

*J. F. Spence,
Steam-Boiler Condenser.*

No 53,498.

Patented Mar. 27, 1866.

Fig. 1.

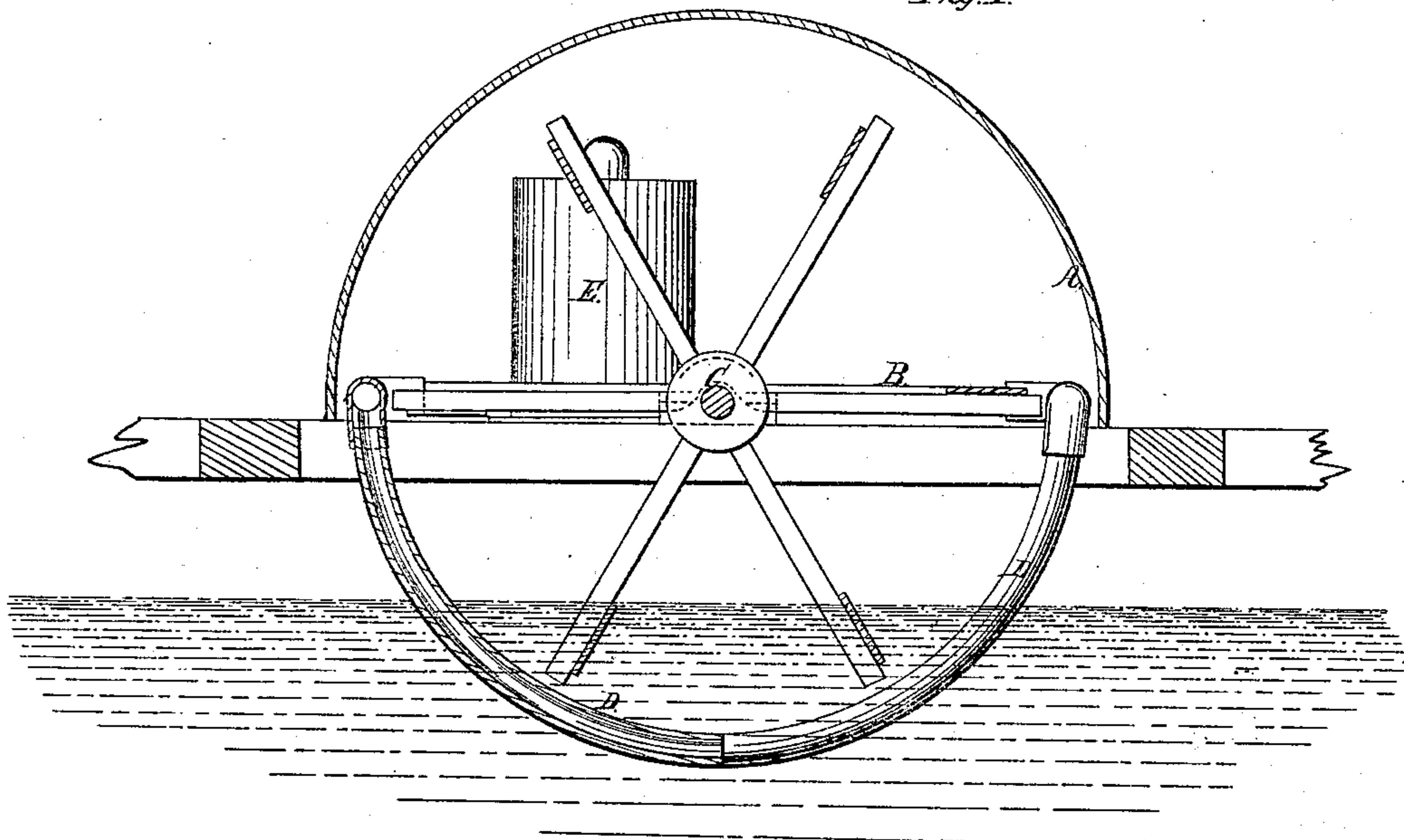
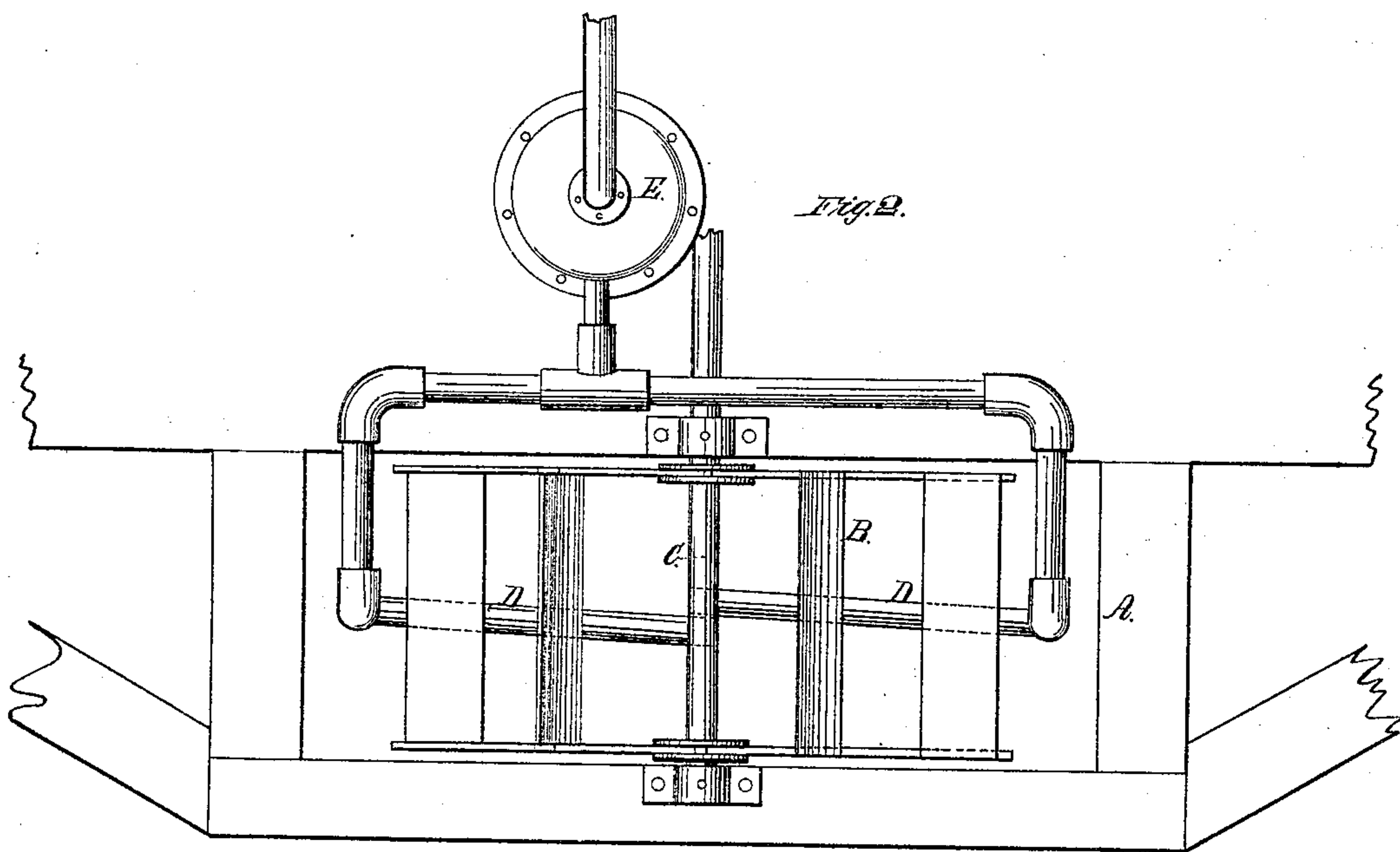


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES F. SPENCE, OF WILLIAMSBURG, NEW YORK.

IMPROVEMENT IN CONDENSERS.

Specification forming part of Letters Patent No. 53,498, dated March 27, 1866.

To all whom it may concern:

Be it known that I, JAMES F. SPENCE, of Williamsburg, in the county of Kings and State of New York, have invented a new and useful Improvement in Low-Pressure Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal section of this invention. Fig. 2 is a plan or top view of the same.

Similar letters of reference indicate like parts.

This invention consists in extending the exhaust-pipe of a steam-engine which is used on board of a vessel to give motion to the paddle-wheels to such a point below the paddle wheel or wheels that the vacuum created at the mouth of said exhaust-pipe relieves the engine of all back-pressure, and the ordinary condenser and air-pump can be dispensed with. If desired, a suitable receiver may be connected with the exhaust-pipe, whereby the freedom of the exhaust *d* may be still further increased.

A represents the wheel-house of a steam-boat, constructed in the usual manner. The wheel B is keyed to the shaft C, to which a revolving motion is imparted by the action of the engine in the interior of the boat or vessel.

D is the exhaust-pipe of the steam-engine, and this pipe extends below the paddle-wheel B to such a point that the suction of the paddles facilitates the exhaust. In order to render this arrangement complete, it is desirable to have a receiver, E, into which the exhaust-steam discharges, and the pipe D forms two curves, which pass around the wheel in opposite directions, as clearly shown in the

drawings, so that the benefit of the motion of the paddle-wheel is obtained in whatever direction the same may be made to revolve.

Suitable check-valves with strainers may be arranged in the ends of the curved pipes D to prevent the water being forced up into the same by the motion of the wheel, and, if desired, two or more such pipes may be applied on either side of the boat.

By the motion of the paddle-wheel a vacuum is created opposite the mouth of the exhaust-pipe, and the steam from the engine exhausts perfectly free, so that the piston is relieved of all back-pressure, and the ordinary condenser and air-pump can be dispensed with. The cost of the engine is thereby materially reduced and the mechanism is greatly simplified. My exhaust-pipes are not liable to get out of order, and when made strong enough they form a guard for the wheel to protect it against pieces of wood or other articles floating in the water; and if one of the branches of said pipes should be crushed in, it can be taken off and replaced in a very short time, and without the necessity of laying the boat up.

My apparatus can also be applied to ordinary steam-engines by disconnecting the exhaust-pipes from the condenser and connecting the same with the curved pipes D.

It must be remarked that the pipes D may be arranged on the sides of the wheels instead of under the same, if desired.

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

The pipe or pipes D, which connect with the exhaust-pipe of a steamboat-engine, in combination with the paddle wheel or wheels B, substantially as and for the purpose described.

JAMES F. SPENCE.

Witnesses:

M. M. LIVINGSTON,
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