(No Model.)

2 Sheets—Sheet 1.

N. A. GUSTAFSON

DEVICE FOR CLEANING SHIP BOTTOMS.

No. 313,822. Patented Mar. 10, 1885.

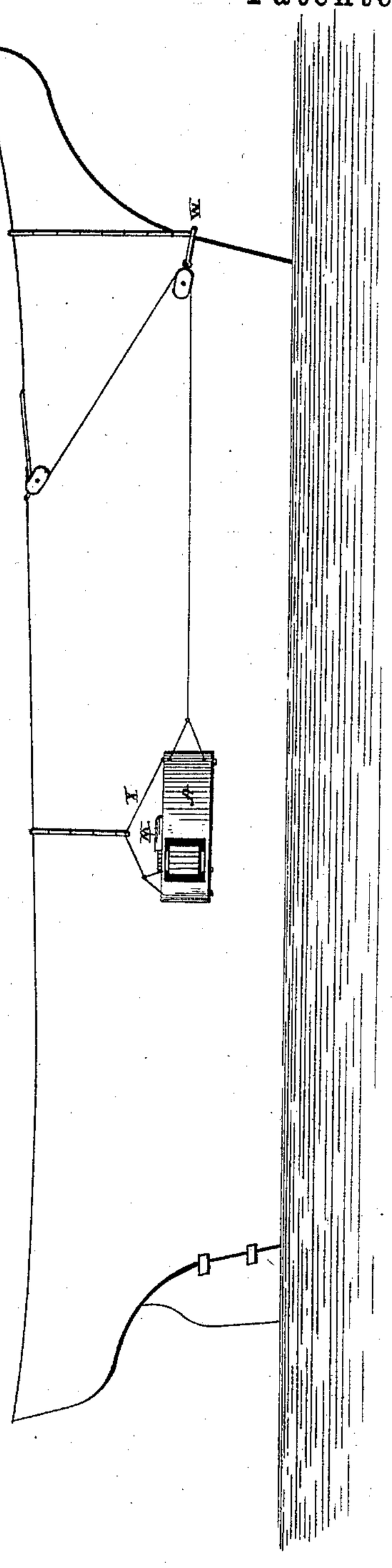

Fig. 1.

WITNESSES

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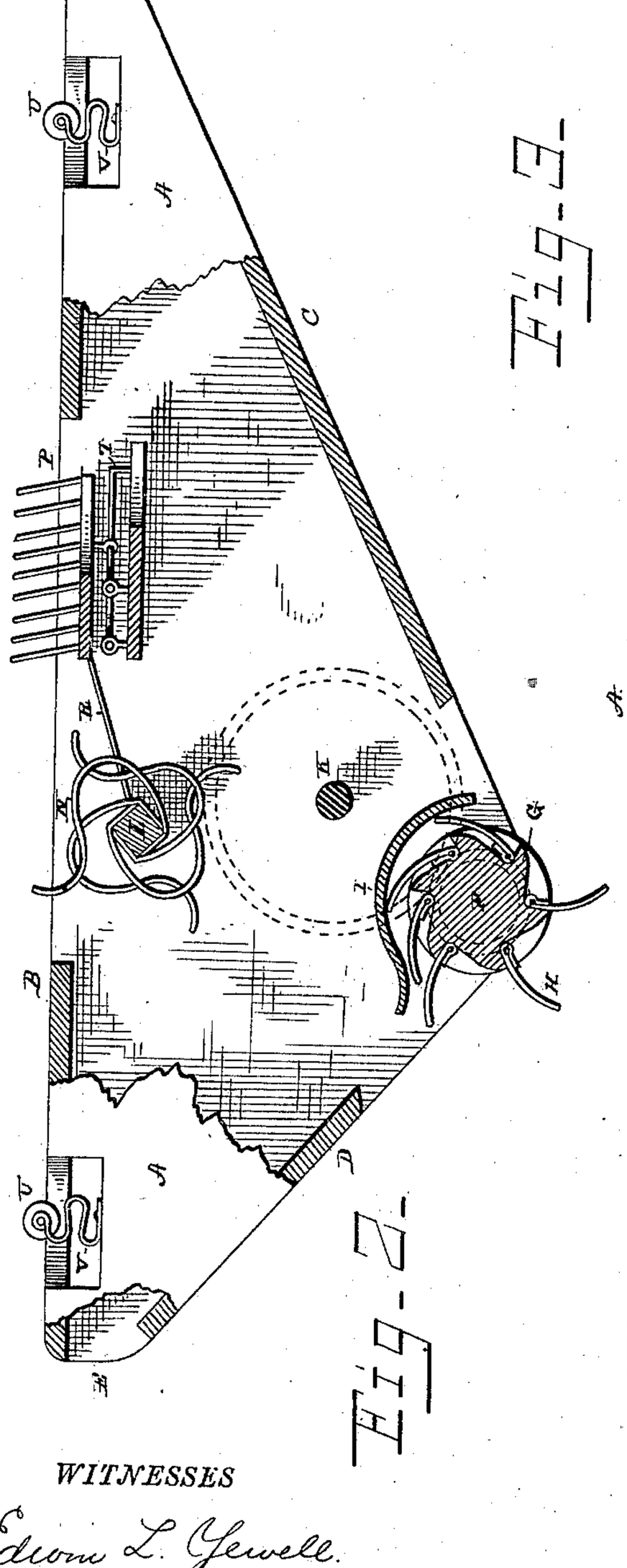
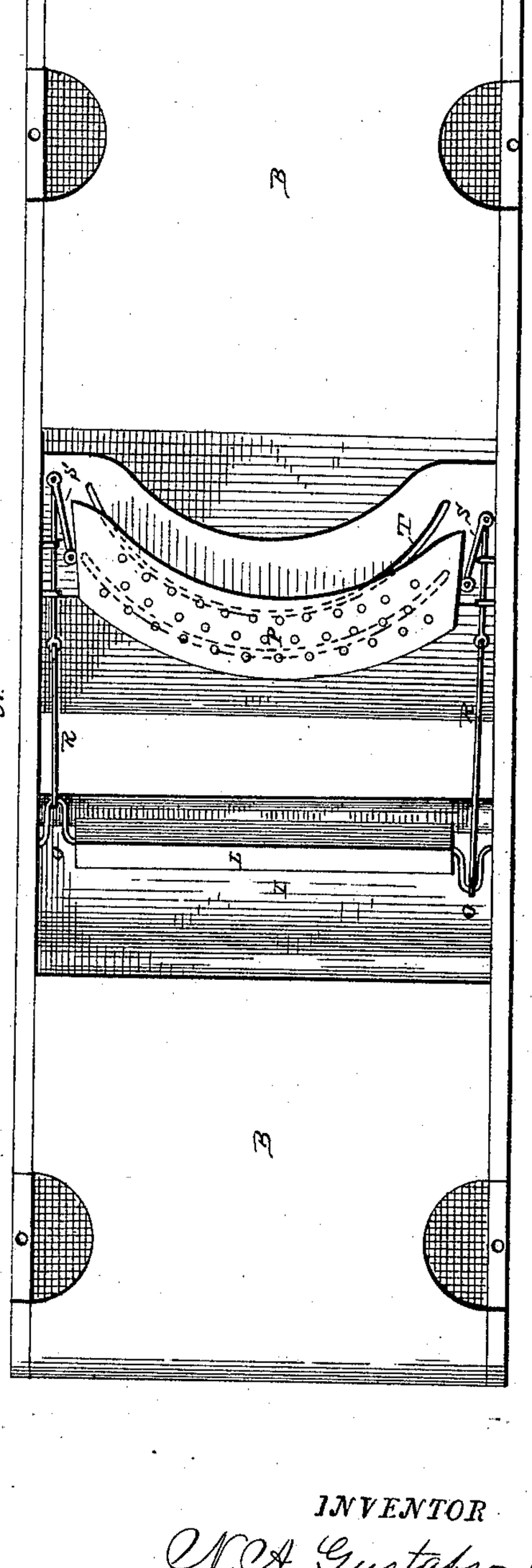


FIG. 2.



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UNITED STATES PATENT OFFICE.

NELS A. GUSTAFSON, OF LEADVILLE, COLORADO.

DEVICE FOR CLEANING SHIP-BOTTOMS.

SPECIFICATION forming part of Letters Patent No. 313,822, dated March 10, 1885.

Application filed October 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, NELS A. GUSTAFSON, a citizen of the United States, residing at Leadville, in the county of Lake and State of Colorado, have invented certain new and useful Improvements in Devices for Cleaning Ship-Bottoms, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in devices for cleaning the bottoms of ships or boats, and is designed, objectively, to produce a device which will remove the accumulations and growths from a ship's bottom, the scrapers being given motion through mechanism driven by the water in which the said ship travels.

The operation of the device is entirely automatic.

In the following description reference is had to the annexed drawings, in which Figure 1 represents the device attached to a ship, but above water-level, so as to clearly show the connections; Fig. 2, a section and plan view, and Fig. 3 an elevation of the side coincident with the ship.

A designates a box of a general triangular shape, having openings at various points for purposes set forth hereinafter. One side, B, engages with the side of the ship, and another, C, is presented to the force of the water, and by projecting outward from the front toward the rear keeps the device constantly pressed against the ship's side or bottom. The side D approaches the side B from the outermost point of the box toward the rear, but does not meet it, an opening, E, being left for the escape of water that enters the said box. A drum, F, is journaled at the outermost point of the device in an opening left by the restriction of the sides C and D. The drum has a series of longitudinal shoulders, G, against which rest hinged and curved blades H, the curving being considered preferable to flat blades. The blades are so hinged that the water will throw them outward, they resting against the said shoulders, and cause the drum to rotate, and when they have passed beyond the influence of the water a shield, I, causes them to flatten against the drum, and so offer no resistance to any water that may pass on that side of the said drum; or, in other words, they "feather." The drum carries at one end a gear-wheel, (shown in dotted lines, Fig. 2,) which intermeshes with a gear on a shaft, K, said gear imparting motion to another on a shaft, L. This arrangement gives the shaft L and the drum F a rotation in the same direction. A guard, M, protects the gear-wheels, they all being placed, preferably, on top the box. The shaft L, between its journals, is preferably made square or polygonal in cross-section, and carries a series of spring-blades, N, having their free ends formed into scraping-heads.

At each end of the shaft L, inside the box, are cranks O, which are connected to a scraper, P, by a jointed rod, R, and a short rod, S, returned in the direction of the rod R, but at an angle thereto. The scraper P is in the form of an arc, preferably, and travels on curved ways T. The cranks O are diametrically opposite in the direction of projection, so that one will carry the scraper P in one direction and the other in the other direction. The scraper P is provided with a series of pins for more effectually loosening the accumulations on the ship's bottom preparatory to the action of the scraping-blades N. Both scraping devices project through an opening in the side B of the box. A sufficient number—four shown—of rollers, U, on pivoted spring-bearings V, and placed in recesses in the box, project beyond the side B. These rest against the side or bottom of the ship, the spring-bearings giving sufficiently to allow the scraping devices to operate properly, and also facilitate the removal of the device from one point to another.

Reference to Fig. 1 will show the manner of suspending the device. A clevis, W, is suspended, so as to engage around the cut-water of the vessel, by means of a line having foot-marks or other indications thereon. The device is also suspended by an indicating-line connected to a bail, X, which is attachable to either side of the box, as it is used upside down on one side of the ship, as the front must always point toward the bow of the ship. A tackle is attached to the clevis at the bow of the ship and also on deck, so that the scraper may be hauled along the bottom of the ship.

As before stated, the water-pressure keeps the device pressed firmly against the ship.

It is evident from the above that the operation of the scraper is entirely automatic.

What I claim is—

1. In a ship-bottom cleaner, a means to utilize the relative inertia of the water when said ship is in motion to drive the cleaning mechanism, consisting of a wheel with feathering blades which engage with the water, said wheel having connection with said mechanism.

2. In a ship-bottom cleaner, a driving-wheel connected to a cleaning mechanism, said wheel consisting of a drum with longitudinal shoulders, and a series of hinged blades longitudinally arranged coincident with said shoulders, substantially as and for the purpose specified.

3. In a ship-bottom cleaner, the combination, with a box containing a cleaning mechanism, of a driving-wheel with feathering blades, and a coincident shield within the box, separating the wheel from the cleaning mechanism, substantially as and for the purpose specified.

4. In a ship-bottom cleaner, a wheel with feathering blades engaging with the water when the ship is in motion, in combination with a shaft carrying spring-blades with scraping-heads, the said wheel being connected to and driving the shaft, substantially as and for the purpose specified.

5. In a ship-bottom cleaner, a curved block having pins projecting from its surface, said block being within the frame of the cleaner coincident with the ship, and operating as a loosener, substantially as and for the purpose specified.

6. In a ship-bottom cleaner, a loosening-scraper consisting of a curved block with pins projecting from its surface, and a curved track on which it travels, in combination with a driving or actuating mechanism, substantially as and for the purpose specified.

7. In a ship-bottom cleaner, a cleaning mechanism consisting of a loosening-scraper formed of a curved block with projecting pins, and provided with a curved track on which it travels, and a shaft carrying spring-blades with scraping-heads, the parts being connected to each other and to an actuating mechanism, substantially as and for the purpose specified.

8. In a ship-bottom cleaner, the combination, with a curved loosening-scraper traveling on curved ways, of a shaft carrying one or more spring-arms, and having cranks at each end and a jointed rod and short connecting-rod, the rods connecting the scraper and shaft, substantially as and for the purpose specified.

9. In a ship-bottom cleaner, the combination, with a feathering propelling-wheel, of a cleaning mechanism consisting of a shaft having cranks at each end, and carrying spring scraping arms or blades, and a curved loosening-scraper provided with a curved track or way, the several parts being connected and operated substantially as and for the purpose specified.

10. In a ship-bottom cleaner, rollers with curved flat spring-bearings pivoted in recesses at the forward and rear ends of the main box, so as to yield when pressed against the bottom of the ship, substantially as shown and specified.

11. A ship-bottom cleaner consisting of a box pointed at the forward end and carrying a feathering propelling-wheel at its outermost point, and at the bearing-surface a shaft carrying spring scraping-arms, and a curved loosening-scraper traveling on curved ways, the box having also rollers provided with pivoted spring-bearings, the entire device operating and the parts connected substantially as and for the purpose specified.

12. In combination with a ship-bottom cleaner, a line or lines for suspending and sustaining the same, said line having foot-marks or the like for indicating the position of the device, substantially as and for the purpose specified.

13. In combination with a ship-bottom cleaner, a device for operating the same consisting of a clevis straddling the cut-water of the ship, a line or lines graduated to indicate the position of the cleaner, and connected to a reversible bail on the said cleaner and to the clevis, and a suitable connecting-tackle, substantially as and for the purpose set forth.

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

NELS A. GUSTAFSON.

Witnesses:
R. M. SULLIVAN,
JOHN GULBERG.