H. J. COLE.

Apparatus for Cleaning Hulls of Vessels, &c

No. 200,696. Patented Feb. 26, 1878.

Fig. 4

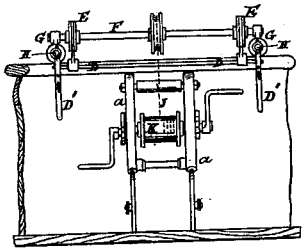


Fig. 1

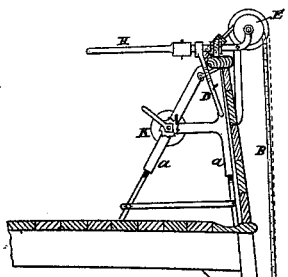


Fig. 2.

Fig. 5.

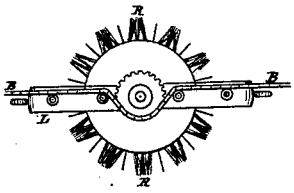
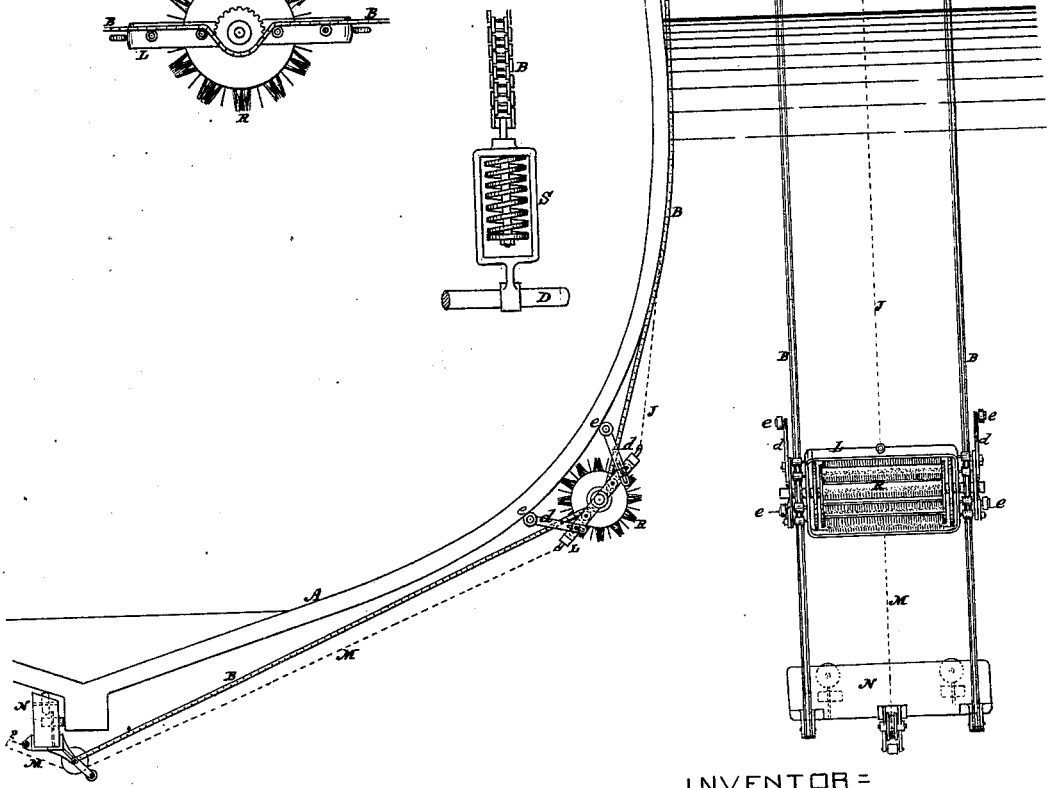


Fig. 3





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# UNITED STATES PATENT OFFICE.

HENRY JAMES COLE, OF LONDON, ENGLAND.

## IMPROVEMENT IN APPARATUS FOR CLEANING HULLS OF VESSELS, &c.

Specification forming part of Letters Patent No. **200,696**, dated February 26, 1878; application filed November 13, 1876.

*To all whom it may concern:*

Be it known that I, HENRY JAMES COLE, of Wandsworth Road, in the county of Surrey, England, have invented certain Improvements in Apparatus for Cleansing the Hulls of Vessels or other floating marine structures, of which the following is a specification:

This invention relates to apparatus for removing barnacles, sea-weed, and other foreign adhering matter from the submerged portions of marine structures, and especially vessels, being operated from the decks of same.

The invention consists, essentially, in two "Vaucauson" or ladder chains, provided with elastic attachments, and extended between an inboard-winch and a keel-block. A rotary brush, mounted in a castered carriage or frame, has toothed wheels, which engage the ladder-chains, and, when the carriage is drawn up or down by means of ropes led to the winch, the chains cause the brush to rotate, all as will be hereinafter set forth.

In the drawings, Figure 1 is a side elevation of my apparatus as in use on ship-board, the vessel being shown in section. Fig. 2 is a front elevation of the same. Fig. 3 is a detail view of the spring on the end of the chain. Fig. 4 is a rear view of the winch from inboard. Fig. 5 is an end view of the brush enlarged.

Let A represent a section of the vessel's hull, upon the deck of which a winch, K, is mounted. The winch-frame has telescopic legs *a a*, which permit it to be adjusted to the height of the ship's rail, under which it is made to fit snugly.

B B are ladder or Vaucauson chains. These are provided with coil-springs at their ends, and are attached at one end to a keel-block, N, and at the other to a bar, D, which forms a part of a frame, G, which straddles the top rail of the vessel. The chains pass over wheels E E mounted upon a shaft, F.

H is a lever, to cant the frame G inboard and put the necessary tension upon the chains B B. The tension may be preserved by lashing or any other well-known means.

The keel-block N rests against the keel, and may be hauled forward or aft, as required, by means of ropes or chains led fore and aft from it. It is kept in place by means of a rope, P, led to it from the opposite side of the vessel.

The brush-frame L has legs *d d*, with rollers or casters *e e* on their feet, to roll against the hull. These rollers may, however, be omitted.

R is the brush, which may be constructed of any suitable material. It rotates in the frame L in contact with the hull, and has toothed wheels on the extremities of its shaft, which engage a semi-wrap of the chains B B.

A light rope or chain, J, is attached to the brush-frame, and leads over a carrier-pulley to the winch K. By this rope the brush is drawn up the side. A similar rope, M, attached to the frame leads over the pulley mounted on the keel-block N, and passes thence to a winch on the opposite side of the vessel. By this rope the brush is drawn down, the two winches winding and unwinding simultaneously.

The chains B B being fixed, it is obvious that when the brush is drawn up and down it will be caused to rotate and clean off all matter adhering to the vessel's side within its track. When one breadth is cleaned the apparatus may be moved along and the operation repeated.

The springs S on the extremities of the chains B B permit the brush to travel over the bilge or convex portions of the hull.

The brush may be of cane, bass, metal, or other suitable material, substantially as shown.

Having thus described my invention, what I claim as new is—

1. The Vaucauson or ladder chains B B, provided with springs at one or both extremities, in combination with the keel-block N and frame G, arranged to straddle the top rail of the vessel, all constructed and arranged to operate substantially as set forth.

2. The combination of a rotating brush, R, mounted in a traveling frame, L, with ladder-chains B B, fixed elastically at the ends, as set forth, and arranged to engage toothed wheels on the shaft of the brush, as and for the purposes set forth.

3. The combination of the winch K, ropes J M, chains B B, block N, frame G, and brush R, all arranged to operate substantially as set forth.

HENRY JAMES COLE.

Witnesses:

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