

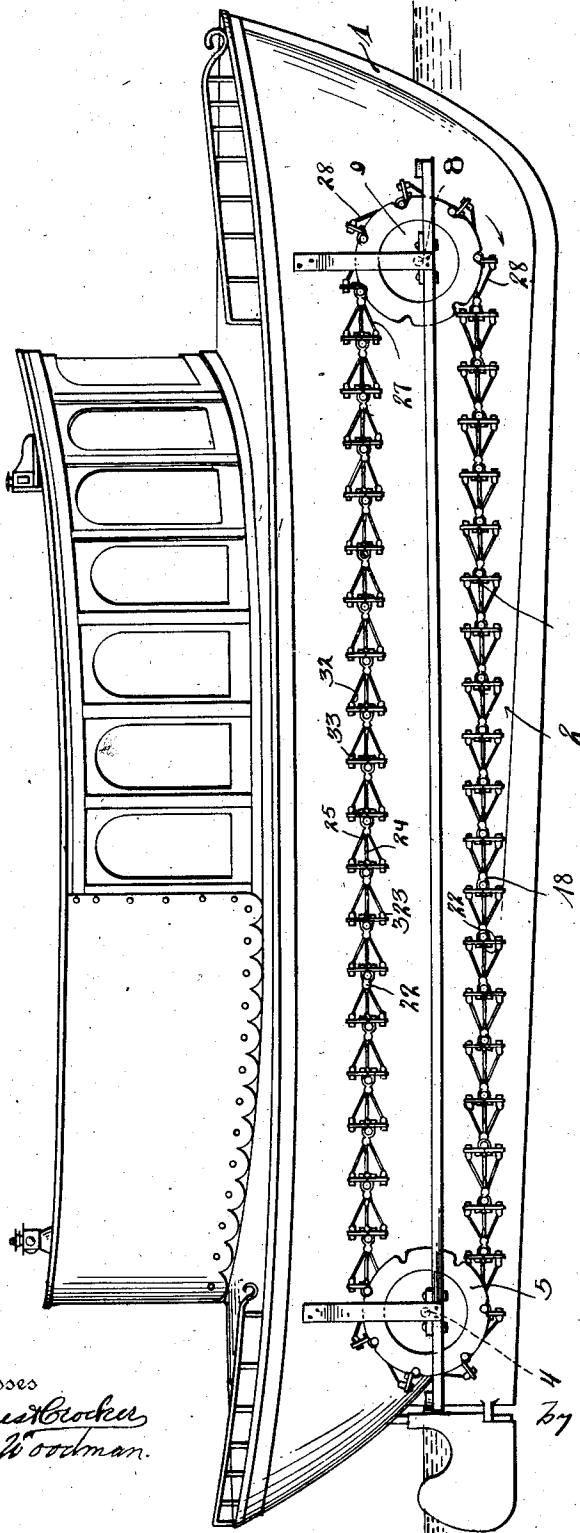
E. A. WILLIAMS.
 ENDLESS CHAIN PROPELLER FOR BOATS.
 APPLICATION FILED APR. 25, 1911.

1,010,996.

Patented Dec. 5, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



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Fig. 7.

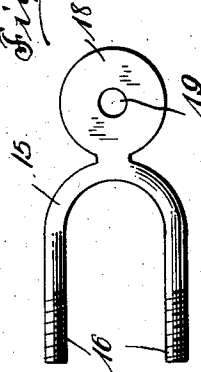
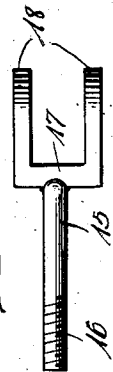


Fig. 6.



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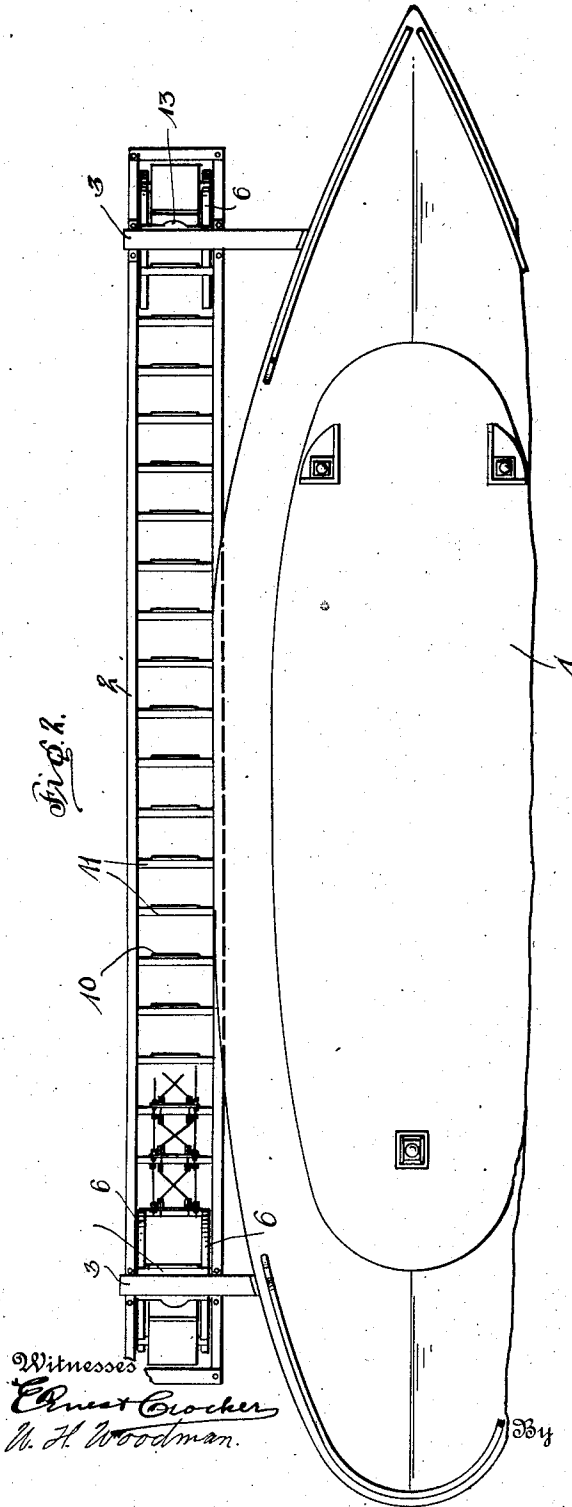
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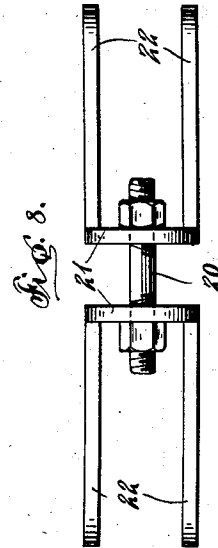
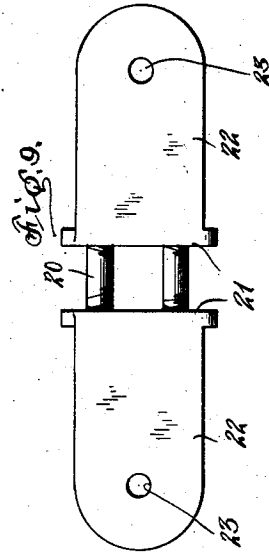
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3 SHEETS-SHEET 2.



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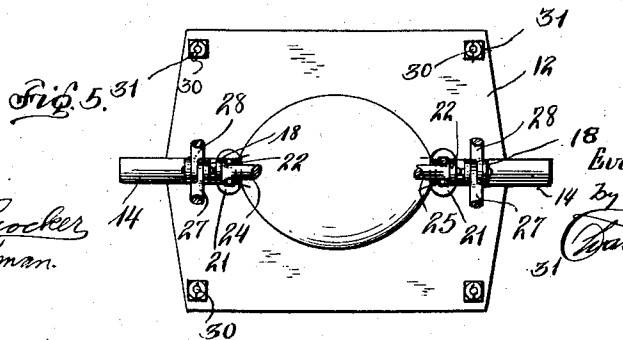
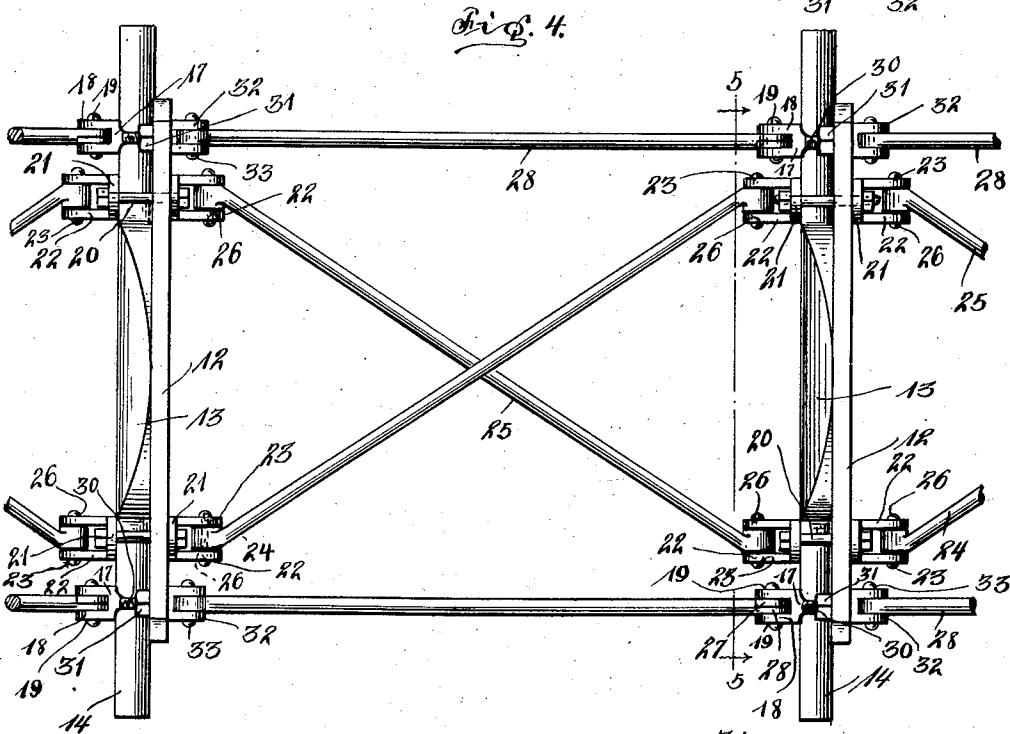
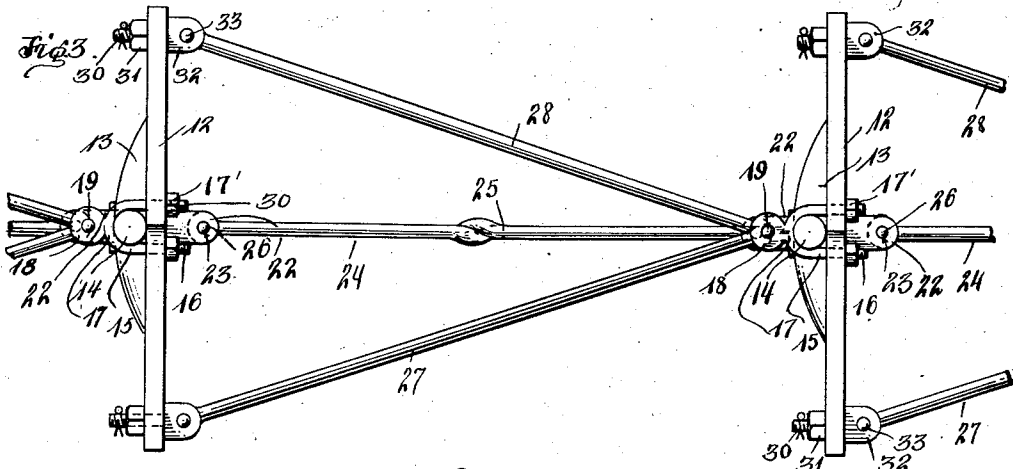
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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ENDLESS-CHAIN PROPELLER FOR BOATS.

1,010,996.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EVERETT A. WILLIAMS, a citizen of the United States, residing at Leonard, in the county of San Miguel, State of Colorado, have invented certain new and useful Improvements in Endless-Chain Propellers for Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to new and useful improvements in propellers for boats and more especially to that class known as the endless chain type of propellers and the object of my invention is to improve the construction and increase the efficiency of propellers of that type.

A further object of my invention is to provide a peculiar form of braces between the links of the propeller chains, which will enable the chain to pass readily about the drive wheel and will at the same time maintain the blades in proper operative position when in the water.

A further object of my invention is to provide additional braces which will counteract all tendencies for one side of the chain to "creep up" or work ahead of the other. And a still further object of my invention is to provide a peculiar form of fastening means, which will secure said braces to the blades and at the same time will secure the bearing members of the blade in position.

With these and other objects in view, my invention will be more fully described, illustrated in the drawings and then specifically pointed out in the claims which are attached to and form a part of this application.

In the accompanying drawings which illustrate a preferred embodiment of my device, Figure 1 is a side elevation of a boat with my improved propeller in operative position. Fig. 2 is a top plan view of the same. Fig. 3 is a detail side elevation of a portion of my propelling chain showing the braces between the blades thereof. Fig. 4 is a top plan view of the same. Fig. 5 is a front elevation showing one of the propeller blades in detail, the braces being shown in section on the line 5-5 of Fig. 1. Fig. 6 is a plan of one of the securing mem-

bers used for securing the brace rods in place. Fig. 7 is a side elevation of the same. Fig. 8 is a top plan of another form of securing member, used in connection with the diagonal braces of my chain propeller and, Fig. 9 is a side elevation of the same.

Referring more specifically to the drawings in which similar reference numerals designate corresponding parts throughout, 1 designates in general a boat of the usual, or any preferred form of construction, and having upon either side one of my endless chain propellers, which as a whole will be designated by the numeral 2. As the construction of the propeller upon one side of the boat is identical with that upon the other side a description of one will suffice for both.

Secured to the sides of the boat and extending outwardly therefrom, preferably at a point a slight distance above the water line is a suitable frame 3. This frame is designed to support the endless chain propeller and may be made in any desired size or proportion, but I prefer to construct it sufficiently long to extend nearly the entire length of the boat in order to make the propeller chain as long as possible, thus increasing the propulsive power of the boat. Journaled in this frame and adjacent the rear end thereof is a drive shaft 4 which is extended inwardly through the side of the boat and which is connected either directly, or through the intercession of suitable gears to the crank shaft of the engine. As the means for supplying power to the shaft 4 is in no way a part of my invention I have shown no means for doing so, but any one skilled in the art will readily understand how it is accomplished. Mounted upon this shaft 4, and keyed to rotate therewith, is a drive wheel 5, which is slightly wider than the propeller chain which it is to drive and which is composed of two parts, each consisting of a toothed wheel or disk 6 which is keyed or otherwise secured to the shaft. Also journaled in the frame 3 and adjacent its forward end, is a second shaft 8, said shaft being so journaled as to run idly in its bearing, and keyed upon this shaft 8 is a second wheel 9 identical in construction with the wheel 5 previously described. Mounted upon these wheels 5 and 9 and adapted to be driven thereby is the endless chain propeller 10, which chain, consists of a plurality of blades 11 each provided with

a bearing member adapted to engage with the teeth of the wheels, and of a plurality of braces extending between said blades and serving both as a means for securing the blades to each other and as a means for holding the blades in their spaced apart relation. As will be best seen by referring to Fig. 5 of the drawings, each of these blades consists of a substantially rectangular shaped member 12 which may be constructed of wood, or non-corrosive sheet metal, as preferred and provided with a reinforcing member 13 preferably formed of metal, the central portion of said reinforcing member being enlarged and thickened, in order to provide sufficient support for the blade, and the ends of said members being reduced to form cylindrical bearing members 14, which latter extend beyond the sides of the blades and form the means for engagement between the blades and the teeth of the wheels 5 and 9. As a means for securing this reinforcing member 13 to the blade member proper 12 I have provided a peculiar form of clamp 15, which as best shown in Figs. 6 and 7 of the drawings, will be seen to consist of a U-bolt having the threaded terminals 16 and having its bight portion enlarged and bifurcated as at 17 to form the spaced apart ears 18 each of which is provided with a bolt receiving aperture 19. The threaded members 16 of this U-bolt are placed one upon either side of the reduced portion 14 of the reinforcing member and passed through suitable apertures in the blade 12 and then secured firmly in place by means of nuts 17'. One of these fasteners is used upon each side of the reinforcing member and it will thus be seen that said member is firmly secured to the blade proper. The advantage of this construction is that the spaced apart ears 18 also provide securing means for the ends of the side brace members.

As an additional securing means between the reinforcing member and the blade and also to provide means for securing the diagonal brace members to the blade, I have provided a second form of clamp best shown, in Figs. 8 and 9 of the drawings. These latter clamp members consist each in a pair of plates adapted to rest one upon either side of the blade and to be secured in said position by means of bolts 20 passed through said plates and blade one upon either side of the member 14. Each of these plates, which for convenience, I have designated by the numeral 21 is provided with enlarged side members which extend outwardly to form the spaced apart ears 22, said ears being each provided with a bolt receiving aperture 23. Diagonal brace rods 24 and 25 connect the outer and inner sides of each blade with the inner and outer sides respectively of the adjacent blades, the ends of said rods being positioned between the

ears 22, of the latter described clamp members and secured in place by means of bolts 26. It will be seen from the above construction that these brace members serve both to secure the blades to each other and to maintain them in their spaced apart relation and that they also serve to prevent one side of the chain creeping up, or working ahead of the other side. It will further be seen that because of the peculiar manner in which these braces are secured to the blades, a flexible chain is obtained in which the blades will always be maintained at right angles to the chain proper. As an additional bracing means however and to assist in maintaining these blades in their vertical position I also provide between each pair of blades two pairs of additional braces 27 and 28, one end of each of said braces being secured between the ears 18 of the clamp members 15 by means of the bolt 29, while the other end of the brace 28 is secured to the adjacent blade near its upper edge and the other end of the brace 27 is secured to the adjacent blade near its lower edge, the securing means in these latter cases consisting of a bolt 30 passed through the blade and secured in place by a nut or other preferred means 31, said bolt terminating in a slotted head 32 between the ears of which the terminals of the braces are secured by means of the bolts 33. It will be seen by this latter construction that these braces 27 and 28 will serve to positively maintain the blades in their operative position while at the same time, owing to the peculiar manner in which they are positioned, they in no way interfere with the flexibility of the chain.

As the operation of my propeller differs in no way from the operation of the ordinary endless chain propeller no description of the same is necessary.

It will be readily understood from the above description that I have provided a form of endless propeller chain in which I have taken advantage of the peculiar method of fastening the reinforcing member to the blade, to provide at the same time, means for fastening the braces between the blade. It will also be seen that I have provided a propeller chain in which the reinforcing members of the blade are also adapted to act as the bearing members of the chain.

What I claim is:—

1. An endless chain propeller comprising a plurality of propeller blades, a reinforcing member for each of said blades and extending beyond the same to form bearings, diagonal braces between said blades, means for securing said braces to the blades, said means also including means for securing the reinforcing member to the blades, and additional braces connecting the axial portion

of each blade with the upper and lower portions of the adjacent blades.

2. An endless chain propeller comprising a plurality of propeller blades, a reinforcing member for each of said blades, diagonal
5 braces between said blades, additional braces extending from the axial portion of each blade to the upper and lower portions of the adjacent blade, and means for securing said

braces to the blades, said means also including means for securing the reinforcing members to the blades. 10

In testimony whereof, I affix my signature, in presence of two witnesses.

EVERETT A. WILLIAMS.

Witnesses:

FRANK E. HOWARD,
MINNIE E. RUMBURG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
