

W. MORROW.  
AERIAL CAR.

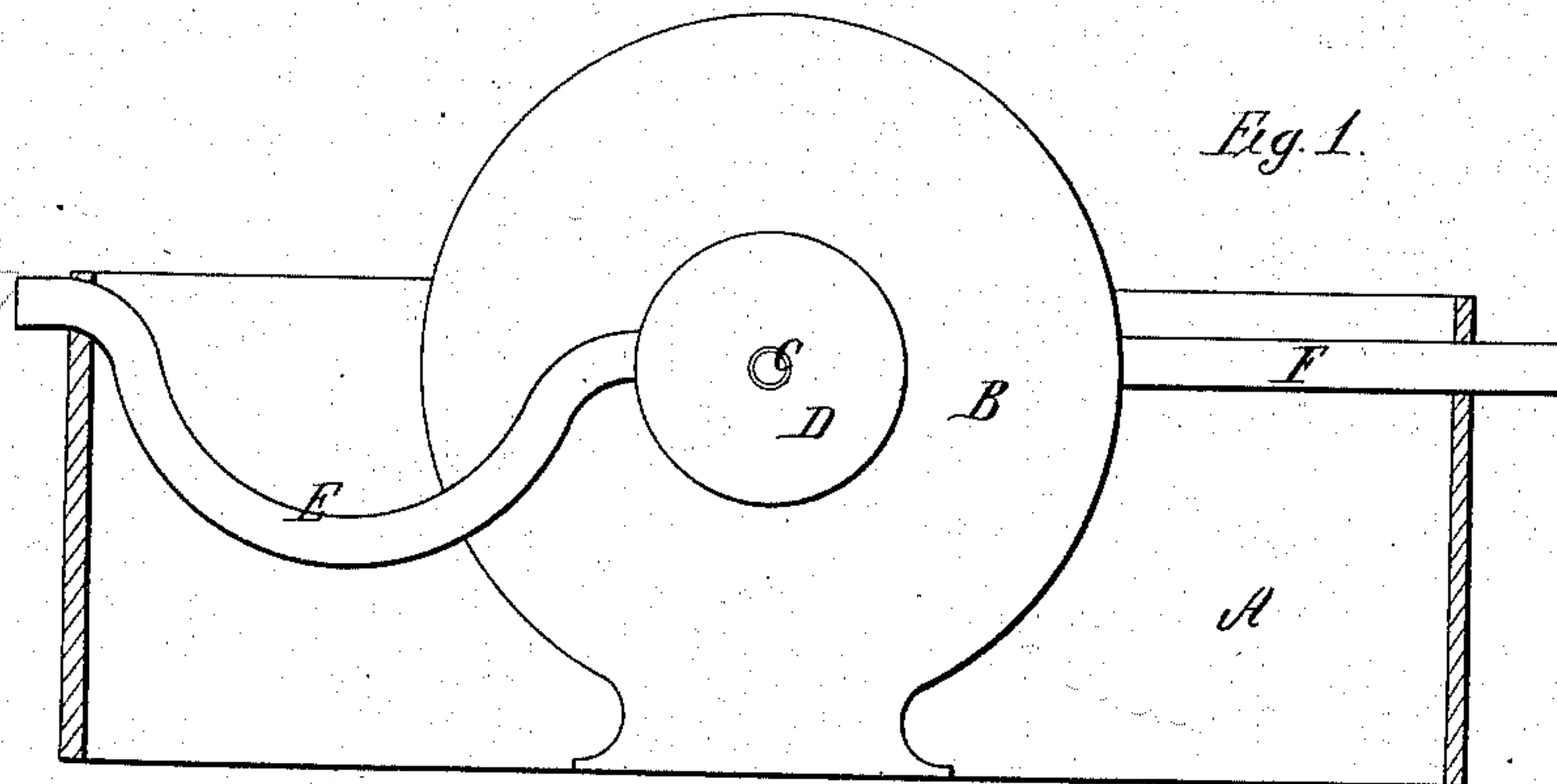


Fig. 1.

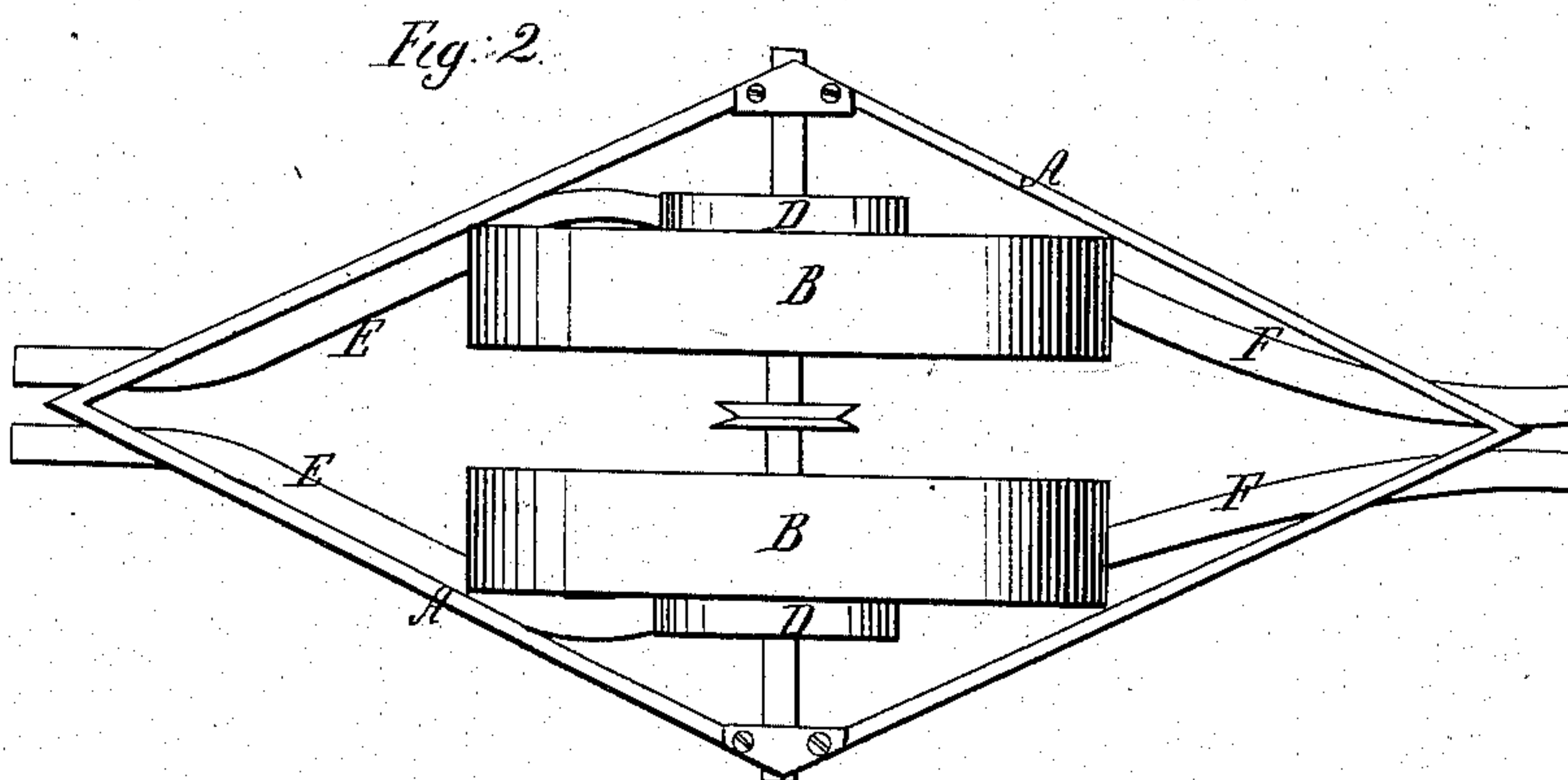


Fig. 2.

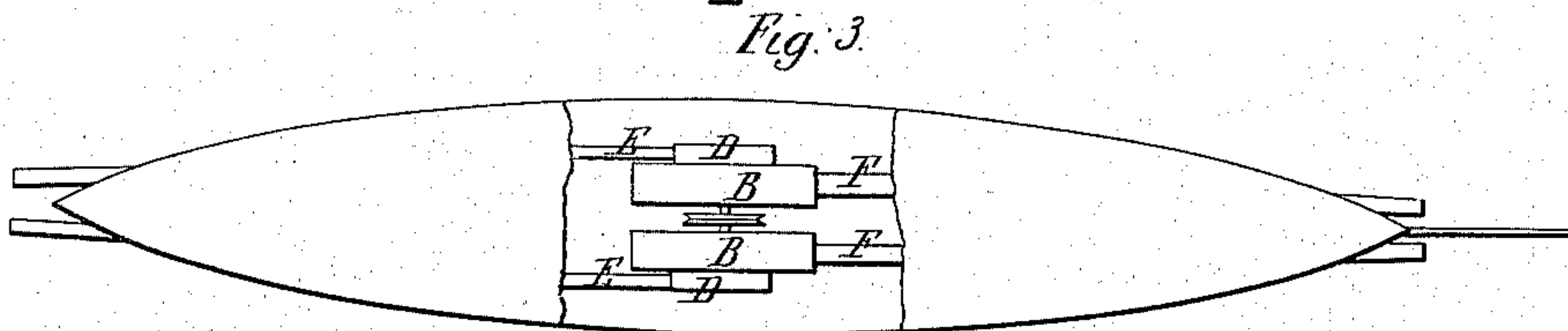


Fig. 3.

Witnesses;  
J. L. Boorne  
Geo. H. Strong,

Inventor;  
W. Morrow  
By his atty, Dwyer



# United States Patent Office.

WILLIAM MORROW, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 88,324, dated March 30, 1869.

## IMPROVEMENT IN AERIAL CARS.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern:

Be it known that I, WILLIAM MORROW, of the city and county of San Francisco, State of California, have invented an Improved Propeller for Aërial Navigation; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention, or improvements, without further invention or experiment.

The object of my invention is to provide an improved apparatus for propelling vessels, or crafts through the air.

It is an acknowledged fact, that bodies containing a gas specifically lighter than common air, will rise in the atmosphere with a greater or less degree of ascensional force, and there remain in the stratum of equivalent attenuity or density, until some portion of the gas or light air is allowed to escape, when the body will seek a lower stratum where the specific gravities of the gas and air are equivalent. This fact is known, but very little benefit can be derived from it, unless some means be devised by which this floating body can be propelled, or navigated through the air, and be made to answer a different purpose than that of simply rising upward and being blown hither and thither, wherever the wind listeth.

To produce this result, I have constructed a propeller as follows:

Two blowers, or wheels, with wide floats, or vanes, are placed near together inside of the vessel to be navigated, and revolve upon the same shaft. The blowers are enclosed in separate boxes, or cases, inside of which they revolve. On the outer side of these boxes, and surrounding the shaft, are two projecting circular cases, forming chambers on the outside centre of each, into which two pipes lead, their opposite ends passing through openings at the front of the vessel. Two similar pipes also lead from the rims forming the circumferences of the circular cases, passing from the opposite side out through openings in the rear of the craft.

To more fully illustrate and describe my invention, reference is had to the accompanying drawings, and letters marked thereon, forming a part of this specification, of which—

Figure 1 is a side view, showing one of the blowers.

Figure 2 is a plan.

Figure 3 shows its application to an air-vessel.

In the accompanying drawing, only a sufficient construction is given, to show the application of the propeller to an aërial craft, of which A may represent an aërial vessel, of any form, or construction, capable of being inflated sufficiently to be buoyed upward into the air.

On each side of this vessel is placed a blower, having wide vanes, and which are encased in the two cir-

cular boxes, B B, both being revolved by the same shaft, C, which has its bearings in the sides of the vessel.

On the outer sides of these circular boxes, are projecting circular cases, D D, having the shaft C also passing through their centres, forming a chamber on the outside centre of each box.

Pipes E E, which may be either metallic or flexible, pass through openings in the front end of the vessel, at each side, and pass back, entering the case D, and serve to supply air to the blowers. The mouths of these pipes may be flaring, or otherwise, as desired.

Similar pipes F F pass from the circumferences, or rims of the circular boxes B B, on the opposite side, and have their exit at the rear of the vessel.

The shaft C is intended to be driven by an engine of limited power, the belt-connection being made between the two circular boxes, and the whole will be made of the lightest material that will answer the ends required.

### Operation.

The proper means having been applied, to cause the car, or vessel to float in the air, the fans are set in motion, and air blown forcibly out through the pipes F, and discharged at the rear, a supply being at the same time forced in from the front, through the pipes E, by the ordinary pressure of the atmosphere, to fill the space left by that blown out. The force required to overcome the inertia of the air, and give it thus a rapid motion in a certain direction, reacts upon the apparatus by which the motion is given, and this reaction tends to propel the apparatus, together with the car containing it, in a direction opposite to that in which the air is driven, as the paddle-wheels, or screw of a steamer drive the vessel ahead, by forcing the water backward. At the same time, the pressure of the atmosphere upon the front of the car is lessened, in some degree, by the escape of a portion of it into the tubes, as above described, while the discharge of air at the rear tends to increase the pressure upon that end; and in this way, too, the movement of the car through the air is assisted and increased.

Having thus described my invention,

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

The combination and arrangement of the supply-pipes E, blowers B, and discharge-pipes F, substantially as and for the purpose set forth.

In witness whereof, I have hereunto set my hand and seal.

WM. MORROW. [L. s.]

Witnesses:

C. W. M. SMITH,

J. L. BOONE.