

W. E. PRALL & JOHN D. DEFREES.

Improvement in Propulsion for Canal Boats.

No. 121,469.

Patented Dec. 5, 1871.

Fig. 1.

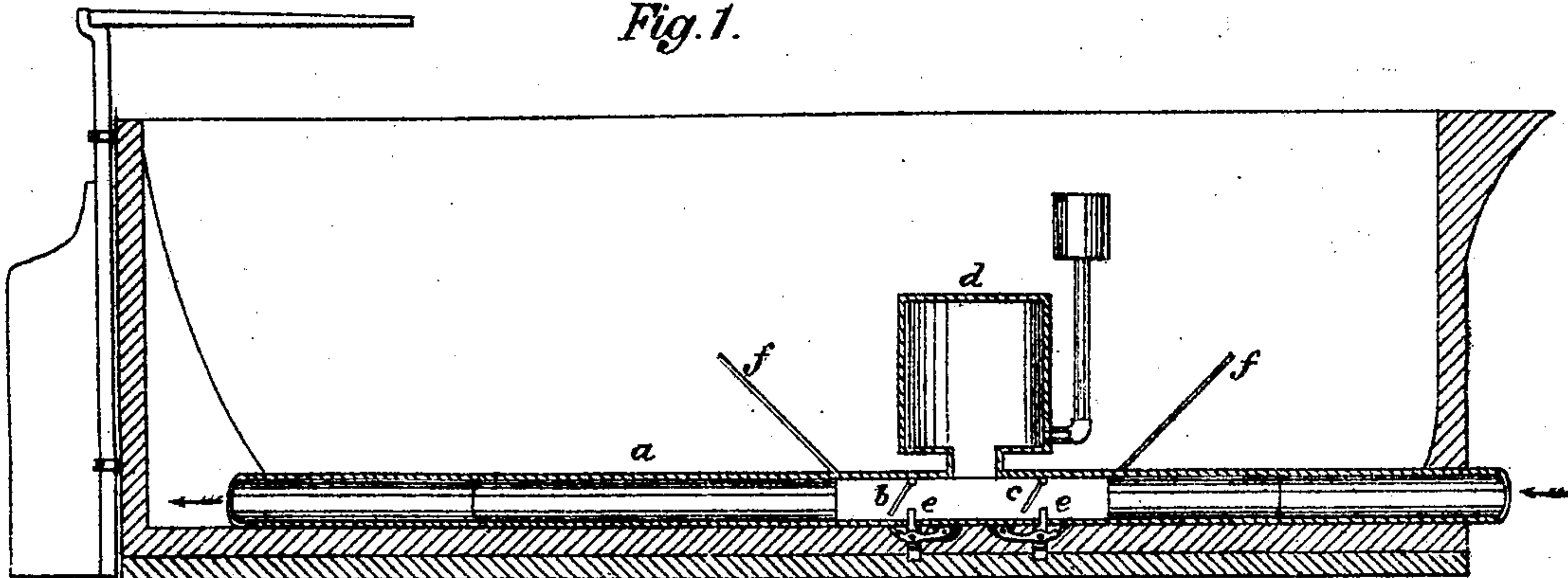


Fig. 2.

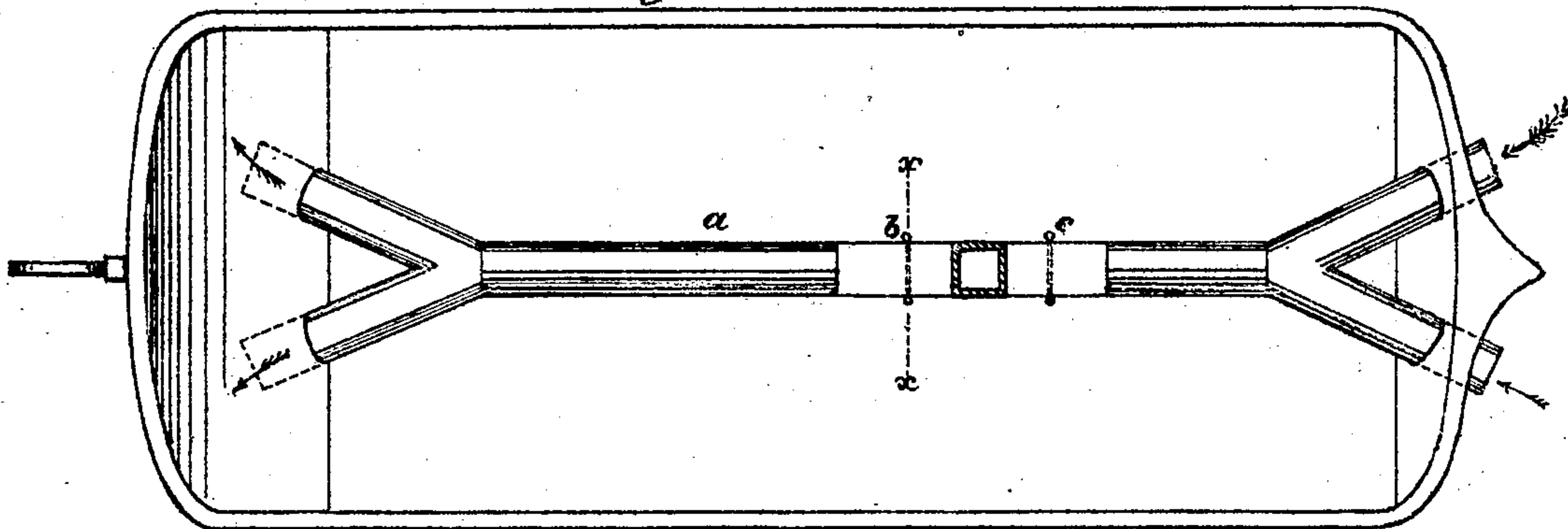
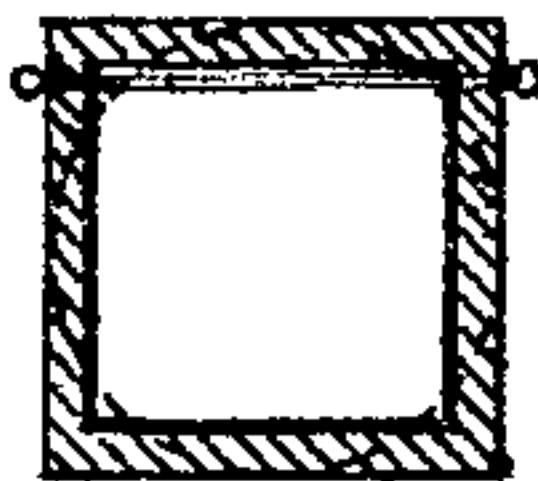


Fig. 3.



Section on Line x. x.

Witnesses:

Edgar F. Brown.  
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Inventors,

W. E. Prall  
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# UNITED STATES PATENT OFFICE.

WILLIAM E. PRALL AND JOHN D. DEFREES, OF WASHINGTON, D. C.

## IMPROVEMENT IN PROPULSION OF CANAL-BOATS.

Specification forming part of Letters Patent No. 121,469, dated December 5, 1871.

*To all whom it may concern:*

Be it known that we, WILLIAM E. PRALL and JOHN D. DEFREES, both of Washington, District of Columbia, have invented certain Improvements in Steam-Pumps, of which the following is a specification:

The nature of this invention consists in the application of the new device known as "Prall's automatic steam-pump," for which Letters Patent were granted on the 4th of July, 1871, for propelling canal or other boats or vessels.

The manner of the application of this device or steam-pump for the purpose aforesaid is as follows, to wit: It is so constructed as to utilize the vacuum as well as the expansive force of the steam, and, being operated by the direct action of the steam, the steam-engine, and the friction consequent upon complicated machinery is dispensed with; and, when applied for the purpose aforesaid, will be placed within the boat or vessel and connected with a main pipe, *a*, of sufficient size to give the required propelling power, said pipe extending the whole length of the boat or vessel and opening into the water at each end. Within such pipe, at each end or at any other point, will be fixed common hinge or gate-valves, *b* and *c*, the action and purpose of which will be hereinafter more minutely described. The cylinder *d* of the device or pump and the suction and discharge-pipes being filled by the outside pressure of water, steam from a suitable boiler will be admitted into the top, which will force the water down through the discharge-valve *b*,

the effect of which will be to propel the boat in the opposite direction, caused by the resistance of the column by the outside water. When the water has thus been forced out of the cylinder the condensation of steam produces a vacuum, which will close the valve *b* of the discharge-pipe and open the valve *c* of the suction-pipe—which takes in water at the bow of the boat, the effect of which will be to draw the boat forward and also to diminish the head-water, thereby lessening its effect upon the shores of the canal and the resistance to the propulsion of the boat.

Movable lugs *e*, which support the pressure of the water upon the valve, are so arranged as to be changed by lever *f* to the opposite side of the valve, thereby reversing its action or the direction of their movement, thus causing the suction-pipe to become the discharge-pipe and the discharge-pipe the suction-pipe, for the purpose of changing the course of the boat.

Having thus described our invention, what we claim, and desire Letters Patent for, is—

1. The movable lug *e* or its equivalent, forming a bearing for the valve on either side, substantially in the manner and for the purpose specified.

2. The combination of the valve *b*, movable lug *e*, and tube *a*, substantially as described.

W. E. PRALL.

JNO. D. DEFREES.

Witnesses:

CHAS. W. CUNNINGHAM,  
EDM. F. BROWN.

(139)