No. 732,568. PATENTED JUNE 30, 1903.

C. H. LEE.

SELF CLEARING PROPELLER.

APPLICATION FILED MAR. 30, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig 1

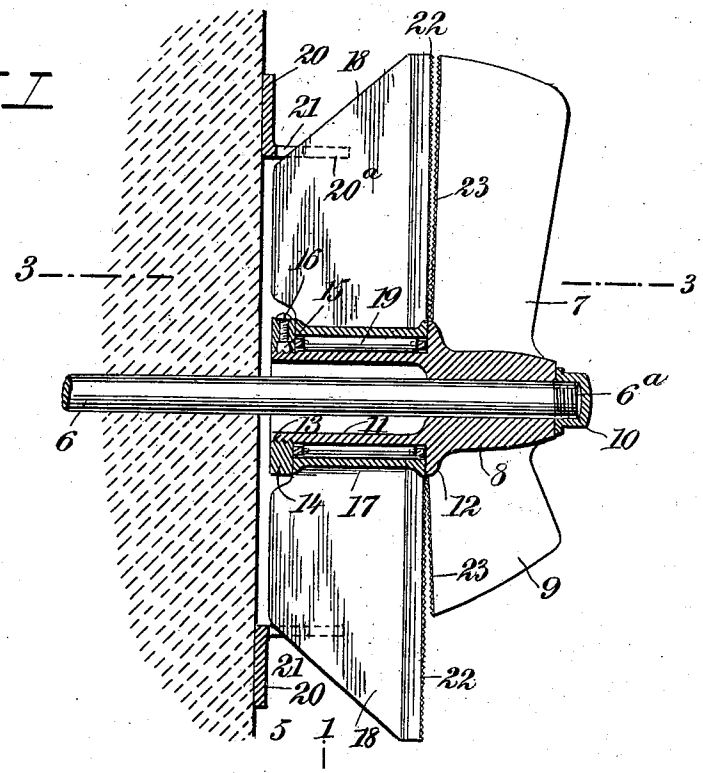
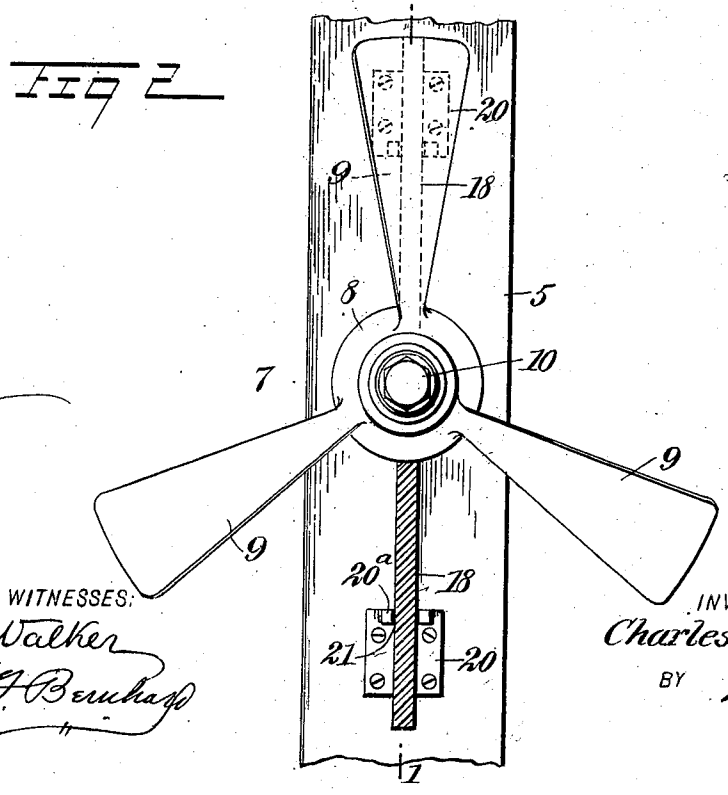


Fig 2



WITNESSES:

H. Walker

H. J. Benchaff

INVENTOR

Charles H. Lee

BY Munn & Co

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 732,568. PATENTED JUNE 30, 1903.

C. H. LEE.

SELF CLEARING PROPELLER.

APPLICATION FILED MAR. 30, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig 3

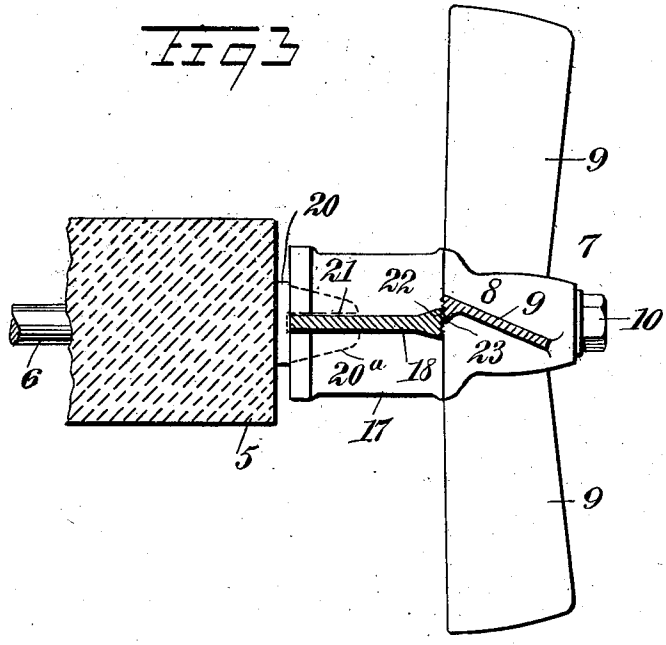
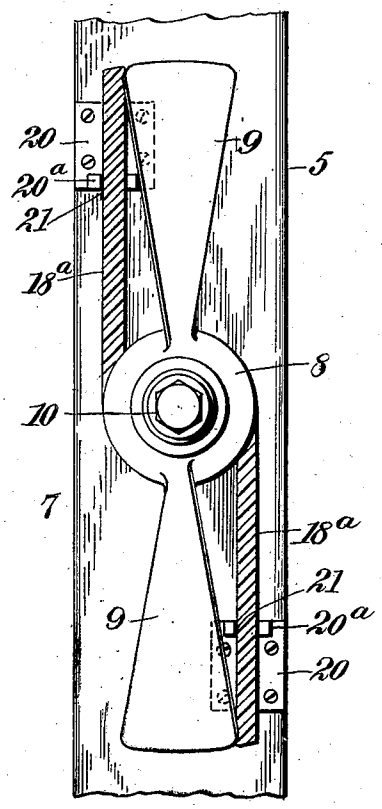


Fig 4



WITNESSES:

H. Walker

H. J. Bruchaf

INVENTOR

Charles H. Lee

BY Munn

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 732,568. Patented June 30, 1903.

UNITED STATES PATENT OFFICE.

CHARLES H. LEE, OF SOUTHAMPTON, NEW YORK.

SELF-CLEARING PROPELLER.

SPECIFICATION forming part of Letters Patent No. 732,568, dated June 30, 1903.

Application filed March 30, 1903. Serial No. 150,212. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. LEE, a citizen of the United States, and a resident of Southampton, in the county of Suffolk and State of New York, have invented a new and Improved Self-Clearing Propeller, of which the following is a full, clear, and exact description.

The present invention relates to means for preventing the fouling of screw-propellers by the accumulation of seaweed.

In a prior application filed by me on September 10, 1902, Serial No. 122,750, I have disclosed a self-clearing propeller wherein a single rib or a group of ribs extend from the stern-post toward the propeller to prevent the accumulation of seaweed around the revoluble parts, said rib or ribs and the propeller-blades or either of said parts being provided with crushing or tearing faces adapted to sever any seaweed which may pass between the cooperating edges of the rib or ribs and the propeller-blades. The efficiency of the crushing or tearing action between the rib or ribs and the propeller depends upon a nicety of adjustment between them; but when the rib or a group of ribs is mounted on or carried by the stern-post, as disclosed by said prior application, it is found in practical service that the spaces between the edges of the ribs and the propeller-blades separate or widen owing to various causes, such as the bending of the propeller-blades, thus impairing the efficiency of the structure. I aim to overcome this practical difficulty by mounting or carrying a clearing or antifouling device on a part of the propeller itself, thus maintaining the clearing device and the propeller in a predetermined invariable operative relation. Said clearing device of this invention is held from rotation with the propeller by suitable retaining devices, the latter being supported by the stern-post or other part of the vessel. I prefer to loosely fit the clearing device to the stationary retaining devices in order that said clearing device may have a certain amount of play with the propeller or its shaft with relation to the retaining device.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the novelty will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation in the plane of the propeller-shaft, illustrating the antifouling device of the present invention, the plane of the section being indicated by the dotted line 1 1 of Fig. 2. Fig. 2 is a rear elevation of the structure shown by Fig. 1. Fig. 3 is a sectional plan view, the plane of the section being indicated by the dotted line 3 3 of Fig. 1; and Fig. 4 is a rear elevation of another embodiment of the invention especially adapted for use in connection with a two-bladed propeller.

5 designates a portion of the stern-post of any type of marine vessel.

6 is a part of a propeller-shaft, and 7 is a screw-propeller carried by said shaft and located in rear of the stern-post. This propeller may be of any preferred type, and it is adapted to be fastened in a suitable way on the rear portion of the shaft 6. In Figs. 1, 2, and 3 of the drawings the propeller is shown as having a hub 8 and a series of three blades 9; but the number of blades of the propeller is not material, because I may use a two-bladed propeller, as shown by Fig. 4. As one means for fastening the propeller on the shaft I may employ a key, which is inserted in the propeller-hub, and on the threaded rear extremity 6^a of said shaft is screwed a nut 10, which serves to prevent endwise displacement of the propeller in one direction on said shaft.

As hereinbefore described, I employ a clearing or antifouling device, which is carried by a rotary part of the propeller, and in one embodiment of the invention the propeller-hub 8 is elongated, as at 11, for the reception of this clearing device. The elongated portion 11 of said propeller-hub is of less diameter than the hub proper, 8, thereby producing an annular shoulder 12 between the hub and its elongated portion. The inner extremity of the elongated portion of the hub is provided with external screw-threads, as at 13, adapted to receive a ring or disk 14, which is screwed thereon, and this ring or disk is

held from displacement by any suitable type of locking means, such as the threaded block or plug 15, adapted to fit in a socket of the ring or disk, said locking-plug being engaged with the threaded portion 13 of the propeller-hub and being held in place by a suitable screw 16, as shown more clearly by Fig. 1.

One form of the clearing device is suitable for use in connection with a three-bladed propeller, as shown by Figs. 1 to 3, inclusive, said clearing device consisting of a sleeve 17 and a series of ribs 18, preferably two in number. In the practical manufacture of the clearing device the sleeve 17 and the ribs 18 are cast in a single piece of suitable metal, said ribs being disposed radially to the sleeve and extending from opposite sides thereof, as shown by the drawings. The diameter of the sleeve 17 exceeds that of the elongated portion 11 of the propeller-hub, and this sleeve of the clearing device is fitted loosely on said member 11 of the hub, as shown by the drawings. An annular space is left between the opposing faces of the elongated member 11 of the hub and the sleeve 17 of the clearing device, and in this space is housed or contained any suitable kind of antifriction device—such, for example, as a roller-bearing consisting of a suitable cage and an annular series of antifriction-rollers 19. The position of the antifriction-roller bearing is indicated by Fig. 1 of the drawings; but as the cage and rollers of this bearing are well known to those skilled in the art it is not considered necessary to fully illustrate and describe the same. The employment of the antifriction-bearing between the extended carrying portion of the propeller-hub and the sleeve of the clearing device minimizes the frictional engagement between these parts.

The sleeve 17 of the clearing device has engagement at its outer end with the annular shoulder 12 of the propeller-hub and at its inner end with the ring or disk 14, the inner edges of the radial ribs 18 being cut away somewhat, as shown by Fig. 1, to allow the disk 14 to be screwed snugly against the sleeve 17 of the said clearing device. The shoulder 12 of the propeller and the ring 14 on the carrying portion 11 of said propeller confine the antifriction-bearing and the sleeve 17 against endwise movement on the carrying member 11 of said hub, whereby the parts are held in proper relation at all times. The clearing device is held from rotation with the propeller by any suitable means; but, as shown by the drawings, I employ retaining devices in the form of angle-plates 20, fastened to the stern-post 5 in any suitable way, said angle-plates having the offstanding members 20^a thereof provided with slots 21, in which are loosely fitted the ribs 18 of the clearing device. These angular retaining-plates engage loosely with said ribs 18 in a way to restrain the clearing device from rotation with the hub 8 or its extended carrying portion 11; but said retaining device is capable of a loose movement or limited play in the slotted retaining-plates, thus enabling the clearing device to adjust itself to any change in position of the propeller-shaft and the screw-propeller.

From the foregoing description it will be seen that the clearing device is entirely disassociated from the stern-post in so far as this clearing device is supported or carried by the stern-post; but, on the contrary, the clearing device is carried by a rotary part of the propeller-hub, thus insuring the proper relation of the clearing device to the blades of the propeller at all times.

The ribs 18 of the clearing device extend from points adjacent to the stern-post toward the propeller-blades, and these ribs are so proportioned and arranged that the rear edges thereof are presented in coöperative relation to the edges of said propeller-blades. Said rear edges of the ribs 18 are provided with crushing or tearing faces 22, preferably formed by cutting or otherwise producing transverse grooves in the rear edges of the ribs. The forward edges of the propeller-blades 9 are also provided with similar crushing or tearing faces 23, and these crushing or tearing faces 22 23 extend diagonally across the ribs and the blades, the diagonal tearing faces on one part being inclined reversely to the corresponding faces on the other part. I do not, however, limit myself to any particular type of crushing or tearing face nor to the reversed diagonal disposition of these tearing-faces of the respective parts, because under some conditions I may omit the tearing-faces on the ribs and on the propeller-blades or on either of these parts. When the tearing-faces are used, the rear edges of the ribs and the front edges of the propeller-blades are widened or thickened, as shown by Fig. 3, in order to provide comparatively wide edges, which enable the formation of efficient crushing or tearing faces; but this increase in the thickness of the edges is not material and may be omitted. The tearing-faces on the rear edges of the ribs and the front edges of the propeller-blades may be disposed in parallel planes throughout the length of said ribs and blades; but either or both of these parts may have inclined tearing-faces. The tearing-faces on one part may be inclined with relation to perpendicular tearing-faces on the other part, as shown by Fig. 1.

In the embodiment of the invention shown by Figs. 1 to 3, inclusive, I employ two ribs on the clearing device and three blades on the propeller, so that one blade and rib will coöperate at a time in crushing and tearing interposed seaweed; but in Fig. 4 of the drawings I have shown the propeller as having two blades and the clearing device as having two ribs. The ribs 18^a of the device shown in Fig. 4 project from opposite sides of the sleeve 17, forming a part of the clearing device; but these ribs 18^a lie on opposite sides of a verti-

cal plane intersecting the axis of rotation of the propeller. This relative disposition of the ribs to the double-bladed propeller brings the parts in such coactive relation that while the blades of the propeller operate simultaneously in conjunction with the ribs of the clearing device, yet the crushing or tearing faces of the propeller-blade are presented successively at different points along their length to the corresponding faces of the ribs, thus securing at a smaller expenditure of engine-power a shear-crushing action on seaweed which may lodge either on the propeller-blades or on the ribs of the clearing device.

The clearing device (shown by Fig. 4) is mounted on an extended part of the hub of the propeller, so that said clearing device will be carried by a rotary part of the propeller, and this clearing device is provided with the crushing or tearing faces, and its ribs are adapted for engagement with stationary angular brackets which operate to restrain said clearing device from rotation with the propeller and to allow said clearing device to have a limited movement or play relative to the stern-post.

As shown by Fig. 1, the extended member 11 of the propeller-hub is of larger diameter than the shaft 6, thus forming an intermediate space adapted for the reception of a stuffing-box, (not shown;) but when a stuffing-box is not employed the extension of the propeller-hub may be made of less diameter and arranged to inclose the shaft in an obvious way.

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

1. A screw-propeller having a non-revoluble clearing device carried on a revoluble part of said propeller and located forward of said propeller.

2. The combination with a screw-propeller, of a non-revoluble clearing device carried directly by a part revoluble with said propeller, located forward of the latter, and occupying a predetermined invariable relation to the blades thereof.

3. The combination with a screw-propeller, of a clearing device located forward of the propeller and mounted on a rotary part thereof, and means for holding the clearing device from rotation.

4. The combination with a screw-propeller, of a clearing device located forward of the propeller, and means for loosely holding the clearing device in non-revoluble relation to a stern-post.

5. The combination with a screw-propeller, and a stern-post, of a clearing device mounted on a part rotating with the propeller and located between the stern-post and the propeller and occupying a predetermined invariable relation to the latter, and means for holding said clearing device against rotation with the propeller.

6. The combination of a screw-propeller having an extended hub, of a non-revoluble clearing device located forward of said propeller and carried by said hub, said clearing device occupying an invariable relation to the path of the propeller-blades, and means for holding the clearing device against rotation with said propeller.

7. The combination of a screw-propeller having an elongated hub, of a clearing device mounted on said hub, an antifriction-bearing between the hub and said clearing device, and means for holding the clearing device against rotation with the propeller.

8. The combination with a screw-propeller, of a clearing device located forward of the propeller and carried by a rotating part thereof, said clearing device consisting of a sleeve and a rib, and means for holding the clearing device against rotation with said propeller.

9. The combination with a screw-propeller, of a clearing device carried by a revoluble part of the propeller, and a stationary retaining device loosely engaging with said clearing device.

10. The combination with a screw-propeller, of a clearing device carried by a revoluble part of the propeller and having outwardly-extending ribs, and stationary brackets engaging loosely with said ribs and holding the clearing device against rotation with the propeller.

11. The combination of a propeller having an extended hub and a shoulder, a ribbed clearing device having a sleeve fitted to said hub and engaging said shoulder, and means for holding said sleeve against endwise displacement on said hub.

12. The combination with a propeller, of a non-revoluble clearing device having a rib located at one side of the plane of the axis of rotation of the propeller and in close relation to the path of the propeller-blades.

13. The combination with a propeller, of a clearing device located forward of and mounted on a part rotating with the propeller and having ribs disposed on opposite sides of the plane of the axis of rotation of said propeller.

14. The combination with a screw-propeller, of a non-rovoluble clearing device carried by a rotary part of said propeller, one of said parts having crushing or tearing faces.

15. The combination with a screw-propeller, of a non-revoluble clearing device having ribs and carried by a revoluble part of said propeller, said ribs and the propeller-blades having crushing or tearing faces.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. H. LEE.

Witnesses:
H. F. BERNHARD,
EVERARD BOLTON MARSHALL.