

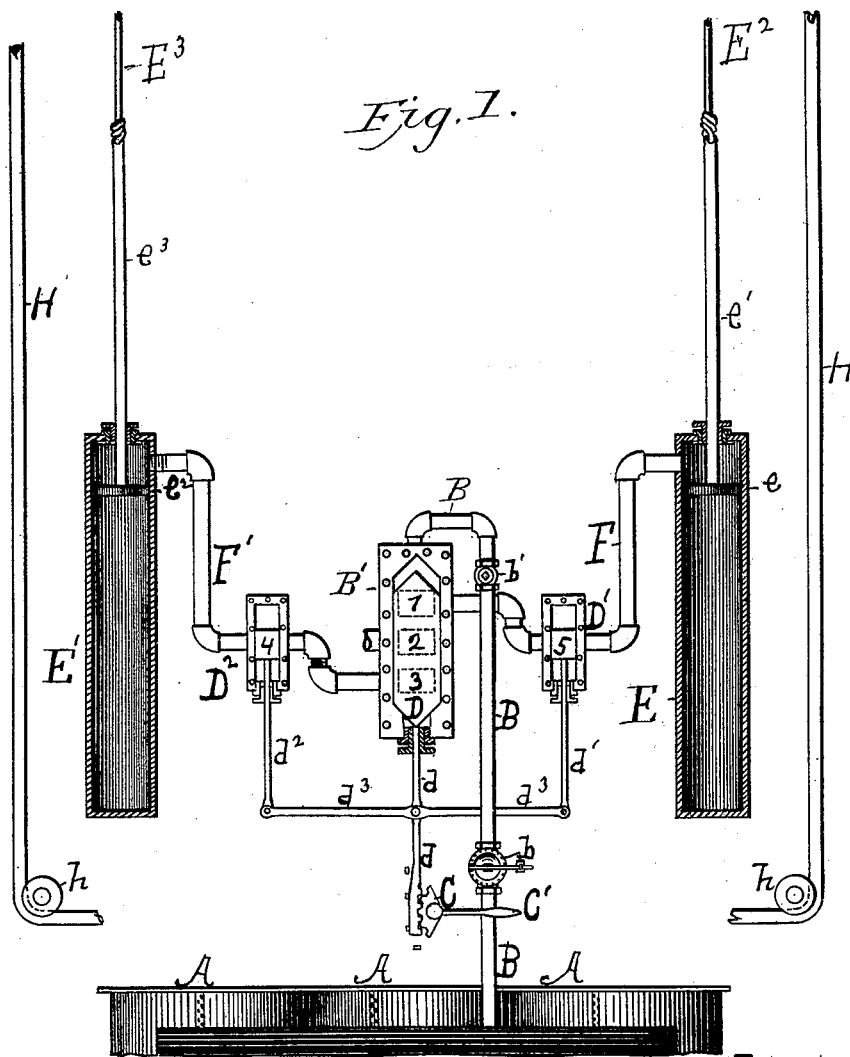
(No Model.)

2 Sheets--Sheet 1.

J. IRVIN.  
STEERING VESSELS BY STEAM.

No. 454,909.

Patented June 30, 1891.



Witnesses:

Geo H Harway  
J. W. Stevenson

Inventor.

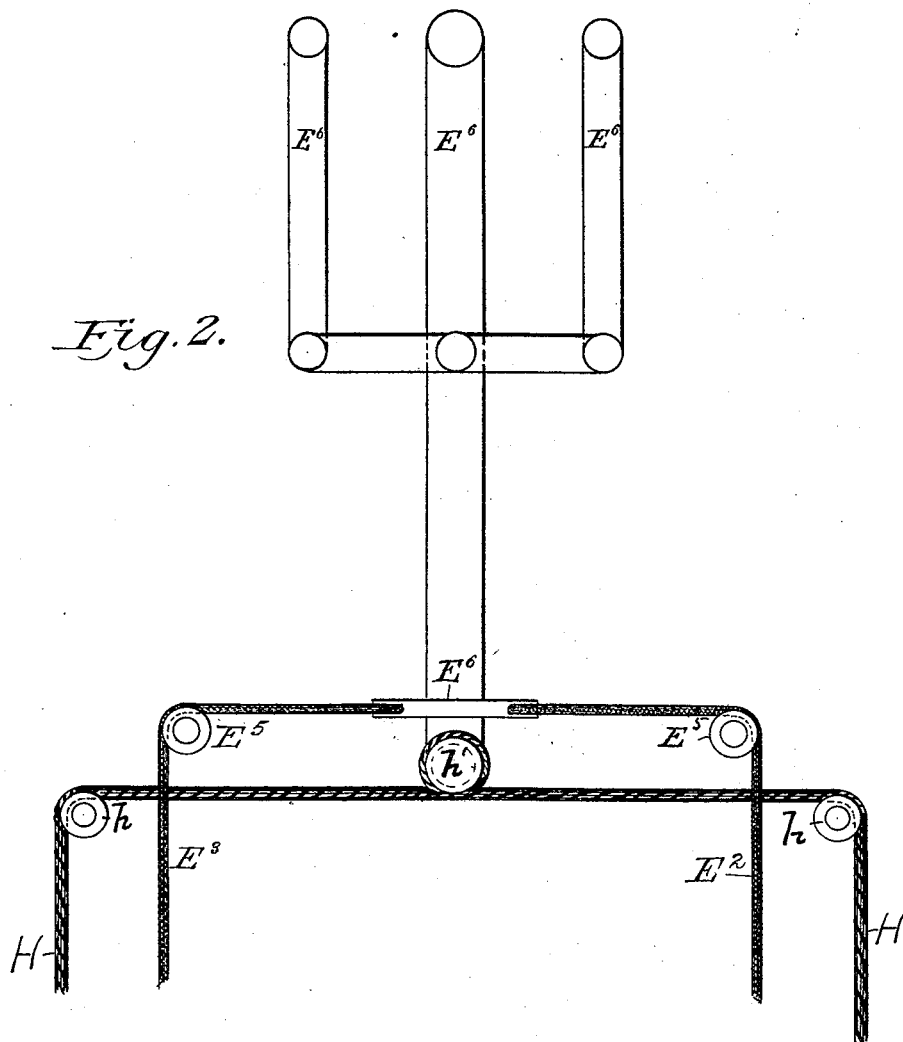
Johnson Irvin  
by J. H. Stevenson  
Atty

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*Fig. 2.*



Witnesses:

*Geo. H. Hawley*  
*J. W. Stevenson*

*Johnson Irvin* Inventor.  
*J. H. Stevenson*  
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# UNITED STATES PATENT OFFICE.

JOHNSON IRVIN, OF ROCHESTER, PENNSYLVANIA.

## STEERING VESSELS BY STEAM.

SPECIFICATION forming part of Letters Patent No. 454,909, dated June 30, 1891.

Application filed November 24, 1890. Serial No. 372,531. (No model.)

*To all whom it may concern:*

Be it known that I, JOHNSON IRVIN, a citizen of the United States, residing at Rochester, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Steering Vessels by Steam-Power; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an apparatus for steering vessels on lakes, rivers, or other bodies of water in which the rudder is controlled by steam-power or by compressed air, the construction and operation of which will be fully set forth hereinafter.

To enable others to understand my invention I have illustrated the same in the accompanying drawings, in which—

Figure I is a plan view, partially in section, of my improvements; and Fig. II is a like view showing the connections with the rudder of a vessel.

A A A represent a battery of steam-boilers, from which steam is conveyed to the main steam-chest B' through the pipe B. As it is important not to have too much of a steam-pressure to operate my device, I place a regulator *b* on the pipe B, so that I can admit steam for steering purposes under such pressure as I desire.

E E' designate two steam-cylinders, which are connected with the steam-chest B' by pipes F F', respectively. In these cylinders are fitted pistons *e e'*, which are respectively attached to piston-rods *e' e'*, and to the outer ends of these piston-rods are connected tiller-ropes E<sup>2</sup> E<sup>3</sup>.

In the steam-chest B' are the ports 1, 2, and 3. Port 1 is to admit steam to pipe F' and cylinder E, port 3 to admit steam to the pipe F' and cylinder E', while port No. 2 is an exhaust.

D is a slide-valve in the steam-chest B', regulating and controlling the steam to the cylinders E and E'. This slide-valve is controlled by quadrant C, having a lever-handle

C' operating the rod *d*, which has connection with the valve D. This quadrant C has a number of cogs meshing in a corresponding series in the rod *d*. In this way I control the valve D in the steam-chest B'.

b' is a check-valve or shut-off valve.

D' is a small steam-chest secured to the pipe F. It has a slide-valve No. 5, which is controlled or operated by the same device that operates the valve D through the medium of the rod *d'*, fixed to the cross-bar *d'*, the latter being riveted to the rod *d*.

D<sup>2</sup> is a similar steam-chest to that already mentioned, D', having connections with the steam-pipe F' and having a like slide-valve No. 4 connecting rod *d*, &c.

The utility of these two steam-chests D' and D<sup>2</sup> is to prevent a back action of the steam from the cylinders to E or E' to the chest B', which is a necessity at times, for under certain emergencies when a powerful force is exerted on the rudder, especially in backing, steam is forced back into the chest B' and against the valve therein. This back action is thoroughly prevented by using the chests D' and D<sup>2</sup>, as seen in Fig. 1. The tiller-ropes E<sup>2</sup> and E<sup>3</sup> are extended to the sheaves E<sup>4</sup> and E<sup>5</sup> and to the tiller at E<sup>6</sup>.

H H are tiller-ropes for use in the old system of steering. I merely show them, thereby indicating that my system or apparatus for steering by steam can be put on vessels and used without disturbing the old plan now generally used, and which may still be used in case of an accident to my apparatus.

In operation of my steam steering device or apparatus I admit steam to the cylinders by operation of the valve D, wherein it may be conveyed to the rear or behind the piston on either side—as, for example, to cylinder E. This would move the piston forward in the cylinder, thus drawing on the rod *e'* and tiller-rope E<sup>2</sup>, thus moving the rudder the required distance. A similar movement will admit steam to the other cylinder E', thus operating the rudder in another direction. My actual demonstration of this apparatus on the Ohio and Mississippi rivers leaves no room for doubting the practicability of my apparatus to fully control the rudder under any and all circumstances.

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

5 The combination, with a boiler, of a steam-chest provided with a series of three ports, a cylinder arranged on either side of the steam-chest, pipes connecting said cylinders respectively with opposite ports in the steam-chest, pistons fitted in said cylinders and con-  
10 nected with the rudder of the vessel, and valves arranged in the connecting-pipes between the steam-chest and the cylinders, said

valves being connected to and adapted to be operated by the valve-rod of the steam-chest, substantially as shown and described, for the purpose described. 15

In testimony that I claim the foregoing I hereunto affix my signature this 6th day of August, A. D. 1890.

JOHNSON IRVIN. [L. s.]

In presence of—

J. C. STEVENSON,

H. W. STEVENSON.