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J. T. BEELENDORF.

MEANS FOR SCRAPING AND CLEANING THE HULLS OF VESSELS.

APPLICATION FILED OCT. 9, 1905.

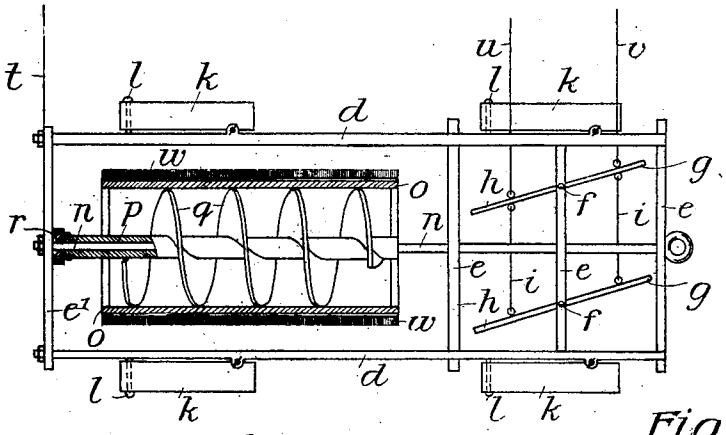


Fig. 2.

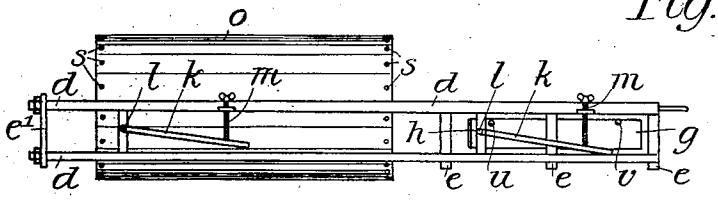


Fig. 3

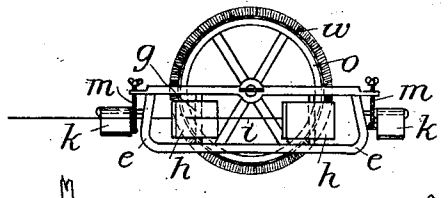


Fig. 4

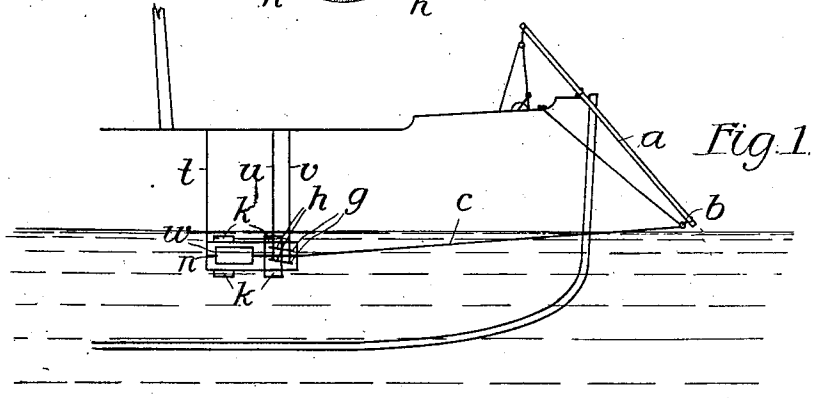


Fig. 1.

Witnesses

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MEANS FOR SCRAPING AND CLEANING THE HULLS OF VESSELS.

No. 826,012. Specification of Letters Patent. Patented July 17, 1906.

Application filed October 9, 1905. Serial No. 282,005.

To all whom it may concern:

Be it known that I, JÜRGEN THEODOR BEELENDORF, retired captain of the navy, a subject of the King of Prussia, German Emperor, and a resident of Süderende, Föhr Island, in the Empire of Germany, have invented new and useful Improved Means for Scraping and Cleaning the Hulls of Vessels, of which the following is a specification.

The present invention relates to improved means for scraping and cleaning the immersed surfaces of the hulls of vessels during their voyage.

Special objects of the invention are to simplify and cheapen the construction and to render more efficient, serviceable, and durable in operation devices of the kind referred to.

With these ends in view the invention consists in the novel combination, arrangement, and adaptation of parts, all as more fully hereinafter explained, shown in the accompanying drawings, and then specifically set out in the appended claims.

In the drawings, Figure 1 illustrates the mode of employment of my improved device. Fig. 2 shows, on an enlarged scale, the device similar to Fig. 1. Fig. 3 is an inverted plan view of Fig. 2. Fig. 4 is an end elevation seen from the right of Fig. 2.

The carrier-frame of my improved device comprises four longitudinal bars *d* and four hoop-shaped transverse pieces *e*, of which latter the end piece *e'* is removable for reasons to be explained later on. I preferably use round iron bars in the construction of the aforesaid frame. The curved portions of the transverse frame-pieces *e* facilitate the movement of the device along the overlapping plates of the hull.

The front part of the frame carries two horizontal shafts *f*, and on these shafts two plates or rudders are turnable, which serve for regulating the raising and lowering of the device in the water. The stroke of the rudder-plates can be limited by the longitudinal bars *d* of the carrier-frame. The front portion *g* of the rudder-plates, which regulates the raising of the device in the water, is longer than the rear portion *h*, which governs the lowering of same. Both plates are parallelly secured together and depending in their position and motion by links *i*. Ropes *u* and *v* are attached at each end of the top plate and run upward through suitable holes in the carrier-frame, terminating on board.

The longitudinal bars *d* of the carrier-frame are provided with outwardly-extending vertical pivots *l*, on which are mounted two plates *k k*, rotatable in a horizontal plane. The free extremities of these presser-plates *k* can be adjusted and fixed by means of screw-bolts *m* in such a manner that in accordance with the speed of propulsion of the vessel the scrubbing and cleaning device is pushed against the hull with the required force.

Centrally between the longitudinal bars *d* a shaft *n* is fixed in the transverse pieces *e e'*. After the separation of the end piece *e'* from the shaft *n*, which is effected by loosening screw-nuts or the like holding said end piece to the carrier-frame, a cylindrical shell *o* is pushed on the shaft *n* by means of a suitable nave *p*. The nave *p* is concentrically connected to the hollow shell *o* in any suitable manner—for instance, by radial stays-rods or the like. The nave *p* carries a propeller-screw *q* with a plurality of spiral coils, running from end to end of the shell *o*. The propulsion of the vessel causes, by virtue of the described arrangement of the propeller-screw *q*, the rotation of the cylindrical shell *o*. To minimize friction, it is advisable to journal the rear end of the nave *p* in ball-bearings *r*.

The cylindrical shell *o* is adapted to receive the scrubbing or scraping roller, which fits tightly on the shell and is suitably secured thereto by means of screws entering screw-holes *s*. According to the work the cleaning device is destined to execute and according to the kind of growth settled on the hull which is to be removed I may employ steel or other brushes *w* or scrubbing-surfaces of emery or the like, suitably fixed to the circumferential surface of the roller. The scrubbing or cleaning device projects sufficiently beyond the straight central portion of the transverse bars *e* of the carrier-frame to insure its proper working, as shown in Fig. 4.

The arrangement of conducting and guiding the aforesaid scrubbing and cleaning device alongside the hull is as follows: The vessel carries at its front end a spar *a*, which extends downward to or almost to the water-line and which is suitably and revolubly se-

cured on board. The lower extremity of this spar *a* is provided with a sheave or pulley *b*, which guides a thin steel hawser *c*. One end of this hawser is attached to the carrier-frame. The second end is led on board and received by a winch. The length of the hawser is chosen to enable the scrubber to reach the stern of the vessel, while the length of the spar from its point of support downward corresponds to or is at least like half the maximum width of the vessel. Besides the hawser *c* and the two ropes *u v*, leading from the rudder-plates *g h*, I found it advisable to provide a third rope *t*, attached to the rear end of the carrier-frame and running on board, which rope facilitates the hauling up of the scraper after use.

After adjustment of the presser-plates *k* by means of the screw-bolts *m* in accordance with the speed of propulsion of the vessel to insure the proper pressure of the scraper against the hull the device is lowered down into the water from the front end of the vessel. Supposing the work is to start in the descent of the device, it is necessary to hold the rope *u* taut or tight, while the second rope *v* is slackened. This causes the rudder-plates *g h* to assume the position illustrated in Fig. 1, in which the speed of the vessel attains the lowering of the scrubber by slowly letting go the rope *u*. At the same time the presser-plates *k* insure the close contact between the scrubber and the hull. The water passing through the scrubber sets the propeller-screw *q*, and consequently the shell *o*, in rotation, so that the brushes or the like on the latter scrape and clean the hull as required. On reaching the keel portion of the hull the rope *u* is let loose and the rope *v* is pulled and continually kept tight, as indicated in Fig. 2, so that the scraper rises while it performs its cleaning operations on the hull. After reaching the water-surface or the keel portion the hawser is extended the length of the scraper or less. By manipulating the rudder-plates *g h* in the manner described the raising or lowering of the scrubber is automatically attained. In order to enable the scrubber to pass the widest portion of the hull and to attain a proper working of the scrubber at the drawn-in rear portion of the vessel without undue wear of the hawser by friction along the hull, the spar *a* can be turned sidewise in its bearings till the hawser *c*, guided over the pulley *b*, runs parallel with the keel.

I wish it to be distinctly understood that I may carry out many modifications in the practical construction of my hereinbefore-described device without departing from the spirit of the invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Improved means for scraping and cleaning the immersed hulls of vessels during their voyage, comprising a carrier-frame, a cylindrical shell for the reception of a rotary scraper on its exterior surface, a propeller-screw for driving the aforesaid cylindrical shell, rudder-plates for raising and lowering the device in the water, adjustable presser-plates for insuring the contact between the device and the hull, means for operating the rudder-plates on board and means for holding and guiding the device alongside the vessel, substantially as described and shown.

2. Improved means for scraping and cleaning the immersed hulls of vessels during their voyage comprising a carrier-frame constructed of four longitudinal and four curved transverse bars, a centrally-supported shaft fixed in said carrier-frame, a cylindrical shell for the reception of a rotary scraper on its exterior surface provided with a concentric nave, said nave fitting and rotatable on the aforesaid shaft, a propeller-screw fast to the nave inside the cylindrical shell, rudder-plates for raising and lowering the device in the water, adjustable presser-plates for insuring the contact between the device and the hull, means for operating the rudder-plates on board and means for holding and guiding the device alongside the vessel, substantially as described and shown.

3. Improved means for scraping and cleaning the immersed hulls of vessels during their voyage comprising a carrier-frame, a cylindrical shell for the reception of a rotary scraper on its exterior surface, a propeller-screw for driving the aforesaid shell, a pair of rudder-plates for raising and lowering the device in the water turnable on horizontal axles, links interconnecting the rudder-plates to insure their uniform motion and position, ropes attached at both ends of the rudder-plates running upward through the carrier-frame on board for operating the rudder-plates, adjustable presser-plates mounted on vertical pivots of the carrier-frame for insuring the contact between the device and the hull, and means for holding and guiding the device alongside the vessel, substantially as described and shown.

4. Improved means for scraping and cleaning the immersed hulls of vessels during their voyage, comprising a carrier-frame, a cylindrical shell for the reception of a rotary scraper on its exterior surface, a propeller-screw for driving the aforesaid shell, rudder-plates for raising and lowering the device in the water, adjustable presser-plates for insuring the contact between the device and the hull, means for operating the rudder-plates on board and means for holding and guiding the device alongside the vessel consisting of a spar turnable in suitable bearings in all directions, a pulley at the outer end of the spar, a rope having one end attached to the carrier-frame of the device the other end

connected with a winch situated at the front portion of the vessel, said rope running over the aforesaid pulley and insuring by lateral adjustment of the spar the parallel direction of the scraper-shaft in regard to the keel at the widest part of the vessel, substantially as described and shown.

In witness whereof I have hereunto signed my name, this 22d day of September, 1905, in the presence of two subscribing witnesses.

JÜRGEN THEODOR BEELENDORF.

Witnesses:

OTTO W. HELLMRICH,

IDA CHRIST. HAFERMANN.