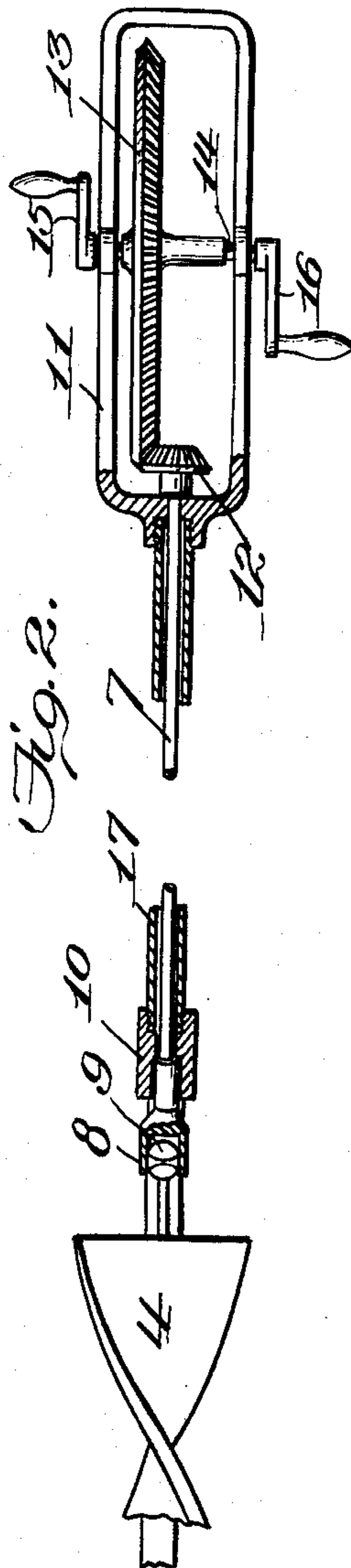
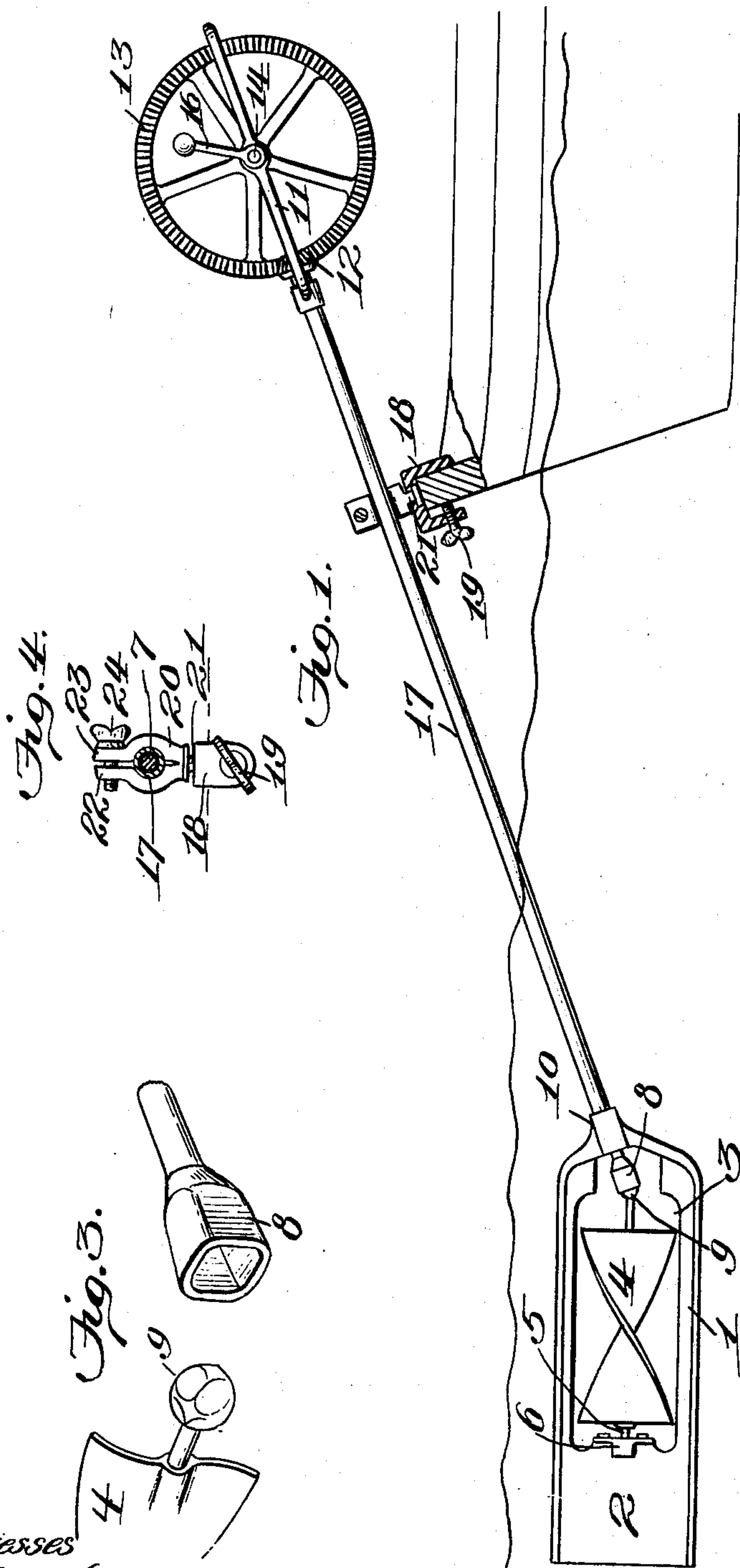


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Witnesses

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BOAT-PROPELLER.

No. 929,564.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SAMUEL T. CRAWFORD, a citizen of the United States, residing at Baltimore city, and State of Maryland, have
5 invented new and useful Improvements in Boat-Propellers, of which the following is a specification.

My present invention relates to improvements in marine propellers, and it has for its
10 object primarily to provide a simple and efficient propelling apparatus which is capable of being readily applied to vessels of various kinds and especially to small vessels, such as
15 row boats or the like, and in some instances it may be applied to the usual steam or sailing vessels of moderate size to serve in cases of emergency to effect the propulsion and steering thereof.

Another object of the invention is to provide
20 propelling means of this character wherein the propelling blade or screw is mounted in coöperative relation and movable with a rudder element whereby the apparatus serves not only for the propulsion of
25 the vessel, but may be used also for the steering thereof.

Further objects of the invention are to provide propelling mechanism of the class described which is provided with novel
30 means for attaching it to the stern of the boat, the mounting thus provided serving to support an inclined shaft carrying the propelling means, the said shaft being adjustable axially so as to vary the depth of the
35 propeller so as to accommodate it to shallow water, and it is also an object of my invention to provide operating means for the propeller that may be conveniently manipulated while the operator either sits within the boat
40 or is in a standing position.

To these and other ends, the invention consists in certain improvements, and combinations and arrangements of parts, all as will be hereinafter more fully described, the
45 novel features being pointed out particularly in the claims at the end of the specification.

In the accompanying drawing:—Figure 1 is a side elevation of a propeller constructed in accordance with my present invention,
50 the propeller being shown attached to the stern of a small boat; Fig. 2 represents a plan view of the device partly in section; Fig. 3 is a perspective view showing the coupling elements which provide a universal
55 connection between the shaft of the propeller

screw and the main operating shaft; and Fig. 4 is a sectional view of a device for mounting the propelling means upon a boat.

Similar parts are designated by the same reference characters in the several views. 60

Propelling apparatus constructed in accordance with my present invention is capable of being used generally on vessels of various kinds and sizes, the size of the propelling
65 apparatus and the detail construction thereof varying according to the different application of the invention, the apparatus being shown in the present instance as applied to a vessel of relatively small size, such as a row
70 boat, which is capable of being propelled by hand power.

The propelling apparatus shown in the present embodiment of my invention comprises a frame 1 which is preferably flat and provided with a plate or blade 2 at the rear
75 end which serves as a rudder. The forward portion of this frame is recessed at 3 to receive a propeller. Any suitable form of propeller may be used, but it is generally preferable to employ an axially-elongated screw or
80 auger propeller 4, the axis of which is arranged horizontally of the rudder frame. This propeller is provided with a supporting shaft 5, the rear end of which is journaled in a bearing 6 formed at the forward end of the
85 rudder blade 2, and the forward end of the propeller shaft is connected by a suitable universal joint to an operating shaft 7. This operating shaft is preferably inclined relatively to the axis of the propeller in order
90 that the axis of the propeller may remain in a horizontal position beneath the surface of the water while the inclined shaft extends upwardly so as to be accessible for operation from the boat. The operating shaft in the
95 present instance is provided with a socket 8 at its lower end having a square or other angular-shaped recess therein to receive a corresponding angular-shaped member 9 fixed
100 to the forward end of the propeller shaft, the recess in the socket being preferably tapered toward its inner end and the member 9 being also correspondingly tapered in order that the socket and its coöperating member may
105 provide a driving connection between the shaft and propeller notwithstanding the angular relation of the two shafts. The socket 8 may be keyed, pinned or otherwise suitably attached to the lower end of the driving shaft, the adjacent end of said shaft be- 110

ing journaled in a bearing 10 formed in the forward end of the rudder frame. The opposite end of the driving shaft is journaled in a gear supporting frame 11, and a driving pinion 12 is keyed, pinned or otherwise suitably fixed to the upper end of the driving shaft. A relatively large bevel wheel 13 co-operates with the smaller pinion 12 and is mounted on a shaft 14 journaled in the opposite sides of the gear frame. The pinion 12 is preferably much smaller in diameter than that of the driving wheel 13 in order that the speed of the propeller may be multiplied in suitable ratio with respect to that of the shaft 14, and this shaft in the present instance is provided with a pair of oppositely-set cranks 15 and 16 on its opposite ends whereby an occupant of the boat may conveniently manipulate these handles to propel the boat. The gear frame is connected rigidly to the rudder frame preferably by means of a tube or pipe 17, the ends of which may be threaded into the respective frames, and this tube or pipe incloses the driving shaft and thus protects it from sea-weed or from the deteriorating action of the water.

Any suitable means may be employed for mounting the propelling means upon the boat or vessel. It is generally preferable to so mount the propelling means as to enable the same to be swerved or turned in a horizontal direction so as to steer the course of the vessel by the use of the rudder, and to also permit an adjustment of the apparatus in the direction of the axis of the driving shaft in order that the depth of the propeller and rudder beneath the surface of the water may be varied according to the depth of the water which the boat is navigating. In the present instance, a bracket is provided which comprises a clamp portion 18, the arms of which are adapted to fit over the boat or vessel at the stern and is provided with a screw or other appropriate device 19 for locking the clamp in position. A swiveled clamp 20 is mounted on the attaching clamp, it having a stem 21 which fits into a bearing opening formed in the upper side of the attaching clamp, and it is provided with a pair of arms 22 and 23 which are connected by a clamping screw 24. The proximate sides of the arms 22 and 23 are formed with concentric recesses to receive the tube 17 which connects the rudder and gear frames and surrounds the driving shaft. While the screw 24 is loose, the tube may be adjusted axially so as to vary the depth of the propeller below the surface of the water and also the distance of the propeller from the stern of the boat, and by tightening the screw 24, the apparatus will be firmly locked in adjusted position, the rudder 2 at this time standing in a vertical position, and the driving shaft being inclined upwardly and forwardly from the propeller.

In practice the boat or vessel is propelled by an occupant thereof turning the handles 15 and 16 in an appropriate direction, the motion of the wheel 13 being transmitted through the pinion 12 to the driving shaft 7, and rotation of the driving shaft communicates motion through the universal joint to the propeller, causing the latter to revolve and by reason of its screw form, it will act upon the water to propel the vessel. By swinging the apparatus into different angular positions with respect to the length of the boat, the position of the propeller and of the rudder associated therewith will enable the course of the vessel to be varied as desired, and by loosening the screw 24, the apparatus may be adjusted in a direction axially of the driving shaft to vary the immersion of the propeller and rudder according to the depth of the water. As the swivel clamp is capable of rotating only about the stem 21 as an axis, the apparatus will be supported at all times in the proper angular position. By surrounding the propeller with a frame such as that described, the propeller is protected from fouling upon shallow bottoms and other sunken objects.

Propelling apparatus constructed in accordance with my present invention is comparatively simple in construction and efficient in operation, all parts of the apparatus being connected together so that it is only necessary to attach the securing clamp to the boat in order to apply the apparatus thereto, and in practice a relatively high efficiency is obtained for the reason that the axis of the propeller is horizontal or parallel to the surface of the water so that the driving force of the propeller is in a plane parallel to the path of movement of the boat, the inclined driving shaft being operatively connected by the universal joint to the shaft of the propeller and extending in a direction upwardly and forwardly to the boat.

I claim as my invention:—

1. In a boat propeller, in combination, a clamp for attachment to a boat, a gear frame, a propeller frame, a tube connecting said frames and held in said clamp, said tube being mounted in said clamp for axial adjustment, a driving shaft passed through said tube and having its end portions journaled in said frames, gear means supported by said gear frame for driving said shaft, a propeller shaft having a bearing in said propeller frame, a propeller carried by said propeller shaft, and a driving connection between said driving shaft and said propeller shaft.

2. A propeller attachment for boats comprising a revoluble propeller supported for angular adjustment in a horizontal direction with respect to a boat, a rigid driving shaft arranged angularly with respect to the axis of the propeller, means for permanently maintaining the propeller and its driving

shaft in fixed angular relation, a universal driving connection between said shaft and propeller, and means for operating the driving shaft from a boat.

5 3. A propeller attachment for boats comprising a revoluble propeller having its axis arranged substantially horizontal, a driving shaft inclined relatively to the axis of the propeller, one of said parts having a socket
10 provided with an angular tapering recess and the other part having an angularly-shaped tapering stem to coöperate with said socket and form a driving connection therewith, and means for supporting the propeller and
15 shaft for angular adjustment with respect to the length of the boat and for driving the propeller and shaft.

4. A propeller attachment for boats comprising a revoluble propeller having its axis
20 arranged substantially horizontal, a rigid driving shaft inclined relatively to the axis of the propeller, means for permanently maintaining the axes of the propeller and driving shaft in fixed angular relation, a uni-
25 versal joint operatively connecting the propeller and the driving shaft, and means for supporting the propeller and shaft for angular adjustment bodily with respect to the boat and for operating the shaft and pro-
30 peller.

5. A propeller attachment for boats comprising a revoluble propeller having a longitudinal axis, a propeller frame having a steering rudder thereon in rear and in co-
35 operative relation with said propeller, a driving shaft inclined relatively to the axis of the propeller and operable from the boat, a driving connection between the propeller and said inclined shaft, and means for sup-
40 porting the propeller and shaft for angular adjustment about an axis transverse to the length of the driving shaft.

6. A propeller attachment for boats comprising a frame, a propeller journaled on a
45 longitudinal axis therein, a rudder formed by the rear portion of said frame, a rigid driving shaft inclined with respect to the axis of the propeller and having its lower end journaled in said frame, means for rigidly
50 maintaining the said shaft in fixed angular relation to the axis of each propeller, a universal joint operatively connecting said inclined shaft and propeller, and means connected to the frame for supporting it in dif-
55 ferent angular positions with respect to the boat.

7. A propeller attachment for boats comprising a propeller frame having a rudder formed in the rear portion thereof, a revolu-
60 ble propeller having a shaft journaled at its rear end in said frame and provided with a member of a universal joint at its forward

end, a rigid driving shaft arranged in inclined relation to the axis of the propeller and journaled in the forward end of said frame, 65 said shaft being provided with an element of a universal joint which coöperates with that on the propeller shaft, means for operating the upper end of the shaft from the boat, and means connected to the frame for supporting 70 it in different angular positions with respect to the boat.

8. A propeller attachment for boats comprising a frame, a rudder formed in the rear portion of said frame, a propeller journaled 75 in the frame in advance of the rudder, a rigid driving shaft arranged in inclined relation to the axis of the propeller and having its lower end journaled in the frame and provided with a universal joint forming a driving con- 80 nection with the propeller, a gear frame mounted on the upper end of the shaft and provided with suitable operating mechanism, a tube inclosing the shaft and having its ends secured respectively to the rudder frame and 85 the gear frame, and means coöperating with said tube for supporting the apparatus for angular adjustment with respect to the boat.

9. A propeller attachment for boats comprising a propeller frame, a revoluble pro- 90 peller journaled therein, a rigid driving shaft inclined with respect to the axis of the propeller and having a universal joint providing a driving connection therewith, means at the upper end of the driving shaft for operating 95 the latter, a tube inclosing the driving shaft, and a bracket coöperating with said tube and adapted for attachment to the boat and providing for an axial adjustment of the driving shaft with respect thereto to vary the immer- 100 sion of the propeller.

10. A propeller attachment for boats comprising a revoluble propeller, a driving shaft operatively connected thereto and provided with gearing for driving the same, the axis 105 of said shaft being inclined relative to the axis of the propeller, and a bracket for supporting the apparatus upon a boat, said bracket being provided with an attaching clamp, and with a clamp swiveled to turn on 110 the bracket about an axis transverse to the axis of the driving shaft, the swiveled bracket being provided with means to surround said inclined driving shaft for permitting a relative axial adjustment thereof, 115 and for securing the same in different adjusted positions.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SAMUEL T. CRAWFORD.

Witnesses:

WILLIAM GREEN,
HIRAM S. JONES.