

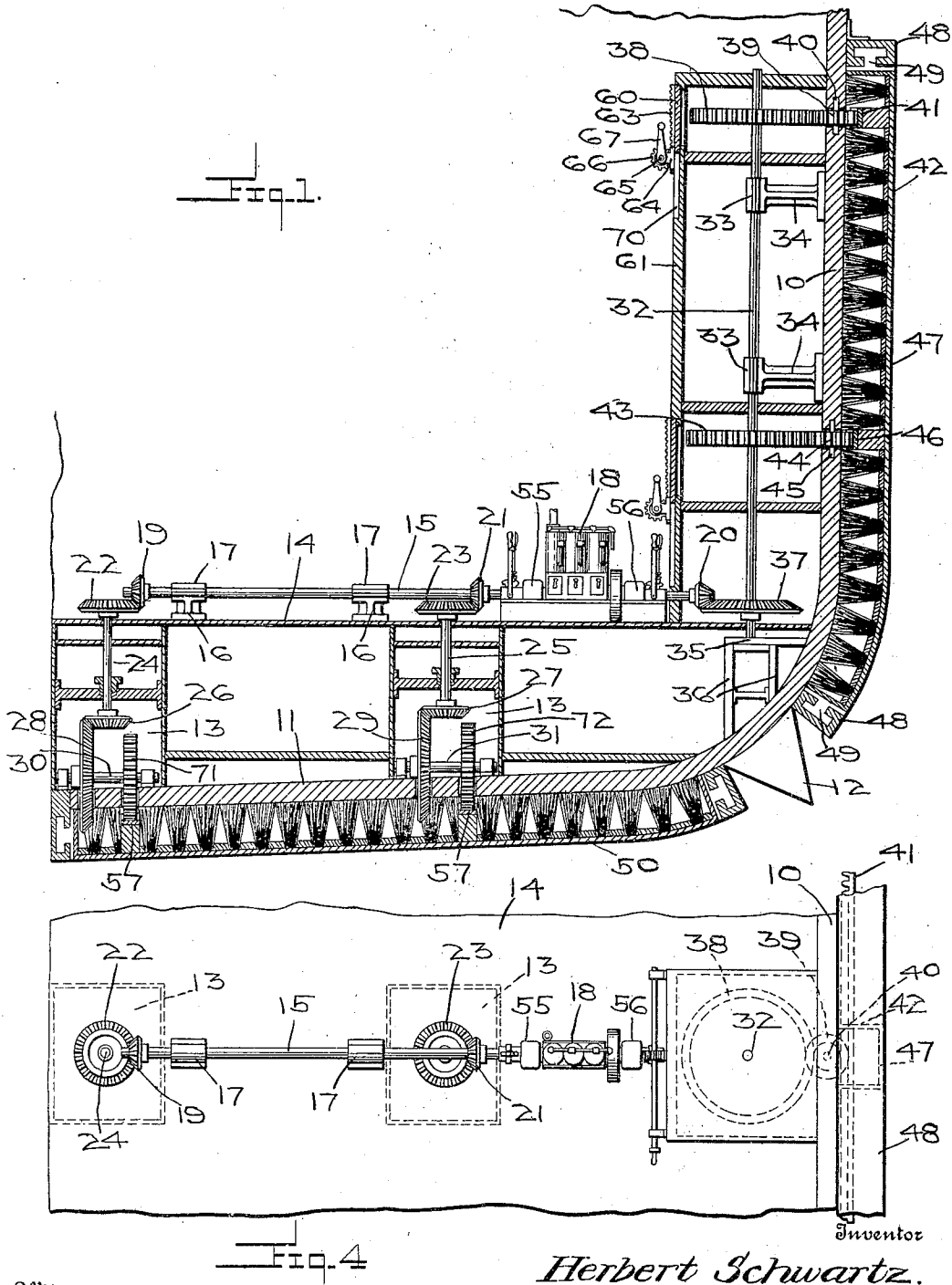
H. SCHWARTZ.
SHIP CLEANER.

APPLICATION FILED MAY 12, 1908.

938,794.

Patented Nov. 2, 1909.

3 SHEETS—SHEET 1.



Witnesses
Ed. P. Lushy.
E. L. Chandler

By Woodward & Chandler
Attorney

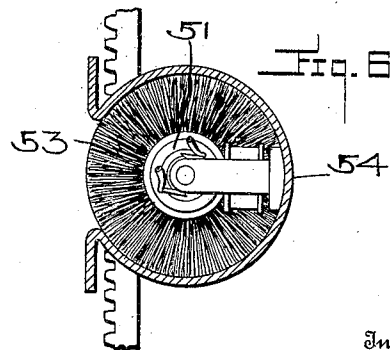
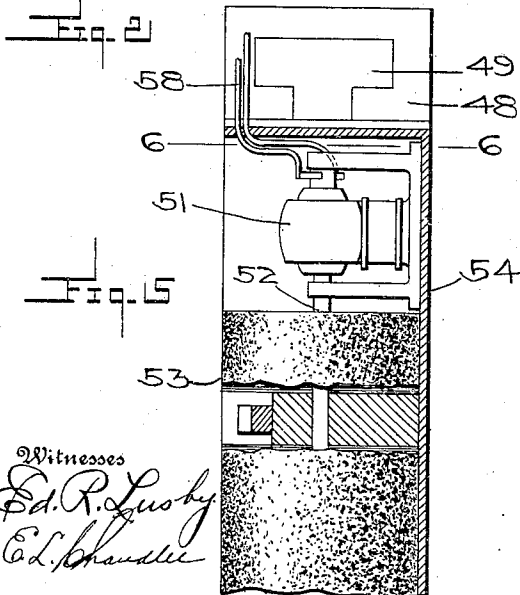
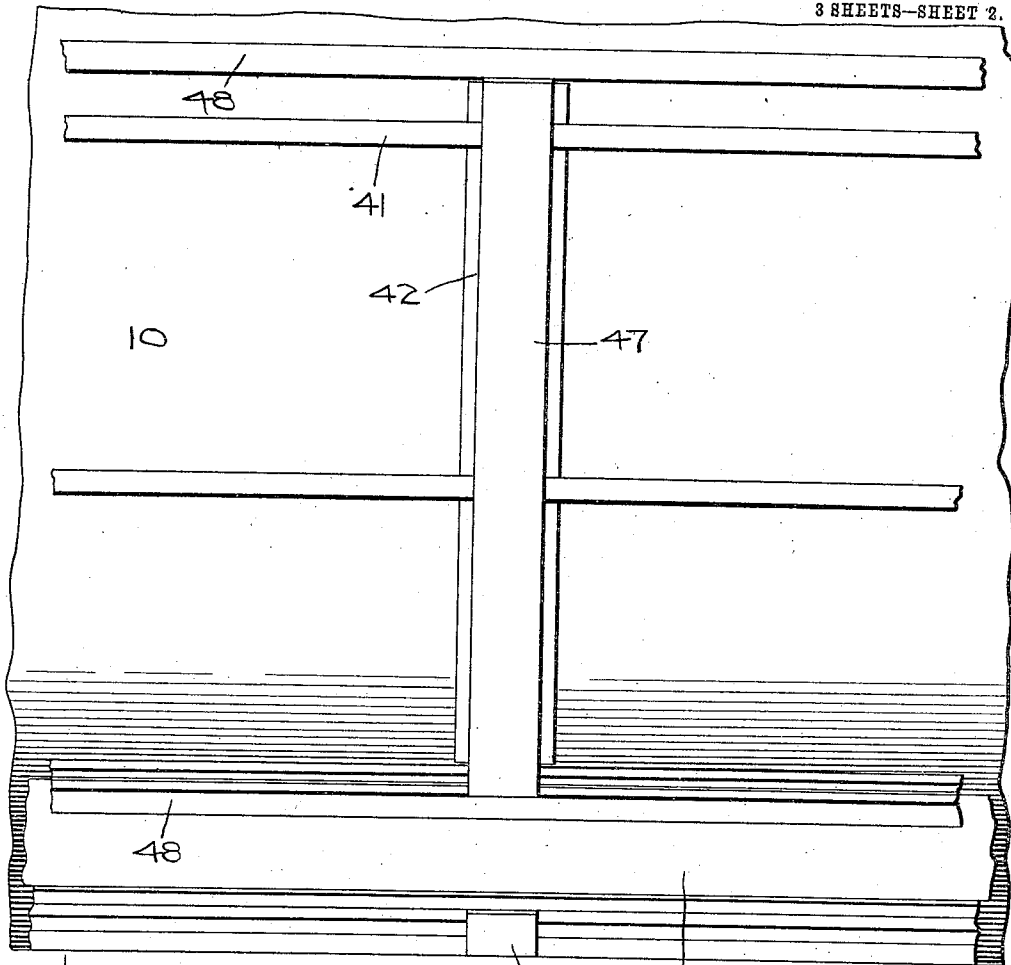
H. SCHWARTZ.
SHIP CLEANER.

APPLICATION FILED MAY 12, 1908.

938,794.

Patented Nov. 2, 1909.

3 SHEETS—SHEET 2.



Inventor

Herbert Schwartz

By *Woodward Chandler*

Attorney

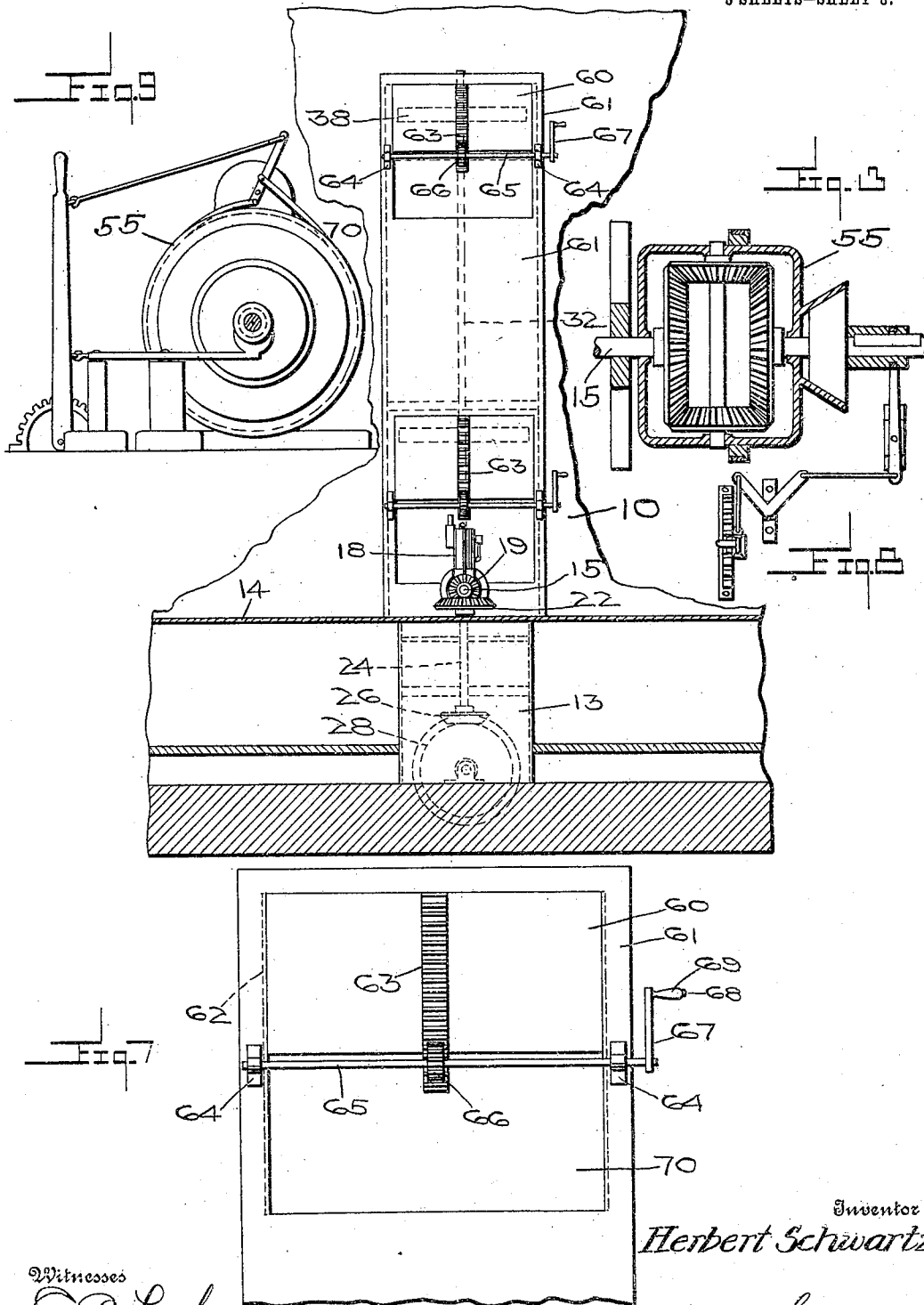
H. SCHWARTZ.
SHIP CLEANER.

APPLICATION FILED MAY 12, 1908.

Patented Nov. 2, 1909.

3 SHEETS—SHEET 3.

938,794.



Witnesses
E. R. Lushy
E. L. Chandler

Inventor
Herbert Schwartz
By Woodward & Chandler

Attorney

UNITED STATES PATENT OFFICE.

HERBERT SCHWARTZ, OF NASHVILLE, TENNESSEE.

SHIP-CLEANER.

938,794.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed May 12, 1908. Serial No. 432,480.

To all whom it may concern:

Be it known that I, HERBERT SCHWARTZ, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Ship-Cleaners, of which the following is a specification.

This invention relates to devices for cleaning ships' bottoms and has special reference to devices of this character which are carried by and operated from the ship to be cleaned.

An object of this invention is to form a device of this nature that will be accessible at all times and will always be ready to put in operation whether the ship is traveling or docked.

Another object is to construct a device of this character that will be operable from within the ship by any convenient source of power.

A further object is to provide a means of giving the traveling brushes a rotary motion independent of all main operating engines.

The invention has for a further object the provision of means for effecting the above enumerated results which will take but small space in the ship and protrude but a slight distance from the sides of the ship.

A still further object of this invention is the provision of an apparatus that will conform to the bilge of the vessel and yet operate effectively for the removal of substances which adhere to the outer surfaces of vessel bottoms below the water line.

Other objects and advantages will be apparent from the following description and it will be understood that changes in the specific structure shown and described may be made within the scope of the claims and that any suitable materials may be used without departing from the spirit of the invention.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a cross sectional view of a ship, the starboard side only shown, Fig. 2 is a side elevation of the outside of the starboard side, Fig. 3 is an inside elevation of Fig. 1, Fig. 4 is a top plan view of the same, Fig. 5 shows a modification of a rotary brush and an operating mechanism therefor, Fig. 6 is a top plan of the same. Fig. 7 is a front elevation of one of the bulkhead doors and casing therefor. Fig. 8 is a detail hori-

zontal section illustrating the reversing mechanism, Fig. 9 is a side elevation of the same.

Referring to the drawings, 10 designates the wall of a ship extending below the water line and 11 represents the bottom of the ship while 12 is the bilge-keel. On the bottom 11 are formed two chambers 13 which are rendered water-tight in any well known and efficient manner, the walls of which support a flooring or platform 14 upon which is mounted the operating mechanism of the invention. Transversely of the ship a shaft 15 is mounted revolvably upon the platform 14 in suitable standards 16 having journal boxes 17. Disposed near the side of the wall 10 is an engine 18 for the purpose of operating the mechanism. The shaft 15 carries gears 19, 20 and 21, the first two being disposed at opposite ends of the shaft 15 and the latter one intermediately thereof. The gears 19 and 21 are disposed directly above the chambers 13 and meshed with the gears 22 and 23, which are mounted upon the upper ends of the vertically disposed shafts 24 and 25. Horizontally disposed beveled gears 26 and 27 are carried upon the lower ends of shafts 24 and 25 respectively engaged with the gears 28 and 29 which are mounted upon counter shafts 30 and 31 supported near the bottoms of the chambers 13. A vertically disposed shaft 32 is mounted in the journal boxes 33 carried by the inwardly extending brackets 34 on the wall 10 and is supported at its lower end by the thrust bearing 35 which is supported by standards 36. At the lower end of said shaft 32 a beveled gear 37 is employed engaging with the gear 20 on the power shaft 15. On the upper end of the shaft 32 a gear 38 is carried which meshes and operates a pinion 39 loosely mounted upon a counter shaft 40 carried by the wall 10. The pinion 39 extends through the side of the ship and engages in a rack bar 41 which carries a casing 42 outwardly thereof. Intermediately upon said shaft 32 there is a gear 43 meshing and operating a pinion 44 mounted similarly to the one 39 and engaging a rack 46 which also supports the casing 42. The casing 42 extends vertically in spaced relation with the side of the ship and is open upon the inner side. The outer side 47 of the casing 42 carries upon its inner face a plurality of steel bristles which engage the side and act as a brush when in operation. The lower end of the

casing 42 is shown as being curved toward its lower end to conform to the curvature of the bilge of the ship. Longitudinal T-shaped runways 48 are provided upon the side at a distance apart equal to the length of the casing 42 and which are engaged by T-shaped guides 49 carried on the ends of said casing. Upon the bottom 11 of the ship the same arrangement is provided. Here the gears 71 and 72 engage in rack bars 57 carrying the brush mechanism 50.

In Figs. 5 and 6 a modified form of the brush is disclosed where a motor 51 is mounted on the brush shaft 52 which carries steel bristles 53, the whole apparatus being inclosed in a cylindrical casing 54 having the same form of guides 49 which are adapted to travel in the runways 48. The casing 54 must necessarily have an opening at the side next to the side of the ship.

It will be obvious that the cleaning mechanism above described is adapted for operation in either direction.

For the purpose of disconnecting the power shaft 15 from the engine 18 or reversing the rotation of the shaft 15 a suitable clutch 55 is disposed at one side of the engine to regulate the brush mechanism 50 while a second clutch 56 is employed to transmit the motions of the engine to the shaft 32.

Although these drawings show only the starboard side of the ship the apparatus thus shown is duplicated on the port side in actual practice.

In operation, the motor 18 being started, when the transmission 55 is operated the shaft 15 is thrown into rotative position. As the shaft 15 revolves the gears 19 and 21 revolve and operate the shafts 24 and 25 through the gears 22 and 23. Thus the gears 26 and 27 are caused to revolve and actuate gears 28 and 29 which through gears 71 and 72 operate the racks 57 moving the casing 42 in the runways 48 directed by the guides 49. This causes a sliding contact of the steel bristles and clears the outer surface of the bottom 11. Similarly, when the transmission 56 is operated the casing 42 is moved along the ship, cleaning its outer surface.

If the rotary brushes are used instead of the ones shown in the first four figures, a waterproof cable 58 will be used to convey the current from the ship to the motor 51 in the casing. The operation of the casing will be the same, the difference residing in the fact that the motor 51 is revolving the bristles 53 and causing a more rapid contacting of the bristles 53 than is effected by the simple reciprocation of the casing 42.

Fig. 7 illustrates a door 60 suitable for access to the chambers 13, or other inclosures around the mechanism mounted in a casing 61 and adapted to vertically

reciprocate in the same. The door 60 is held in position by tongues 62 which engage grooves formed in the inner faces of the casing 61. The door 60 is provided upon its outer face with a rack 63 which extends the full height of the door and a slight distance below the same. The casing 61 is provided with forwardly extending journal boxes 64 which are disposed upon the opposite sides of the door 60 and which support a shaft 65 which extends across the face of the door. A pinion 66 is keyed intermediately upon the shaft 65 which engages the rack 63 and operates the door 60. The shaft 65 is provided with a crank 67 on one extremity thereof which carries a pin 68 upon which is rotatably secured a handle 69. The casing 61 is provided with a recessed portion 70 in its outer face disposed directly below and in a line with the door 60 for the purpose of receiving the door when the same is in an open position. The crank 67 is rotated through the medium of the handle 69 and pin 68 to cause the revolution of the shaft 65 and the pinion 66. This motion actuates the rack 63 which causes the door 60 to be moved either up or down according to the direction in which the crank 67 is rotated.

What is claimed is:

1. A device of the character described comprising a ship, a plurality of runways longitudinally disposed thereupon, a casing mounted on said runways, racks carried by the casing, gears carried by the ship in engagement with said racks, means for reciprocally actuating said gears, and means for rotating a brush disposed in said casing.

2. A device of the class described comprising a ship, runways mounted on the sides thereof, a casing slidably disposed on said runways, said casing being opened at one side against the ship, a brush disposed in said casing for engagement against the side of the ship, a rack carried by said casing, gears carried by the ship for engagement with said rack and means for actuating said gears, said mechanism being adapted for reverse operation.

3. A device of the character described comprising a ship, gears carried thereby, a cleaner on the side of said ship, said cleaner comprising a casing which is opened against the ship, bristle members in said casing extending through said opening, laterally disposed racks on said casing, engaged with the gears, runways on the outside of said ship, guides carried by said casing adapted to engage in said runways and operative connections for the gears.

4. A device of the character described including a motor, shafts connected to said motor, gears on said shafts, gears meshing with gears on said shaft, racks adapted to be operated by said gears and brush mem-

bers constructed and adapted to be carried by said racks.

operative connections for said trains of gears.

In testimony whereof I affix my signature, in presence of two witnesses.

HERBERT SCHWARTZ.

Witnesses:

FRANK P. BOND,
RICHARD S. WEITZELL.

5. A device of the character described comprising a ship, brush members on the outside of said ship, racks on said members, trains of gears extending through the wall of said ship and engaging said racks, chambers surrounding said trains of gears and