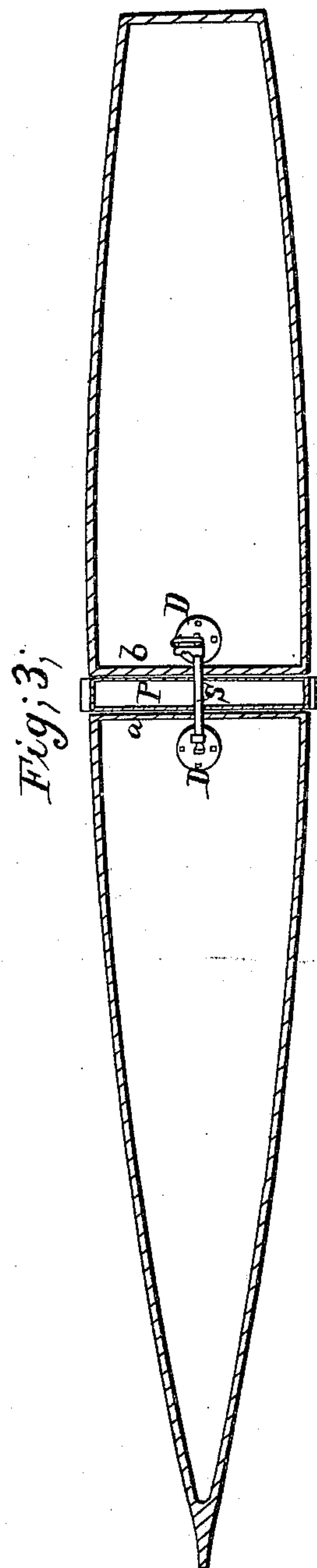
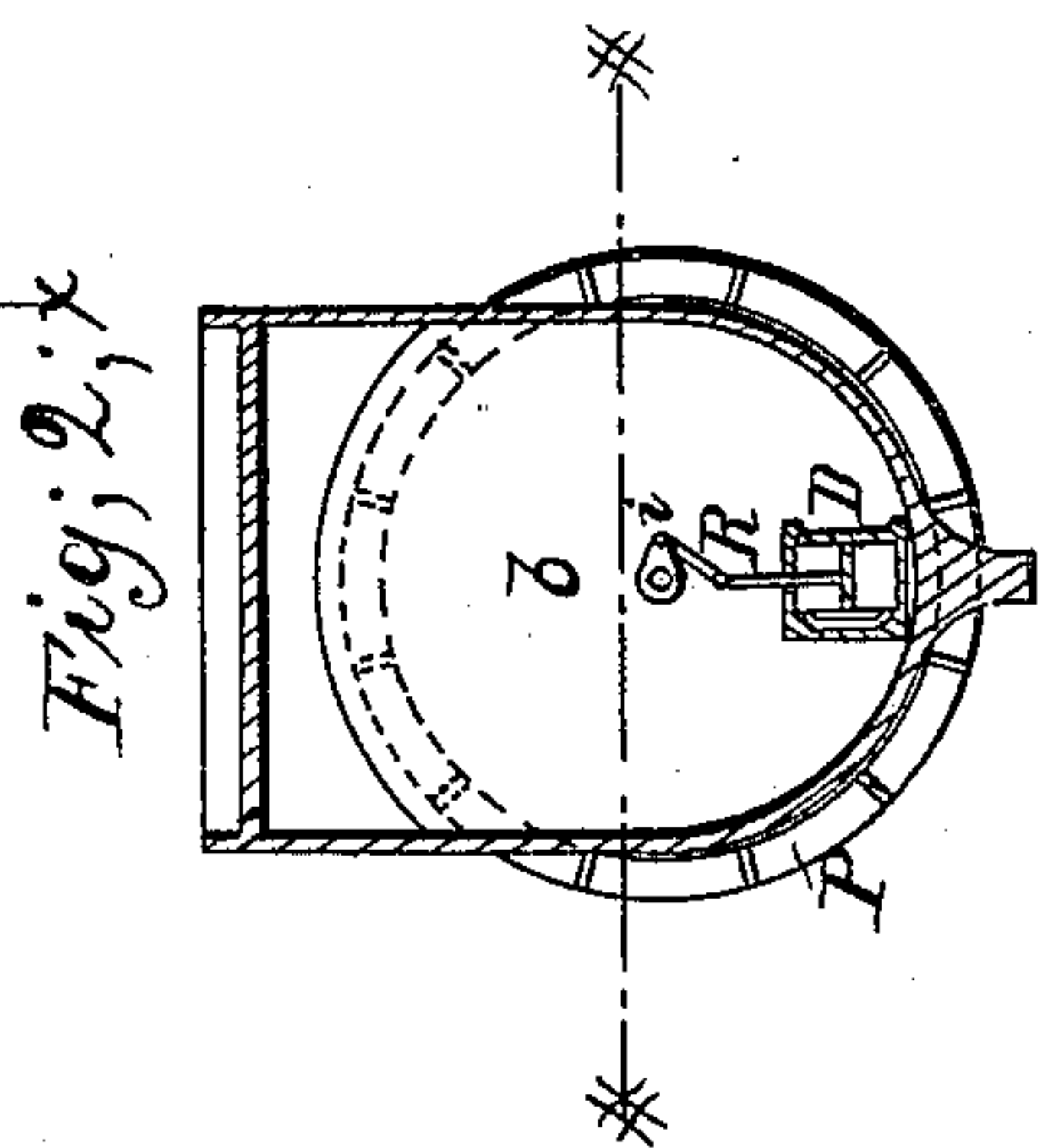
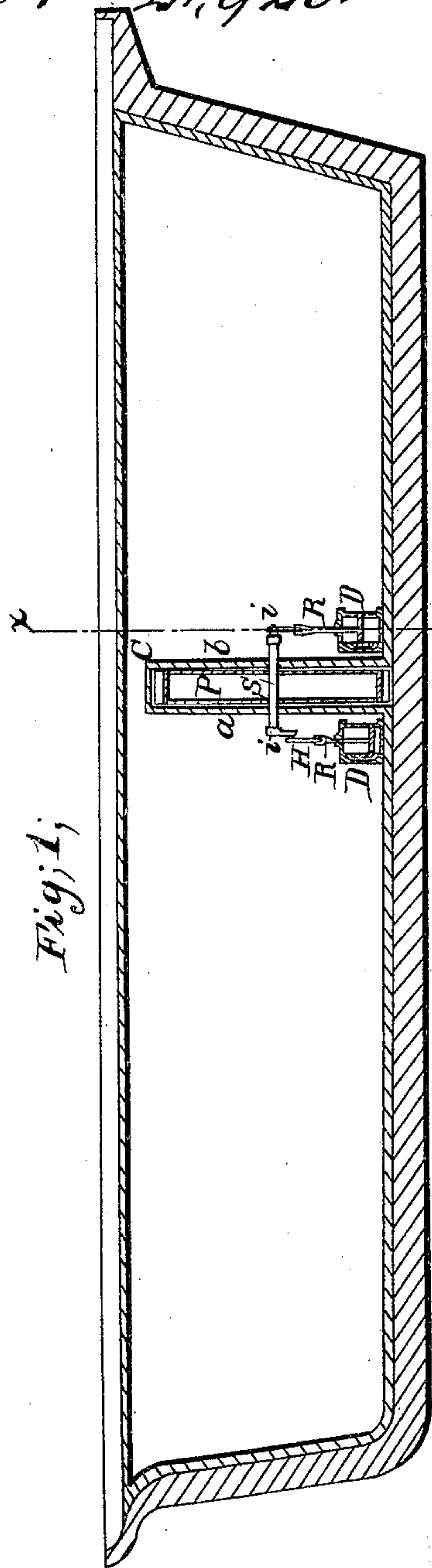


R. & T. Winans.
Screw Propeller.

No. 21,920.

Patented Oct. 26, 1858.



UNITED STATES PATENT OFFICE.

ROSS WINANS AND THOS. WINANS, OF BALTIMORE, MARYLAND.

CONNECTION OF STEAM-ENGINES WITH PROPELLERS OF STEAM VESSELS.

Specification of Letters Patent No. 21,920, dated October 26, 1858.

To all whom it may concern:

Be it known that we, ROSS WINANS and THOMAS WINANS, of the city of Baltimore, in the State of Maryland, have invented a new and useful Improvement in the Mode of Combining the Engines and Propeller-Shafts of Steam Vessels; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a vertical longitudinal section through the keel of the vessel. Fig. 2 represents a transverse section at the line $x x$ of Fig. 1, passing through the axis of the cylinder of one of the engines, the propeller being partly shown and partly indicated by dotted lines, and Fig. 3 represents a section of the vessel at the line $\# \#$ of Fig. 2, showing the arrangement in plan of the propelling mechanism including the engine and the propelling wheel.

Our invention is designed to secure greater compactness in the arrangement of the engines and propeller than has hitherto been attained, particularly in ocean steamers; to secure for both the engines and the propeller the best position for them in the vessel and to connect them without employing long shafts.

In an application for another patent, made simultaneously with the application for this, we have shown by what means a vertical transverse propelling wheel of large diameter may be employed with advantage in vessels of forms not essentially different from those now in use. Our present invention is applicable to these or to other forms of vessels in which such a propeller is so arranged that it has a part of the hull before and another part behind it.

The application of our improvement to one form of vessel thus arranged is shown in the accompanying drawings, in which the hull of the vessel is represented with a transverse opening through its lower part, of sufficient size to accommodate a screw propeller. This opening is most advantageously placed at that part of the length of the vessel at which side paddle wheels would be placed—which is generally nearer the stern than the bow—and is inclosed before and behind by water-tight bulkheads or partitions ($a, b,$) and covered by a roof (C), forming a trunk, open at the sides and bot-

tom, for the reception of the propeller (P) whose shaft (S) is supported in bearings in the partitions and whose blades project out of the trunk beyond the surface of the vessel at the bottom and on both sides. Other modifications of such a trunk and propeller are described in the application for another patent before mentioned, in which we have also shown the peculiar advantages resulting from the employment of a large propelling wheel.

On both ends of the shaft (S) of the propeller, cranks (i) are fitted at a suitable angle with each other to enable each engine to assist the other in passing its dead point. Beneath these cranks respectively, the cylinder (D) of a steam engine is placed, whose piston rods (R) are connected by rods (H) to the pins of the cranks in the usual manner, to give a rotary motion to the shaft (S).

The details of the engine are not shown in the drawings as these are common and well known to steam engine builders; for the same reason we omit the description of the furnaces and boilers for generating steam for the engines, as these need not differ in their construction or mode of connection with the cylinders from such as are in common use in ocean steamers.

In some cases it may be deemed most suitable to place the boiler or boilers either before or behind the propeller, a steam pipe being carried over the trunk for connecting the boilers with the engine on the opposite side of the propeller. In other cases it might prove advantageous to place one boiler or a set of boilers and an engine on each side of the propeller, so that the engine and boiler before and those abaft the trunk would be capable of working independently of each other.

The great weight and bulk of the powerful engines and capacious boilers required for ocean steamers renders it a matter of necessity that they should be placed not far from the middle portion of the length of the vessel; hence when stern propellers are used, shafts of great length must be employed to transmit motion from the engine to the propeller. This increase of length requires a corresponding increase of strength in the shafts which, consequently, are not only very heavy but very difficult to make and require numerous bearings to support them. Moreover, as an ordinary vessel is not a rigid body but has considerable flexibility, every

additional point of support to a long shaft in such a vessel is liable to displacement which however slight in degree, increases the friction and uselessly consumes power especially under high velocities. These serious difficulties attending the employment of stern propellers we avoid by our arrangement in which, by suitable framing, the shaft may be supported immediately at the place where it passes through the partitions and thus only two bearings will be required. The length between these two bearings will be but little more than the breadth of the wheel and the thickness of the bulk heads, and there will only be as much more length of shaft required before and abaft the bearings as will support the cranks over the cylinders beneath. By thus arranging the engine close to and on both sides of the propeller, the power is directly and economically applied and this propelling mechanism—as a whole—is more compact, occupies a better position in the vessel and possesses a higher degree of efficiency than is

attainable by any combination known prior to our invention. 25

We have mentioned engines with guides and connecting rods, but trunk engines might be used and with far better effect than in ordinary stern propellers, owing to the less rapid motion required. Oscillating engines might also be used with similar advantages. In case of very great power being needed two engines, inclined to each other in the well known way, might be used at each end of the shaft. 30 35

Having thus described our invention what we claim under this patent is—

The combination of two engines or sets of engines with an intermediate vertical transverse propelling wheel, to the shaft of which the engines are directly connected, substantially as herein set forth. 40

ROSS WINANS.
THOS. WINANS.

Witnesses:

M. W. MEANS,
F. MEARIZ.