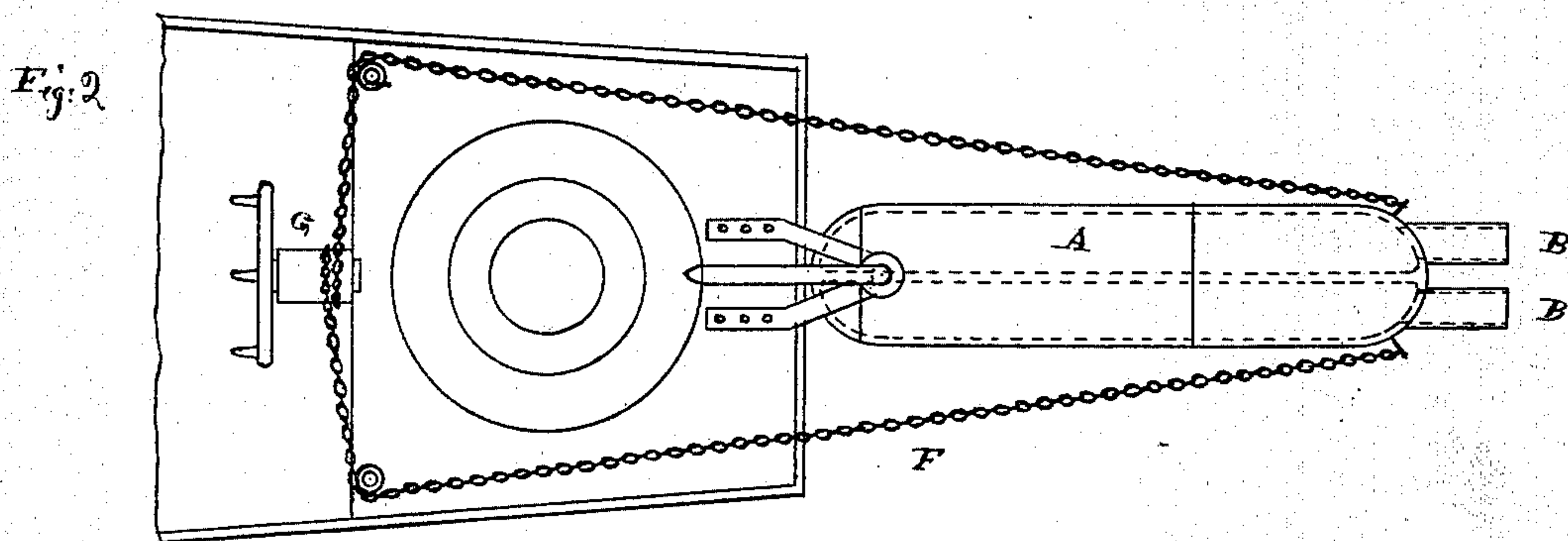
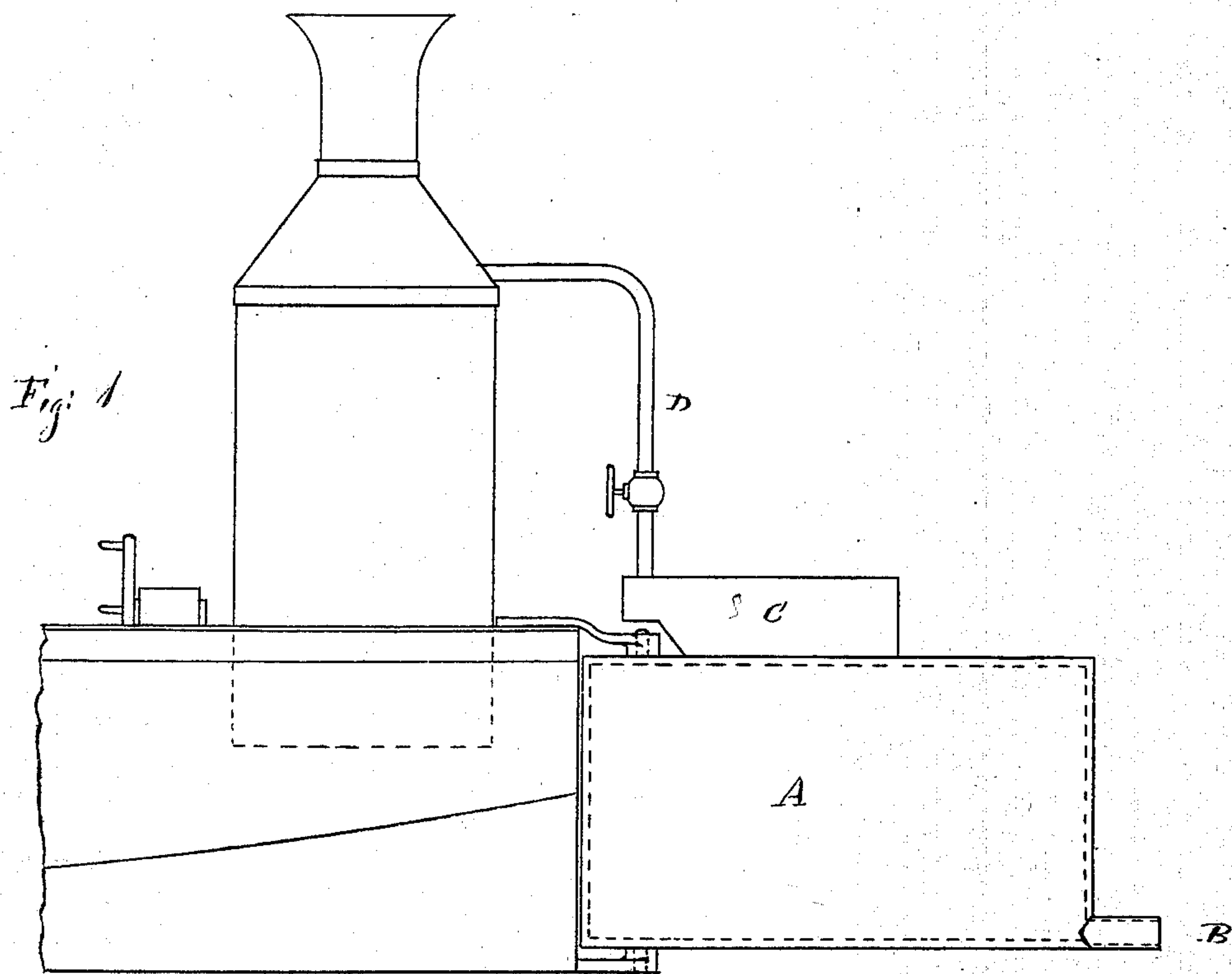


J. BLACK & G. W. JONES.  
Propelling Boats.

No. 144,732.

Patented Nov. 18, 1873.



Witnesses:  
Wm. P. Hubbard  
George W. Jones.

Inventors:  
James Black  
George W. Jones



# UNITED STATES PATENT OFFICE.

JAMES BLACK AND GEORGE W. JONES, OF PHILADELPHIA, PA.

## IMPROVEMENT IN PROPELLING BOATS.

Specification forming part of Letters Patent No. **144,732**, dated November 18, 1873; application filed April 11, 1873.

*To all whom it may concern:*

Be it known that we, JAMES BLACK and GEORGE W. JONES, in the city of Philadelphia and State of Pennsylvania, have invented a new Mode of Propulsion for Canal-Boats, and all other vessels driven wholly or in part by steam, of which the following is a specification:

Our invention relates to the invention and application of a hollow double rudder, made of the proper size and strength to bear the internal strain of the steam and water to which it will be subjected in serving as the propeller to the boat. Its two equal upright compartments, into which it is divided from front to rear, have each an opening to the water (in which the vessel floats) at the bottom and rear part thereof. Each compartment of the rudder stands, therefore, filled with water to the level of the surrounding water. Steam, or, by a proper arrangement, steam and air, is now admitted from a suitable boiler, by a suitable valve, upon the surface of the water in each half of the rudder alternately; and the water contained therein is forced out of the open pipe or orifice rearward, thereby propelling the boat forward with the power due to the weight and velocity of the water projected. The steam flow is now shifted to the adjoining compartment, and, a valve being opened for the escape or condensation of the steam in the first one, the water, by the natural pressure due to the difference of level, flows in again to refill it through the permanent opening at the bottom, and also, by a flap-valve opening inward near the bottom of the rudder, to aid in refilling it more rapidly. This refilling of the first half takes place while the steam is entering and forcing the water out of the second, thus keeping up a continuous propelling force.

By our process nothing but a boiler is required on the boat—no other space occupied or weight abstracted from its carrying capacity—the propulsion being induced solely by the direct action of the steam and air in the water in our rudder.

The hollow rudder, though larger than present rudders, will float itself, as in action one-half of its cavities are always filled with air and steam.

If desirable, instead of the steam-chest being attached to the upper part of the rudder, it can be placed in the stern of the boat, and communicate by flexible conveying-pipes to the rudder; but, preferably, we would place it as in the drawing, in order that the valves for ingress and egress of steam for one compartment may be moved automatically by the inflow and outflow of water from the other compartment, and also that the pipe for the supply of steam can be placed in the central pivotal line of the movable rudder through a stuffing-box, or a ball-and-socket joint; and thus, without interference to the working power, the rudder can be moved by the steering-gear either way for steering the boat, and it will require but little movement, owing to the great power of the jet of water then diverted from the straight line.

No steam-engine or other machinery being necessary, canal-boats and all others can be changed by this application of ours without any alterations to themselves, a new rudder, as it were, only replacing the old one.

When passing locks, the rudder can be brought flat to the stern of the boat, as usual.

For backing the boat, a valve or gate will close the usual orifice and open a corresponding one at the opposite foot of the rudder.

Figure 1 is a side elevation of the stern end of the boat, and of the rudder embodying our invention and its application. Fig. 2 is a plan of the same.

A is the rudder. B B are the pipes out which the water is projected. C is the steam-chest to supply both compartments; D, the steam-pipe from boiler to chest; E, the boiler. F are the steering-chains secured to the rear top of the rudder. G is the barrel-shaft of hand-wheel, on which the chain ends are secured, one above and the other under.

We claim as our invention—

A double hollow rudder, into which water is admitted and forced out again alternately, thereby propelling a boat or vessel, substantially as hereinbefore set forth.

JAMES BLACK.  
GEORGE W. JONES.

Witnesses:

WM. P. HIBBERD,  
GEORGE W. JONES.