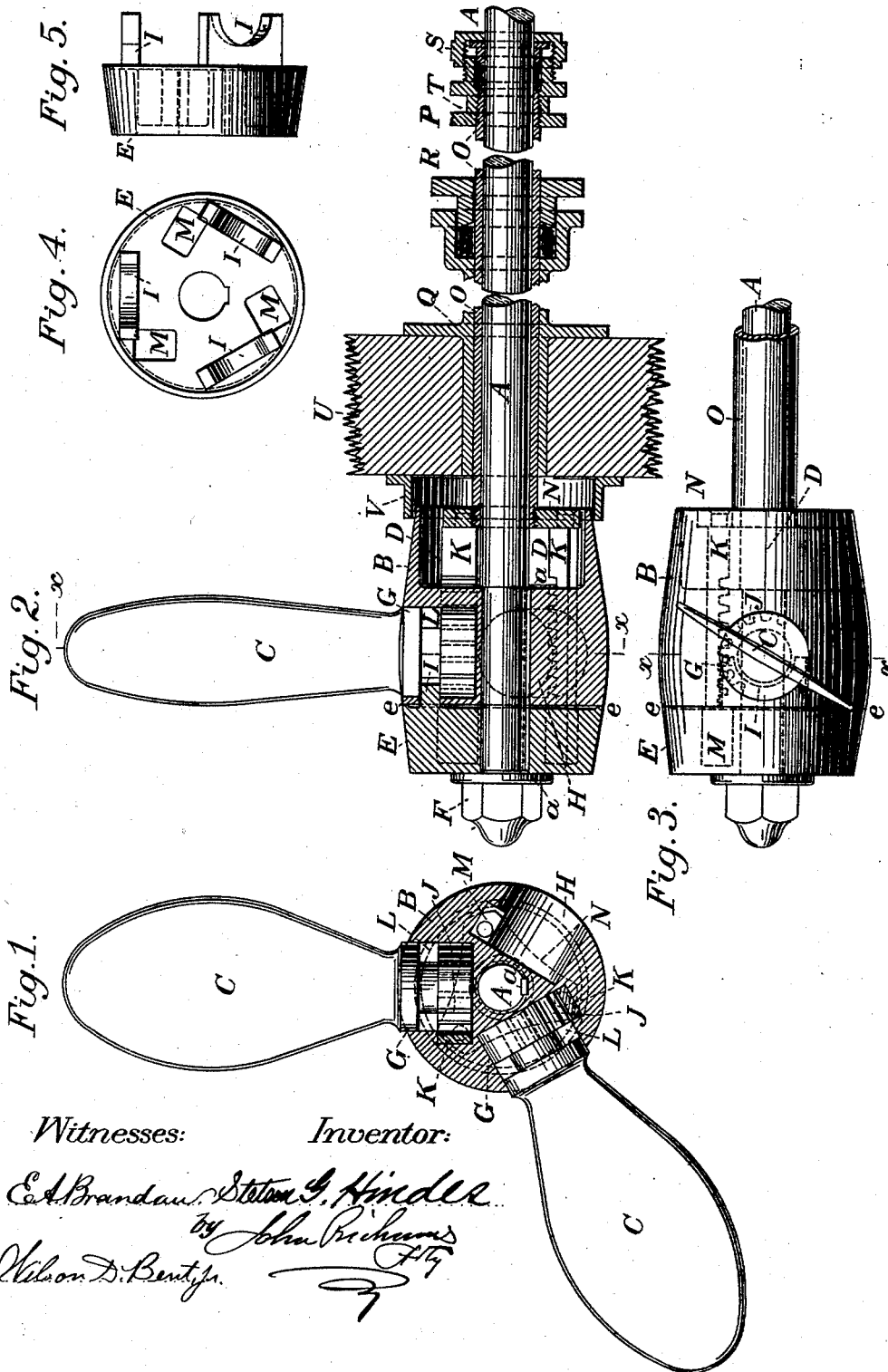


(No Model.)

S. G. HINDES.
SCREW PROPELLER.

No. 524,500.

Patented Aug. 14, 1894.



Witnesses:

Inventor:

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UNITED STATES PATENT OFFICE.

STETSON G. HINDES, OF SAN FRANCISCO, CALIFORNIA.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 524,500, dated August 14, 1894.

Application filed December 20, 1893. Serial No. 494,157. (No model.)

To all whom it may concern:

Be it known that I, STETSON G. HINDES, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Marine Screw-Propellers; and I hereby declare the following specification and the drawings therewith to be a full, true, and exact description of my improvements.

My invention relates to that class of propellers wherein the vanes are reversible, or the convolutions thereof can be altered to right and left, so a vessel can be propelled ahead or astern, or the pitch can be altered at will while the screw and shaft are revolving in the same direction, and especially to boats or vessels impelled by gas engines which are difficult to reverse; also to facilitate the starting of such engines by setting the blades transversely so they will offer a minimum resistance.

My improvements consist in providing the vanes with cylindrical parallel stems, of such depth or length and so fitted that the vanes will have a firm and sufficient support in the nave or hub of the propeller to resist lateral or canting strain, and avoid undue friction thereby; also in serrating or forming gear teeth on the stems of the vanes, whereby they may be turned with a toothed rack, without reducing practically the bearing area of the stems, and in providing these stems with an annular channel or groove in the middle or neutral axis of the bearing, whereby they are held in place when mounted, and providing ready means for the removal of the vanes.

My invention also includes mechanism for turning or setting the propeller vanes from the interior of a boat or vessel, and in various constructive details set forth in the drawings herewith, in which—

Figure 1 is an end view of a propeller made according to my invention, with the outer section or cap of the nave or hub removed. Fig. 2 is a longitudinal section through the same propeller, stern tube and packing glands. Fig. 3 is a plan view of a complete propeller taken normal to one of the vanes, the other vanes being omitted. Figs. 4 and 5 are side and end views of the removable outer section or cap of the nave or hub, detached.

Similar letters of reference are employed to denote like parts in the different figures of the drawings.

The propeller shaft A extends through a nave or hub B, composed of two sections, one having sockets transversely, to receive the vanes C, and is fastened to the shaft A by the key *a a*, as shown in Fig. 2, its rear or inward extension forming a chamber D, to contain mechanism to be hereinafter described. The other removable section, E, is separated on the line *e*, and is held by the key *a a*, and a screw-nut F on the outer end of the shaft A.

The vanes C have parallel cylindrical stems G, fitting into corresponding sockets H in the hub B, and extending inward almost to the shaft A, so as to secure ample lateral bearing. Around these stems G are formed channels or grooves L, into which fit the concave ledges or lugs I, on the detachable section E of the nave or hub, as shown in Figs. 2, 4, and 5. These lugs hold the vanes C in the sockets H against centrifugal force, or other outward strain, and permit their easy removal when the section or cap E is taken off.

To reverse the vanes C, or to adjust their pitch, teeth J are formed partially around the inner ends of the stems G, constituting a toothed sector, as indicated by dotted lines in Fig. 3, but not in such form as to remove or cut away the surface so as to impair the bearing area, which is practically complete over the whole inner surface of the socket H, except as to the grooves L. These being central or neutral in the bearing area, cause no loss of stability. Meshing into these toothed sectors J, are toothed racks K, that slide in rectangular seats M, formed in the sections B and E of the nave or hub, but not through the section E, the outer end of these seats being closed to prevent the entrance of sand or grit. These toothed racks K extend back into the chamber D, and are there attached by screwed or riveted shanks in a follower plate N, that is moved forward or back in the chamber D, by means of a sheath or tube O, that surrounds the shaft A and is attached at its outer end to the follower plate N, and its inner end to a grooved collar P on the shaft A, inside the boat or vessel. This sleeve or tube O fits in the stern tube Q, and is packed by a gland R, in the usual manner. The sleeve or tube

O is also packed around the shaft A by a second gland S, as shown in Fig. 2.

In the groove T of the collar P is applied a crotch-lever in the usual manner, so this sleeve or tube O can be moved outward or inward, thus moving the follower plate N and racks K, turning uniformly the blades C, so as to reverse their action or change their pitch from the inside of the vessel while the propeller is in motion, and the shaft is moving continually in the same direction. This chamber D protects the racks K and follower plate N from injury, and is further made secure by means of a fixed shroud or cover V, fastened to the stern post U, and overlapping the chamber D, as shown in Fig. 2. The follower N and racks K can be operated by means of a rod passing through the axis of the shaft A and cotters engaging the follower N and the collar P. I have here shown the method believed to be preferable for small vessels and boats.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a propeller, the combination of the propeller-shaft, the transverse bi-sectional hub or nave thereon, one of whose sections is provided with a series of radial cylindrical sockets and the other with a series of lugs that laterally enter said sockets, a series of vanes or blades whose cylindrical stems enter said sockets and are provided with grooves which are engaged by the aforesaid lugs and also with toothed segments, together with movable rack bars which mesh with said segments, substantially as described.

2. In a propeller, the combination of the propeller-shaft, the hub thereon, consisting of a main section having a series of radial cylindrical sockets therein, and a detachable section having a series of concave tangential lugs that laterally enter said sockets, and a series of vanes or blades having cylindrical stems entering said sockets, said stems having annular grooves that are engaged by the aforesaid lugs and having also at their inner ends toothed segments, and the endwise movable racks which engage said segments, substantially as described.

3. In a propeller, the combination of the propeller-shaft, the hub thereon, consisting of

a main section having a series of cylindrical sockets therein, and a detachable section having a series of concave lugs which enter said sockets laterally, a series of vanes or blades having cylindrical stems entering said sockets, said stems having annular grooves that are engaged by the aforesaid lugs, and having also at their inner ends toothed segments, the endwise movable racks which engage said segments and slide in rectangular seats formed in the hub, and the follower-plate to which said racks are connected, substantially as described.

4. In a propeller, the combination of the propeller shaft, the hub thereon, consisting of a main section having a series of cylindrical sockets therein and a detachable section having a series of concave lugs that enter said sockets, a series of blades having cylindrical stems entering said sockets, said stems having annular grooves that are engaged by the aforesaid lugs and having also at their inner ends a series of teeth, the endwise movable racks located in rectangular seats in the hub and engaging said teeth, the follower-plate to which the racks are attached, the sheath or tube surrounding the propeller-shaft and attached to the follower-plate, and operating mechanism for moving said tube, substantially as described.

5. In a propeller, the combination of the propeller-shaft, the hub thereon consisting of a main section having a series of cylindrical sockets therein, and a detachable section having a series of lugs entering said sockets laterally, a series of blades having cylindrical stems located in said sockets, said stems having annular grooves that are engaged by the lugs and having also toothed sectors, a longitudinal adjustable tube or sleeve surrounding the propeller-shaft and connected to the racks which mesh with the sectors and an adjustable collar inside the steering tube of the vessel, to which the adjustable tube is likewise connected, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

STETSON G. HINDES.

Witnesses:

ALFRED A. ENQUIST,
WILSON D. BENT, Jr.