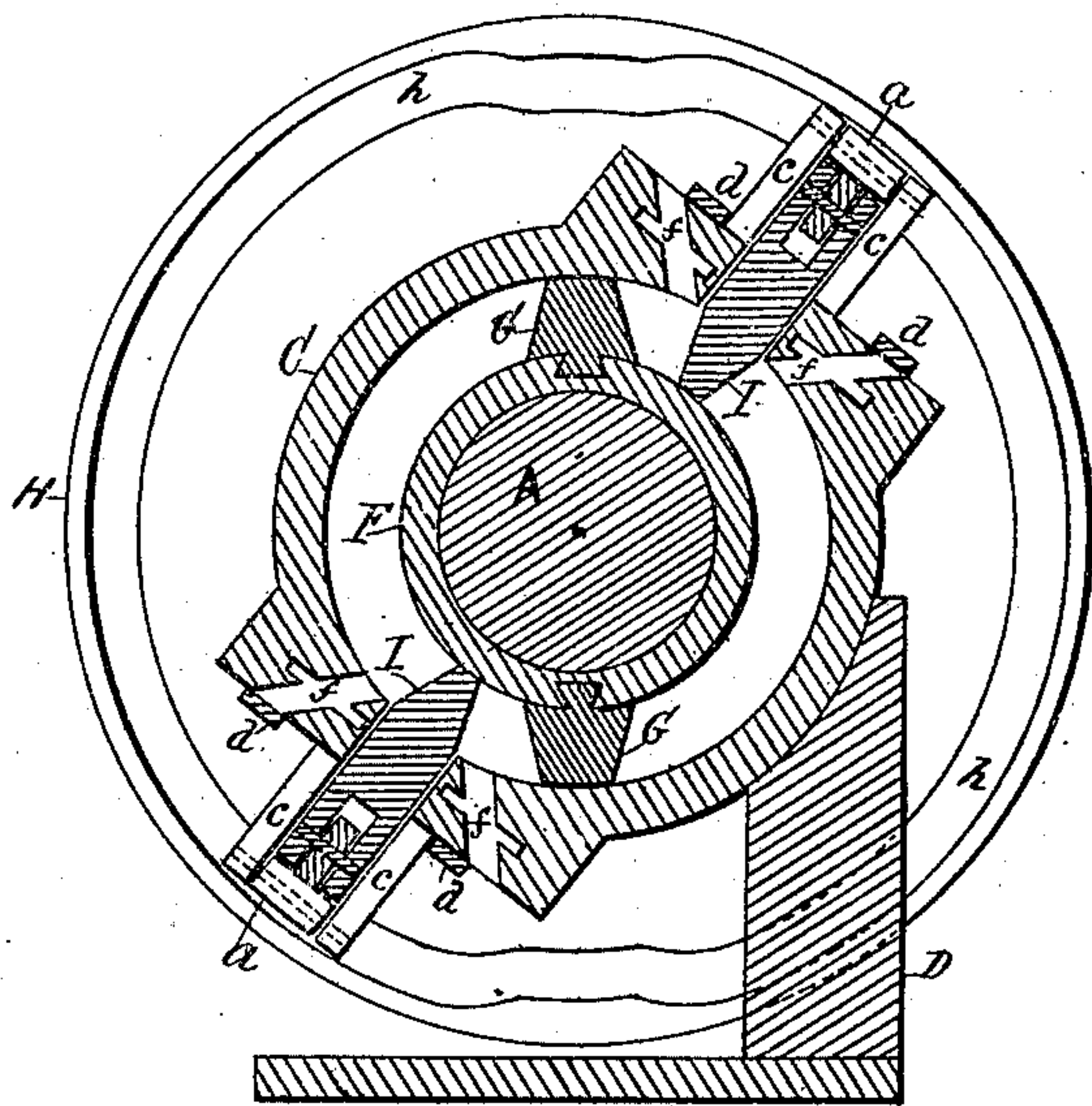
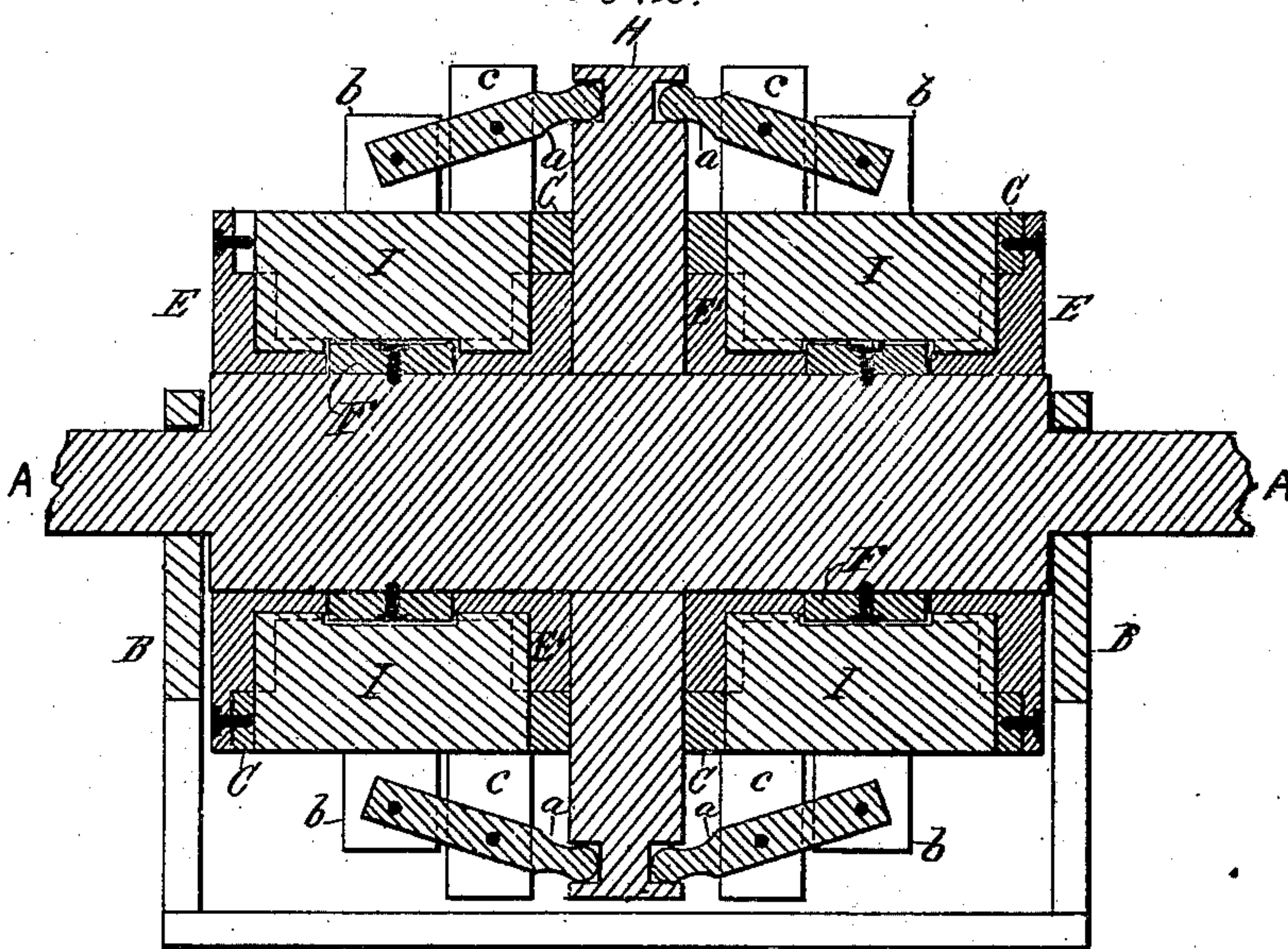


Fig. 2.



Witnesses
John Tucker.
F. W. Mauaford.

Mortimer G. Lewis.
Inventor.
By Wm. C. Wood
Attorney.

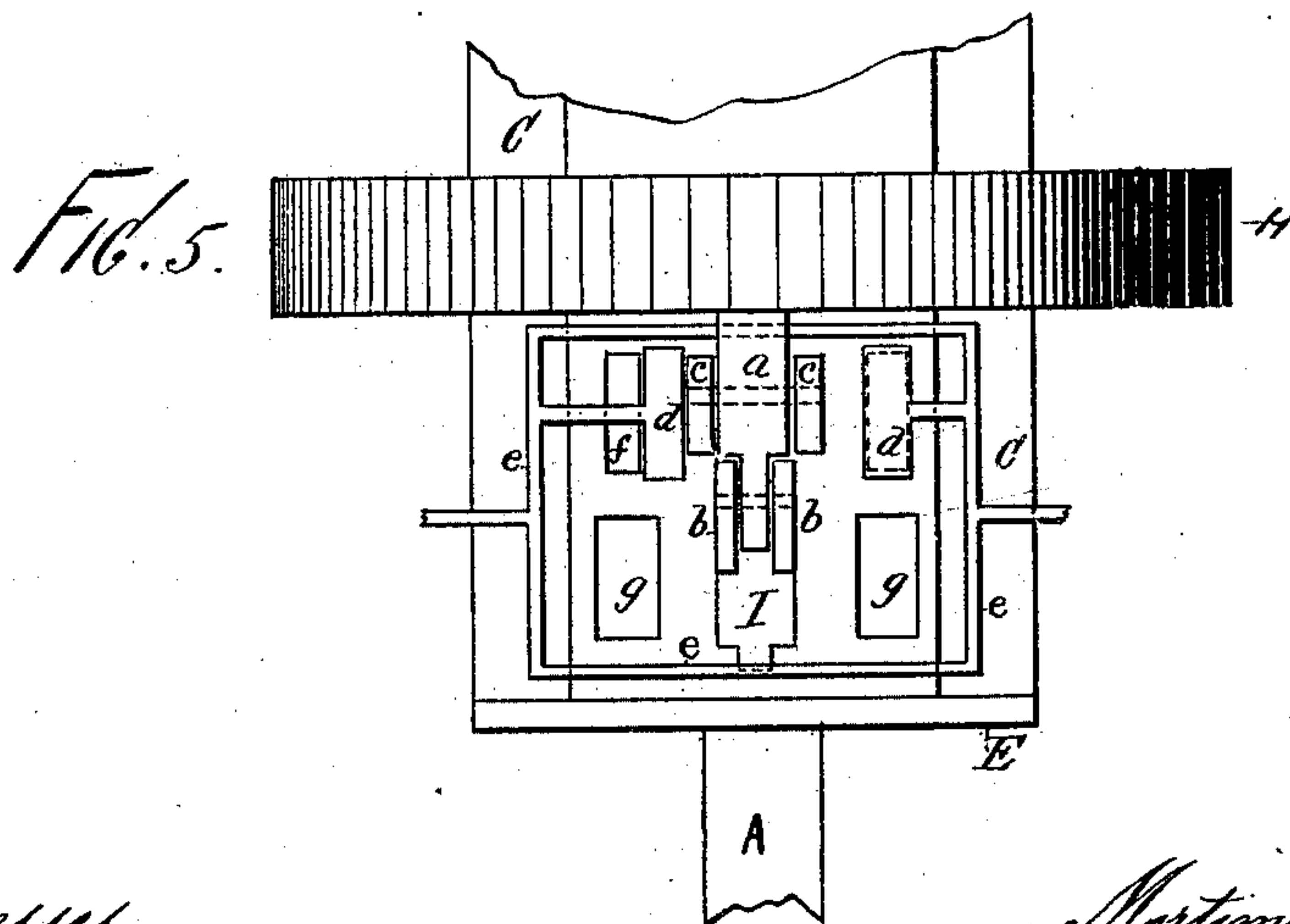
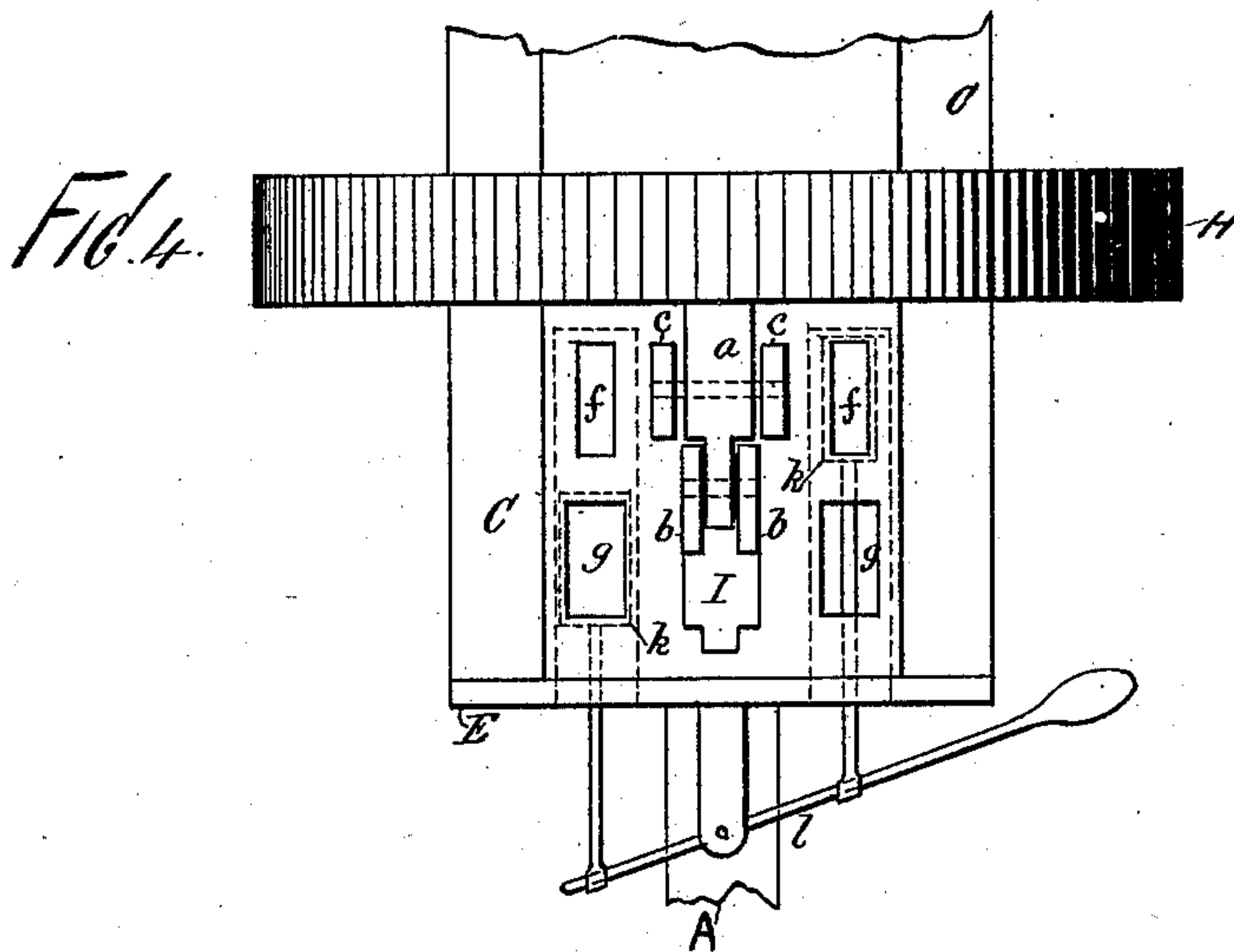
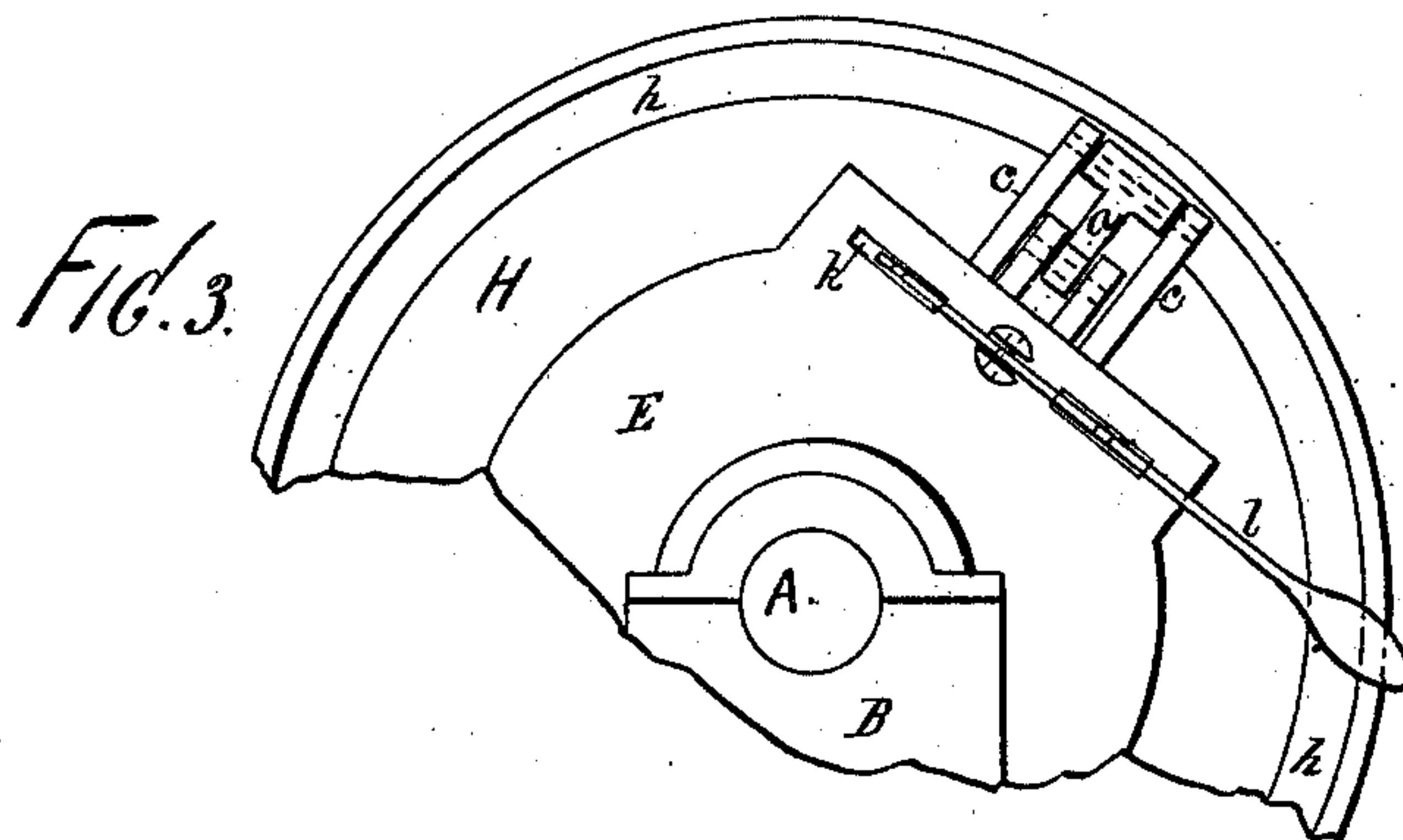
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2 Sheets—Sheet 2.

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Witnesses.
John Buckler,
F. W. Gannaford.

Mortimer G. Lewis,
Inventor.
By *Wm. Aspinall*
Attorney.

UNITED STATES PATENT OFFICE.

MORTIMER G. LEWIS, OF LOWVILLE, NEW YORK.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 272,964, dated February 27, 1883.

Application filed September 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, MORTIMER G. LEWIS, of Lowville, county of Lewis, and State of New York, have invented certain new and useful

5 Improvements in Rotary Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

10 My invention has relation to rotary engines for use with steam, water, or air or gas under pressure for the usual purposes of power-engines; and the object of my said invention is to produce a simple, compact, and easily-operating engine, wherein principal parts are

15 readily accessible from the exterior for adjustment or repairs, and in which the steam or fluid under pressure is capable of economical use, and the valves or steam-gates shifted with

20 but little friction or wear. To accomplish this my improvements involve certain novel and useful peculiarities in the construction and arrangement of the movable gates and the piston blades or wings operating in conjunction

25 therewith, certain novel and useful means of operating or moving the gates at the proper time, shifting the valves for reversing the engine, and in other peculiarities of construction and relative arrangements or combinations of

30 parts, all of which will be herein first fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a cross-section and elevation upon a plane passing through one

35 of the cylinders; and Fig. 2 is a longitudinal section upon a plane passing through the movable gates. Fig. 3 is an end elevation, and Fig. 4 a plan view, illustrating an arrangement of valves for reversing the engine. Fig. 5 is

40 a plan view illustrating the arrangement of the cut-off valves in connection with the inlet-ports.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

45 A is the central shaft of the engine, to be rotated by the steam or other fluid or liquid under pressure. It is mounted in and turns in suitable pillow-blocks, B B, secured upon any convenient foundation or bed-plate.

50 O O are the main cylinders, firmly supported upon any suitable standards, as D D.

E E are the cylinder-heads, having flanges

which project over the ends of the cylinders, and fitted thereto with ground joints, and bolted, so that they may be readily removed. 55 E' E' are similar blocks closing the inner ends of the cylinders; but these may be cast together with the cam-wheel, if desired.

Upon the shaft, and about at the middle of each cylinder, are secured collars F F, upon 60 which are secured the piston-wings G G, preferably by a dovetail joint, substantially as shown. These wings extend to the inner surface of the cylinder and out to the ends thereof, and may be packed in any of the usual 65 ways. They are made tapering to correspond with the taper of the movable gates, so that as the latter are withdrawn to permit the passage of the piston-wings they (the gates) will quickly close the space behind the wings, so 70 as to instantly direct the motive fluid against the wings.

H is the central flanged wheel, upon either side of which is the cam-groove *h*, within which the gate-arms *a* project, and by which said 75 arms are moved at the proper times. The cam-wheel is of course connected with the central shaft.

I I are the gates which project through the walls of the cylinders. They are made to 80 straddle the collar upon the shaft, and enter shallow grooves cut for them in the parts E E E' E', as indicated by the dotted lines in Fig. 2, so as to pack them against passage of steam or air, &c., and brace them at their margins 85 against the pressure. The arms or levers *a* are connected with the gates by a suitable joint, as a pin through the standards *b*, erected upon the gates, and are also journaled within other standards, as *c*, erected upon the cylinders. 90 Through the medium of the arms or levers *a*, actuated by the cams, the gates are made to move at the proper times.

The flanged wheel carrying the cams may be employed as a balance-wheel, band-wheel, 95 or gear-wheel, and it should be understood that a single cylinder may be employed, or more than two, and that the shaft need carry but one feather or piston-blade, or may carry any number, the cams being suitably adjusted 100 to properly govern the gates.

The gates may be moved longitudinally to permit the passage of the wings, and this movement may be in either or both directions

by suitably modifying the arrangement of the moving levers or arms.

The inlet-ports are controlled by suitable cut-off valves, as at *d d*, shifted by any form of eccentric at the proper times. These valves should of course be located in a suitable valve-chest, (not shown,) and they are connected by valve-rods and a frame, as *e e*, so that all the cut-off valves on the engine may be operated simultaneously. The cut-off valves should be shifted before the piston-wings reach the outlet-ports, so as to avoid waste of live steam or fluid. As steam enters the cylinder it forces the wings around, and they carry the shaft, the gates being elevated or retracted at the proper instant to permit the passage of the wings, after which they are instantly closed.

In order that the engine may be reversed, I arrange the ports in pairs, as indicated, *ff* being the inlet-ports and *g g* the outlet-ports or exhausts. By closing the inlet on one side of the gates and the exhaust on the other the revolving piston is made to move in one direction, and by reversing the arrangement the piston will be reversed. To accomplish this quickly and easily I cut slots in the cylinder, so as to intercept the ports, and in these slots locate slide-valves, as at *k k*. These are arranged so that as one is moved in the other is pulled out, and for this purpose they may be connected with a centrally-pivoted lever, *l*, by any suitable rods. The lever is only designed to show one means of moving these valves. All the shifting valves on one cylinder are intended to be connected, so that by a simple movement of the hand the movement of the engine may be reversed.

The gates may be packed in any desired manner, either inside or outside the cylinder. When required to be moved the gates are not under pressure of steam, and hence may be moved with very little power, little friction, and subject to little wear.

The inlet and outlet ports, instead of being located upon the walls of the cylinder, might be made in the ends thereof with equal advantage.

The engine, constructed and arranged as

above set forth, is capable of moving at a high rate of speed, or at a slow rate, with equal economy in either case, and will be found to answer all the purposes and objects of the invention, as previously set forth.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a rotary engine, the piston-wings secured to and movable with the main shaft, and the gates projecting through slots in the cylinder, recessed to straddle the collar upon the main shaft, and provided with levers exterior to the cylinder, which open and close the gates at the proper time, substantially as and for the purposes set forth.

2. In a rotary engine, the cam-wheel connected with the main shaft, the piston-wings, also secured to said shaft, the movable gates projecting through slots in the cylinder, and fitting the recesses cut for them in the heads of the cylinder, the gate-levers located outside of the cylinder and moved by the cam-wheel, these parts being combined and arranged substantially as shown and described.

3. In a rotary engine, the movable gates made to straddle the collar which is secured to the main shaft, and entering shallow grooves cut in the ends of the cylinder, substantially as shown and described, and for the purposes set forth.

4. In a rotary engine, the inlet-ports provided with cut-off valves, the inclined movable gates projecting through the cylinder and entering the recesses in the cylinder-heads, the inclined piston-wings connected with the main shaft, the cam-wheel and levers for operating the gates, and the reversing-valves projecting through slots in the cylinder, all combined and arranged substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

M. G. LEWIS.

Witnesses:

WORTH OSGOOD,
JOHN BUCKLER.