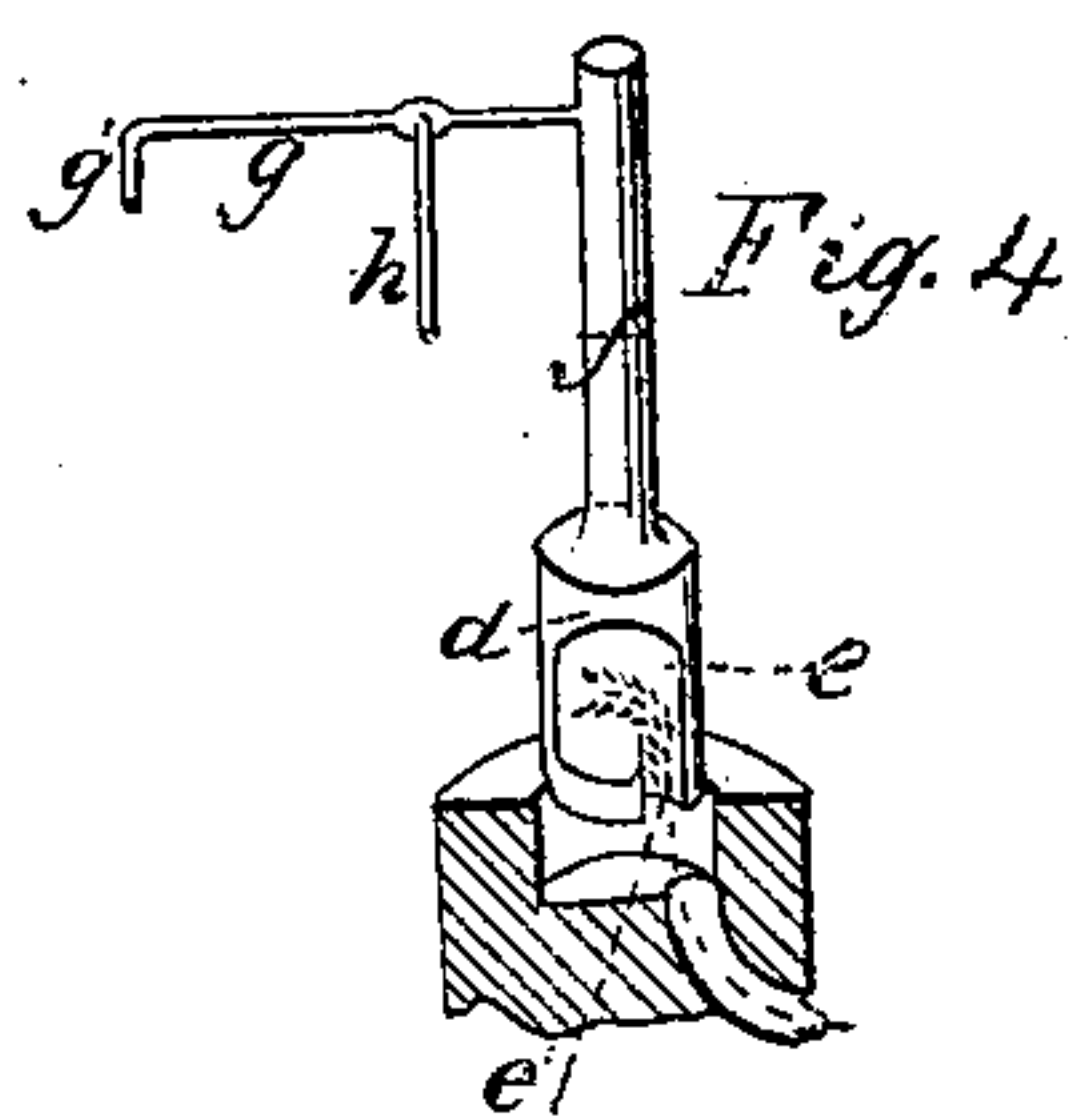
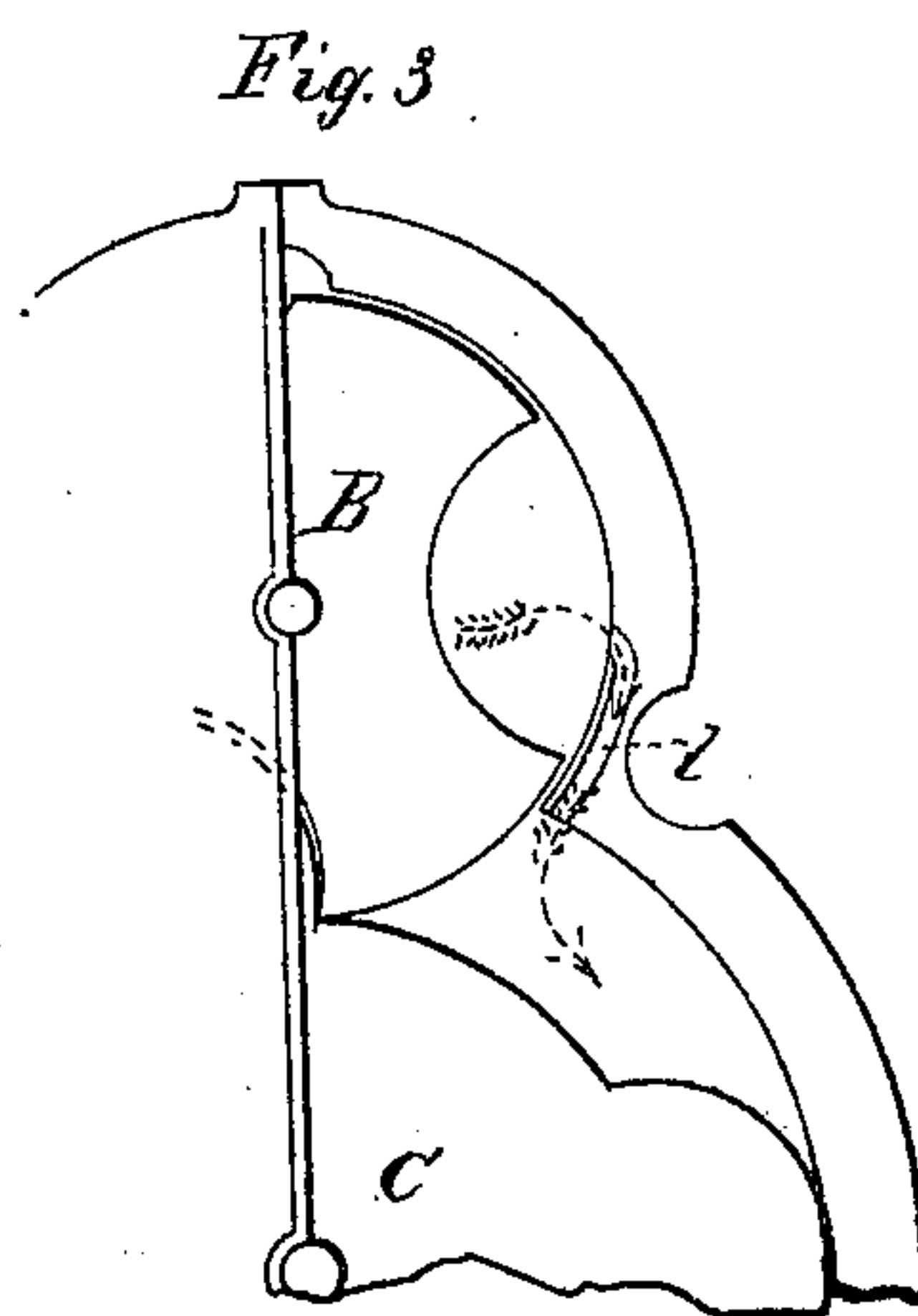
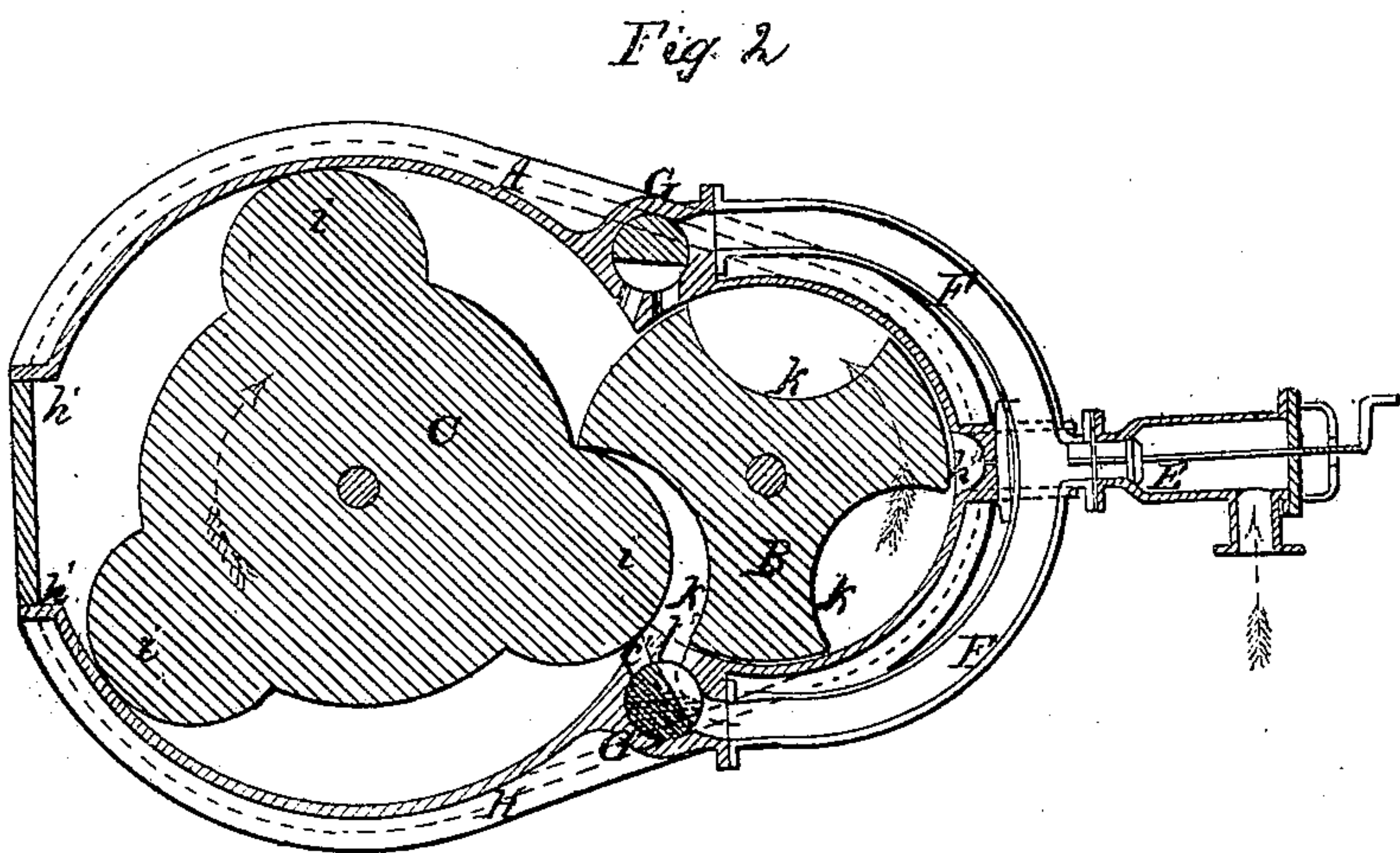
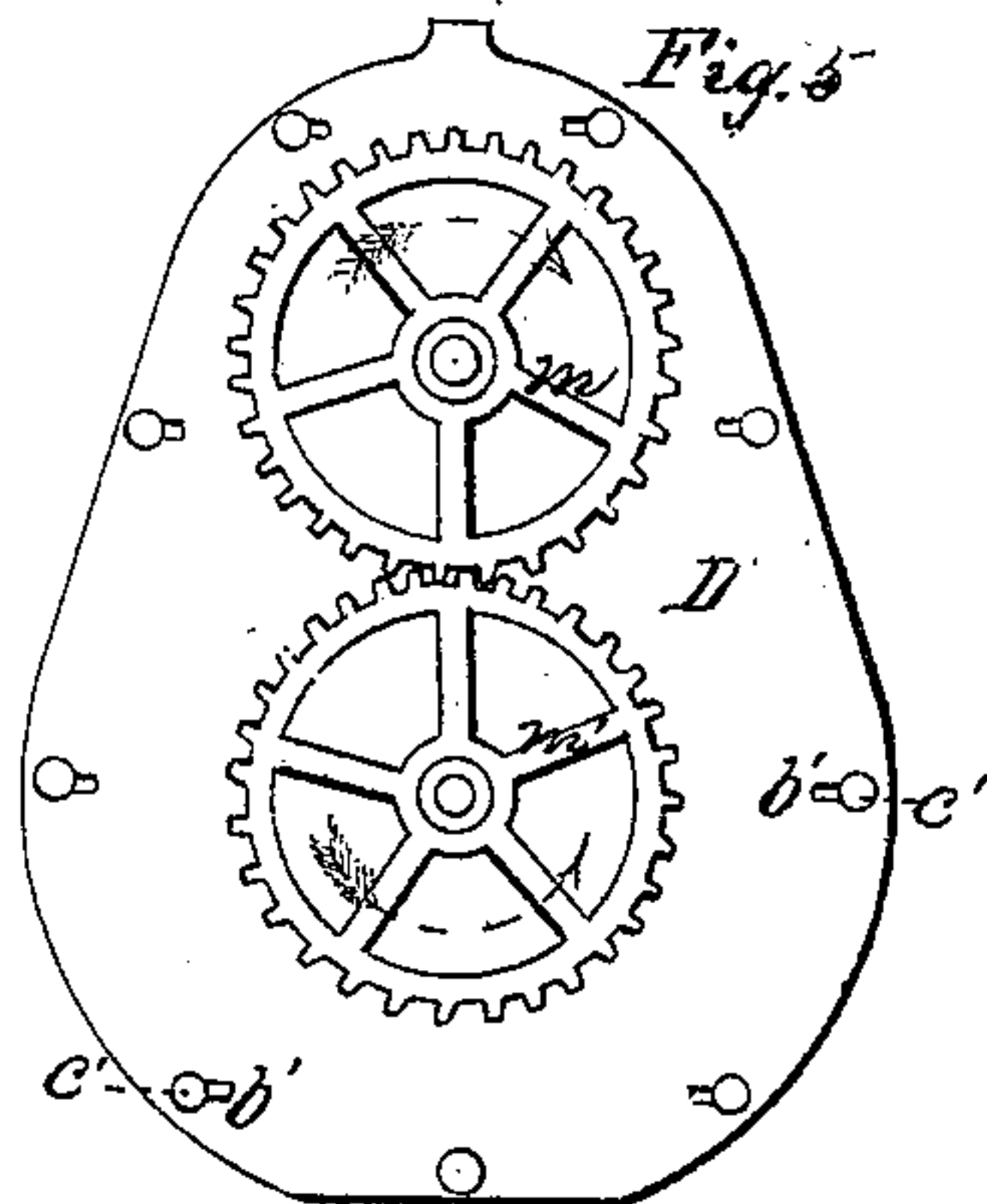
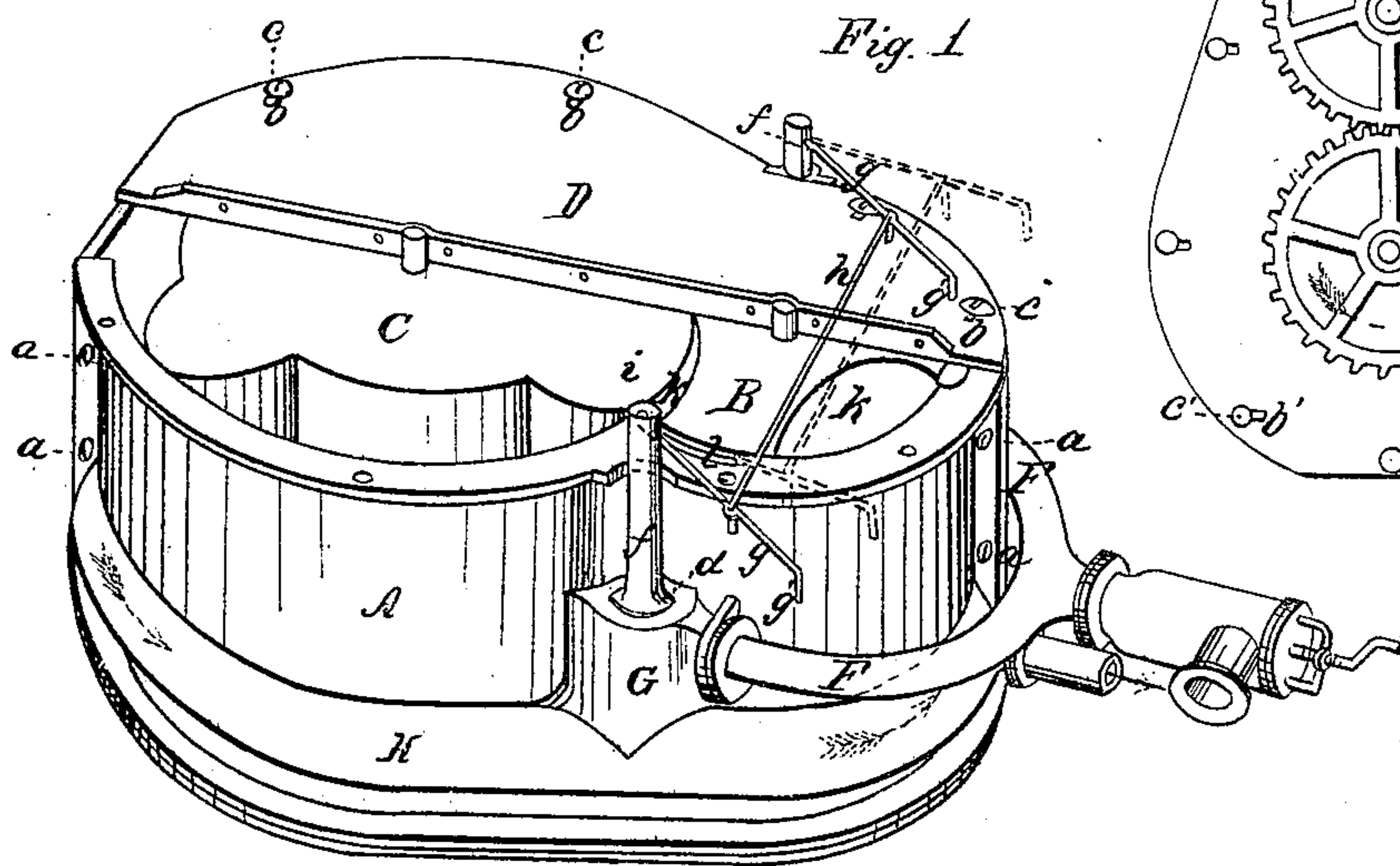


*W. J. Norton,
Rotary Engine,*

No 54,006,

Patented Apr. 17, 1866.



*Witnesses
L. Homann
Wm. Degen*

*Inventor
Wm. J. Norton*

UNITED STATES PATENT OFFICE.

WILLIAM J. NORTON, OF CINCINNATI, OHIO.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. 54,006, dated April 17, 1866.

To all whom it may concern:

Be it known that I, WILLIAM J. NORTON, of Cincinnati, Hamilton county, and State of Ohio, have invented a new and useful Improvement in Cut-Off Rotary Engines, of which the following is a full and clear description, reference being had to the accompanying drawings, forming part of this specification.

My improvement in rotary engines has reference to the construction and arrangement of valves for regulating the supply to and escape from the cylinder of steam; also, a cut-off which economizes the steam by accepting all its developing energy.

Figure 1 represents a perspective view of my improved engine with one-half of the front cylinder-head removed, showing the revolving piston and abutment. Fig. 2 is a transverse section of the engine, taken through the valves and supply-pipes. Fig. 3 is a plan of the front of the engine, the cylinder-head being removed. Fig. 4 is a perspective view of one of the valves and valve-seat. Fig. 5 is a plan of the back of the engine, showing the gear-wheels attached to the axles of the revolving piston and abutment.

A represents the cylinder of the engine, in two pieces, secured together by bolts *a*. Within the cylinder A are the abutment B and revolving piston C.

The front cylinder-head, D, is in two parts to admit of adjustment. The bolts *c*, which secure the cylinder-head D, pass through slots *b* in the cylinder-head D. Throttle-valve E regulates the supply of steam to the supply-pipes F.

The supply-pipes F are attached to steam-chests G upon the outside of the cylinder A. Cylindrical valves *d* fit the interior of steam-chest G. It has upon one side a depression, *e*, and slot *e'*, connecting with depression *e* and permitting steam to escape from within cylinder A into escape-pipes H. Two vents, *b'* and *c'*, from steam-chest G give passage to steam from supply-pipes F into the chambers occupied by abutment B and revolving piston C.

To stems *f* of cylindrical valves *d* are secured reversing-rods *g*, turned down at their free ends *g'*. They are connected together by rod *h*. The revolving piston C has piston-heads *i*,

which mesh into depressions or grooves *k* in abutment B.

The rear cylinder-head, D', is in one piece, but provided with slotted openings near its edge to enable the sides of cylinder A to be drawn together.

A cut-off channel, *l*, upon each side of one end of cylinder A, gives passage to steam from the chamber in which abutment B revolves into the chamber in which the revolving piston is situated.

Gear-wheels *m* and *m'* are secured to the axles of abutment B and revolving piston C, exterior to the rear cylinder-head, D'.

Operation: When the engine is to be started the reversing-rods *g* are moved around till the free end *g'* of one of rods *g* comes in contact with the central flange of cylinder-head D. The steam then passes from one of the supply-pipes F through steam-chest G and through depression *e* in cylindrical valve *d*, thence through vent *b'*, and exerts pressure between abutment B and piston-heads *i*. The gear-wheels *m* prevent unusual jarring or friction between the various parts of abutment B and revolving piston C. As piston C revolves the useless steam escapes into pipe H through exit-openings *h'* and *h''*. In case the abutment B closes vent *b'* the valve *d* may be rotated so as to admit steam through vent *c'*. When the surface of the abutment B has covered vent *b'* the supply of live steam is cut off from the space between the abutment B and piston-head *i*. The steam which has been locked up in the preceding depression *k* of the abutment B exerts its expansive force between the piston-head *i* and abutment B. When the piston-head *i* has passed the offset in the chamber of cylinder A occupied by the revolving piston C, the exhaust-steam has free passage, through the exit-opening *h'*, into escape-pipe H. When the abutment B has revolved sufficiently to close the opening to cut-off channel *l*, the exit-opening *h''* is uncovered by abutment B, permitting what steam remains in depression *k* to escape into pipe H. While the engine runs constantly in one direction, the valve *d* upon one side, placed in such a position with reference to the openings from supply-pipe F and vents *b'* and *c'*, or, where economy is looked to, the valve *d*, valve chamber or chest G, supply-pipe F, and escape-pipe

H, may be dispensed with, where there exists no necessity to reverse.

In case it is desirable to obtain the full force of steam upon the working parts of the engine, the valve *d* may be revolved to such an extent as to permit the ingress of steam into the chamber occupied by revolving piston C, as well as into the chamber in which abutment B revolves, the valve *d* being constructed so as to permit of the passage from supply-pipe F through the two vents *b'* and *c'* into the interior of the cylinder A.

The two parts of cylinder A may be drawn together by means of bolts *a*, so as to make the revolving piston C and abutment B steam-tight upon their surfaces. This operation necessitates the near approach of bolts *c*. The slots *b* permit this operation.

Having fully described the construction and operation of my improved cut-off rotary engine, I make the following claims, which I desire to secure by Letters Patent:

1. The cut-off B, in combination with valves *d*, reversing-rods *g*, and rod *h*, all arranged and operating as specified, for the purpose set forth.

2. The valve or valves *d*, reversing-rods *g*, and rod *h*, constructed and operating as above described and set forth.

3. The cylinder A and cylinder-heads D and D', constructed as above specified, and for the purpose set forth.

WM. J. NORTON.

Witnesses:

L. HOMANN,
WM. DOEGEN.