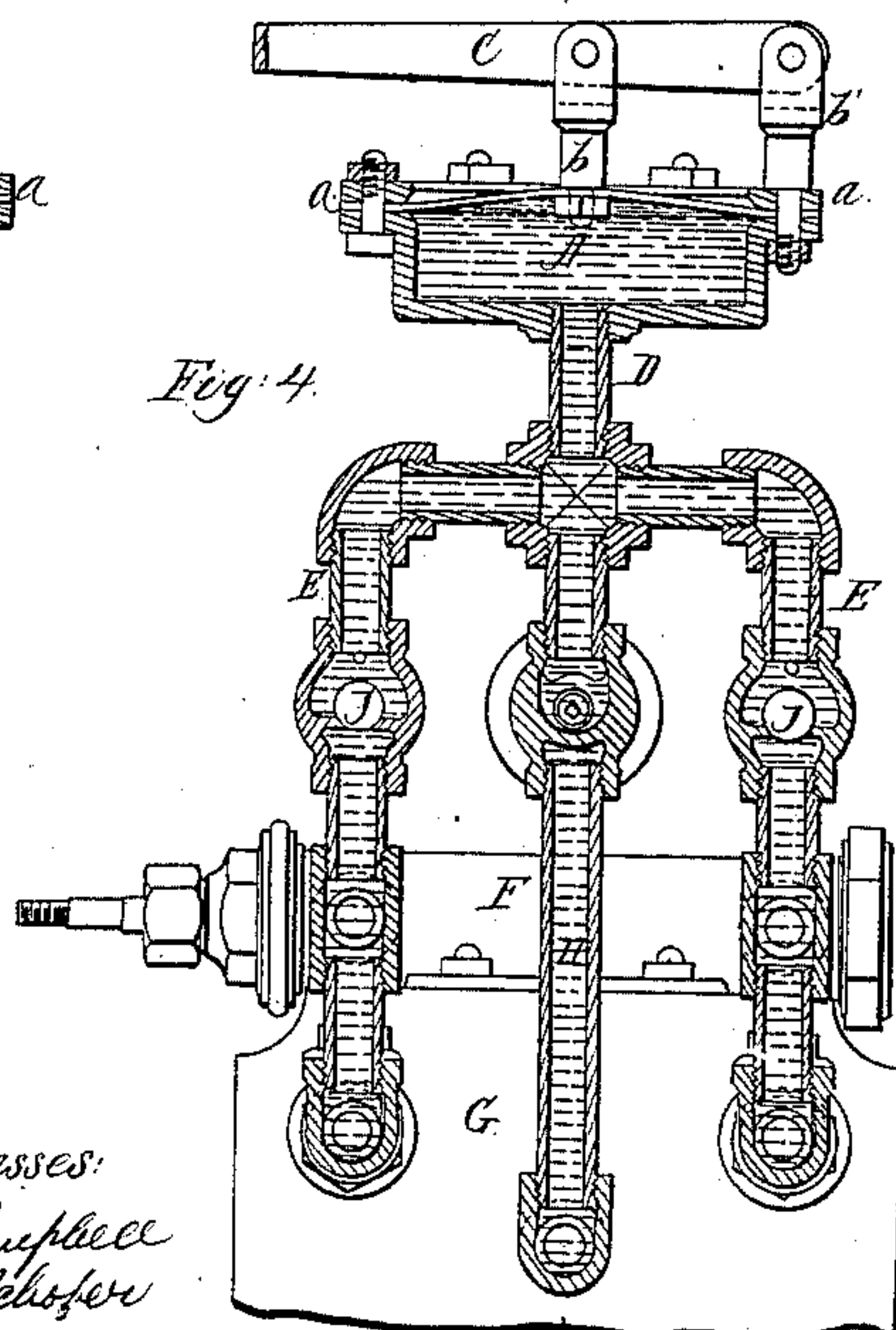
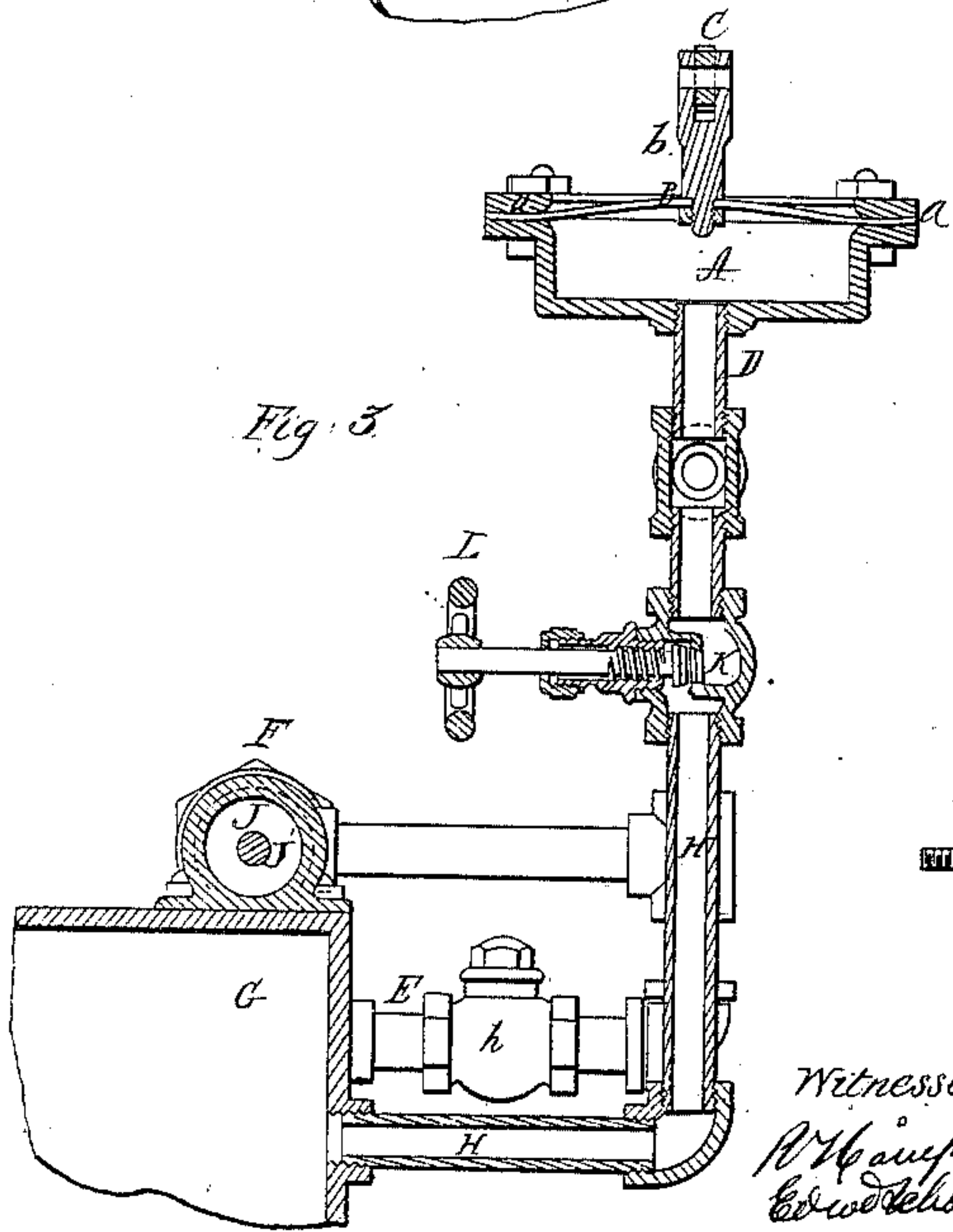
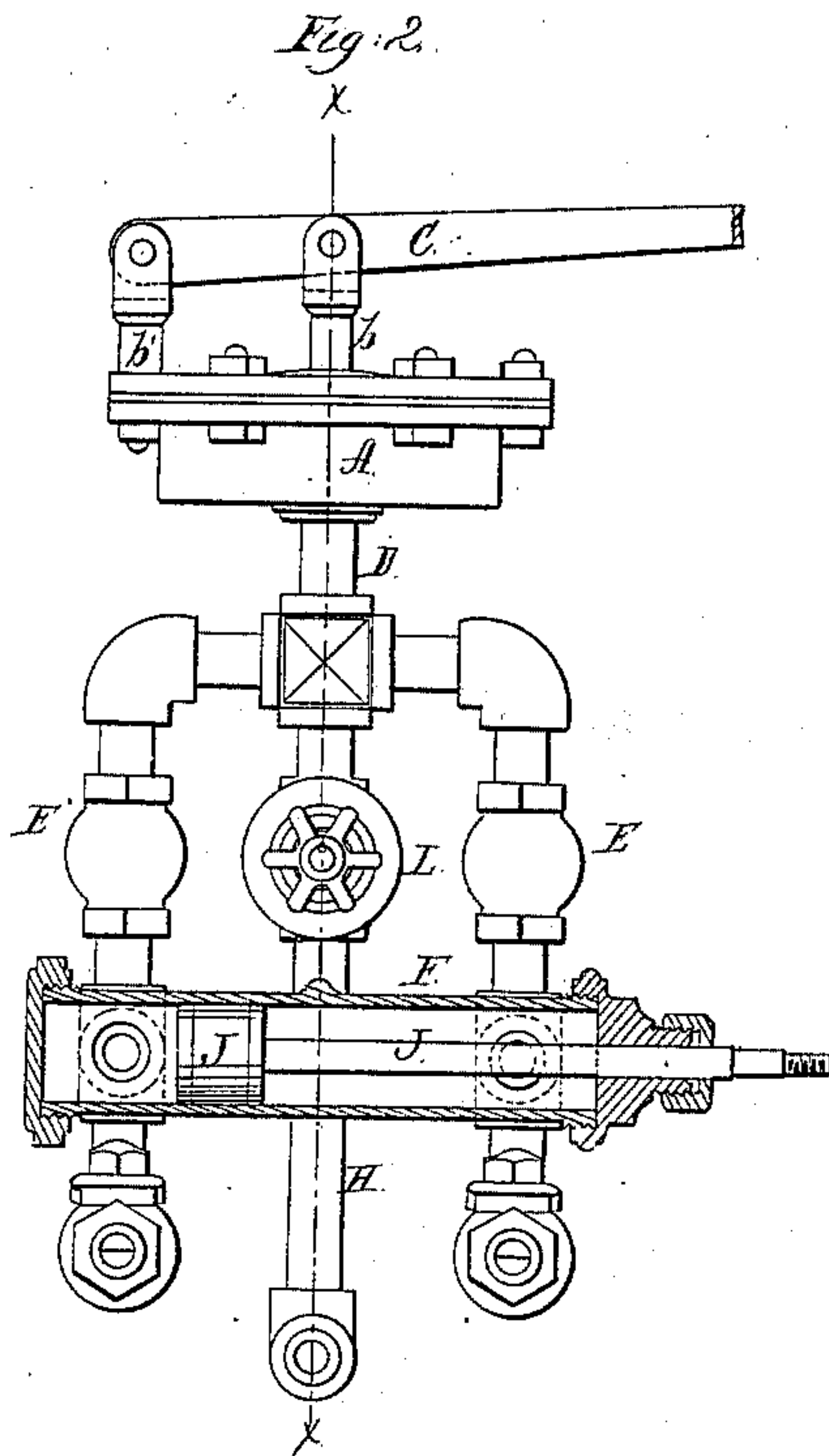
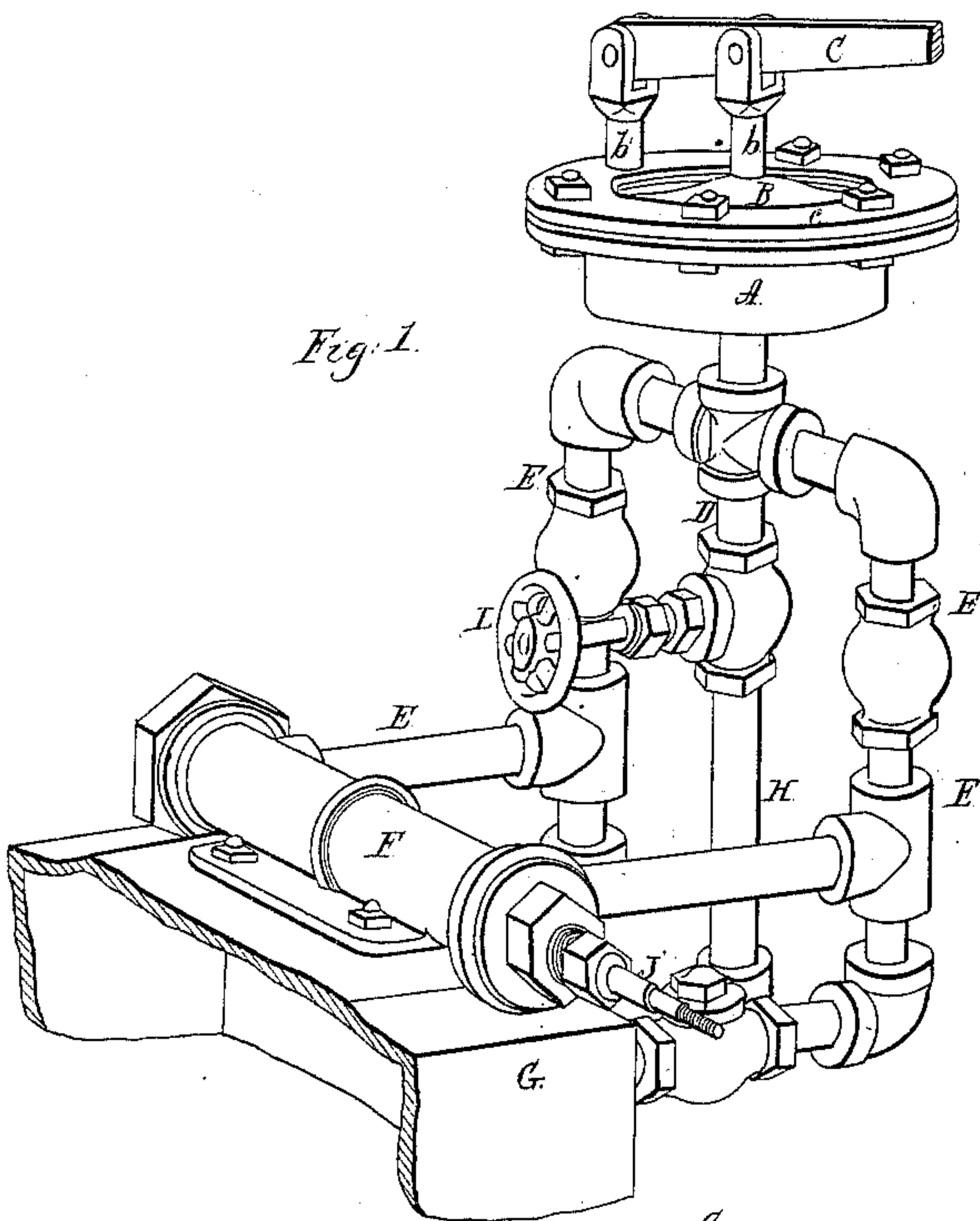


J. H. Springer,
Governor.

No 80,096.

Patented July 21, 1868.



Witnesses:
R. H. Campbell
Edw. DeLofer

Inventor:
J. H. Springer
Manuf. by J. H. Springer

United States Patent Office.

JOSEPH H. SPRINGER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
HIMSELF, JOHN M. HESS, AND SMITH BOWEN.

Letters Patent No. 80,096, dated July 21, 1868.

IMPROVEMENT IN STEAM-ENGINE GOVERNORS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOSEPH H. SPRINGER, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and improved Governor; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of the specification, in which—

Figure 1 is a perspective view of the improved governor.

Figure 2 is a front elevation and section through the forcing-pump.

Figure 3 is a transverse section taken in the vertical plane indicated by red line $x x$ in fig. 2.

Figure 4 is a longitudinal section looking towards the pump.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a new and improved governor, which is adapted for use upon marine engines, as well as portable and stationary land-engines, and which is so constructed that, while greater regularity, delicacy, and steadiness of action are secured than are attainable by the old forms of governors, any desired range or amount of movement necessary for regulating purposes can be obtained.

The nature of my invention consists in a receiver, which is provided with a movable cover or elastic diaphragm, and also with an outlet, having an adjustable valve applied to it, for regulating the escape of fluid that is forced into the receiver by a supply-pump, said parts being constructed, adjusted, and connected with the throttle-valve, and also with the slide-valve rod, or some other proper part of an engine, as will be hereinafter explained, so that, should the speed of the engine exceed or fall short of the prescribed limit, the fluid will be forced into the receiver faster in the one case, and slower in the other, than it escapes; by which means the cover of the receiver is caused to operate upon the throttle-valve, and open or close this valve more or less, according to the regulation required.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents a receiver for water, air, or other fluid, which receiver may be made of any suitable shape and of any required capacity.

The top, B, of this receiver is composed of India rubber, or other suitable flexible material, impervious to air or water, which is confined tightly in place by means of a clamp-ring, a , held down in place by screws and nuts.

To the centre of this flexible top or diaphragm B is suitably secured a link, b , which is connected to a lever, C. This lever is pivoted to a fixed standard, b' , upon the top of the receiver, and its opposite end is to be connected in any suitable manner to the rod of a throttle-valve, which regulates the admission of steam to the valve-chest of the engine.

To the centre of the bottom of the receiver A, a pipe, D, is applied, which communicates with branch-pipes E E, leading into a pump-cylinder, F, near its extremities, and also leading down into a chest, G, for containing the fluid to be forced into the receiver. The pipe D also communicates with a central pipe, H, which also leads into said chest G, as shown in the drawings.

The pump-cylinder F may be secured fast to the top of chest G, as shown, and in this cylinder works a solid piston, J, the rod J' of which should be connected in a suitable manner with the rod of the slide-valve of the steam-engine, or with any other convenient part of the engine which will communicate to said piston a steady movement.

In the two branch-pipes E E, suitable valves, h and j , are applied, for the purpose of allowing fluid to be drawn from chest G and forced into the receiver A. The valves h open upward, and allow the fluid to be raised above them by the action of the pump-piston; they then close, and allow the fluid to be forced upward into the receiver A. The valves j prevent the fluid which is forced above them from being drawn back by the pump-piston.

The central pipe D communicates with the pipe H by means of a valve, K, which has a hand-wheel, L, applied on its stem, by means of which the valve-opening can be increased or diminished in size, as circumstances may require.

When a reciprocating motion is given to the piston-rod J' by the starting of the engines, and the opening of valve K, properly adjusted, fluid will be drawn from chest G and forced into the receiver A, from which latter it will escape, through pipes D and H, back again into the said chest. As long as the engine receives a regular motion, there will be no more fluid forced into the receiver A than can escape through said pipes D and H into the chest G. Should the speed of the engine be diminished, the fluid will escape faster from the receiver than it enters it, which will allow the diaphragm B to descend, and thus open the throttle-valve more or less; and, on the other hand, should the speed of the engine be increased, the fluid will be forced into the receiver faster than it can escape therefrom, and consequently it will cause the diaphragm B to rise or expand, and thereby close the throttle-valve more or less.

By means of the valve K the opening through which the fluid is allowed to escape from the receiver A can be nicely regulated, so that the fluid shall only escape at a given rate.

Having described one practical mode of carrying my invention into effect, I wish it to be understood that I do not confine myself to the precise instrumentalities herein set forth, as these may be modified in many particulars without changing the principle of my invention. I have represented a double-acting forcing-pump, which is adapted for forcing water or oil into the receiver, but I do not confine myself to such a force-pump; as one which is adapted for supplying atmospheric air might be employed, if it should be found preferable to use air instead of water or oil.

I have also represented and described a receiver which is provided with a flexible diaphragm, which diaphragm is caused to expand more or less, according to the amount of pressure beneath it, and in this way operate, through the medium of suitable connections, upon a throttle-valve.

Instead of this diaphragm a movable piston, or tightly-fitting sliding plate, might be employed. I prefer the use of the diaphragm because it is frictionless in its action, which would not be the case with a piston or sliding plate.

I am aware of the references cited in official letters dated May 9th and May 25th, 1868, and therefore I do not claim anything shown in said contrivances; but having described one practical mode of carrying out my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The arrangement of the regulating discharge-valve K, intermediate between the reservoir G and the receiver A, and in the relation specified to the supply-pipes E of the force-pump F, whereby the fluid or air which flows into the receiver is made to escape therefrom faster or slower than the supply, as the case may require, and pass back into the reservoir, to be used repeatedly, all substantially in the manner herein described.

2. The arrangement of the receiver A with reference to the connections of the throttle-valve of the engine, central hollow column D H, intermediate valve K, pipes E E, valves j j, and force-pump F, substantially as set forth.

JOSEPH H. SPRINGER.

Witnesses:

J. BARRETT,

EDM. F. BROWN.