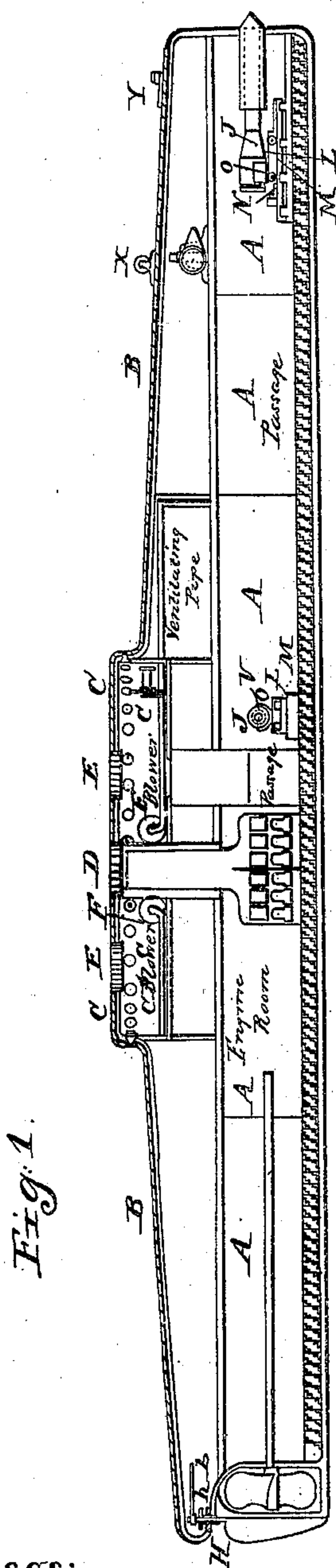
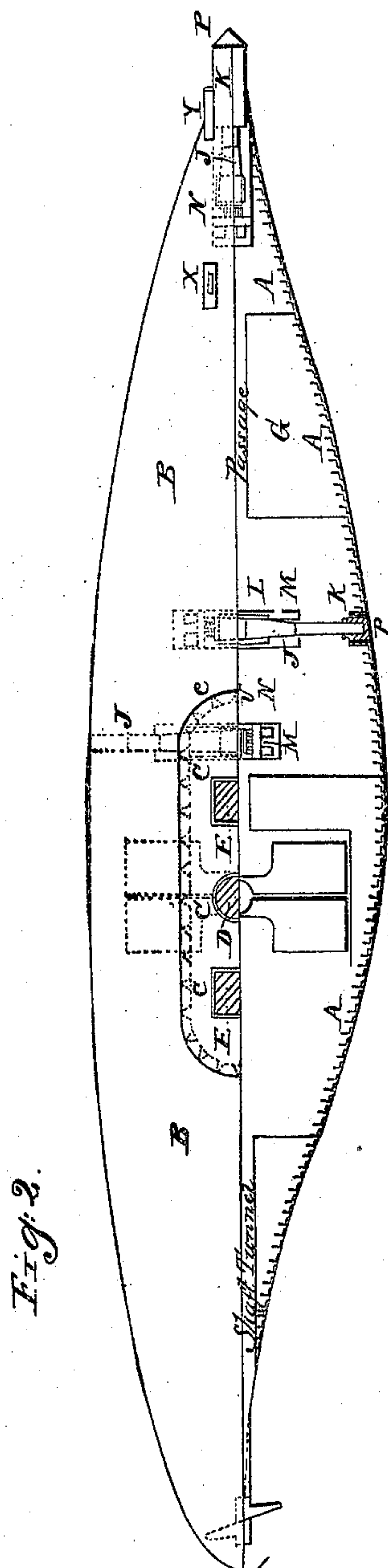


Sheet 1,
4 Sheets

J. P. Woodbury.
Constructing War Vessels.
N^o 35,193. *Patented May 6, 1862.*



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Sheet 2,
4 Sheets.

J. P. Woodbury.
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Fig. 3.

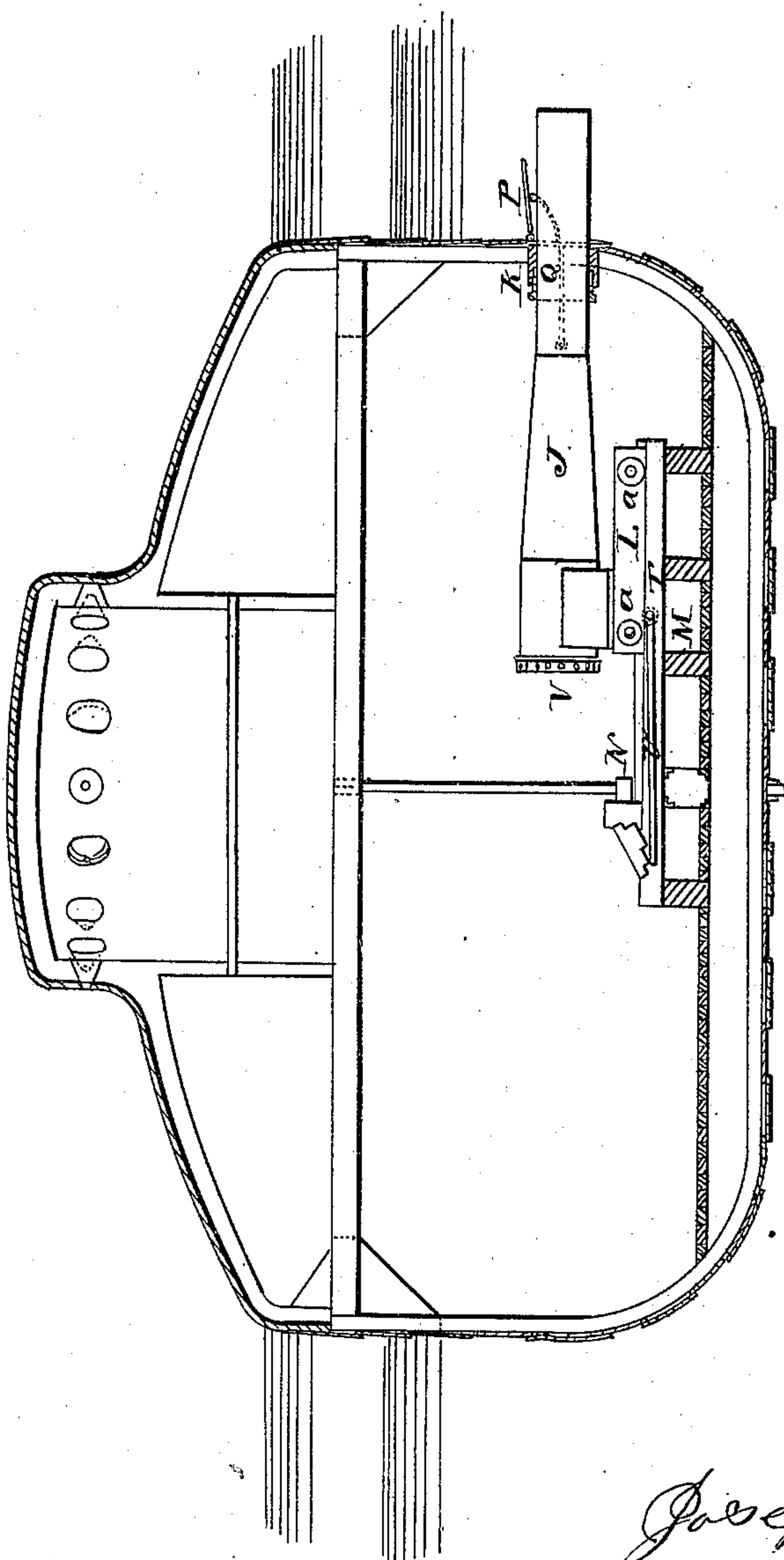


Fig. 7.

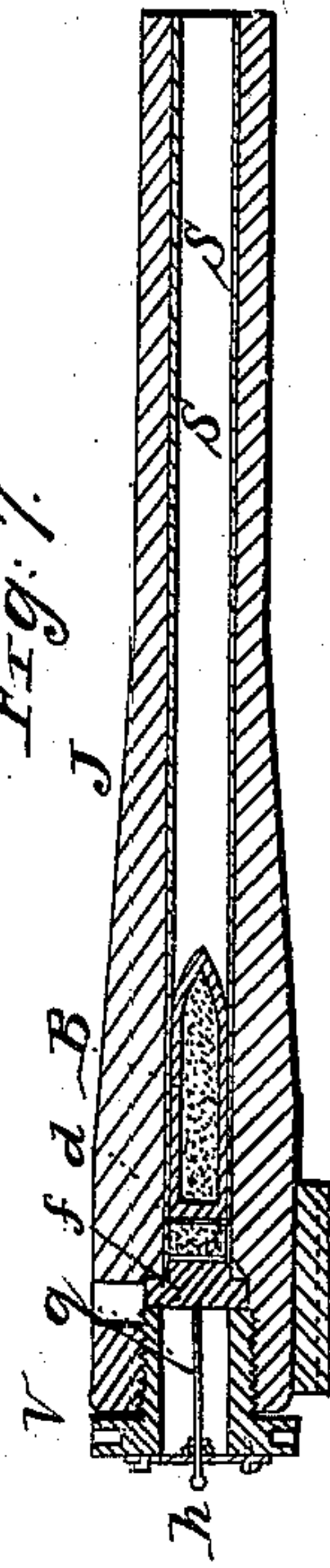
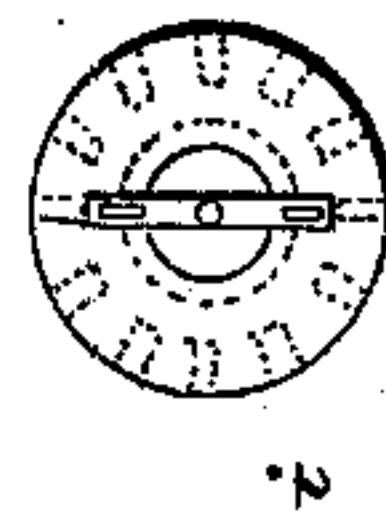


Fig. 8.



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Fig. 4

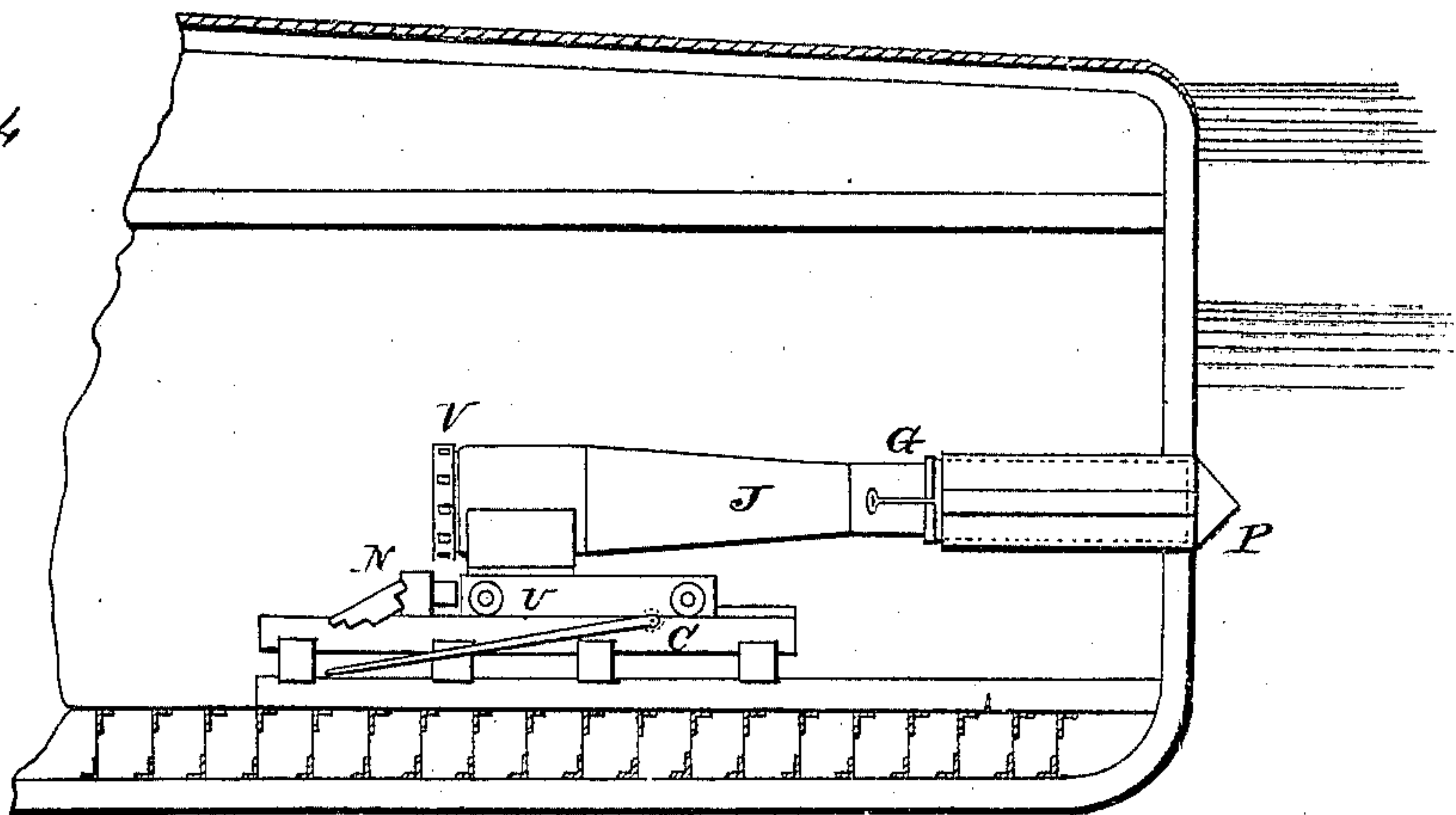
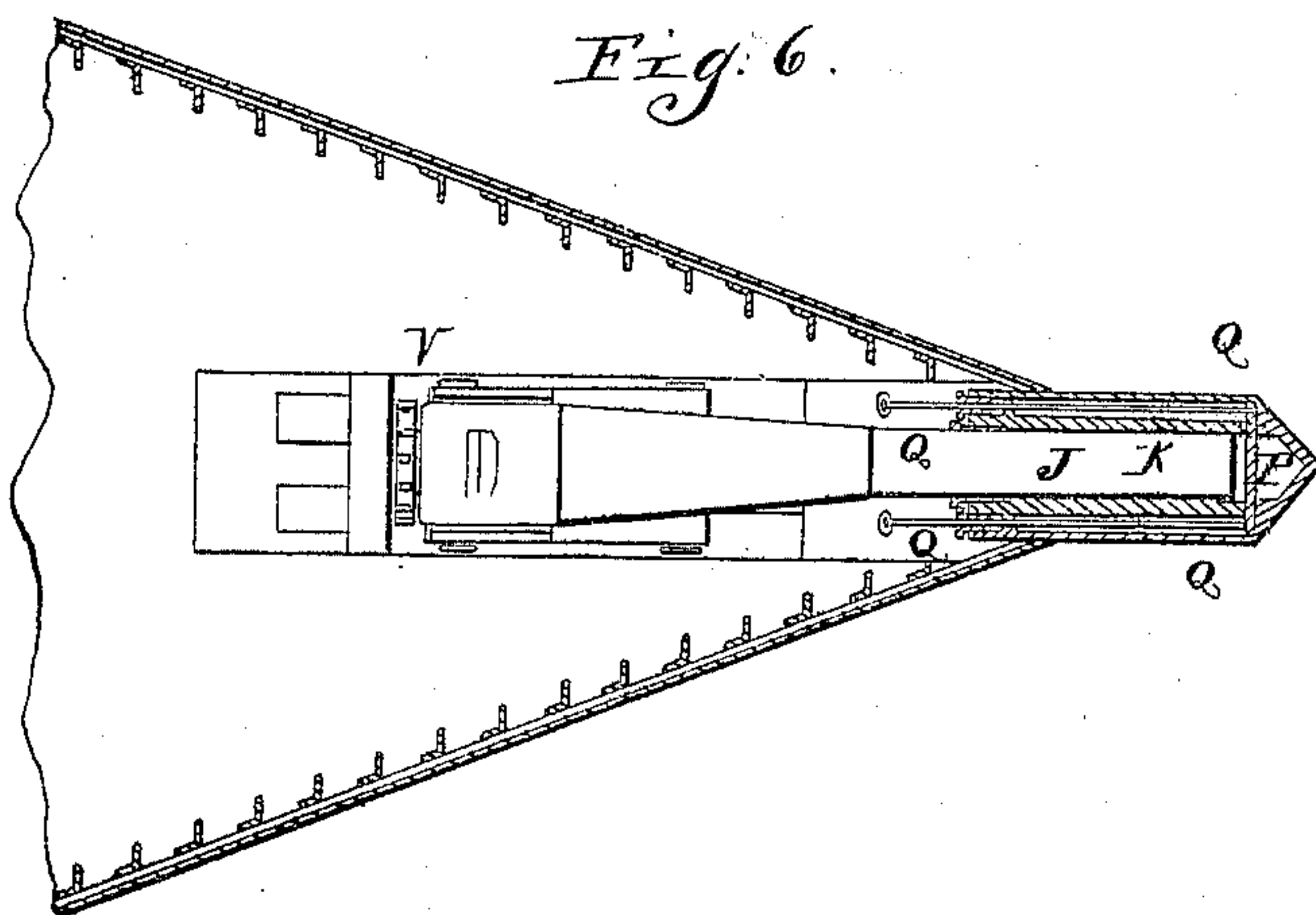


Fig. 6.



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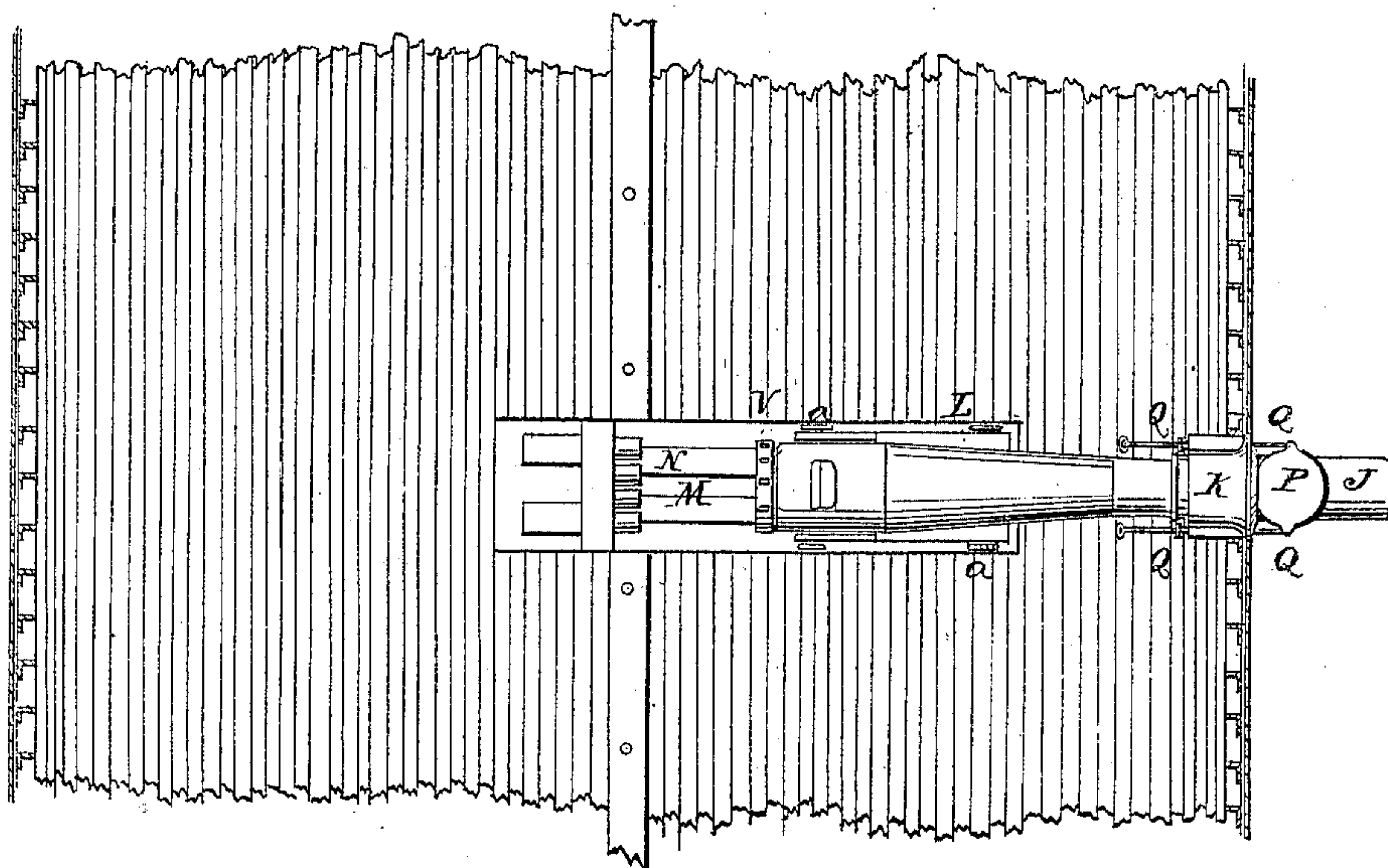
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Sheet 4,
4 Sheets.

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N^o 35,193. *Patented May 6, 1862.*

Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH P. WOODBURY, OF WEST ROXBURY, MASSACHUSETTS.

IMPROVEMENT IN ARMING WAR-VESSELS.

Specification forming part of Letters Patent No. 35,193, dated May 6, 1862.

To all whom it may concern:

Be it known that I, JOSEPH P. WOODBURY, of West Roxbury, in the county of Norfolk and State of Massachusetts, have invented a new Method of Arming War-Vessels; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation thereof, taken in connection with the accompanying drawings; making a part of this specification, in which—

Figure 1 represents a longitudinal vertical section of a vessel, showing the application of the armament thereto. Fig. 2 represents the same, one-half in plan and the other half in horizontal section below the deck at the center of the guns. Fig. 3 is a transverse vertical section through the trunk and through the hull at the center of one of the guns. Fig. 4 is a vertical longitudinal section of a part of the bow of the vessel, showing the application of the bow gun. Fig. 5 is a horizontal section of a part of the hold amidships, showing one of the side guns in plan. Fig. 6 also shows the bow gun in plan with that part of the vessel in horizontal section. Fig. 7 represents a vertical longitudinal section of the gun, showing the disposition of the cartridge, projectile, displacing-case, and arrangements for loading at the breech; and Fig. 8 is a back end elevation of the gun, showing the application of the firing-needle and the bar for holding it to the breech-screw.

The subject-matter of my invention relates to a method of arming a vessel for warlike purposes both as regards its means of attack and defense, and is designed more particularly to enable a vessel to attack and overpower the iron-clad war-steamers which are now being built by the naval powers of the world, and also to be constructed and employed at a reasonable cost. The manner in which I propose to accomplish the object may be stated, in a general way, to consist—

First. In providing a vessel of a good model, shallow draft of water, and of a capacity to carry coals and machinery sufficient to excel in speed the vessel to be attacked.

Second. In providing means for sinking it to the deck by water-ballast when going into action, so as to expose the smallest possible amount of the ship to an enemy's fire, which part only would require to be plated with thick iron to protect it.

Third. In making the deck convex or circular both longitudinally and transversely, so that when the vessel is sunk to a fighting trim the sides of the deck will be below water and the surface exposed will be presented to an enemy's shot at a low angle, and the center of the deck sufficiently above water to enable the vessel to be worked in a sea-way.

Fourth. In forming in the middle of the deck a low oblong trunk projecting a short distance above it, which is also plated and made a part of the deck, through the sides of which are small holes, through which observations are made, and the deck can be defended by musketry, by ejecting hot water, or in any other manner. Through the top of this trunk the smoke from the boilers emerges and the ventilation is effected, and within the same the movements are directed and the vessel steered.

Fifth. For the purposes of attack the vessel is provided with, say, three or more breech-loading cannon of large caliber, which are mounted one at the bow ranging fore and aft, and one on either side ranging athwartship, the muzzles of which extend through the sides of the ship at a considerable distance (say ten feet, more or less) under water, and are provided with many accessory devices, to be hereinafter fully described, to enable the guns to be worked under such conditions. They are designed to carry a large hollow oblong projectile or shell carrying a great bursting charge, which is to be thrown into the hull of the vessel attacked and there exploded by a fuse. The guns are passed through stuffing-boxes in the side of the hull and have no movement, excepting in a longitudinal direction, and are not proposed to be aimed, as they are designed to be used only when near to the object to be assailed.

My invention consists in the first place in the employment, in connection with a vessel so defended with armor-plates or their equivalent that it may approach an enemy with safety, of ordnance constructed and operating substantially in the manner to be hereinafter explained, which is arranged so as to project horizontally through the side of the vessel below the surface of the water, and to be worked in that position for the purpose of attacking a hostile ship in parts that cannot be assailed from above the water; second, in

making the guns with the part that passes through the side of the ship cylindrical and the employment therewith of a suitable gun-carriage to support the breech of the gun, a stuffing-box and socket or sleeve in the side of the vessel to receive the muzzle of the gun, and an external port or shutter which closes outside of the gun, or other devices equivalent thereto, for the purpose of enabling the gun to be drawn in and loaded or removed and run out to be fired; third, in displacing the water from the bore of the gun when it is loaded by means of a hollow displacing-case, or its equivalent, which nearly fills all of the bore of the gun not occupied by the charge, so as not to fire against a column of water within the gun equal to the contents of the bore, but to start the projectile and move it while within the gun in an atmosphere of air or gas.

The same letters are used in all the figures to indicate the same parts.

A represents the hull of the vessel, made of iron in the usual way, and of the usual form of model below the water, adapted to sail in shoal water and propelled by a screw with any desired form of engines and boilers, the positions only of which are represented in the drawings, as my invention does not pertain to them. It is also designed to be fitted with water-tight bulk-heads in appropriate places for safety and convenience, which are not represented.

B represents the deck. Its general form transversely to the ship is that of a portion of a circle joined to the sides of the hull by a circle of smaller radius, which is tangent to both, as is shown in Fig. 3, which represents the form amidships. This form is adopted for the purpose of having it at the center at considerable height above the water when the sides are below the water, and also to present the exposed surface at a low angle to an enemy's fire, and it is also a good form to repel boarding by the enemy. This deck is covered with iron plating, which extends some distance below the water when the hull is submerged, of sufficient thickness to repel any shot that may be fired against it, which from the low angle of the surface presented to an enemy's fire may be made of much less thickness than if it were exposed at nearly a right angle. The radius of curvature of the deck diminishes toward each end and forms into the bow and stern, so as to show a curved outline longitudinally, as is seen in Fig. 1. This form of constructing the deck is important as enabling the upper part of the ship to be made invulnerable by a minimum weight of plating, which again enables an amount of efficiency in speed and capacity to be obtained by a smaller ship than could be otherwise done.

C is a trunk or observatory, built in the middle of the deck and projecting a short distance above it, of the form shown in the drawings, and plated also with metal heavy enough

to withstand any shot that can be thrown against it. It is provided with "peep-holes" c, through the sides, as shown, through which external objects may be observed and the deck defended from boarding by musketry or otherwise, as has been before stated. The trunk upon the top is provided with shot-proof gratings D and E. Through the grating D the smoke from the chimney emerges, and through the gratings E the ventilation of the hold is effected by blowers arranged in any suitable manner. This trunk is built in with the deck and forms a part of it, and by projecting above the deck it enables an open communication to be preserved from the hold to the external air when in a seaway, with the vessel submerged to a fighting trim, preventing the waves that would come on deck from entering the interior.

F F are fan-blowers for ventilating the hold, and they are provided with suitable pipes leading to the several compartments. It is proposed to discharge the foul air into the space around the chimney; but it may be arranged in any convenient manner. G G are tanks or compartments for the water-ballast to sink the vessel to fighting trim. They may be disposed in any convenient manner and provided with proper sea-cocks for filling the same and pumps for emptying them worked by a steam-engine.

The employment of blowers for ventilating vessels and of water ballast and the sinking and raising of vessels by filling and emptying tanks or compartments not being of my invention, I do not deem it necessary to describe and represent these parts in detail, but mention them only as forming a part of the arrangement in my system of armament which may be constructed in any way that will best accommodate the purposes of the vessel.

H is the rudder-stock, which passes through a stuffing-box, h, in the stern, as shown, and is worked by a tiller, b, and chains extending forward under deck to the steering-wheel I within the trunk in the ordinary manner.

J J J are the guns. They are made to load at the breech in any well-devised manner that is found to be efficient. The form shown is substantially that of the "Armstrong gun," so called, as a good example. They are made very heavy, and from about the middle to the muzzle they are made cylindrical, so as to be able to slide back and forth in the stuffing-boxes K in the side of the hull. They are mounted at the breech upon the slides L, which move longitudinally upon their beds M in the manner of the modern improved ships' gun-carriages. They have only a longitudinal movement to run out the gun to fire it, and to permit its recoil when discharged, or to be drawn in to load it. To prevent too great an extent of recoil, the slides L are made to bring up against a series of india-rubber springs or cushions, N, which arrest a further inward movement. The slides L, are provided

with trucks *a a*, which are worked upon an eccentric shaft in the usual way to facilitate the running out of the guns, and may also be provided with frictional devices to increase the resistance to recoil, as is done in gun-carriages now used. They are also provided with a rack and pinion, *T*, worked by a ratchet-lever, *U*, to run out the guns; or they may be worked by tackles instead. The stuffing-box *K*, which forms a socket for the gun, is securely fastened to the hull either at the bow or at the side, as shown in the drawings, and is provided with a shutter or port, *P*, which is made to shut water-tight and to open outward and upward, and is worked by jointed rods *Q*. The port of the bow gun is made pointed externally, to offer less resistance to the water when the vessel is in motion, but those at the side are made to shut in flush with the outside. The rods *Q* pass through longitudinal passages and stuffing-boxes on each side of the gun, so that the shutter or port can be opened and closed upon the inside by moving the rods *Q* back and forth. When the gun is drawn in and the shutter closed, it permits the breech of the gun to be opened to load it, the water in the gun escaping into the hold.

The manner of loading the gun is shown more clearly in Fig. 7, where the gun and its contents are shown in section, *d* representing the charge of powder in a water-tight cartridge of copper or other suitable material, in the rear end of which at *e* is a fulminating primer within it, which is exploded by a driver or needle, *g*, inserted at the center of the vent-piece *f* by a blow upon the outer end, *h*, from a lock or hammer; or, instead thereof, the cartridge may be fired in any other suitable manner. The outer end of the driver *g* is held by the bar *i* upon the breech-screw *V*, which is constructed so as to be removed with the driver when the gun is to be opened.

R is the projectile. It is a long thick shell of sufficient strength to penetrate a ship's side where not defended by thick plating, and has a cavity sufficient to contain a large quantity of gunpowder. It is designed to be fired with a small charge, so as not to send it out of an enemy's vessel at the opposite side, and to be itself fired by a fuse. The remainder of the bore is filled with a water-tight case, *S*, of tin or other thin metal, whose purpose is to displace the water from the bore of the gun, so that the discharge will not have to expel a mass of water therefrom, the weight of which would have the effect of adding so much to the weight of the projectile and produce an increased recoil of the gun. This case may be made to inclose the projectile and charge or occupy the space in front of

them, as may be desired. The case, projectile, and cartridge all fit the bore loosely, as there is no provision for firing with accuracy, nor is any needed, as they are designed to fire at an object only when near it; but the guns may be rifled or the projectiles made with wings to give them rotation to insure their motion endwise, if desired. These guns I propose to arrange as shown—namely, one at the bow and in a line with the keel and one at either side, or two or more could be placed at the side, if desired.

W is the windlass, placed below deck with the cable leading upward over a sheave, *X*, on deck to a hawse-pipe, *Y*, as is shown. The vessel may be fitted with hatches where required, closed by gratings or hatch-covers made shot-proof.

The manner of attack by such a vessel is to chase the enemy at a light draft until within reach of his guns. The vessel is then submerged, so as to expose only the deck to his fire, which enables it to approach him with impunity. When almost in contact with him, the gun that bears most advantageously upon him is fired, and the projectile is thrown through his side far below the part usually protected by platings and left within the hold to explode at the proper time and destroy everything in its vicinity. No vessel ever yet made could withstand the effect of one shot under such conditions, neither the explosion of the shell nor the opening made through the side so far below water. One shot would suffice to end the conflict.

Having thus set forth my invention, what I claim is as follows:

1. The employment of a gun or guns constructed and operating substantially as described in a ship so constructed and defended with armor-plates or their equivalent that the ship may approach an enemy with reasonable safety, substantially in the manner and for the purpose described.

2. Combining a gun constructed and employed in a vessel as described, with an appropriate gun-carriage to support the breech, a socket and stuffing-box in the side of the hull to support the muzzle, and an external port or shutter or other devices equivalent thereto to enable the gun to be worked, substantially as described.

3. Displacing the water from the bore of the gun between the charge and muzzle by means of an air-tight displacing-case or its equivalent, substantially as described.

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