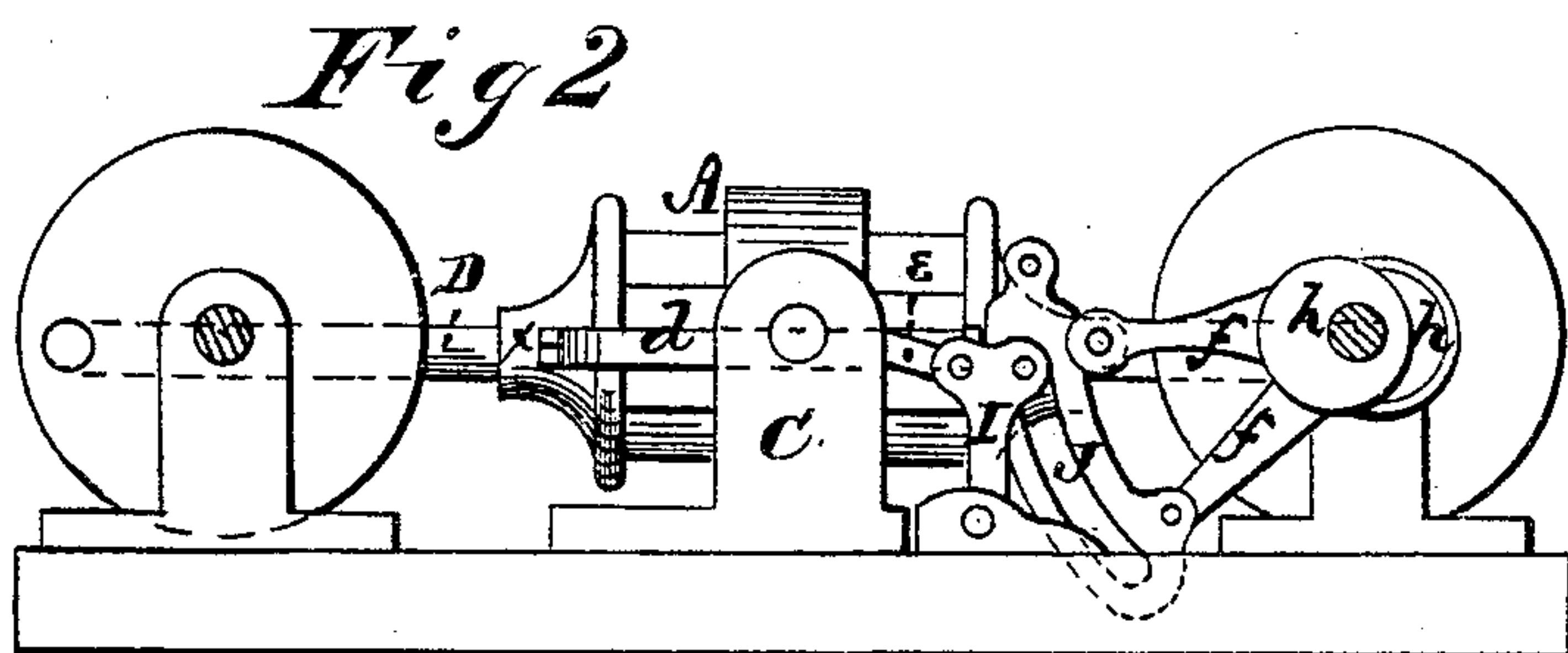
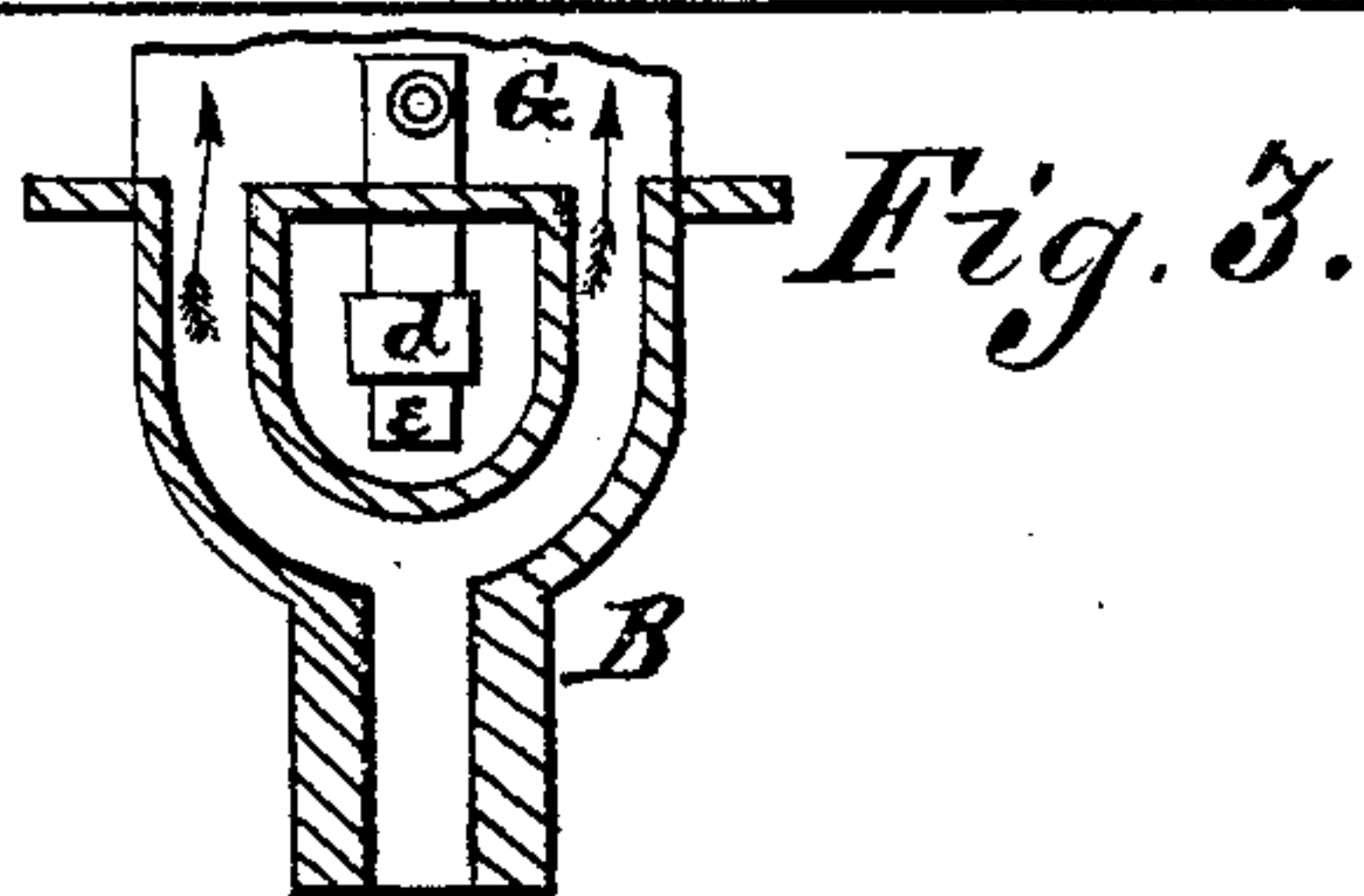
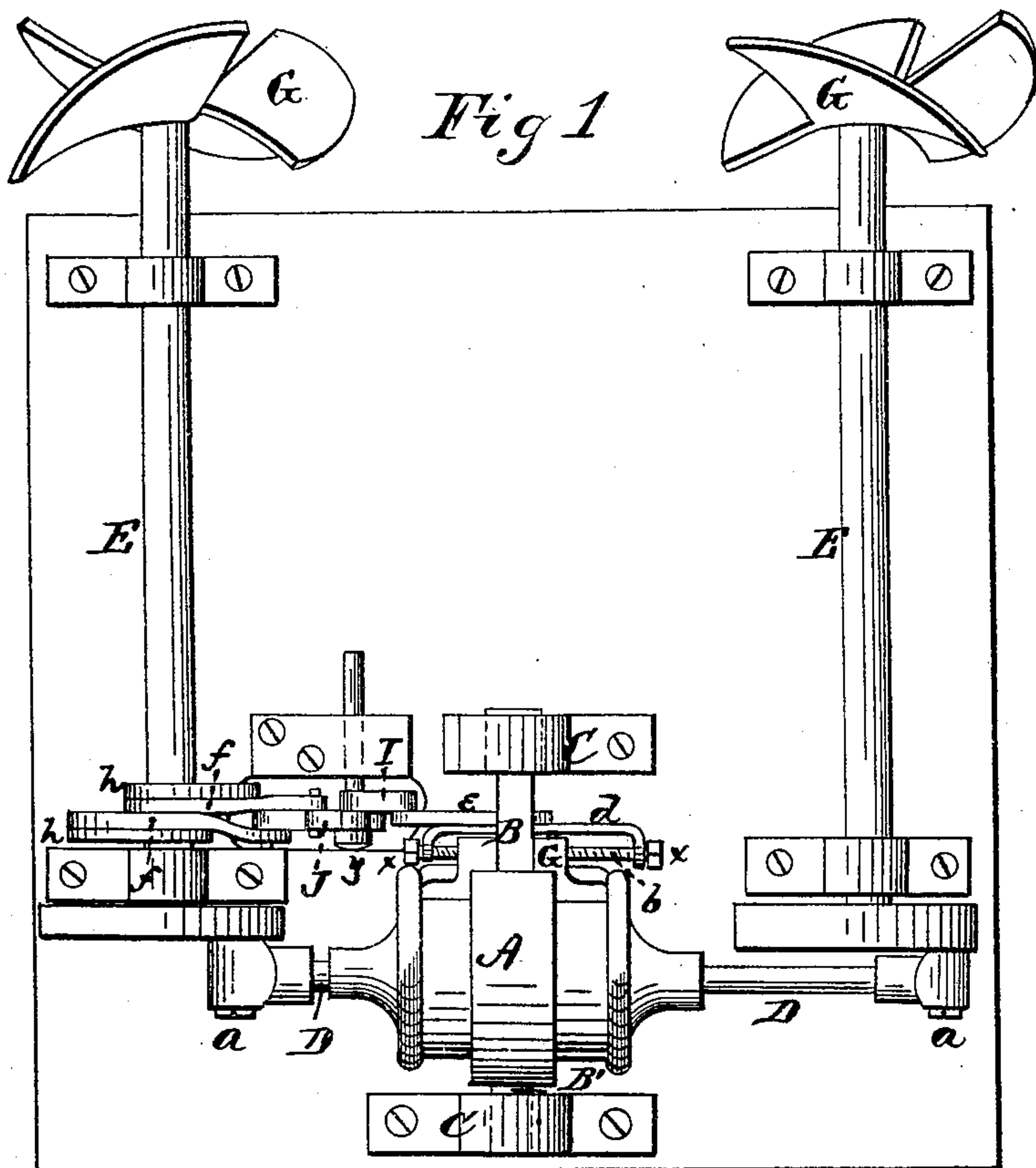


J. T. HILL.  
Engines for Propelling Boats.  
No. 149,221. Patented March 31, 1874.



WITNESSES.  
F. L. Oviand  
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By

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# UNITED STATES PATENT OFFICE.

JAMES T. HILL, OF CUMBERLAND, MARYLAND.

## IMPROVEMENT IN ENGINES FOR PROPELLING BOATS.

Specification forming part of Letters Patent No. **149,221**, dated March 31, 1874; application filed January 12, 1874.

*To all whom it may concern:*

Be it known that I, JAMES T. HILL, of Cumberland, in the county of Alleghany and in the State of Maryland, have invented certain new and useful Improvements in Engines for Propelling Boats; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention relates to the construction of an engine for propelling boats; and consists in the combination with two propeller-shafts of an oscillating cylinder placed between them, a piston-rod extending through the cylinder, and connected at its ends with crank-pins on the propeller-shafts, and in the general construction of parts therewith, all as hereinafter more fully set forth.

In the accompanying drawing, Figure 1 is a plan view of an engine embodying my invention. Fig. 2 is a side view of the device for operating the slide-valve, and Fig. 3 is a section of the steam-inlet to the steam-chest.

A represents the steam-cylinder, hung upon trunnions B B' in bearings C C. This cylinder is provided with the usual piston, and this piston is provided with a piston-rod, D, extending in both directions through suitable stuffing-boxes in the ends of the cylinder. The ends of the piston-rod D are placed upon cranks *a a* of two parallel shafts, E E, each carrying a propeller-wheel, G, the two cranks being so arranged that when one is up the other is down, and vice versa. The piston in the cylinder A being moved by the steam back and forth, it will readily be seen that the two shafts E E are revolved in opposite directions, causing the propellers to run, one right, and the other left. The cylinder-trunnion B is hollow, forming the steam-inlet, and is then branched, as shown in Fig. 3, to admit steam, both from the top and bottom, into the steam-chest G, which is formed on or attached to the side of the oscillating cylinder A. In the steam-chest G is an ordinary slide-valve, pro-

vided with a valve-rod, *b*, which extends in both directions through the ends of the steam-chest, and the ends of the rod or stem *b* are secured to a yoke, *d*, by means of nuts *x x*. These nuts aid in arranging or setting the valve properly. The yoke *d* runs in suitable guides on the steam-chest cover, and in its center is a stud, from which a rod, *e*, connects it with a rocking arm, I. On this arm is a stud, *y*, which passes through a slot in a curved link, J, and this link is at its ends, by means of arms and straps *f f*, connected with eccentrics *h h* upon one of the propeller-shafts E.

The connection of the operating mechanism with the valve, being directly in the center, gives a steady and uniform motion to the valve, both in a vertical and a horizontal engine. The travel of the valve, being divided equally of the center of the trunnion, gives so little oscillation that it does not affect the uniform motion of the valve. It is simple, and cheaply constructed.

By moving the link J so that the position of the stud *y* will be changed from one end of the same to the other, the motion of the engine is quickly reversed.

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

The combination, with the two propeller-shafts E E, of the oscillating cylinder A, placed between the same, the piston-rod D, extending through both ends of the cylinder, and connected at its ends with the crank-pins *a a* on the shafts E E, steam-chest G, valve-stem *b*, extending through both ends of the chest, the yoke *d*, attached to each end of the valve-stem, link J, rocking arm I, and connecting-rod *e*, all constructed substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of December, 1873.

JAMES T. HILL.

Witnesses:

C. F. HETZEL,  
JAMES N. FALLON.