

L. DION.

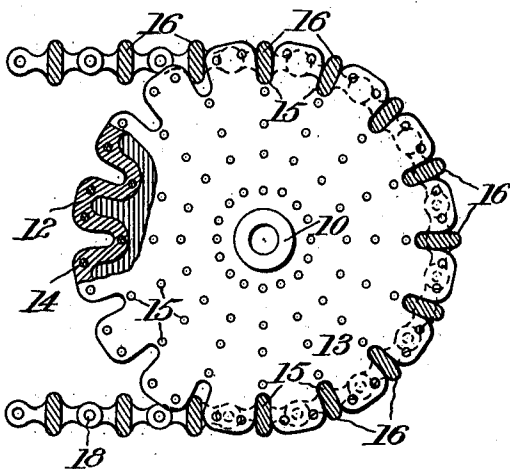
DRUM FOR MARINE PROPULSION.

APPLICATION FILED OCT. 20, 1905. RENEWED MAR. 11, 1909.

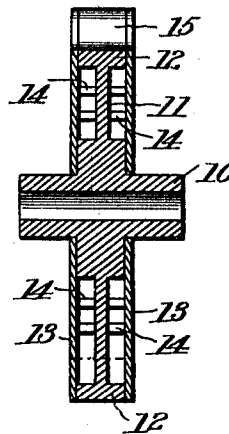
1,004,633.

Patented Oct. 3, 1911.

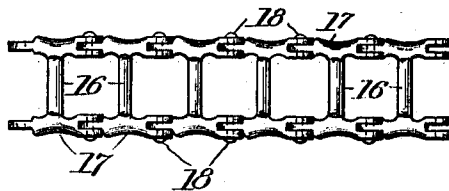
*Fig. 1.*



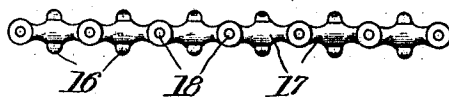
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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Witnesses

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# UNITED STATES PATENT OFFICE.

LÉON DION, OF WILKES-BARRE, PENNSYLVANIA.

DRUM FOR MARINE PROPULSION.

1,004,633.

Specification of Letters Patent.

Patented Oct. 3, 1911.

Application filed October 20, 1905, Serial No. 283,674. Renewed March 11, 1909. Serial No. 482,829.

*To all whom it may concern:*

Be it known that I, LÉON DION, of Wilkes-Barre, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Drums for Marine Propulsion, of which the following is a specification.

This invention relates to the propulsion of navigable vessels, and particularly to that type employing an endless series or chain of paddles passing over supporting and driving drums and having the lower stretch of the endless series or chain immersed in the water while the upper or return stretch is above the surface of the water. Broadly speaking, such means of propulsion are old, and therefore it is unnecessary to illustrate or describe the same herein, in detail. So far as I am aware however, in all such constructions, the paddles exert a downward pressure on the water when entering it, and an upward and lifting force when leaving it, resulting in the waste of considerable power in directions other than that required to propel the boat.

The object of the present invention is to provide a drum or wheel for the support or drive of an endless series of paddles, so constructed that the latter will exert little or no force upon the water while said paddles are on said drum, leaving the force to be applied to the water solely to the paddles that are moving in a horizontal direction from one drum to another.

To this end, the invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

Of the accompanying drawings:—Figure 1 is a side elevation of a drum embodying my invention, and a portion of a series of connected paddles, the drum being partly broken out. Fig. 2 represents a vertical section through the drum shown in Fig. 1. Fig. 3 is a plan view and Fig. 4 a side elevation of an endless series of paddles proportioned to co-act with the drum shown in Figs. 1 and 2.

Similar reference characters indicate the same or similar parts in all views.

The drum, when constructed as shown in Figs. 1 and 2, comprises a hub 10 having arms or a central disk 11 and a peripheral rim or web 12 all of which may be cast integral with each other, the hub having an axial bore to receive a suitable shaft on

which the drum is mounted. Preferably there are also side plates 13 secured by suitable means such as rivets 14. The peripheral web of the drum is irregular or serpentine in contour to form pockets or recesses 15, and the edges of the side plates correspond therewith, to receive the paddles 16 which latter are of a form to closely fit and fill the inner portions of the pockets, to prevent access of water thereto.

Each paddle is provided with an arm 17 at each end thereof, preferably integral with the paddle, each arm extending equally to the front and rear. Each paddle 16 and its arms 17, in plan, is somewhat the form of a letter H, the paddle being the connecting or cross member and having the plane of its greatest area substantially at a right angle to the plane in which the arms 17 extend. The width of each paddle, from one free edge to the other, is substantially equal to the depth of the pockets or recesses of the drum so that when the inner edge of a paddle rests on the bottom of a pocket its outer edge will not project beyond the greatest radius of the drum. And the thickness of the paddle is such that it will quite fill the lower part of the pocket. The outer portions of the pockets must be of slightly greater width (in the direction of rotation of the drum) than the thickness of the paddles to permit the latter to enter and leave the pockets without binding, but the difference is not such as to permit the entrance of any material amount of water in front of and behind the paddles.

The ends of the arms 17 are inter-engaged, as shown in Figs. 3 and 4, and connected by rivets 18 serving as pivots or pintles whereby the several paddle sections are jointed together, there being, in practice, an endless series of these paddle sections and, of course, a drum at each end thereof or a drum at one end and a curved guide at the other, as usual in such forms of mechanism for marine propulsion.

It will now be understood that when the drum or wheel is partially immersed in water and it and the series of paddle sections actuated in either direction, there can be very little resistance offered by the water to vertical movements of the paddles because the latter are in pockets to which the water can not obtain access, said paddles being practically caged during their movements into or from the water. While it

cannot be said that the resistance is as slight as if an absolutely smooth disk or drum were being revolved while semi-immersed, yet it is far less than if the entire broad sides of the paddles, or even half thereof, were required to act on the water when entering or leaving it. But as soon as the paddles reach the position where they are to move in a straight path to exert the pulling force on the water, they move out of the pockets, at a tangent to the drum, and present their broad sides squarely to the water.

I do not limit myself to the details of construction here shown, as I may variously modify the same without departing from the spirit of the invention. For instance the space or spaces shown in Fig. 2 may be filled up. In other words, the device, as a whole, shown in said figure, may be solid, and differently proportioned.

Having now described my invention, I claim:—

1. The combination with an endless series or chain of paddles, of a support therefor comprising a drum having peripheral pockets or recesses of a depth and width substantially equal to the area of the paddles.

2. The combination with a connected series of paddles for marine propulsion, of

a drum or wheel having pockets or recesses shaped to closely receive the paddles throughout substantially their entire length and width to the practical exclusion of water.

3. The combination with a drum having a continuous or unbroken peripheral portion formed with transverse pockets or recesses, of a series of connected paddle sections, each section comprising a cross member and arms at the ends thereof, the cross member having its greatest area substantially equal to the depth of the pockets and in a plane substantially at a right angle to the plane of the said arms, the length of the cross members being substantially equal to the width of the drum and its pockets.

4. A drum for a connected series of paddles for marine propulsion, said drum being hollow and comprising two side plates and an intermediate portion, the latter having pockets or recesses the faces of which are continuous or unbroken whereby no water can pass to the interior of the drum.

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

LÉON DION.

Witnesses:

A. W. HARRISON,  
H. JOSEPH DOYLE.