W. MARTIN.

APPARATUS FOR CLEANSING SHIPS' BOTTOMS.

No. 176,655. Patented April 25, 1876.

Fig: 1.

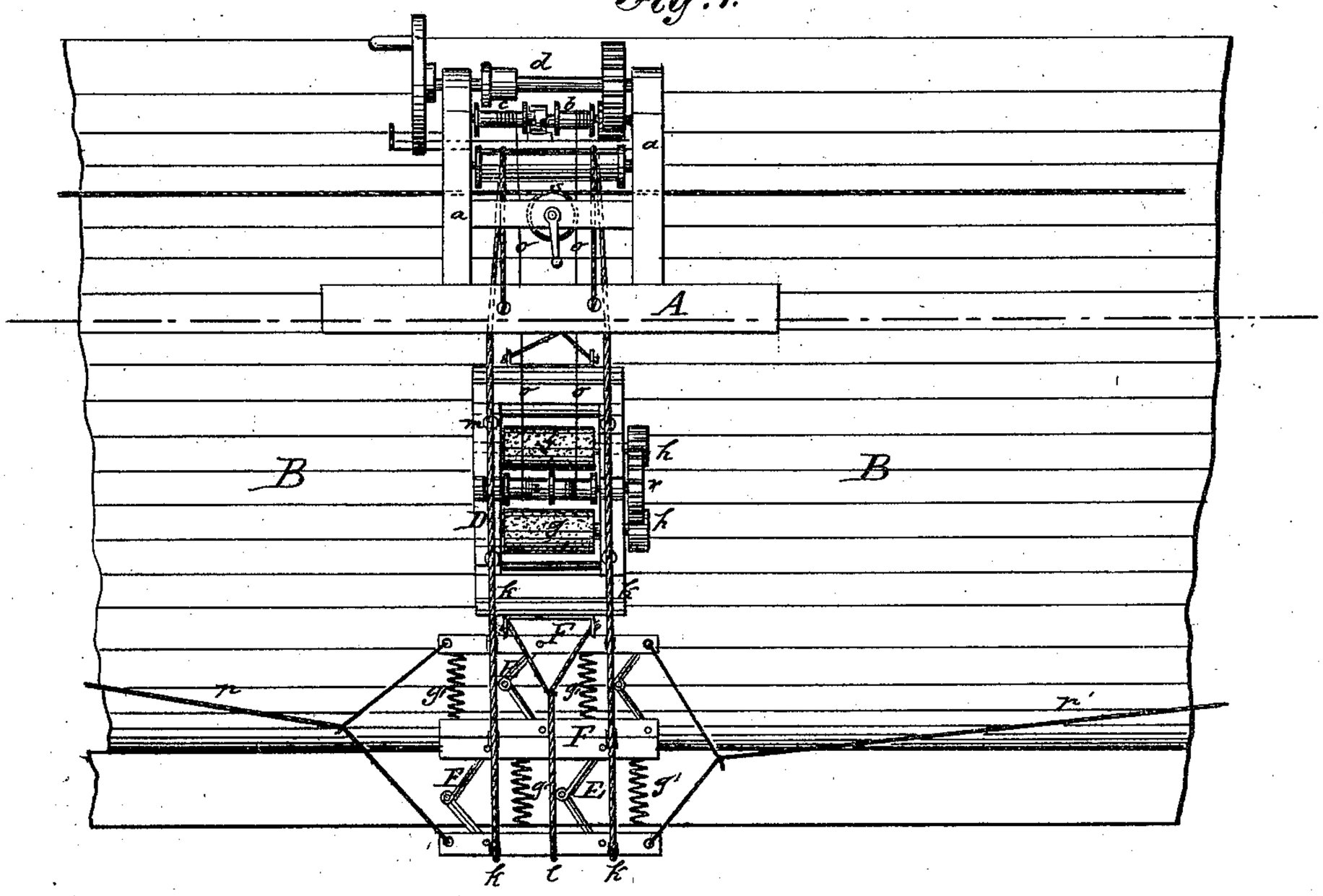
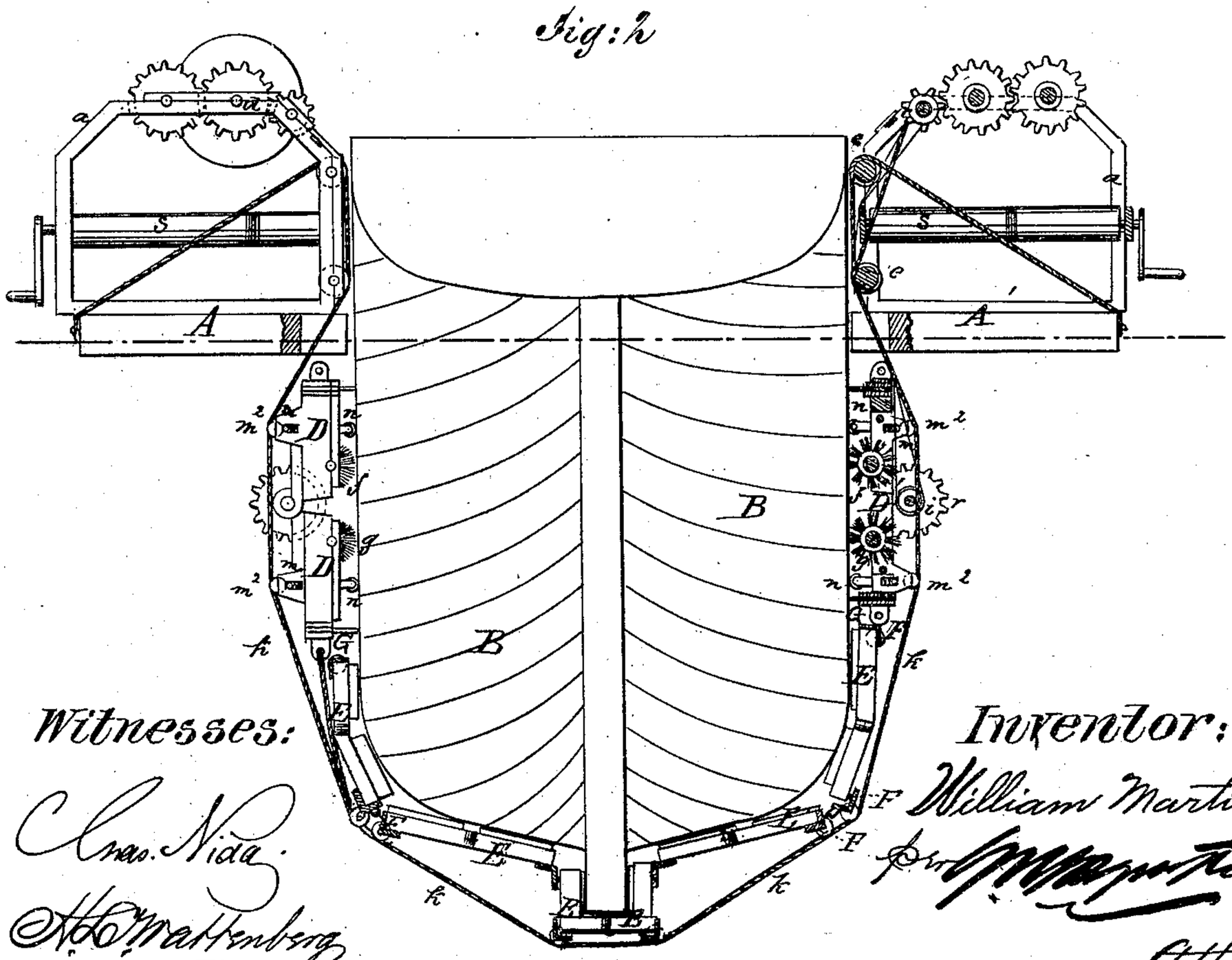


Fig: 2.



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per

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UNITED STATES PATENT OFFICE.

WILLIAM MARTIN, OF POUGHKEEPSIE, ASSIGNOR OF ONE-THIRD HIS RIGHT TO ISAAC HEYMAN, OF SAME PLACE, AND ONE-THIRD TO THOMAS WILSON, OF WADDINGTON, NEW YORK.

IMPROVEMENT IN APPARATUS FOR CLEANSING SHIPS' BOTTOMS.

Specification forming part of Letters Patent No. **176,655**, dated April 25, 1876; application filed July 21, 1875.

To all whom it may concern:

Be it known that I, WILLIAM MARTIN, of Poughkeepsie, in the county of Dutchess and State of New York, have invented a new and Improved Apparatus for Cleansing Ships' Bottoms; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention is in the nature of an improved apparatus for cleaning ships' bottoms; and the invention consists in a series of adjustable brushes and scrapers constructed to cleanse the bottom of a ship and its keel, and to be operated from boats or floats alongside the ship, so that the ship's bottom may be thoroughly cleansed without the necessity of putting her into dock for this purpose, as will more fully appear from the following description and accompanying drawings, wherein—

Figure 1 is a side view of my apparatus for cleansing ships' bottoms; and Fig. 2 an end view, partly in section.

Similar letters of reference indicate like parts in both figures.

It is well known that the fouling of the ship's bottom offers serious obstruction to her sailing, and that it becomes frequently necessary to put the ship in dock to clean the bottom from this accumulation of animal and vegetable matter, and that the docking of the ship is not only expensive, but it consumes much time that would otherwise be profitably employed by the ship. To obviate this expense and loss of time, I construct a series of devices which will effectually scrape, and brush, and remove all of the accumulation of foreign matter that is commonly found on the bottom of ships, such as shell-fish, seaweeds, &c., that attach themselves to and befoul the ship's bottom, and this removal is effected without the necessity of putting the vessel in the dock. To do this I place upon floats or camels A A′ frames *a a*, which support, in suitable bearings, windlasses *b* and *c*, and the necessary gear-wheels and shafts *d* and *e*, with their cranks for operating the same. These floats are moored, as shown in Figs. 1 and 2, one on each side of the hull of the vessel B. Depending from them into the water are carriages D D′. To these carriages are fixed, in suitable bearings, revolving or other brushes *f* and *g′*, and also the gear-wheels *h* and drums *i* designed to operate said brushes. These carriages, with their brushes, rest closely against the ship's side, and to their lower ends are secured, in a suitable manner, a series of scrapers, E, which may be of any desired construction, preferably, however, hinged and supported between plates F, to which are also secured springs *g′*. These scrapers pass under the keel of the ship, so that some of them will rest against the under surface of the keel, the whole series of scrapers, plates, and springs forming, as it were, a chain, the "bight" of which presses against the bottom of the keel, and the ends being secured to the carriages D D′ on each side of the hull. The carriages and the series of scrapers are firmly held in position by suitable lines *k k* and *l l*, the lines *k k* resting upon little plungers *m*, in the upper ends of which plungers are fitted pulley-wheels m^2, and into their lower ends small truck-wheels *n*, the lines *k k* extending upward and being secured to the floats A on each side of the vessel's hull, so that as they are hauled taut they confine the carriages D D′ and the scrapers E closely to the ship's side, the scrapers and their plates adapting themselves to the irregular surfaces of the hull. From the drums *i* pass upward, to the float, lines *o*, these lines being wound about the drum *i*, and also about the windlass *c*. This windlass *c*, as well as the drum *i*, is made in two sections, and each section may have its appropriate line, the lines, however, being wound about the drums and windlasses in different directions—that is, one is coiled about them to the right and the other to the left. From the under side of the supports F of the scrapers E, or rather from the lower one of the series, is secured a guy-rope, *p*, extending forward to a boom with a block seized to its outer end, through which block the guy-rope *p* is rove, the end of the guy-rope being carried to and around the windlass *s*.

My hull-cleaneing apparatus being con-

structed substantially as above described, it is operated as follows:

The carriages, with their brushes and the scrapers, being in position so as to pass down the sides of the ship and under the keel of the same in the manner before described, the floats A are moored to the sides of the vessel—at, for instance, the bow of the same—and, the sustaining-lines *k k* being hauled taut, the brushes and scrapers are confined to the sides of the hull and keel, the springs *g'* between the supporting-plates F of the scrapers permitting the scrapers to adjust themselves to the inequalities in the form of the ship's side, and the guy-rope *p* being in position in the manner mentioned, and a similar guy-rope, extending to the stern of the ship, being in position also, power, either manual or otherwise, is applied to the shaft *d*, causing the gear-wheels thereon to revolve and, through them, the windlass *c* to turn and wind thereon the lines *o*, which, as they are unwound from the drums *i*, cause said drums to revolve, giving motion to a suitable gear-wheel, *r*, attached to it, which latter gear-wheel meshes into the gear-wheels *h* on the revolving brushes *f* and *g*, causing them to revolve rapidly in their bearings, and, as they are in contact with the sides of the ship, brush from it the accumulating foul matter thereon. When this brushing has been accomplished in one position, the windlass *b* is turned by a suitable crank or otherwise, winding up as it is turned the guy-rope *p'*, that passes from the bottom of the scrapers to the after part of the ship, and, the mooring-lines of the floats A being slackened, the scrapers are hauled aft a distance equal to the width of the brushes, when, the lines being made taut again, the operation of revolving the brushes, just described, is repeated, and so on, from time to time, until the entire length of the vessel has been reached.

Now, as these guy-lines are hauled in, the scrapers E are forced from time to time along the sides and keel of the ship, and as they are thus forced they scrape off the accumulated barnacles and other matter which adheres to the vessel and its keel. In this way the entire surface of hull and keel is effectually brushed and scraped and rendered clean.

The carriages D D' may, if desired, be made in sections or links, so that, in brushing a vessel of deep draft or high sides, two or more may be linked together, each link bearing a set of brushes; or, if desired, a guy-rope may be attached to the end of a single carriage, so that it could be raised or lowered, if desired, to enable the brushes to reach the entire surface of the hull.

In addition to the revolving brushes, fixed brushes G may be secured to the carriages, these fixed brushes operating, when the entire apparatus is moved from stem to stern, as before described; or the revolving brushes and the fixed brushes may be combined in one carriage, as shown in Figs. 1 and 2.

The drums *i* and windlass *c*, as before stated, may be made in sections, with the line *o* wound about them in reverse directions, so that by alternately revolving the shaft *d* the brushes may be made to revolve first in one direction and then in the other, which operation would more effectually tend to brush off the accumulated matter from the sides of the ship.

The office of the plungers with the truck-wheels thereon is to keep the carriages D D' from the sides of the vessel, so that they may not be chafed, and also enable it to be easily moved up and down, the truck-wheels revolving as the carriage is moved.

The line *l*, hereinbefore referred to, has a double purpose, viz: keeping the lower end of the carriages close to the vessel's sides, and also aiding in keeping the scrapers in the proper position.

I do not wish to confine myself to any particular construction of the parts I have hereinbefore described; but

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

1. In a device for cleaning ships' bottoms, a series of rotating brushes suspended in adjustable frames, substantially as described.

2. A series of rotating brushes suspended in adjustable frames, in combination with scrapers set in frames adapted to be expanded and contracted, substantially as described.

3. The series of rotating brushes set in adjustable frames, in combination with fixed brushes therein, substantially as described.

4. The floats A, bearing windlasses, in combination with the series of adjustable rotating brushes and expanding and contracting scrapers, substantially as shown and described.

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Witnesses:

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