No. 668,865. Patented Feb. 26, 1901.

L. WILLIAMS.

SCRAPER FOR SHIPS' HULLS.

(Application filed Aug. 23, 1899.)

(No Model.)

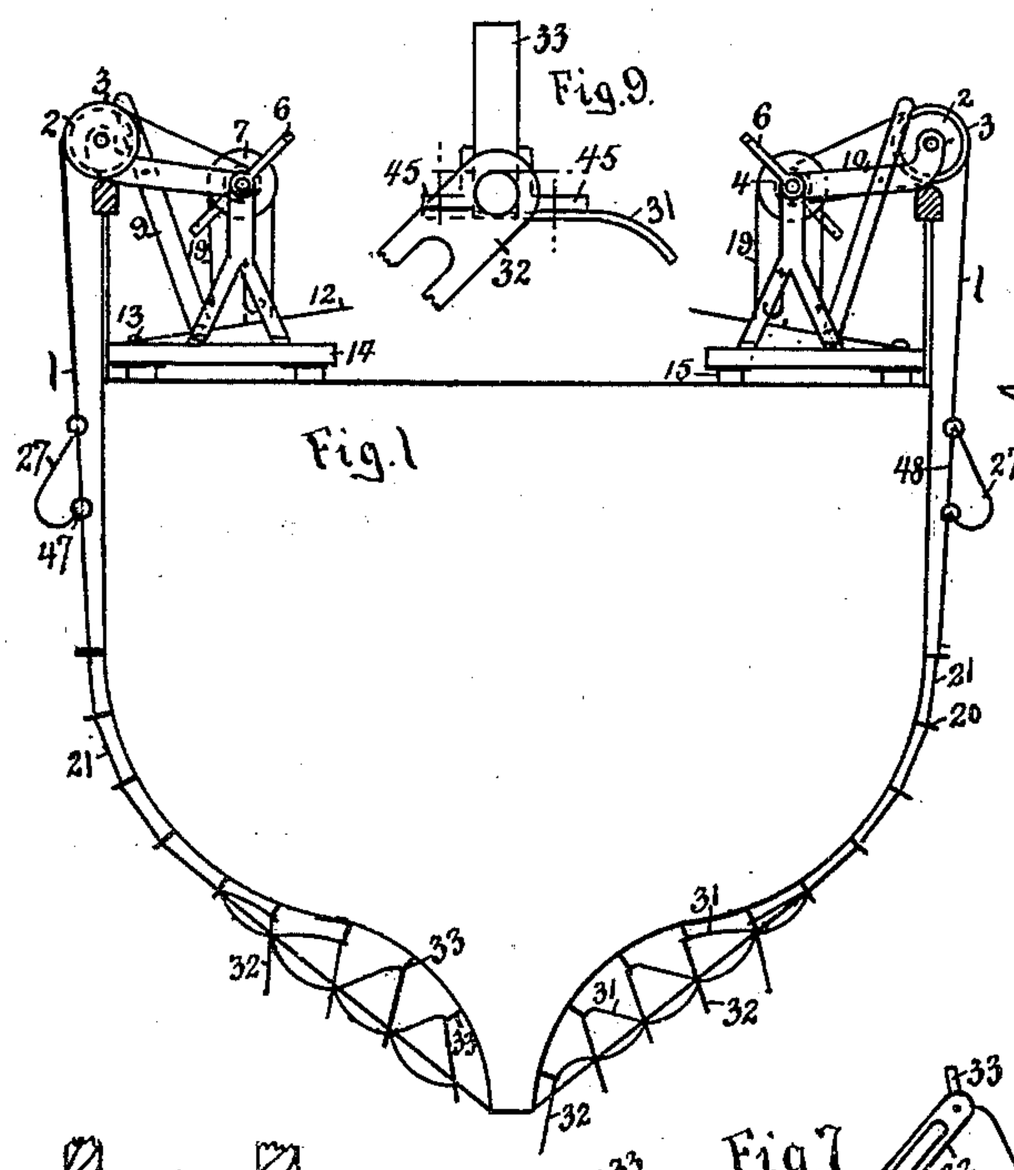

Fig. 1

Fig. 9.

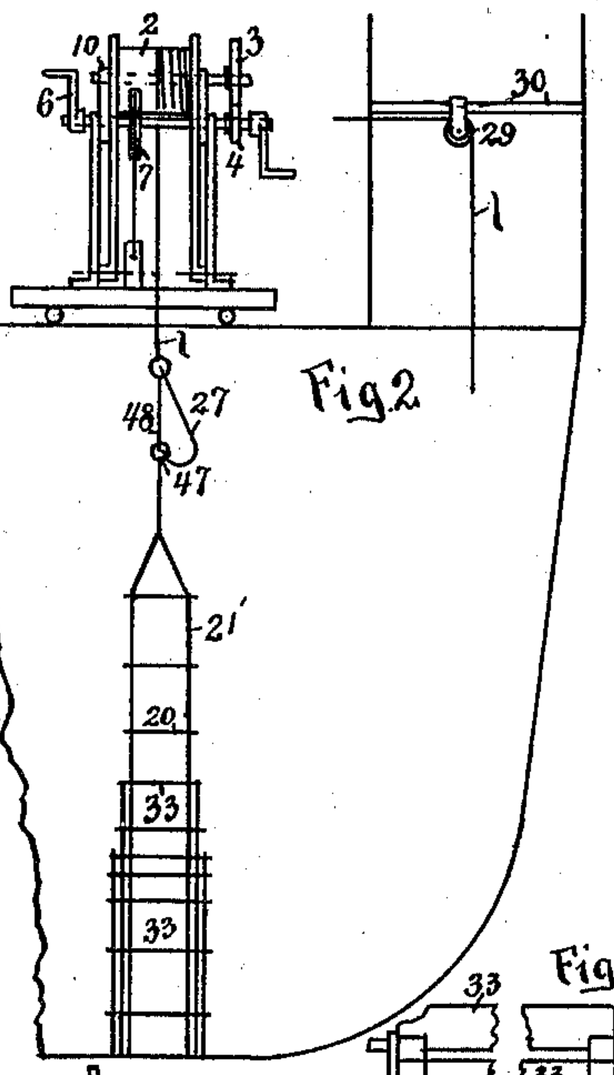

Fig. 2

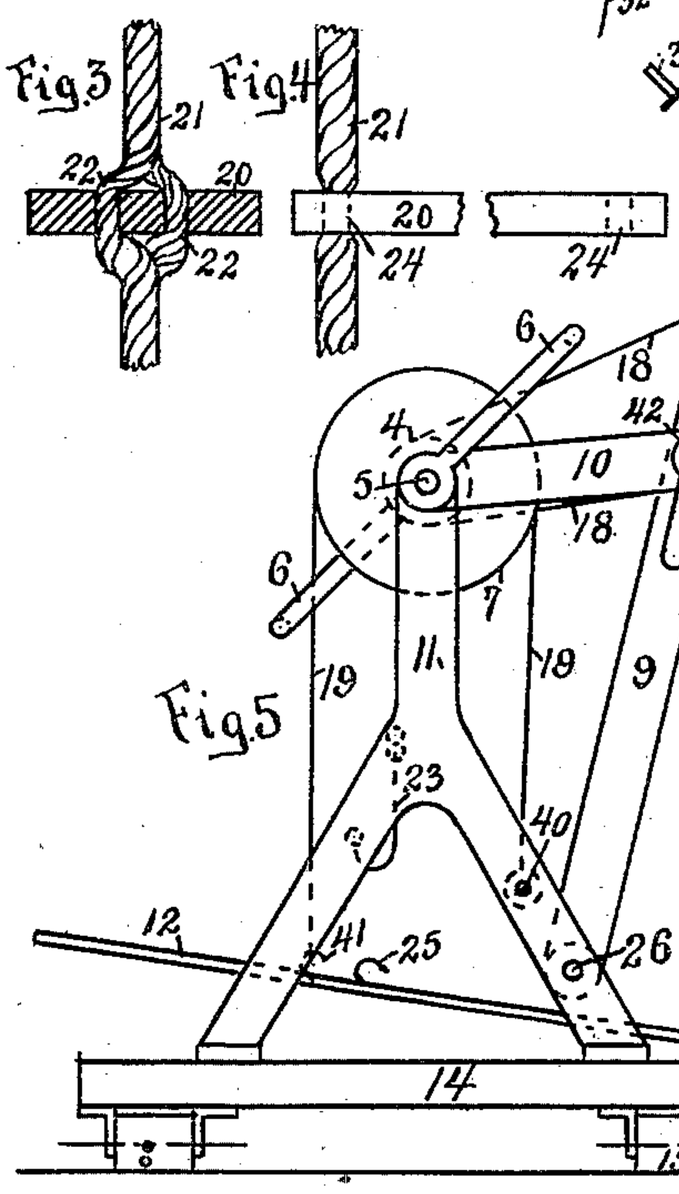

Fig. 3

Fig. 4

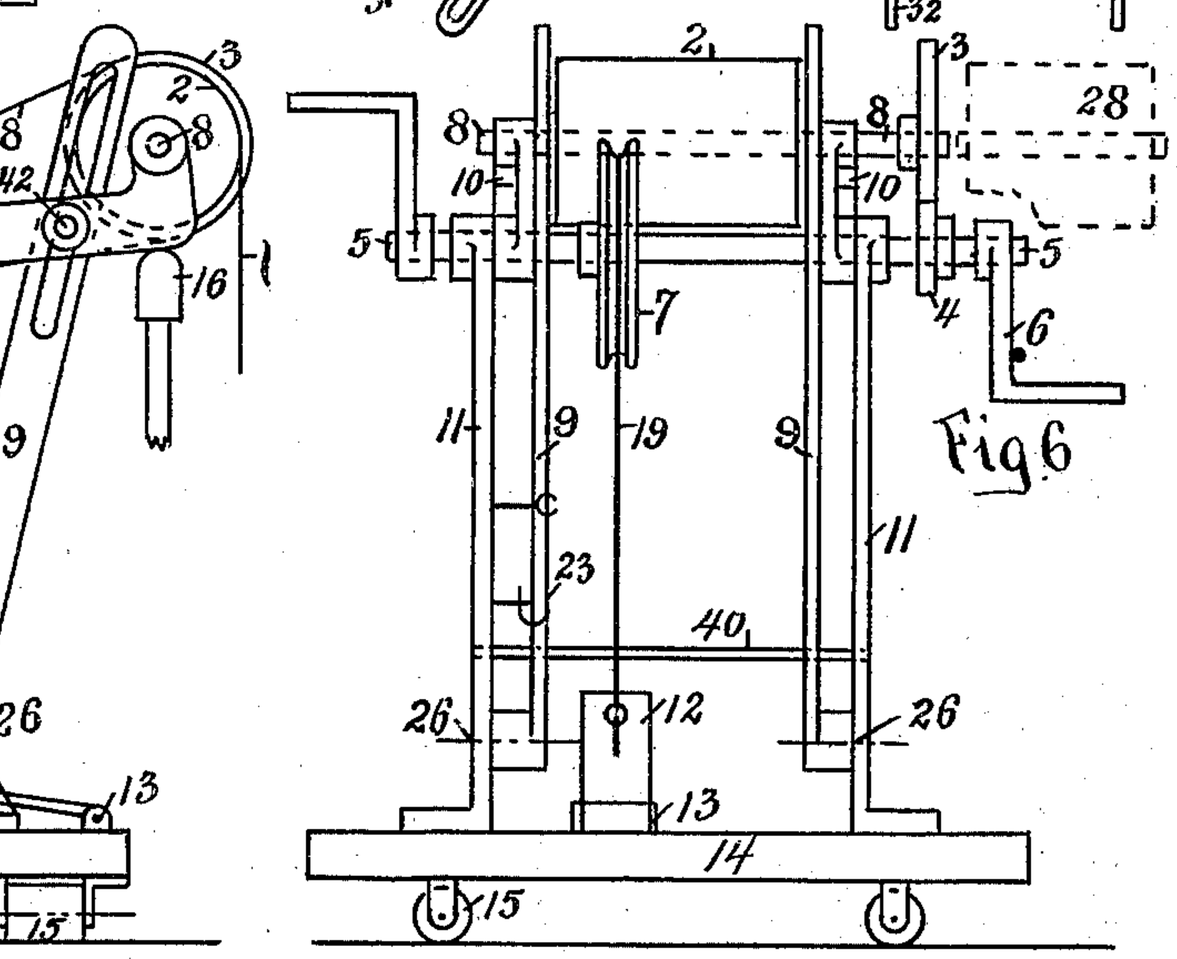

Fig. 7

Fig. 8

Fig. 5

Fig. 6

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SCRAPER FOR SHIPS' HULLS.

SPECIFICATION forming part of Letters Patent No. 668,865, dated February 26, 1901.

Application filed August 23, 1899. Serial No. 728,221. (No model.)

To all whom it may concern:

Be it known that I, LILY WILLIAMS, a citizen of the United States, residing at Lakeview, county of Passaic, and State of New Jersey, have invented a new and useful Improvement in Scrapers for Hulls of Ships, of which the following is a specification.

My invention relates to improvements in the manner of cleaning barnacles, &c., from the bottoms of ships' hulls, in which a number of scrapers held on their edges by a cable passing through them are caused to scrape over the bottom and sides of the boat from the deck, and thus remove the barnacles.

The objects of my invention or improvements are, first, to provide a scraper which can be applied in the most effectual manner; second, to provide a means for bringing the scraper in scraping contact with the ship's sides, both on the concave and convex parts, and, third, a means of operating the scrapers from the deck of the boat and a way of moving the scrapers along the sides, so as to scrape the entire hull of the vessel. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a section of a boat-hull with the two winding and tension apparatuses placed on the deck, one on each side, with the cable holding the scrapers passed around under the boat. Fig. 2 is a side view of Fig. 1. Fig. 3 is a detail view of cable as it passes through a section of the scraper. Fig. 4 is a side view of Fig. 3. Fig. 5 is a side view of the winding and tension apparatus. Fig. 6 is a front view of Fig. 5. Fig. 7 represents a side view of a number of springs with scrapers thereon for cleaning the hollow places. Fig. 8 is an end view of Fig. 7. Fig. 9 is a detail of the scraper attached to the end of the spring and showing the end of the limiting-bar.

Similar letters refer to similar parts throughout the several views.

In Figs. 5 and 6 are shown two uprights or stands 11 on a platform 14, under which are rollers 15. The stands 11 support a shaft 5, on which there are two cranks or handles 6, a tension-pulley 7, and a chain-wheel 4. There are also two arms 10, with one end around and swinging from the shaft 5. The other end of the arms supports the shaft 8. On this shaft there is a cylinder or drum 2, on which the chain or cable 1 is wound, and a chain-gear 3, which connects with the chain-gear 4 by the chain 18. The ends of the arms 10 can rest on the rail 16 of the boat. The bars 9 are braces for holding the arms 10 in a fixed position by the bolts 42. When there is no rail on the boat, the braces 9, which are pivoted on a stud or rod 26 on the uprights 11, hold the arms 10 firmly in the proper position. From the rod 40 there is a rope or band 19, secured and passed over the tension-pulley 7, and the other end is secured to the hook 41 on the lever 12, which has a fulcrum at 13 on the platform 14. The foot when placed on the other end of the lever gives the required tension on the pulley 7 through the band 19 by frictional contact. This tension acts on the cable on the drum through the chain-gears 3 and 4 and the belt 18. A short chain 23 has one end fastened to the frame or supports 11, and the other end has a ring to pass into the hook on the lever 12 to support the lever in a raised position, and thus relieving the band 19 takes the tension from off the pulley 7. The one end of the chain is shown looped or hung out of the way in the drawings. The rollers are made broad, so as not to mark the flooring when the winding-carriage is drawn along the deck.

The winding-carriages, as shown in Fig. 1, are placed one on each side of the boat, and from each of the cylinders 2 one end of the cable which passes down under the boat is fastened. The scrapers on the cable are designated 21, and those on the spring ends by 33, and are about eighteen or twenty inches apart on the cable and about the same in length. The cable passes through two holes 24 in each end of the scrapers 20, as shown in Figs. 3 and 4. These cables or strands 22 after they are passed through the holes are twisted together into the larger cable 21. These larger cables 21 are again twisted together above the water or above where the scraping is necessary and formed into the large cable 1, which passes to the drum 2. For the purpose of scraping the hollows or around the keel the construction is as follows: There are bars of iron or the like 35, with holes in each end through which the cables 2I are passed as snugly as possible. On these bars 35 the wide sides of flat springs 31 are fastened near

their one end, and they are fastened near their center on the adjoining bar. The next spring forward is placed enough to one side of the first spring to permit them to pass each other when they are straightened out. The center of one spring is secured to the same bar as the end of the spring in front of it. By this the springs have a solid and firm fastening, which is necessary to give them the tendency of keeping the working edge of the scraper at right angles to the cable. The scrapers 33 are secured to the springs 31 by means of bolts and small angle-brackets 45, as shown in Fig. 9. The limiting-bar 32 has a hole on its end, which is placed over a pin or turned end 44 of the scraper 33. In the slot in this bar 32 a screw 46 is entered, which is screwed in the end of the bar 35 deep enough to also secure the cable 21 and the screw-bottoms there, so as to leave a space between the head and the end of the bar 35 to permit the limiting-bar to slide freely over the said screw. The ends of the slots limit the extreme movements of the spring. After the scrapers have passed from or beyond the hollow places on the bottom of the boat the springs straighten out nearly parallel with the cable. The scrapers still remain in contact with the sides of the boat and scrape just as effectually.

If it is found necessary to pass a post or an obstruction, the chain-loop 27 is unhooked from 47 and placed around the post and again hooked into the link at 47, and the other short chain 48 is unhooked from the said link at 47. The chain 27 now supports the cable.

When it is found necessary to scrape the boat beneath projections on the deck where the winding-carriage cannot be placed, a longer shaft is inserted in place of the shaft 8 and the cylinder or drum is placed on the end, as shown by the dotted lines in Fig. 6, (marked 28.) The carriage is turned one-quarter way around, so that the winding-cylinder projects beyond the rail of the boat, and cable 1 passes from the drum over a pulley-block 29, Fig. 2, which can slide along on the bar 30, placed around the projection for that purpose. The pulley-blocks are held in one position until that part of the boat is cleaned, and then the pulley-block is moved along by means of ropes passing around the projection parallel to the scraper 33.

In cleaning the bottoms of boats the cable, with the scrapers, is passed over the bows of the boat. Each end is fastened to one of the drums 2 of the two carriages placed near the outside edges of the deck. The arms 10 are then adjusted to the right height and secured in that position by the bolt 42 in said arms. The cables, with the scrapers thereon, are then drawn against the sides of the boat by winding up the cable on the drums 2. The operators at the cranks on the one side—say the right side—wind the cable on the drum to the amount of several feet. Each point on the ship's sides is then passed over by one or more scrapers for a distance equal to the length of the scraper. While the drum on the one side is being wound, the operator on the other side keeps the lever 12 pressed down. This gives as much tension as desired on the cable by the slipping of the rope 19 over the pulley 7, so as to keep the cable, with the scrapers, tight against the bottom of the boat. If it is required to go over the same surface again, the operation is reversed and the men on the opposite side do the winding and the others apply the tension. The carriages are rolled along the deck a distance equal to the length of the scrapers, and the operation of winding and unwinding is repeated until the whole length of the boat is gone over.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a boat-scraping device the combination of a self-adjusting scraper attached to springs secured on bars through which the cables pass, and with scrapers directly on the cables which are connected to the winding apparatus substantially as described.

2. In a boat-scraping device the self-adjusting scraper 33, the spring 31, the limiting-bar 32 retained in position by the screw 46, the screw 46 also securing the cable 21, and the bar 35 connected to the springs, the bar 32 and the cable 21 as set forth and described.

3. In a winding apparatus for scraping boat-bottoms, the combination of the uprights 11 the movable carriage and uprights supporting a shaft the gear 4 the pulley 7, the swinging arms 10, supporting the shaft 8 the gear 3 and the drum 2 as set forth and described.

4. In a boat-scraping apparatus the movable carriage 14, the uprights 11, the arms 10, the lever 9 and bolt 42 for securing the arms 10 at the required height as set forth and described.

5. In a winding attachment for scraping boats the combination of the tension-pulley 7, the lever 12 pivoted at 13, the band 19 passing over the pulley 7, the chain 23 for supporting the lever, the gear 4, chain belt 18 for operating the gear 3 and the drum 2 with the cable attached as set forth and described.

6. In a boat-scraping attachment the combination of the winding and tension device and the cable 1, the chain loop 27 for looping and unlooping in passing around posts, &c., the scraper 20 with the two holes in each end with cables passing through them for the purpose of holding them firmly on their edges, the bars 35 the springs 31 the limiting-bars 32 and the scrapers 33 as set forth and described in the annexed drawings and specification.

Signed at Paterson, in the county of Passaic and State of New Jersey, this 18th day of August, A. D. 1899.

LILY WILLIAMS.

Witnesses:
D. GLEASON,
JOHN C. HOUSTON.