

I. L. THOMPSON.

Improvement in Engines for Paddle-Wheel Propulsion.

No. 131,135.

Patented Sep. 3, 1872.

Fig. 1.

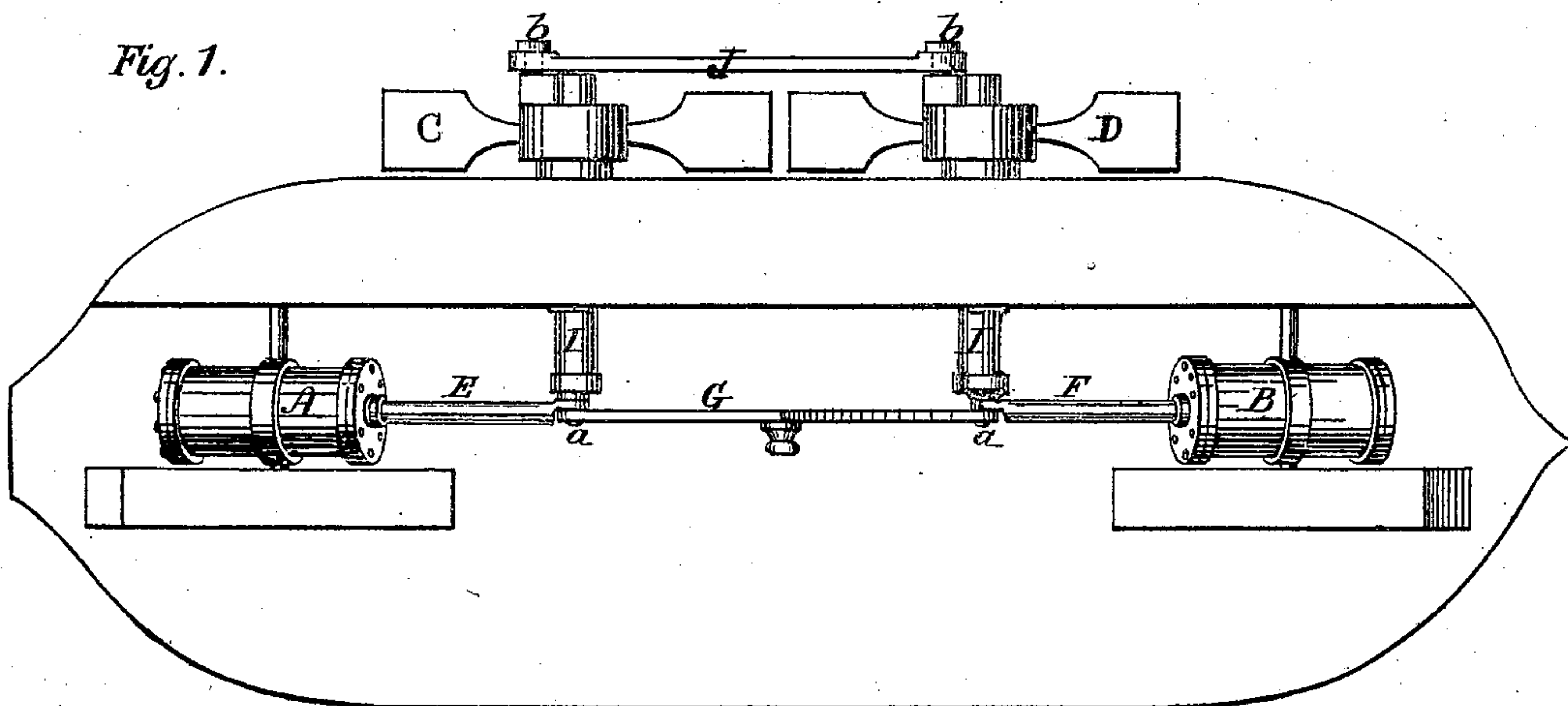
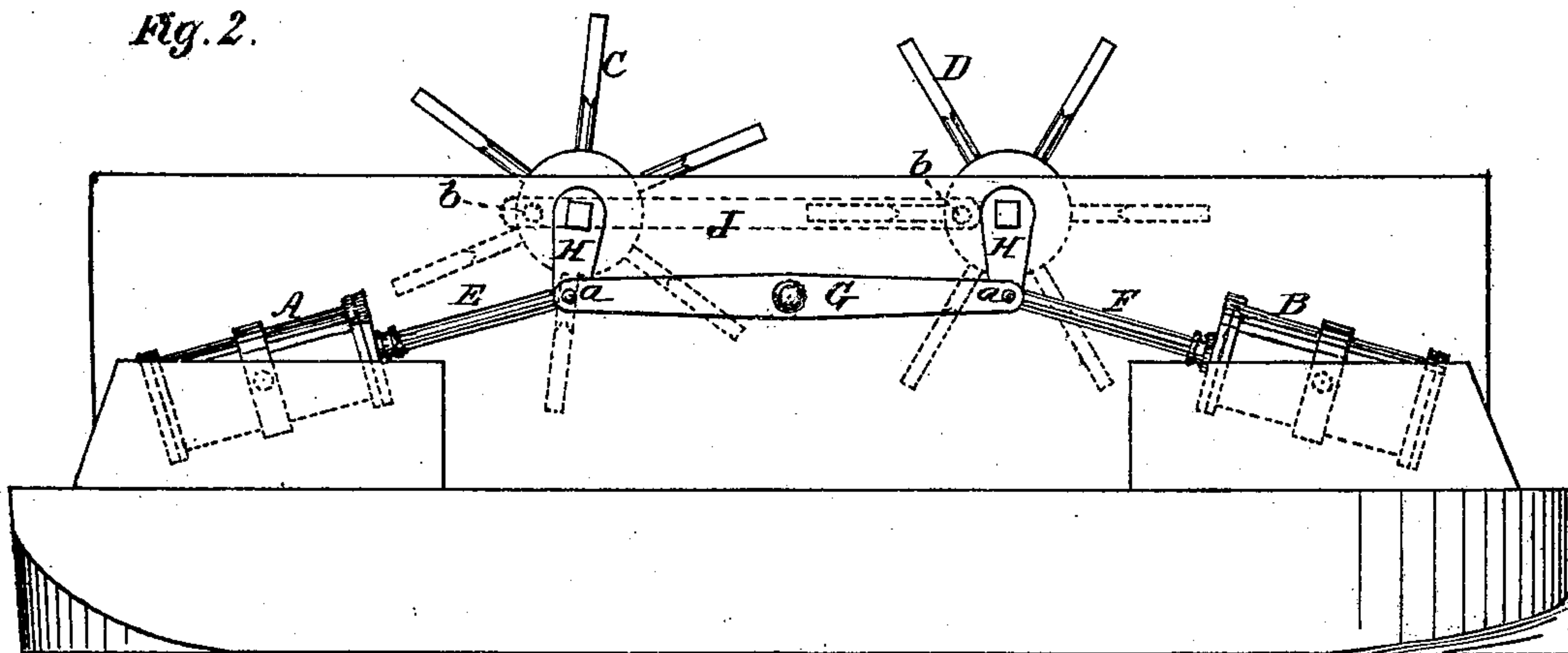


Fig. 2.



Witnesses:

V. E. Duhamel
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UNITED STATES PATENT OFFICE.

ISAAC L. THOMPSON, OF SUN FISH, OHIO.

IMPROVEMENT IN ENGINES FOR PADDLE-WHEEL PROPULSION.

Specification forming part of Letters Patent No. 131,135, dated September 3, 1872.

To all whom it may concern:

Be it known that I, ISAAC L. THOMPSON, of Sunfish, in the county of Monroe and State of Ohio, have invented a new and useful Improvement in Paddle-Wheel Propulsion, of which the following is a specification:

My invention relates to the propulsion of double paddle-wheels for side-wheel steamers; and my said invention consists in the arrangement and combination of the engine-cylinders with the double cranks of the paddle-wheel shafts and the connecting-bars in said double cranks in such a manner that the power of the engines is exerted directly upward upon the ends of the inner crank-connecting bar without locking it, but not in a direct horizontal line with said bar or the shafts of the paddle-wheels, as the piston-rods maintain an angle at all times with the inner crank-connecting bar so as to apply the power of both piston-rods to said connecting-bar at an upward angle—say about forty-five degrees, more or less, or any point within the range of a quadrant—by which arrangement and combination the dead-centers of the cranks of the paddle-wheels are overcome, the one by the other, and the outer crank-connecting bar prevents the inner bar from being locked or put out of a horizontal line, by which the successful operation of two paddle-wheels is made certain; and as all the disadvantages of applying the power direct to one of the crank-shafts are avoided, and the connected wheels driven by the inclined steam-cylinders, arranged directly in a line with the crank-connecting bar, but so as to exert an upward force upon each end of the inner bar by which the inner cranks are thus united.

In the accompanying drawing, Figure 1 represents a side view, showing the engine-cylinders with respect to the paddle-wheel crank-shafts and their connecting-bars; and Fig. 2 represents a top view of the same.

My invention has for its object the propulsion of two or more connected paddle-wheels so that they shall revolve with the same speed and steadiness. This, I am aware, has been done before; but the power has been applied directly to one of the crank-shafts by an additional crank thereon, and in a direct horizontal line with all the cranks, so that one shaft became the driving-power for all the wheels,

and each crank had the disadvantage of overcoming its own dead-centers.

By my improvement two engines, A and B, are arranged, one forward and the other aft of the paddle-wheels C and D. The steam-cylinders A and B, and piston-rods E and F of which work at an upward angle of about forty-five degrees to a horizontal bar, G, which connects the inner paddle-wheel cranks H in such manner that each piston operates the connection-bar G by an end-thrusting motion, causing it to reciprocate with the pistons and in this way communicate a steady revolving motion to the cranks, and the position of each crank with the piston-rods effectually overcoming the dead-centers, while the outer bar J, having its wrist-pins *b* at right angles to those *a* of the inner cranks, prevents them from being locked or put out of horizontal line.

The steam-cylinders may be arranged to oscillate to conform to the motion of the cranks; but this same effect may be attained, by means of a strap or yielding joint in the piston-rod, with a stationary cylinder, which mode I prefer. Each piston-rod is secured directly to the wrist-pin *a* of the cranks, and the union bar is secured to the same points, and by this means the pistons act directly upon each end of the crank-bar; and in every position which this bar and the piston-rods assume during the revolution of the cranks, the latter can have no dead-centers at the same time to turn, as the steam-cylinders are below the axis line of the paddle-wheel shafts, and consequently each cylinder helps the other.

The paddle-wheels are mounted upon short shafts I, which are secured in suitable bearings and frame-work at each side of the vessel. There are many advantages in the use of double connected paddle-wheels; but hitherto they have not been successfully adapted, because of the very great objection in the manner of applying the power of the engine. By using double connected wheels they may be of much less diameter than single wheels, and, moreover, their speed may be much slower than single wheels, and therefore do not agitate the water so much as by a single fast wheel. By using two cylinders they may be made comparatively small and yet produce much better effect than a single engine of their combined capacity, because the two small en-

gines overcome the dead-centers of the cranks, which advantage a large single engine would not have.

I do not claim the invention of double connected paddle-wheels, nor steam-cylinders arranged at oppositely-inclined positions with respect to a single crank-shaft to overcome the dead-centers thereof; but my invention consists in the new application and combination of these old devices to produce new and advantageous results in the propulsion of paddle-wheel steamers.

Having described my invention, I claim—
The arrangement and combination of the

steam-cylinders and piston-rods with the connecting-bars G J of the crank-shafts of double paddle-wheels, whereby the power of the engines is applied directly at an upward angle to the ends of the crank-connecting bar G, to obtain the advantages and for the purposes described.

In testimony whereof I have hereunto set my hand this 6th day of June, A. D. 1872.

ISAAC L. THOMPSON.

Witnesses:

A. E. H. JOHNSON,
J. W. HAMILTON JOHNSON.