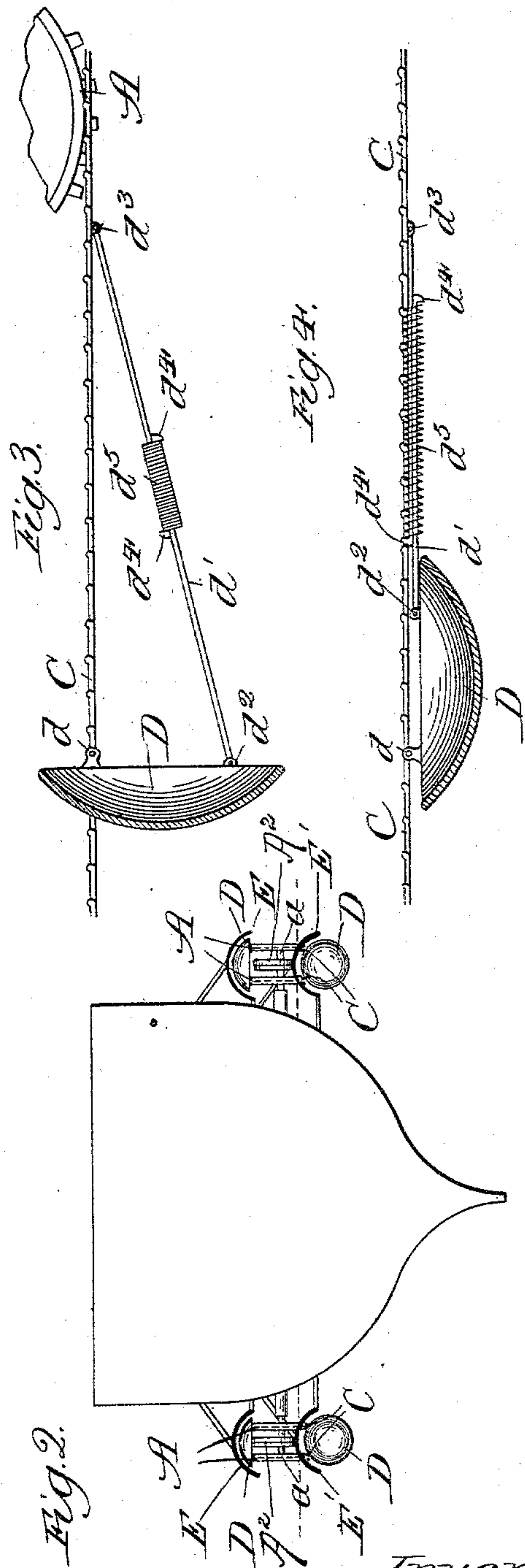
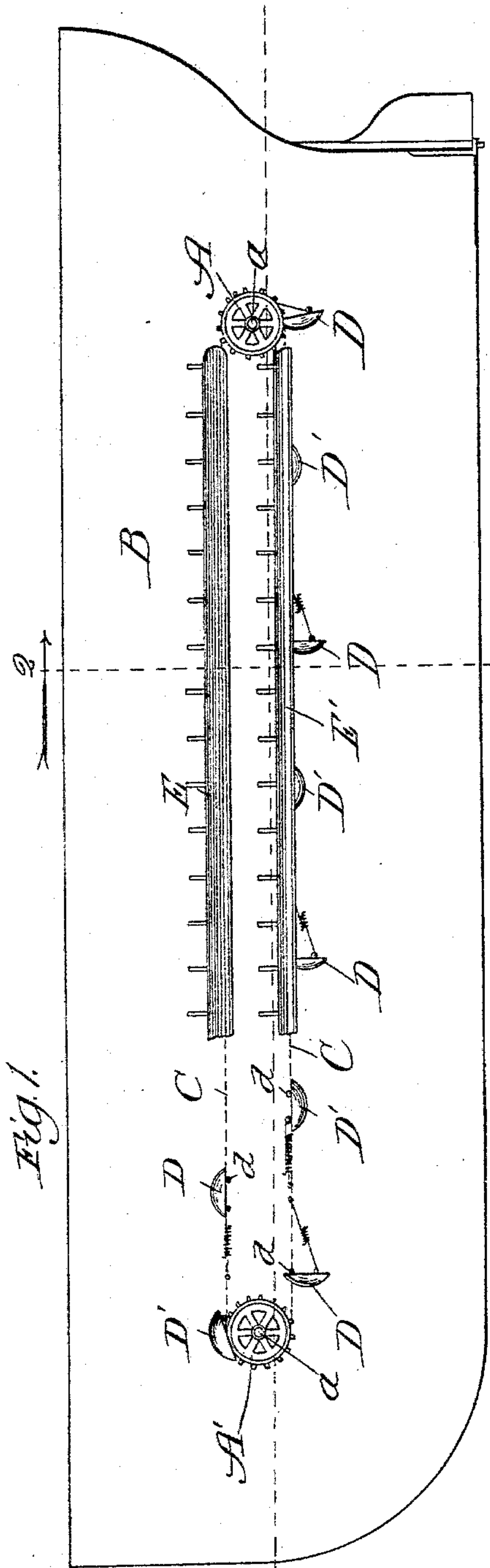


(No Model.)

J. D. MARK.
PROPELLER FOR SHIPS.

No. 565,170.

Patented Aug. 4, 1896.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN D. MARK, OF CHICAGO, ILLINOIS.

PROPELLER FOR SHIPS.

SPECIFICATION forming part of Letters Patent No. 565,170, dated August 4, 1896.

Application filed October 1, 1895. Serial No. 564,269. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. MARK, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain
5 new and useful Improvements in Propellers for Ships, of which the following is a specification.

The object of my invention is to provide a simple, economical, and efficient mechanism
10 for propelling ships through the water; and the invention consists in the features and combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of a ship with my
15 improvement attached thereto; Fig. 2, a transverse vertical section taken on line 2 of Fig. 1; Fig. 3, an enlarged detail of one of the propelling blades or paddles in its open position; and Fig. 4, an enlarged view of the same,
20 showing the blade in its closed position.

This invention relates particularly to the mechanism for propelling ships, and is especially adapted for the propulsion of ships and
boats through canals or inland streams.

25 In the navigation of canals it is well known that the use of ordinary propellers and side wheels are prohibited, owing to the fact that the splash from the paddle-wheels or the waves following the boat in the ordinary
30 stern-propeller wash the banks in such way as to rapidly destroy the walls of the same. The principal object of my invention therefore is to overcome these objections by providing a simple and efficient mechanism for
35 propelling the boat without disturbing the water to any appreciable extent, to such an extent as will raise waves and wash to destroy the banks of an inland canal or stream.

In describing my improvement I will describe the mechanism only, and not enter into
40 any detailed description of any particular kind of a boat, as it will be readily seen that the mechanism is adapted to be applied to any kind of a boat by slight modifications,
45 such as may be used by the ordinary skilled mechanic.

In constructing my improvement I provide two pairs of sprocket-wheels A A', which are
50 mounted upon shafts a a'. Either one of these shafts may be connected with any suitable source of motive power or energy, so as

to drive the connecting mechanism and thereby propel a boat, as hereinafter described. The mechanism in Figs. 1 and 2 is shown as applied to a boat B, of which, as above
55 stated, no detailed description will be given. Each side of the boat is supplied with propelling mechanism; but it is only necessary to describe one side, as such description will answer for both. The sprocket-wheels and
60 their supporting-shafts are placed, as shown in the drawings, one pair at each end of the boat, and around these sprocket-wheels is passed an endless driving-chain C, which supports and operates the paddles or buckets, as
65 hereinafter described. For the purpose of propelling the boats along as the chains are moved a number of buckets D and D' are provided alternately and pivoted to the chain, as at d. The buckets D are so pivoted that
70 when the chain is in operation they operate to drive the boat forward, while each alternate set of buckets D' is pivoted so that during the reverse movement of the chain they will operate to drive the boat backward. In all
75 other respects the construction of the buckets or paddles is substantially the same, so that the description of one will be a description of all.

In order to hold the buckets open in their
80 operative position, as shown in the lower portion of the chain in Fig. 1, connecting-rods d' are provided, which are pivoted to the outer free ends of the buckets at d² and to the chain at d³. These connecting-rods are
85 preferably made in two pieces and provided with heads d⁴, between which is inserted a helical coiled spring d⁵, so that when the buckets are in their operative position, as
90 shown in Fig. 2, the water impact in the concave portion of the buckets draws the bucket into its vertical position and the connecting-rods to their outer position against the tension of the helically-coiled spring, as shown
95 in Figs. 2 and 3. During the continued movement of the chain the buckets are drawn from the prow to the stern of the boat and the boat propelled according to the amount of energy used.

In order to overcome any resistance of the
100 air, it is advisable that the buckets be folded in their returning position, which is accom-

plished as follows: When the bucket is moved out of the water, its upper end contacts a loose wheel A², located between the sprocket-wheels, as shown in Fig. 2. By this action the bucket is tilted in line with the chain and the helically-coiled spring d' allowed to expand to its greatest length, thus shortening the connecting-rod and acting to bring the buckets into their folding position, as shown in Fig. 4, so that no resistance whatever of the air or water is encountered, at least not to any appreciable extent. It will thus be seen that the buckets assume their operative position very easily and without making any appreciable splash. The chain and buckets being propelled gently and at a uniform speed, no wash is made and the water as it is displaced is thrown to the stern of the boat, leaving a very small narrow wake. The waves ordinarily caused by the prow of the boat, due to displacement of the water, are met by the propelling mechanism and flattened down or minimized to such an extent that very little of it reaches the banks of the stream.

Shields or guards E E' are provided and attached to the sides of the boat for the purpose of covering the propelling mechanism and protecting it against articles that might accidentally fall overboard or be thrown overboard, and also from articles floating in the water, as well as offering a safeguard for life and limb, in that they prevent the people on boats from ordinarily contacting the propelling mechanism.

I have not described any particular motor for driving my mechanism; but it is understood that either steam or vapor engines, electric motors, or other prime movers may be used and connected to my improved mechanism, and while I have entered into a more or less detailed description of my improvements and as being embodied in certain precise forms I do not desire to be limited thereto unduly any more than is pointed out in the claims. On the contrary, I contemplate all proper changes, the omission of immaterial

parts and substitution of equivalents as circumstances may suggest or render expedient.

I claim—

1. In a ship-propeller, the combination of an endless driving-chain, sprocket-wheels upon which such chain is mounted for the purpose of supporting and driving the belt adjacent to and along the side of a vessel, buckets or paddles pivoted at one end to such chain and adapted to contact the water and propel the vessel along during the movements of the chain, adjustable connecting-rods pivoted to the free ends of the buckets or paddles and to the chain for the purpose of holding the buckets in their inoperative positions, and spring mechanism on such connecting-rods to permit the expansion of the rods during the operation of the mechanism and close the same when out of contact with the water for the purpose of throwing the buckets into their operative position, substantially as described.

2. In a ship-propeller, the combination of an endless driving-chain, sprocket-wheels upon which such chain is mounted for the purpose of supporting and driving the belt adjacent to and along the side of a vessel, buckets or paddles pivoted at one end to such chain and adapted to contact the water and propel the vessel along during the movements of the chain, adjustable connecting-rods pivoted to the free ends of the buckets or paddles and to the chain for the purpose of holding the buckets in their inoperative positions, spring mechanism on such connecting-rods to permit the expansion of the rods during the operation of the mechanism and close the same when out of contact with the water for the purpose of throwing the buckets into their operative position, and protecting-guards for the operating mechanism, substantially as described.

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Witnesses:

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