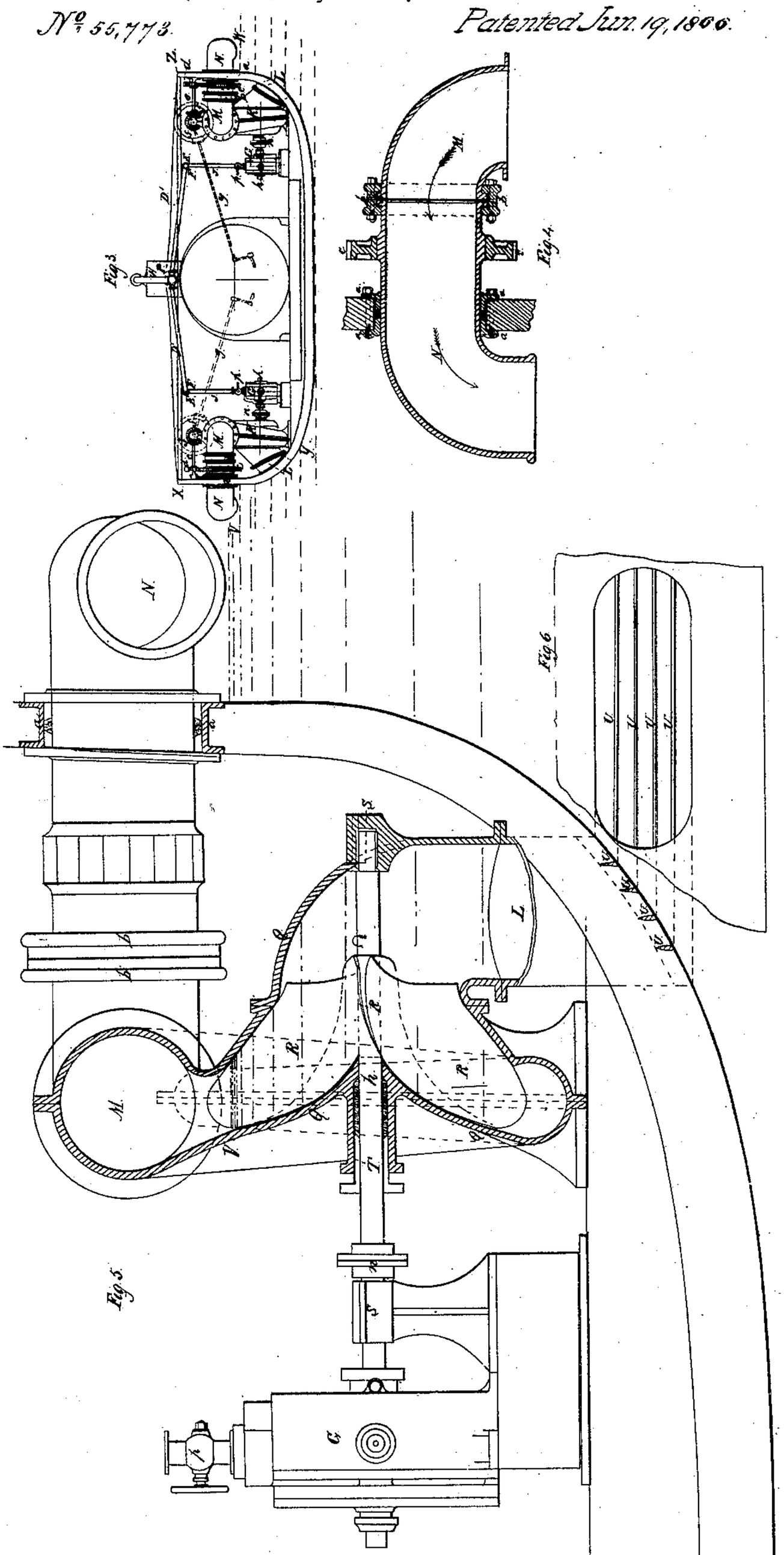
Sheet 1, 2 Sheets.

Kinkel & Hubbe.

Ship Propeller.

No. 55,773. Patented Jun. 19, 1866.



Witnesses.
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Sheet 2, 2 Sheets.

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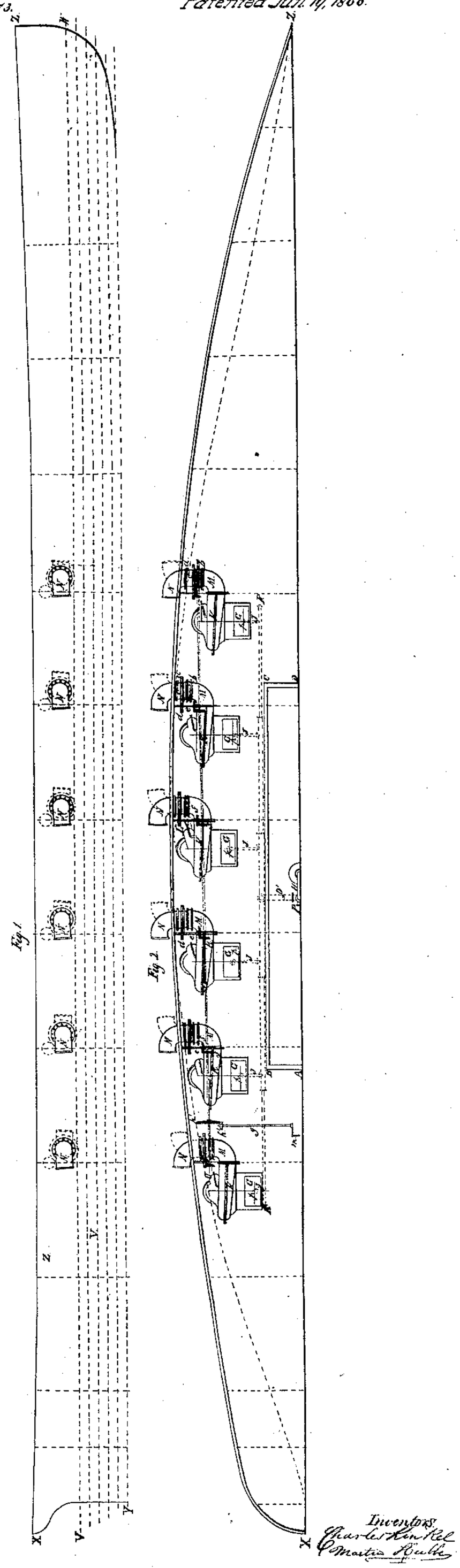

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UNITED STATES PATENT OFFICE.

CHARLES KINKEL AND MARTIN HUBBE, OF NEW YORK, N. Y., ASSIGNORS TO CHARLES WEHLE, OF HOBOKEN, NEW JERSEY.

IMPROVED PROPELLER FOR STEAMSHIPS.

Specification forming part of Letters Patent No. **55,773**, dated June 19, 1866.

To all whom it may concern:

Be it known that we, CHARLES KINKEL and MARTIN HUBBE, of the city, county, and State of New York, have invented a new and useful Method of Propelling Vessels by Hydraulic Reaction; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a longitudinal view of a vessel to which our said new method is applied. Fig. 2 is a horizontal view of one-half of said vessel. Fig. 3 is a cross-section of the same. Fig. 4 is a horizontal cross-section of one of the discharge-pipes and reaction-pipes on an enlarged scale. Fig. 5 is a cross-section of one of the pumps and its connection with the pipes and engine on an enlarged scale. Fig. 6 is a plan view of the strainer of one of the pumps on an enlarged scale.

The same letters of reference mark the same parts in all these figures.

The nature of our invention consists, principally, in employing the hydraulic reaction of the water on more than two points of a vessel for the purpose of propelling or steering the same, substantially as hereinafter described.

The hydraulic reaction is produced in the following manner: A series of bent pipes are inserted through the sides of the hull below or above the water-line, as required for the particular use of the vessel, the said pipes being adjustable by a mechanism in such a manner that the parts of the pipes on the outside of the vessel may be turned aft, forward, or perpendicular. An equal number of such pipes is inserted on each side of the vessel. All of them are properly packed in stuffing-boxes. The end of each of said pipes in the inside of the vessel is connected with a force-pump, and each pump is driven by an engine. Each of said pumps is supplied with water by a suction-pipe through the bilge or bottom of the vessel, and all the engines are supplied with steam from one boiler in such a manner that the supply of steam may be cut off from each engine separately, or from any number of engines, or from all of them, as may be desired.

The inner ends of the outboard-pipes are connected with a mechanism by means of which the series of pipes on either side of the vessel may be turned simultaneously in any direction at the will of the engineer or other person having charge of said mechanism.

We deem it proper to state that the propulsion of steam-vessels by means of wheels or screws has probably attained its highest perfection, the velocity of ships propelled by these means not being capable of a great increase, as great velocity in rotating wheels or screws necessarily reacts upon the vessel, and requires a proportionate increase of strength in the construction of the hull, which again tends to counterbalance the velocity of the moving vessel, while by the method herein described no reaction upon the ship will be perceptible, however great the power may be which we use in forcing out the water of the pipes, or however great the velocity which a vessel thus propelled may attain.

That the reaction of water forced out of pipes from a ship may be used as a propelling power is demonstrated by the fact that three vessels constructed in Europe on that principle have actually been used for traveling purposes. The construction adopted in these vessels consisted, mainly, in placing in the center of the ship a turbine wheel moved by a steam-engine which discharged two jets of water simultaneously out of two nozzle-pipes, one on each side of the vessel; but the discharge-pipes (or nozzle-pipes) on either side of the turbine wheel being necessarily different in length, the power thereby exerted on one side of the vessel was greater than on the other, which impeded the proper steering of the vessel, and, again, the propelling power itself was limited by the two discharge-pipes and by one turbine wheel, all of which is obviated by our method.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

In the annexed drawings, X Y Z represent the hull of the vessel. V W represent the water-line. A B C D represent one-half of the boiler; H, the main steam-pipe; E F, the side steam-pipe; G, one of the steam-engines; D′, the connecting-pipe between the side pipes, E F, and the main pipe H; J, the steam-pipe connecting the side pipe with the steam-engine;

L, the water-pipe through which the water enters the pump; M, the discharge water-pipe; N, the reaction-pipe or nozzle-pipe; K, the centrifugal pump; *a*, the stuffing-box in which the reaction-pipe N is packed, said stuffing-box passing through the side of the ship; *b*, another stuffing-box, covering the joint between the nozzle-pipe N and the discharge-pipe M; *c*, a gear-wheel on the circumference of pipe N and fastened to it; *d*, a pinion gearing into *c* and working the same.

O O is the main shaft for turning nozzle-pipes; *e*, intermediate shaft for same purpose; *f f*, bevel-gear for the same purpose; *g*, crank-shaft for working main shaft O O; *h' h'*, intermediate miter-gear for the same purpose; P, the main steam-valve in main pipe H; *p*, separate steam-valve for each engine; *h*, shaft of the steam-engine in line with shaft of the pump.

n is the coupling between the engine and the pump; *m*, the handle of crank-shaft *g;* Q, the wheel-casing of centrifugal pump or wheel K; R, the centrifugal wheel of the pump K, which is keyed to the shaft *h;* S, the journal-boxes of the pump K; T, the stuffing-box for central shaft, *h;* U, the bars of the strainer.

In the vessel represented in the drawings the nozzle-pipes N, &c., are placed above the water-line—a construction which is applicable in smooth water or for river steamers, while in sea-going vessels, especially in ships of war, the same will be placed entirely below the water-line without any material variance of the principle of construction.

Each nozzle-pipe N is represented as connected with a pump and engine of its own, by which construction the greatest amount of moving power may be exercised; but it is obvious that two or more pumps may be worked by one steam-engine without materially altering the method herein described.

Each of the steam-engines intended to be used in the above vessel is a double-piston square engine, (which is too well known to require a more particular description,) that being a machine of great power and requiring a comparatively small space.

The manner of supplying all the engines with steam and of regulating the supply of each is represented by the blue lines in Fig. 2.

If it is desired to supply the steam to all engines, or to shut the same off from all engines, the main valve P will be opened or closed. If the steam is to be excluded from any one engine, it will be done by means of the respective valve *p*.

The mechanism for turning the nozzle-pipes N, &c., in any direction desired is indicated by the red lines in Fig. 2. The engineer, by turning the handle *m*, will operate upon the gear-wheels *c*, and thereby rotate the pipe N on its joint *b b*, the pipe M being fixed and remaining stationary.

The stuffing-box *a* is placed on that part of the nozzle-pipe N where it passes through the vessel, for the double purpose of affording a secure bearing to the pipe and of preventing any leakage through the side of the ship. The stuffing-box *b* is to prevent any leakage on the joint *b b*.

The nozzle-pipes may be secured against collision or accidents by guards (not shown on the drawings) constructed in any suitable manner.

When the nozzle-pipes N on one side of the vessel are in a position, as in Fig. 1 of the drawings, and the nozzle-pipes on the other side of the vessel are in the opposite direction, the jets of water forced out of said pipes in two opposite directions will cause the vessel to turn on its center, and by these means the vessel may be steered when the rudder is disabled for any cause. When the nozzle-pipes on one side are in the position of Fig. 1, and are turned perpendicular downward on the other side, the jets of water forced out of the nozzles downward will exert no moving power. Consequently the moving power will be entirely on one side of the vessel, and will cause the same to move in a circle the diameter of which may be increased or decreased at pleasure by altering the angle between these pipes.

The pumps which we use for forcing out the water through the reaction-pipes N, &c., are constructed on the principle of centrifugal pumps, and differing from them in this, that no suction of the water is required, (the pump being below the water-line V W,) the whole force of the pump being used for throwing out the water.

The blades R R R of the centrifugal wheel in the pump are constructed upon the plan of the true-screw—that is to say, the form of the blades are in the form of a curve described by a screw, while in the usual centrifugal pumps the blades are radial in their form.

The supply-pipe L on the outside of the vessel is protected by bars U, &c., which form a strainer for said pipe.

The journal S of the pump-shaft H is placed toward the outside of the pump for the purpose of enabling the engineer to adjust the blades R of the centrifugal wheel, and also to oil said journal.

All the steam-engines in the vessel may be set in motion without necessarily moving the vessel, provided the nozzle-pipes are turned perpendicularly downward or upward, and the course of the vessel may be instantly reversed (while moving in a certain direction) without stopping or reversing the engines by simply turning the nozzle-pipes in a direction opposite to that in which they were.

If required for the purposes of repairs or for other purpose, one or more of these engines G may be stopped by shutting off the steam therefrom by means of the valve *p* without stopping the vessel in its course, abundant power being always left to keep the vessel in motion, and it is barely possible that all the engines and pumps would break down at the same time, which sometimes happens with steamships of the usual construction.

By increasing the number of nozzle-pipes, pumps, and engines, the velocity and power of the vessel may be increased to a higher degree than is possible in any side-wheel steamer or screw-steamer.

In construction of vessels, as represented in the drawings, with the reaction-pipes above the water-line, the greatest moving power will be exerted when the water is thrown out of said pipes while they are in an inclined position toward the water-line deviating somewhat from the horizontal line, while in vessels in which said reaction-pipes are submerged the greatest power will be exercised when the same are in an exact horizontal position.

The precise position of the nozzle-pipes may be marked by an indicator in the engine-room moving precisely with the said pipes.

Instead of placing the pumps vertically, as in the drawings, the same may be placed horizontally, and the engines may be set above it, which will be advantageous in vessels with submerged nozzle-pipes.

By means of the method of propelling vessels herein described the propelling power will be largely increased, while the cost of the vessel as well as of its working will be lessened.

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

1. The combination of a number of nozzle-pipes with the hull of the vessel, when each one of said pipes is connected with a pump and engine, substantially as described.

2. The mechanism for connecting and turning the nozzle-pipes, substantially as described, and for the purpose set forth.

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