No. 851,072. PATENTED APR. 23, 1907.

R. B. CRUMP.

SHIP CLEANING DEVICE.

APPLICATION FILED JULY 9, 1906.

Fig. 1

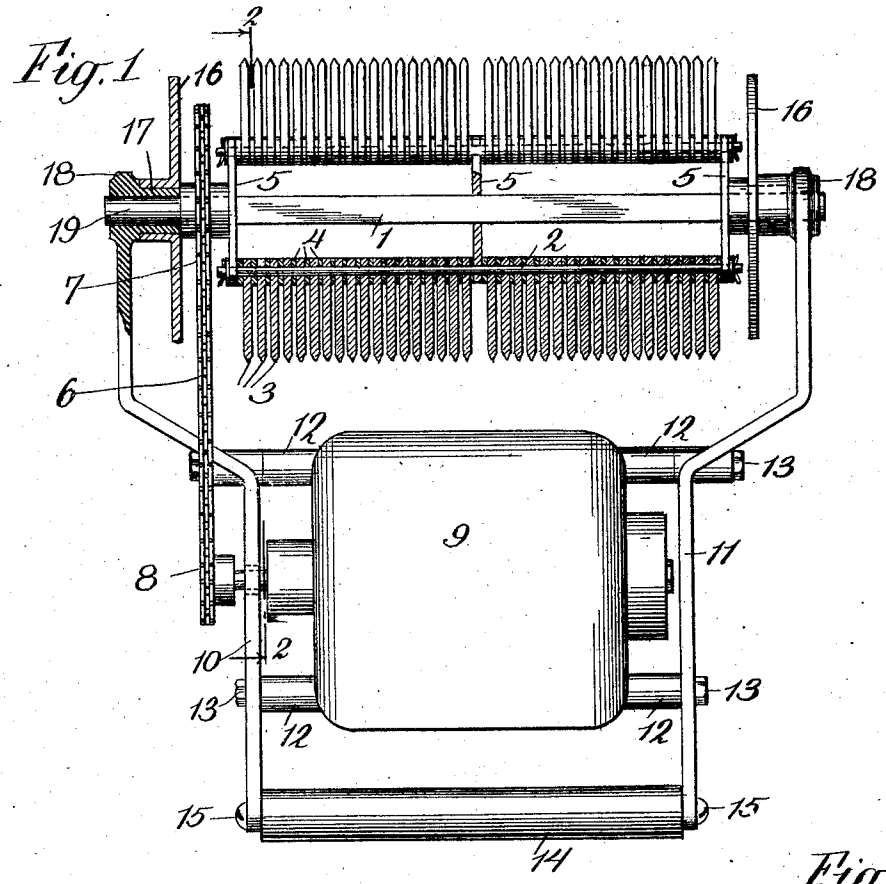



Fig. 3

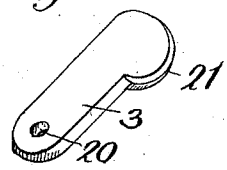



Fig. 2

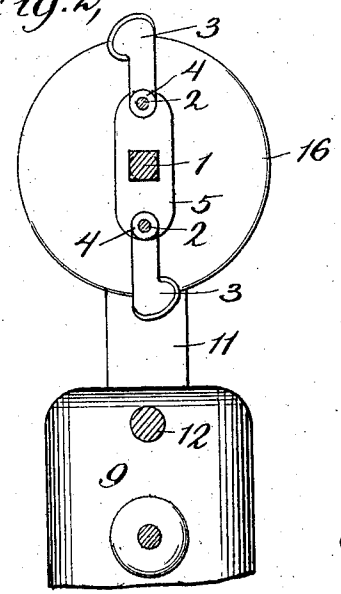
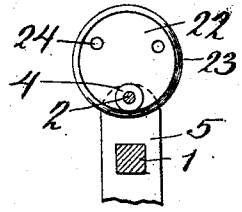



Fig. 4




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## SHIP-CLEANING DEVICE.

No. 851,072. Specification of Letters Patent. Patented April 23, 1907.

Application filed July 9, 1906. Serial No. 325,239.

*To all whom it may concern:*

Be it known that I, ROBERT B. CRUMP, a citizen of the United States, residing at No. 882 Fifth avenue, Brooklyn, in the county of Kings, State of New York, have invented a new and useful Improvement in Ship-Cleaning Devices, of which the following is a specification.

This invention is a machine having numerous chisel shaped hammers arranged to have a rotary motion and strike by centrifugal force, to be driven by hand, electric, or pneumatic power, instead of the usual method of using a hammer and chisel.

In the accompanying drawing forming part of this specification, Figure 1 is a plan of the whole machine. Fig. 2 is a sectional elevation of part of the machine. Fig. 3 shows one form of one of the hammers. Fig. 4 shows another form of hammer.

Like figures refer to like parts.

1 is a square shaft on which is fitted links 5, through holes in the ends of links are passed rods 2. On rod 2 hammers 3 are hung, the rods 2 passing through the hole 20 in each hammer.

4 represents washers on the rods separating the hammers.

The shaft 1 runs in bearings 18, which are part of the frame composed of side pieces 10 and 11 and cross bars 12 and 14, held in place by nuts or screws 13 and 15.

6 is a chain, driving sprocket 7, connected to sprocket 8.

9 is the case of an electric or pneumatic motor fixed to cross bars 12 on frame.

16 are disc shaped wheels having hubs bearing on a portion of bearings 18 marked 17.

21 shows the chisel shaped form of the edges of the hammers.

19 is a journal of the shaft.

In Fig. 4, 22 is a hammer of a circular form having several perforations 24, and having a continuous chisel shaped edge 23.

The action of this apparatus is as follows: Power being furnished by hand, electric, or pneumatic motor, the operator holding the machine by cross bar 14, or other suitable handle, places the bearing wheels 16 against the surface to be operated upon and cleaned, the power being applied and rapid motion imparted to the shaft and hammers, centrifugal force carries the hammers beyond the periphery of wheels 16, and striking the surface fall back and pass by, the operator moving the machine backwards or forward over the surface.

The principal of the machine is capable of various forms, for instance: Shaft 1 can be extended and hammers placed outside of the bearings where it is desirable to work in close corners. The handle also can be in various forms, and the machine put on a long handle or pole to work at a distance from the operator.

Various other forms of hammers, and means of connecting them to the rotating parts can be used.

Having described my invention, what I desire to claim and protect by Letters Patent is:

1. In a machine of the class described, a frame, a motor fixed to the frame, a shaft carrying hammers, bearing wheels on the shaft, and means for revolving the shaft. Substantially as shown.

2. In a machine of the class described, a frame, a handle attached to the frame, a revolvable shaft supported in the frame, bearing wheels on the shaft, hammers attached to the shaft, and means for revolving the shaft. Substantially as shown.

3. In a machine of the class described, a revolvable member, hammers attached to the revolvable member, bearing wheels on the shaft of the revolvable member, means for connecting the several parts. Substantially as shown.

4. In a machine of the class described, a rotating member, hammers attached to the rotating member, means for driving the rotating member, bearing wheels for supporting the rotating member, combined substantially as shown and described.

5. In a machine of the class described, a rotating member, hammers attached to the rotating member, bearings to support the rotating member on the surface to be acted on, means for connecting the several parts, substantially as shown and described.

6. In an apparatus for cleaning ships'

hulls, the combination of a frame for lowering over the side of a ship, a revolvable shaft mounted in said frame, arms supported on said shaft, heads on the outer ends of said arms, and means for turning said shaft.

7. In an apparatus for cleaning ships' hulls, the combination of a frame for carrying the cleaning devices, a shaft mounted in said frame, radial arms supported by said shaft, striking heads on the outer ends of said arms, and a motor for turning said shaft.

ROBERT B. CRUMP.

Witnesses.
E. N. ROBER,
THOS. HALL.