

R. G. NICOLL & G. H. HOLLMANN.
Reciprocating Steam Engines.

No. 139,258.

Patented May 27, 1873.

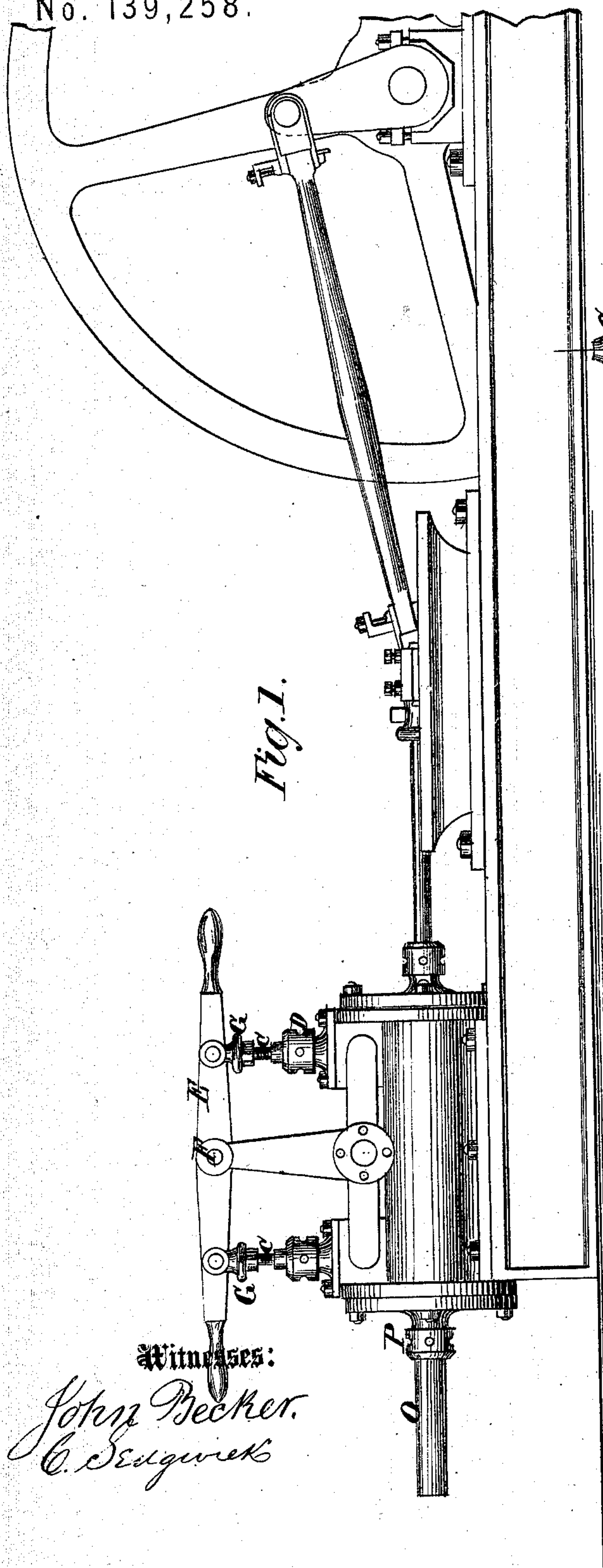


Fig. 1.

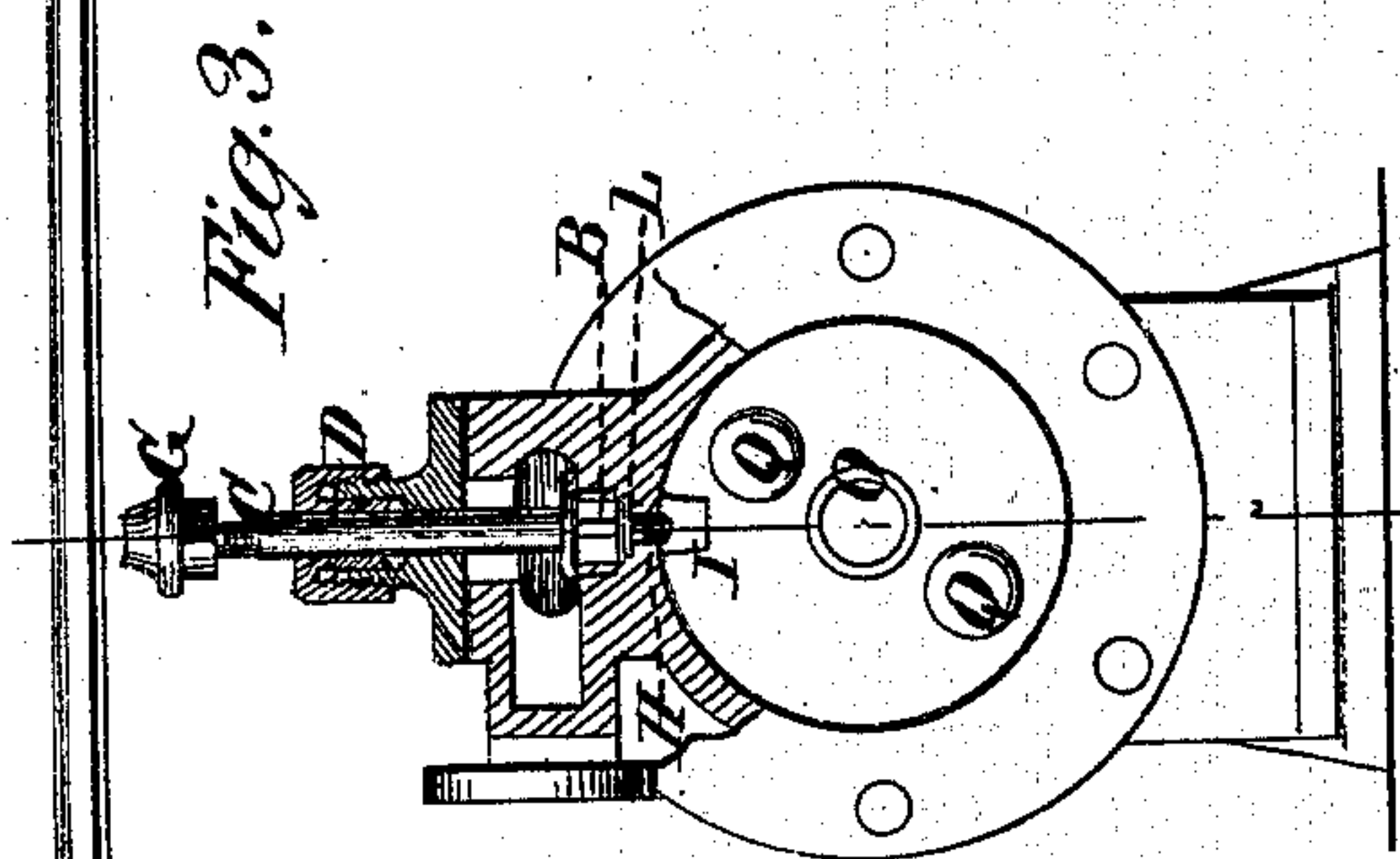


Fig. 3.

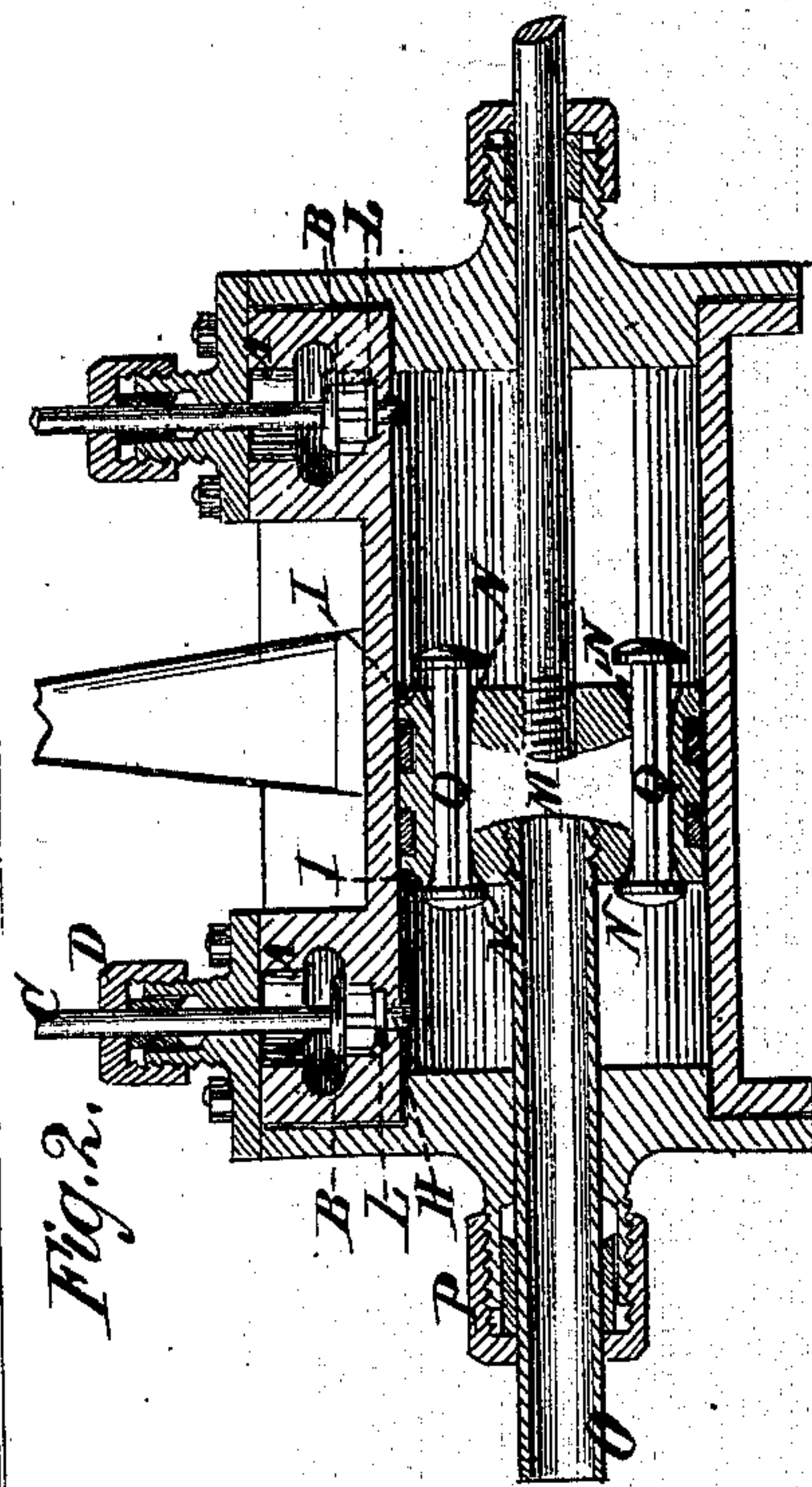


Fig. 2.

Witnesses:

John Becker.
C. Sedgwick

Inventor:

R. G. Nicoll
G. H. Hollmann

PER

Miner
Attorneys.

UNITED STATES PATENT OFFICE.

ROBERT G. NICOLL AND GERHARD H. HOLLMANN, OF HAZLEHURST, MISS.

IMPROVEMENT IN RECIPROCATING STEAM-ENGINES.

Specification forming part of Letters Patent No. **139,258**, dated May 27, 1873; application filed July 27, 1872.

To all whom it may concern:

Be it known that we, ROBERT G. NICOLL and GERHARD H. HOLLMANN, of Hazlehurst, in the county of Copiah and State of Mississippi, have invented a new and useful Improvement in Steam-Engines, of which the following is a specification:

The invention consists in certain improvements upon engines, as hereinafter fully described and subsequently pointed out in the claims.

We desire, however, to state in advance that we have no intention to claim, broadly, the method of supplying steam through lift-valves in the cylinder or exhausting it through the piston.

Figure 1 is a side elevation of our improved engine. Fig. 2 is a longitudinal sectional elevation through the cylinder and valve-chest taken on the line *xx* of Fig. 3, and Fig. 3 is a transverse section through the steam-chest.

Similar letters of reference indicate corresponding parts.

A represents the valve-chest with ports opening through the bottom into the engine, adapted for lift or clack valves with brass-lined seats. B represents the said lift-valves having a stem, C, extending up through stuffing-boxes D in the top of the steam-chest, and connected to the rocking lever E on opposite sides of and equidistant from its pivot F, said stems being connected to said lever by screwing into the pendent nuts G so that they can be readily adjusted in respect of their "lift." Each valve has a blunt-tapered steel pin extending from the under side through the port below the surface of the cylinder to be acted on by the piston for shifting the valves by lifting one and depressing the other, the said piston being provided with steel-faced inclines I for so actuating them. These valves are like an ordinary three-wing valve, except on the bottoms they are carefully rounded off to the junction with the steel plugs that extend through the ports below the seating. Below the valve-seats the metal is cut out so

that the steam-branches off both sides as it enters the cylinder. The plugs H are formed with a flat head, L, to rest on the bottom of the seating, while the valves are also seated above. The piston is provided with an exhaust-chamber, M, with exhaust-ports N entering it from each side of the piston, and a hollow piston-rod, O, extending through a stuffing-box, P, in one of the cylinder-heads. The ports are provided with double-headed valves Q, whose stems are a little longer than the distance through the piston so that the valves project a short distance beyond the piston when opened; also, so that they will be closed by the said projecting ends coming against the cylinder-heads just before the piston stops and at the same time that it opens the valve B above.

By these arrangements we avoid the use of expensive valve-gear, and we have valves which open to the full extent very suddenly, thus effecting the changes quickly, and we avoid the friction of sliding valves.

The motion of the engine is reversed by reversing the valves by hand when the steam is shut off. The valves remain in the positions to which they are shifted by the pressure of the steam on the one covering the exhausting end of the engine.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A steam-valve provided with bearing on top of seat, and plug H having flat head L resting on the bottom thereof, as described.

2. A cylinder having lift-valves B B to admit steam, combined with a piston having means M N Q for exhausting steam, as described.

ROBERT G. NICOLL.
GERHARD H. HOLLMANN.

Witnesses:

CHARLES BAAS,
FRITZ VITZTHUM,
W. A. STONE.