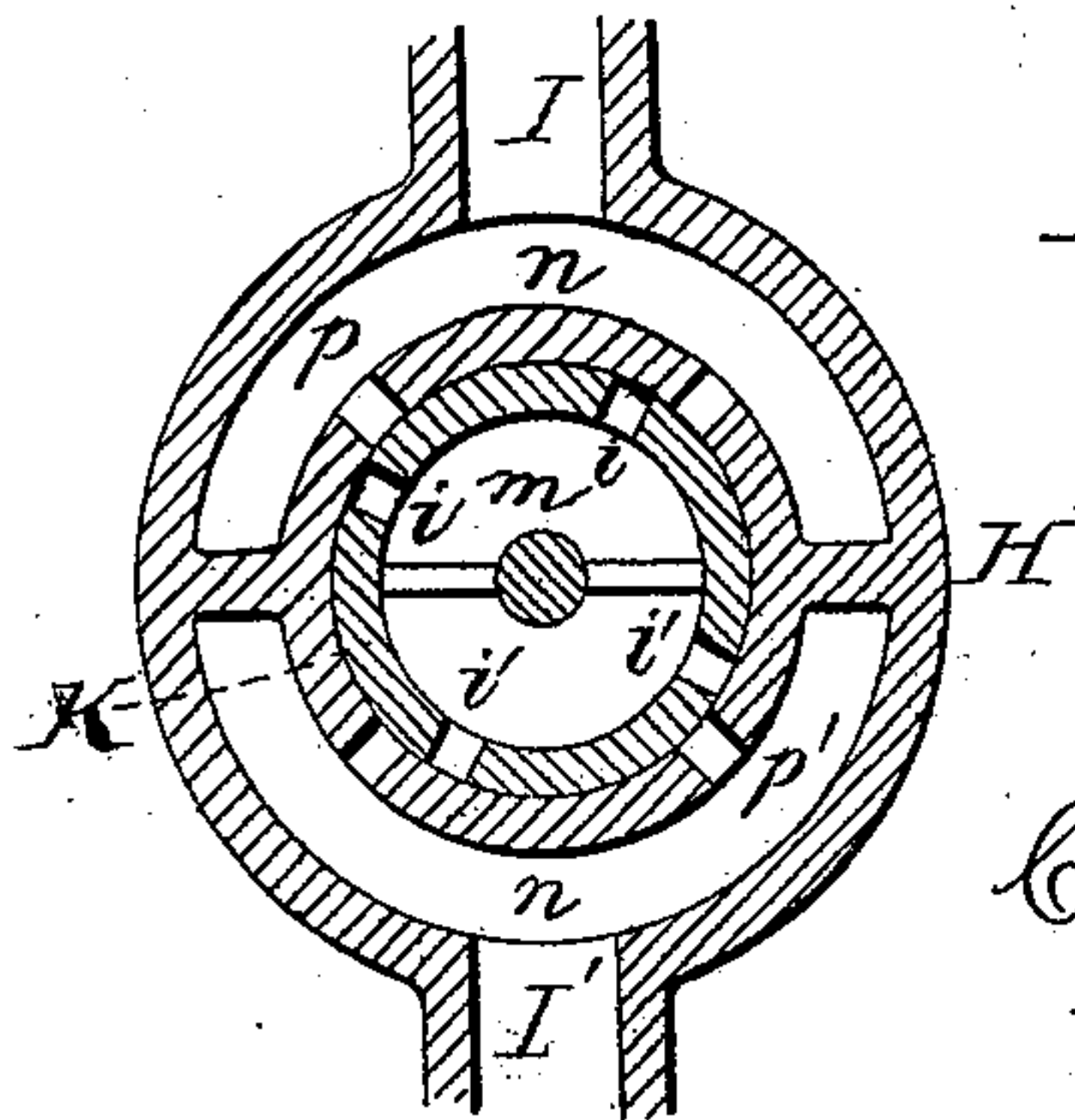
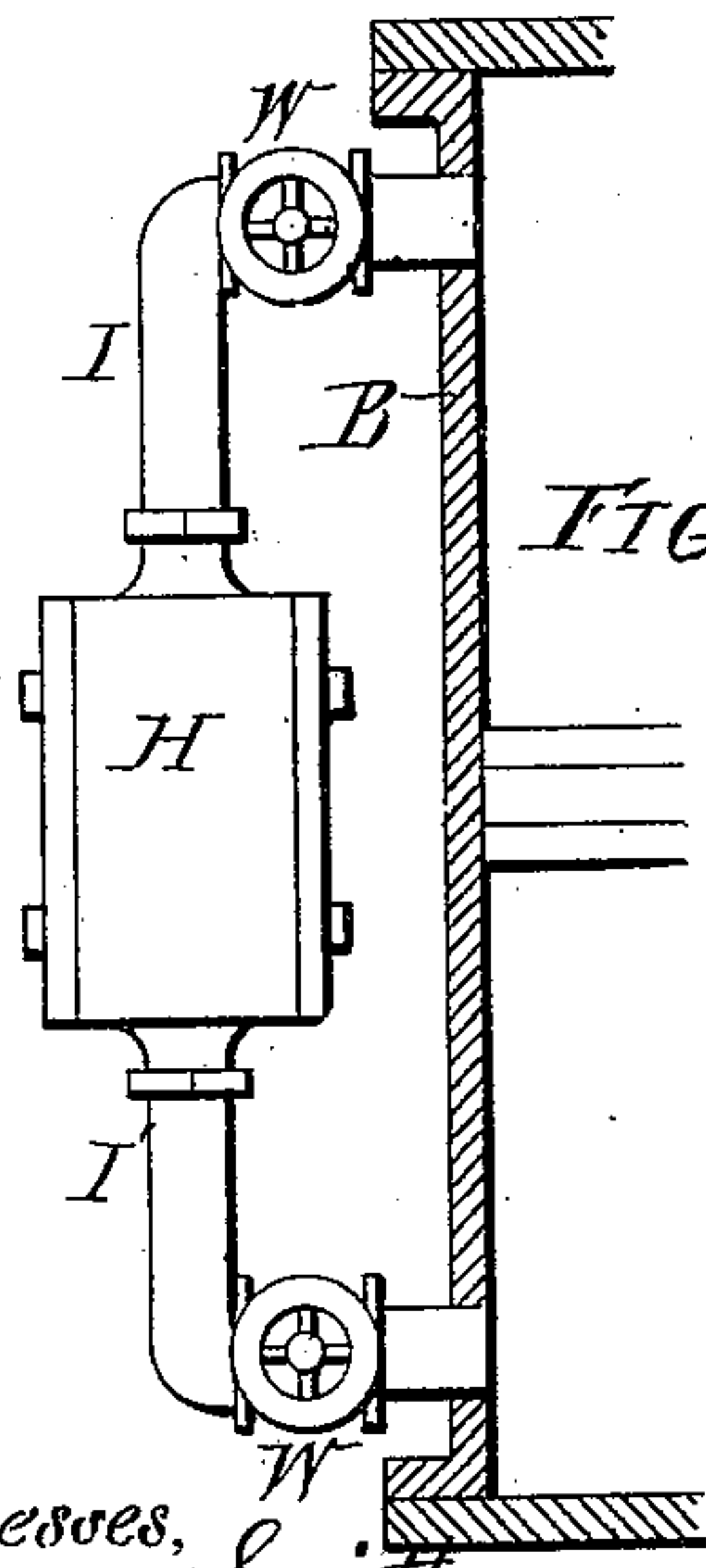
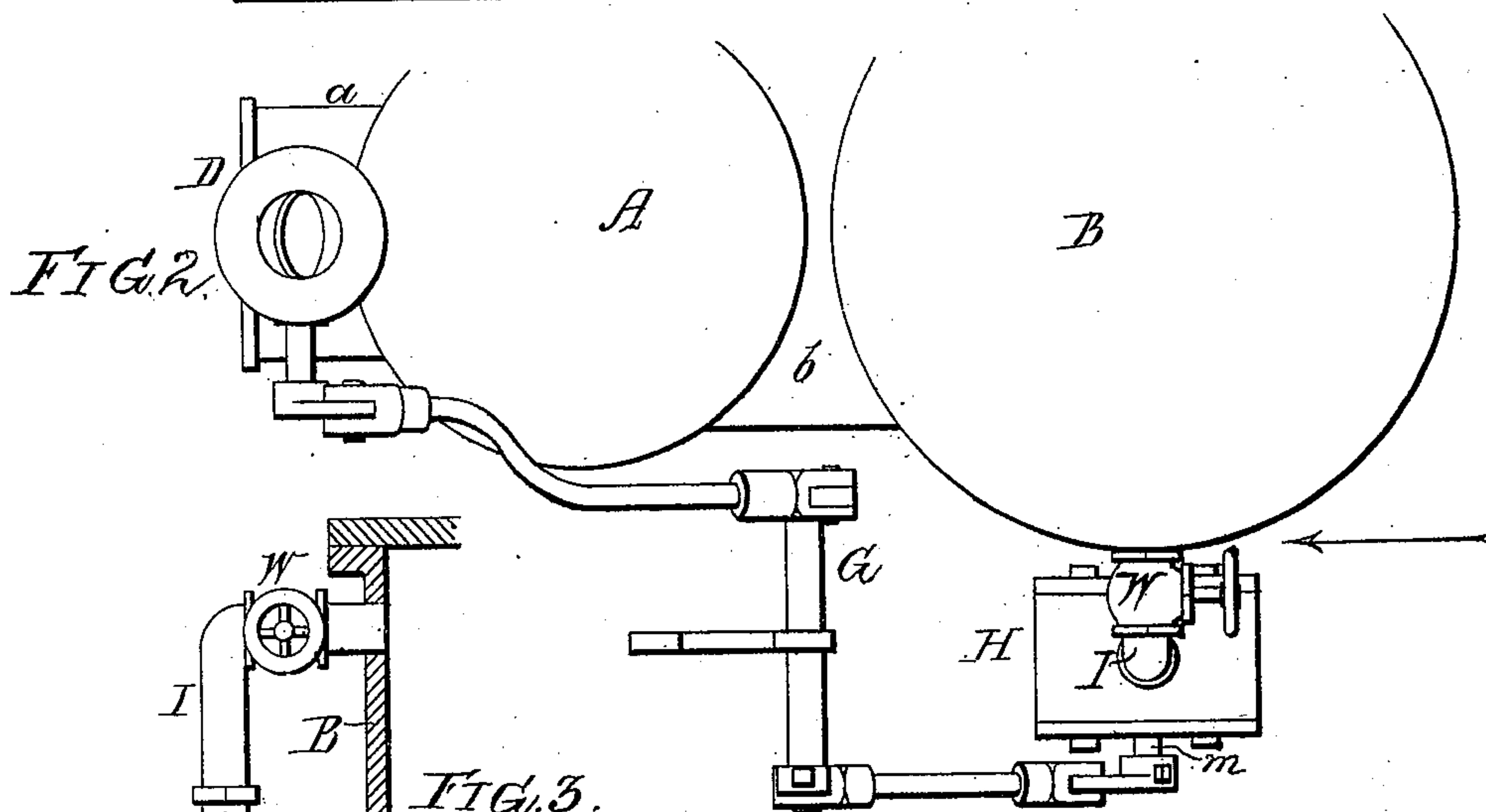
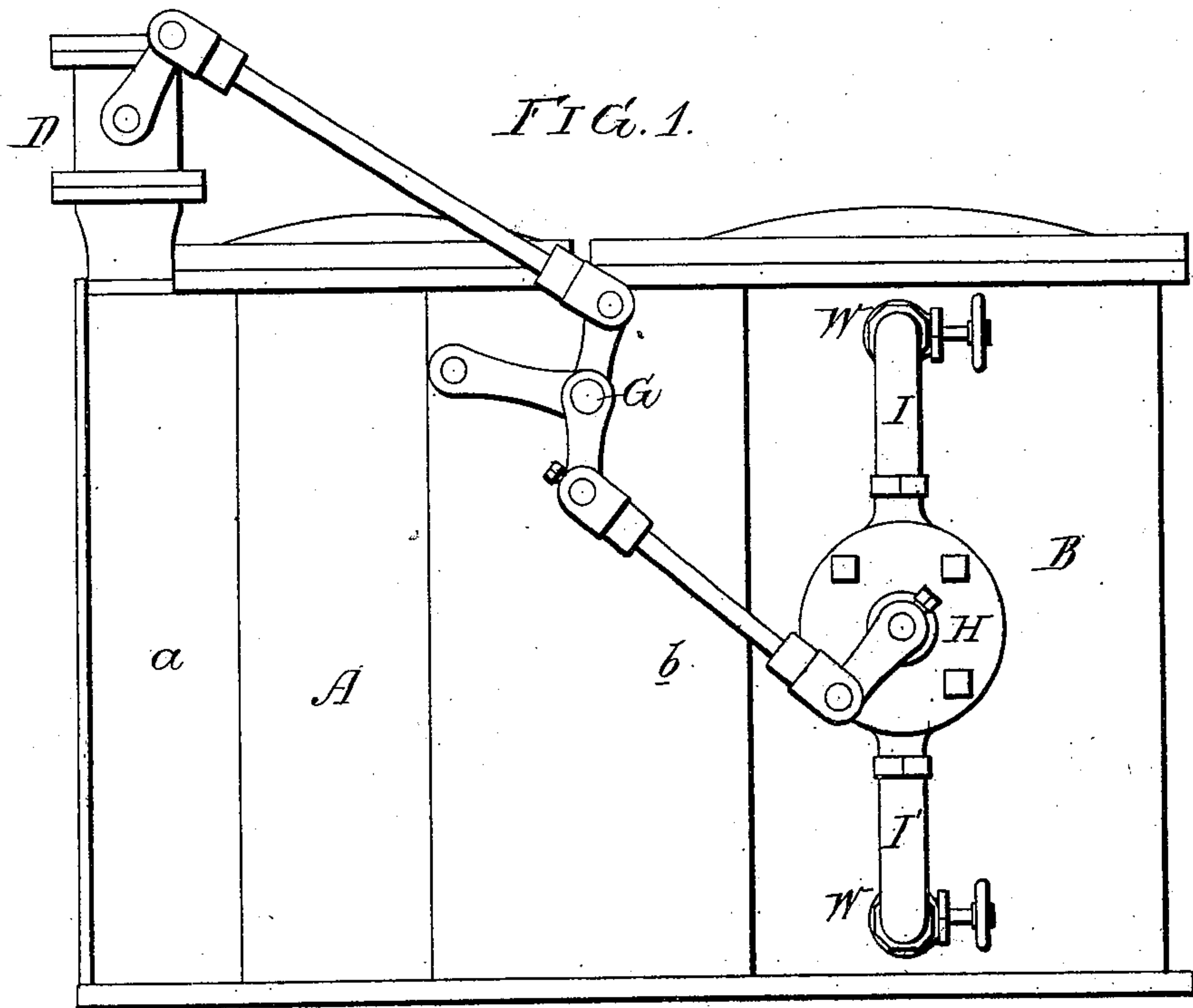


C. C. JENKINS.
Engine-Governor.

No. 204,827.

Patented June 11, 1878.



Witnesses,
Harry Smith
Thomas McKean

Inventor
Caldwell C. Jenkins
by his attorneys
Howman & Son

UNITED STATES PATENT OFFICE.

CALDWELL C. JENKINS, OF PHILADELPHIA, ASSIGNOR OF ONE-HALF HIS
RIGHT TO CHARLES B. LEE, OF WEST CHESTER, PENNSYLVANIA.

IMPROVEMENT IN ENGINE-GOVERNORS.

Specification forming part of Letters Patent No. **204,827**, dated June 11, 1878; application filed
January 21, 1878.

To all whom it may concern:

Be it known that I, CALDWELL C. JENKINS, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Governors for Compound Marine Engines, of which the following is a specification:

The object of my invention is to regulate the speed of compound marine engines by means of any marine governor, through the medium of devices described hereinafter, by which the said governor is caused to regulate the admission of steam to the small high-pressure cylinder and to control the piston of the large cylinder, as described hereinafter.

In the accompanying drawings, Figure 1 is a side view of the two cylinders of a compound marine engine, with regulating appliances to be operated by a governor; Fig. 2, a plan view of Fig. 1; Fig. 3, a view of the large cylinder, looking in the direction of the arrow, Fig. 2; and Fig. 4, a transverse section of the governing-valve of the large cylinder.

A is the small high-pressure cylinder, and B the large cylinder, of a compound marine engine, *a* being the valve-chest of the small cylinder, and *b* the valve-chest of the large cylinder.

My invention having no immediate connection with the valve and the valve-gearing, it will not be necessary to refer to these parts of the engine.

On the steam-chest of the small cylinder is the casing D of a throttle-valve, by which the admission of steam to the said small cylinder may be regulated, an arm on the spindle of this valve being connected to a similar arm on a shaft, G, a second arm on which is connected to the governor, the latter being driven by the engine. A third arm on this shaft is connected to an arm on the spindle of a valve, K, contained in a chest, H, adjoining the large cylinder B, and this chest communicates, through a pipe, I, with the large cylinder above the piston, and through a pipe, I', with the same cylinder below the piston.

It has not been deemed necessary to illustrate or describe a governor, as any marine governor may be used in connection with the above appliances and made to control the shaft G.

The throttle-valve within the chest D may be of the ordinary construction; but I prefer to make the regulating-valve of the large cylinder in the manner shown in the transverse section, Fig. 4, on reference to which it will be observed that the valve K is a hollow cylinder, secured to the spindle *m*, and adapted to a cylindrical seat, *n*, between which and the outer casing of the chest H there are two semi-annular chambers, *p p'*, communicating with the pipes I I', respectively.

There are two ports, *i i*, above, and two similar ports, *i' i'*, below, in the cylindrical valve K, and there are similar ports in the valve-seat *n*.

The valve K should be so set in respect to the throttle-valve D that the latter may be partially closed before the ports in the valve-seat *n* are uncovered, for the governing of the engine for ordinary variations in its speed must be through the medium of the throttle-valve. It is only when the engine, owing to the undue rising of the propeller from the water, has a tendency to operate at a suddenly increased and dangerous speed, or, as it is technically termed, to "race," that the valve K is moved to such an extent that its ports will be open or partly open to those of the seat. The moment this takes place there will be a tendency to equalize the pressure on both sides of the piston, and if the valve remained open, the pressure on both sides would be finally equalized, and the further movement of the piston would cease; but the opening of the ports of the valve-seat due to the excessive speed of the engine will generally be comparatively small and will be of brief duration, for the speed of the engine, and consequently of the governor, will be so quickly reduced that the ports of the valve-seat will be closed before the engine resumes its normal speed.

The rapidity with which the arresting influence of the governor will be felt by the piston of the large engine will depend upon the extent to which the ports of the valve-seat are suddenly opened.

A very sudden increase in the speed of the engine, due to a sudden rising of the wheel from the water, will be counteracted by a sudden and extended opening of the ports of the

valve-seat and an equally sudden arresting action on the piston; but a less sudden increase of speed in the engine, due to a slower rising of the propeller from the water, will be followed by a comparatively slight opening of the ports of the valve-seat, the opening, however, being sufficient to have an instantaneous arresting effect on the piston.

Each of the pipes I I' is furnished with a valve, W, by which the extent of the communication between the upper and lower portions of the cylinder may be increased or diminished, as circumstances may suggest; and during calm weather these valves may be entirely closed, and the valve K thereby rendered inoperative, for it is only in rough or comparatively rough weather (when the vessel has such a motion that the wheel is alternately rising from and being submerged in the water) that the aid of the valve K is necessary for governing purposes.

It will be understood that changes in the

disposal of the above-described parts may be required in different compound engines, for different engine-rooms may require different locations for the governor, and different appliances through which the governor is caused to act on the two valves may be required.

I claim as my invention—

The combination, in a compound steam-engine, of a throttle-valve for regulating the admission of steam to the steam-chest of the small cylinder, a valve and pipes or passages for opening and cutting off communication between the upper and lower portions of the large cylinder, and a governor for operating both valves, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CALDWELL C. JENKINS.

Witnesses:

HARRY A. CRAWFORD,
HARRY SMITH.