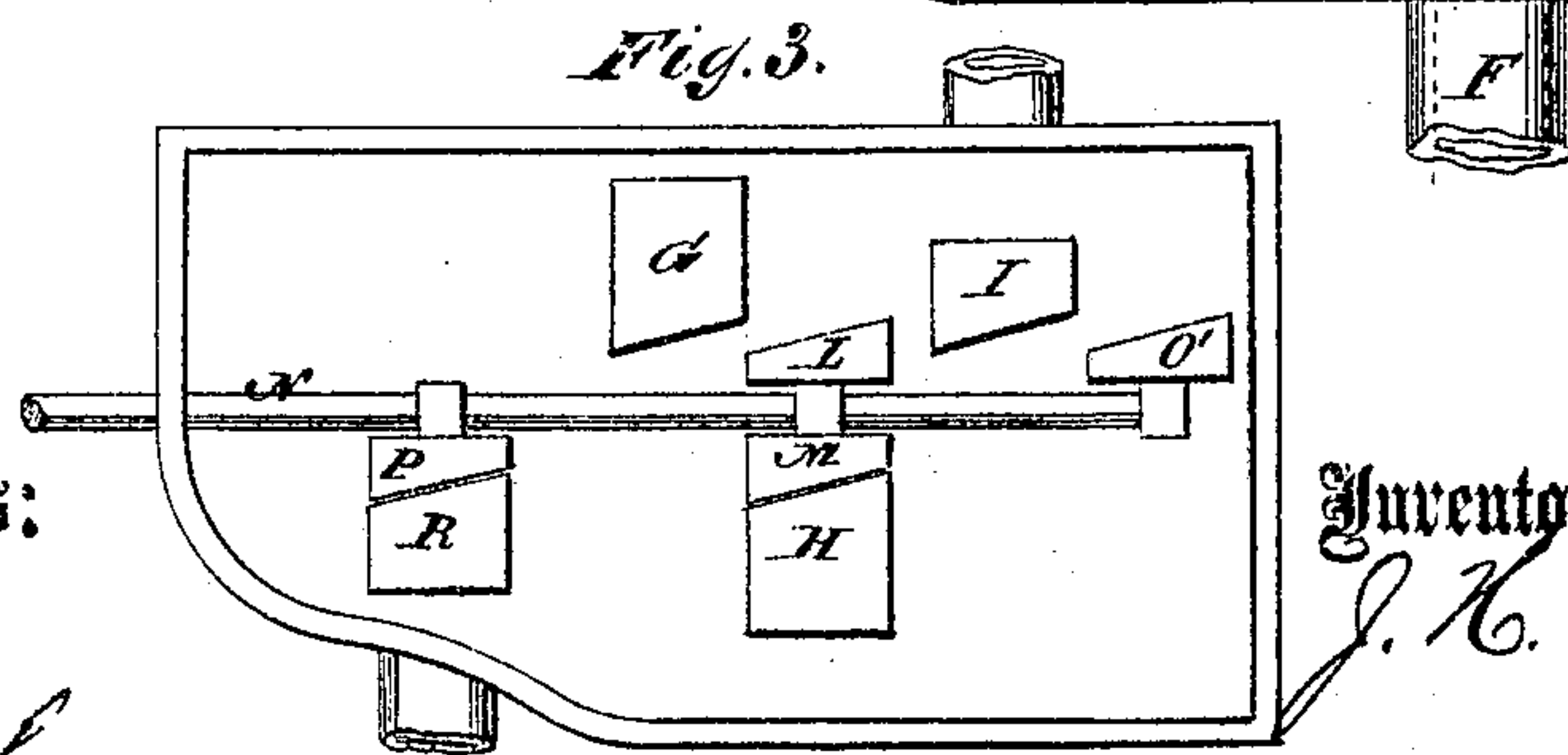
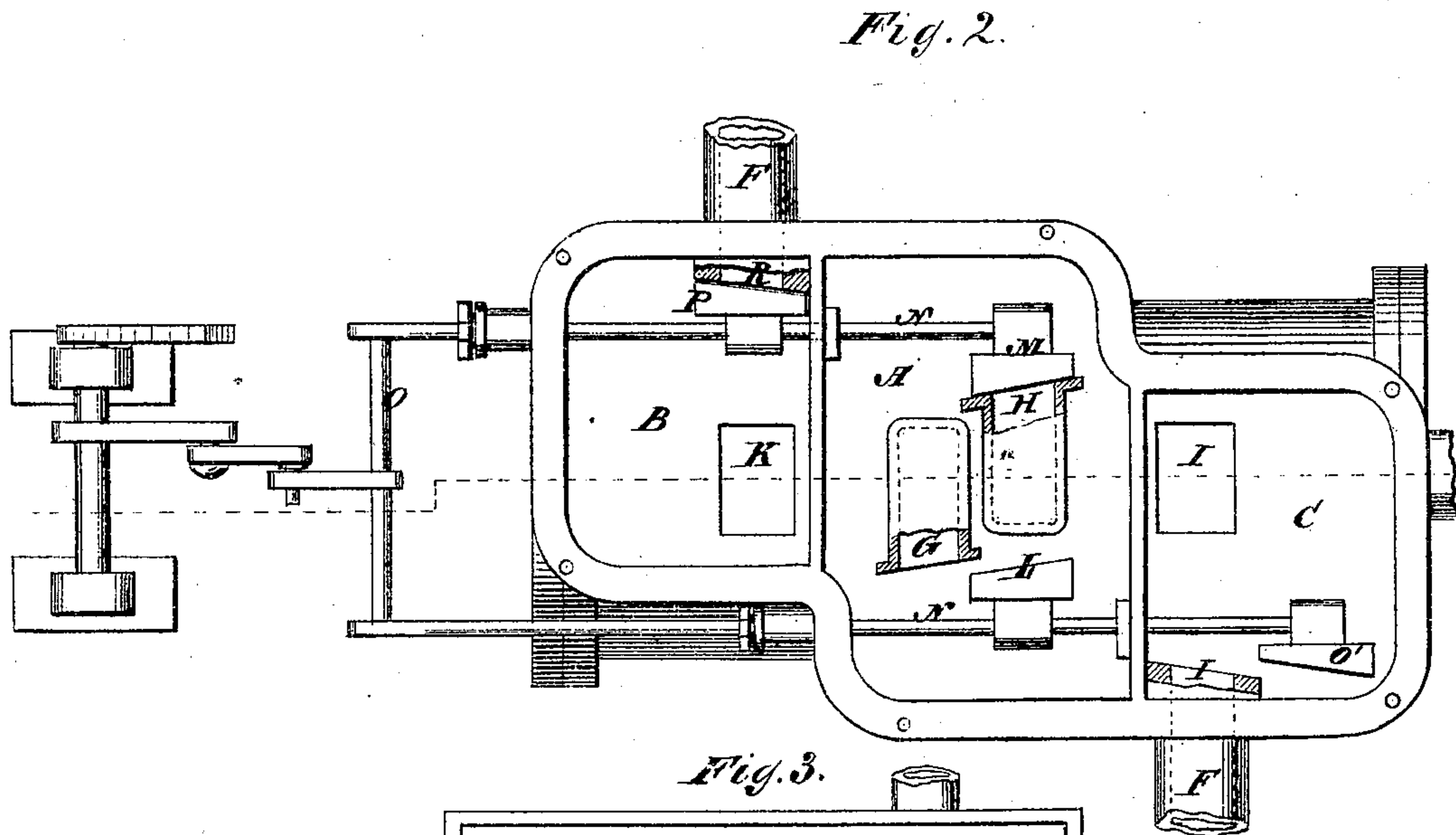
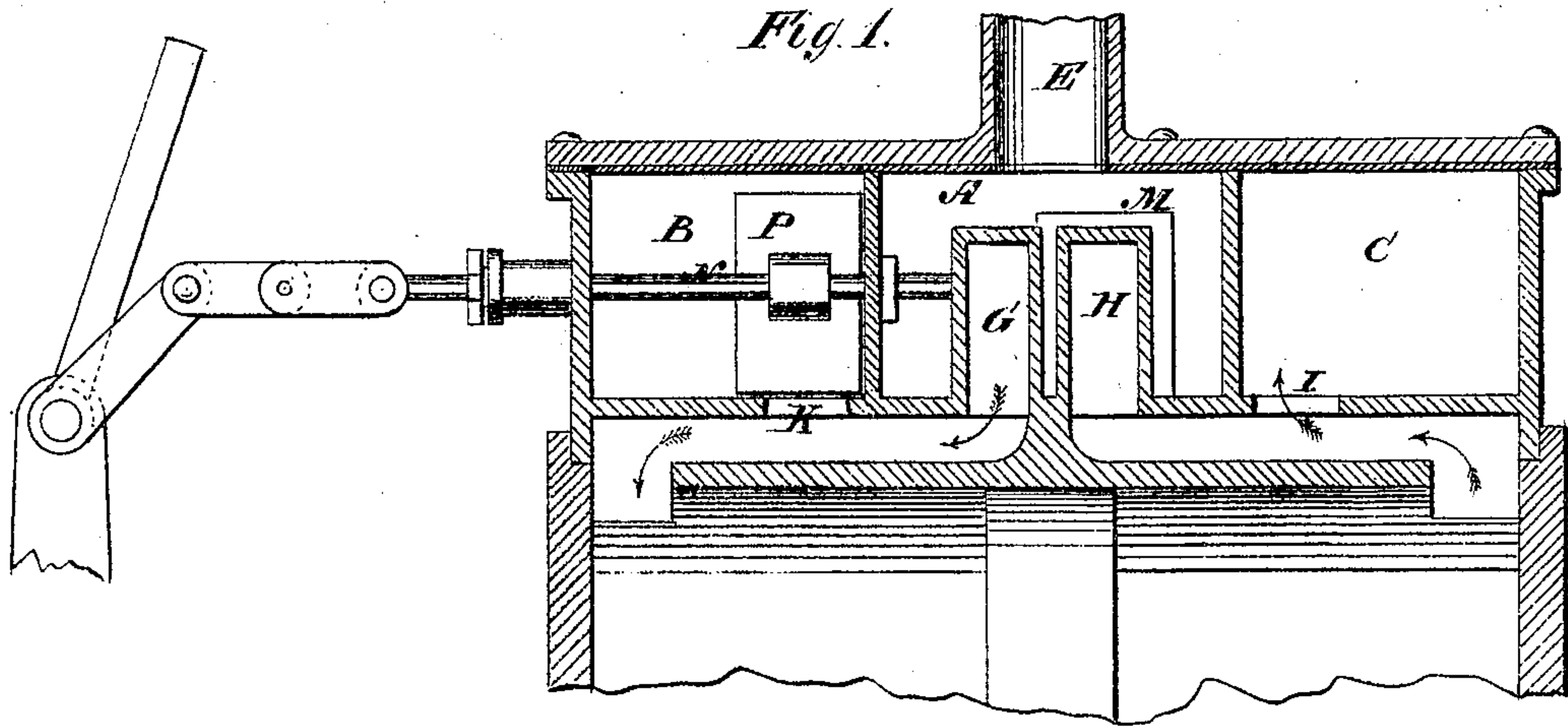


J. H. CONNELL.

Improvement in Slide-Valves for Engines.

No. 129,270.

Patented July 16, 1872.



Witnesses:

*E. Hoff.*  
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# UNITED STATES PATENT OFFICE.

JAMES H. CONNELL, OF ELIZABETH, NEW JERSEY.

## IMPROVEMENT IN SLIDE-VALVES FOR ENGINES.

Specification forming part of Letters Patent No. 129,270, dated July 16, 1872.

Specification describing a new and useful Improvement in Slide-Valves for Water and other Engines, invented by JAMES H. CONNELL, of Elizabeth, in the county of Union and State of New Jersey.

My invention consists in the arrangement of the valve-seats oblique to the line of motion of the valves, and preferably in vertical planes, with corresponding oblique or inclined faces to the valves, so that when the valves open they move directly away from the seat and become wholly surrounded with water very soon after the beginning of the movement, so as to be balanced, or nearly so, thus greatly lessening the friction; and when closing upon the seats rising up an inclined plane and wedging tight.

The invention also consists of a valve-chest, divided into three compartments, the middle one containing the induction-ports, and each end chamber containing one exhaust-port, and the connection of the valve for the induction-port of one end, and the exhaust-valve for the other end being on one rod, with the opposite valves on the other, both rods being connected to one cross-head and worked together, all as hereinafter described.

Figure 1 is a longitudinal sectional elevation of my improvement in valves. Fig. 2 is a top view, with the top of the valve-chest raised; and Fig. 3 shows a modification of the relative arrangement of the ports, valves, and valve-rod.

Similar letters of reference indicate corresponding parts.

A is the middle compartment of the valve-chest, B and C the two end compartments, E is the supply-pipe, and F the exhaust-pipes. G and H are the induction-ports; I and K, the exhausts. The valve-seats of these induction-ports are inclined to the line of movement of the valves in opposite directions; and the valves L M O P have inclined faces to correspond, and the exhaust-ports and the valves O P are arranged in the same way.

In this case the valve-seats and the valve-faces are arranged vertically, and the lower sides of the valves work on the bottom-plates of the chest. But this is not essential, for they may be arranged horizontally, and the ends of

the valves projecting beyond the seats may be arranged to run onto ways immediately after leaving the valve-seat.

It will be seen that the valves rise up the inclined seats immediately after coming in contact with them, so as to close tightly; and when opening, after starting, they move away from the seats so as to be balanced very quickly by being wholly surrounded or nearly so.

By dividing the valve-chest into separate compartments and having the induction-ports for one end and the exhaust for the other on the same side of the chest, and connecting the respective valves therefor to a rod, N, passing between said ports as shown, I am enabled to connect said rods to one cross-head and work both rods in the same direction simultaneously by one rock-shaft.

These valves are designed to have a quick movement and cut-off at the end of the stroke. The valves may be shifted along on the rods to take up for wear. In case I may want to cut off before the end of the stroke I may work each rod separately. For water-engines only I may arrange all the valves on one rod, by having the valve-seats so arranged relatively to one rod that one induction-valve will close on its seat when the other moves off its seat, and the same with the exhausts, as shown in Fig. 3.

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

1. The valve-chest A B C, having an exhaust-port in each of two end sections, both induction-ports in a middle section, and valves attached to a frame, N O N, as and for the purpose described.

2. The reversely-inclined valves L M, combined with valve-seats G H, correspondingly inclined, and at an acute angle to the line of motion of said valves, as and for the purpose described.

The above specification of my invention signed by me this 13th day of March, 1872.

JAMES H. CONNELL.

Witnesses:

GEO. W. MABEE.

T. B. MOSHER.