

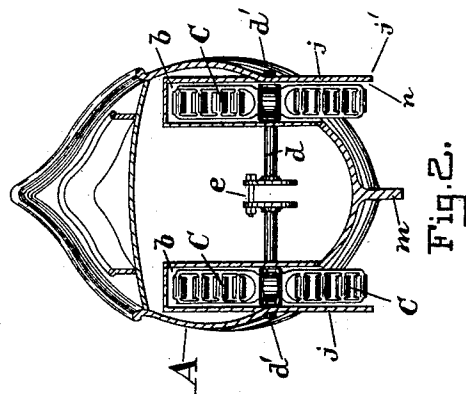
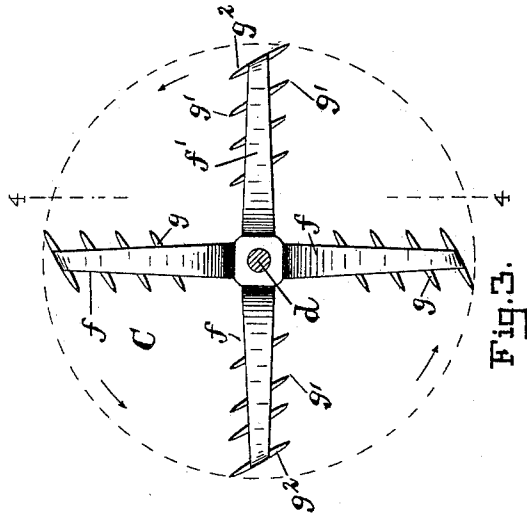
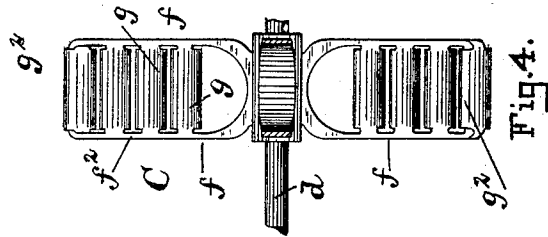
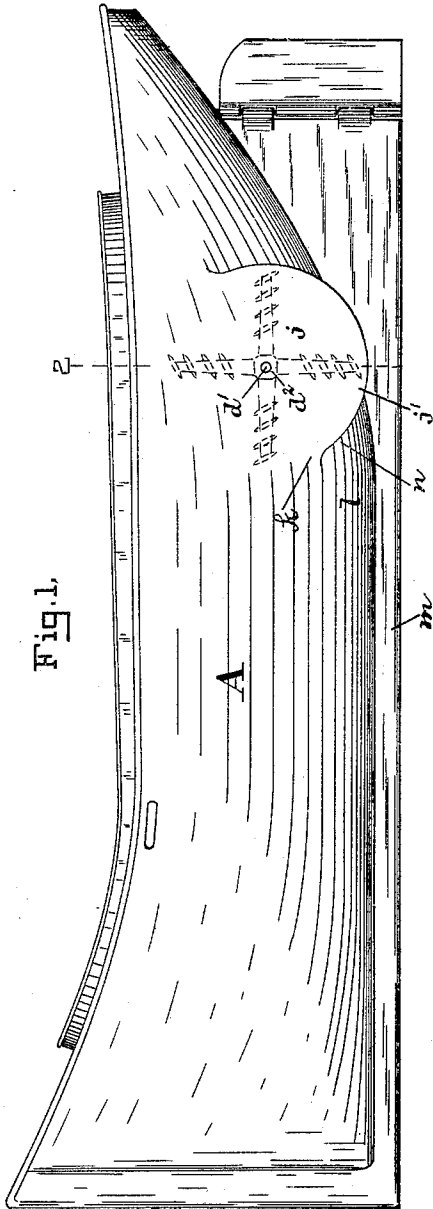
(No Model.)

A. COOPER.

SIDE PROPELLER FOR STEAM VESSELS.

No. 468,039.

Patented Feb. 2, 1892.



WITNESSES:

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ALFRED COOPER, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE COOPER
SIDE PROPELLER COMPANY, OF SAME PLACE.

SIDE PROPELLER FOR STEAM-VESSELS.

SPECIFICATION forming part of Letters Patent No. 468,039, dated February 2, 1892.

Application filed February 28, 1891. Serial No. 383,166. (No model.)

To all whom it may concern:

Be it known that I, ALFRED COOPER, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Side Propellers for Steam-Vessels, of which the following is a specification.

This invention relates to propellers for steam-vessels of that class which have the wheels revolving in chambers formed partly in the vessel's hull, as that shown in my patent, No. 421,818, of February 18, 1890.

The main objects in view are a better protection for the propellers and such a construction of the housings as will confine the water to prevent its lateral displacement by the propeller-blades and yet be no hinderance to the forward movement of the vessel, by which the vessel has the capacity for greater speed.

With these ends in view the invention consists in the features of construction which will be pointed out hereinafter and specified in the claims.

In the accompanying drawings, illustrating the invention, Figure 1 represents a side elevation of the hull of a vessel provided with my improvements; Fig. 2, a cross-section of the same on line 2 2 of Fig. 1; Fig. 3, a side view of one of the propellers; and Fig. 4 another view of the propeller, taken on line 4 4 of Fig. 3.

In the drawings, the letter A designates the hull of the vessel; *b*, the chambers formed in the hull and in which the upper part of each propeller C is housed; *d*, the shaft on which the propellers are mounted, and *e* the crank of the shaft, which is here shown without any other connecting parts. The two propellers C may be on one shaft, or each may be on a different shaft to admit of turning separately. The propeller C has radial arms *f*, which carry the oblique buckets or blades *g*. These arms are broad on the side *f'* (see Fig. 3) and narrow or thin on the edges *f''*. (See Fig. 4.) By this arrangement the arms in revolving will readily pass through the water edgewise with least resistance. The blades *g* are substantially elliptical in cross-section or end elevation, as seen in Fig. 3. They are thickest at the center and have a gradual taper therefrom toward each edge *g'*, which is compar-

tively thin and sharp. Thus formed the blades in their revoluble movement will readily enter the water offering the least resistance; but as soon as they pass below they act effectively on the water to propel the vessel forward. The bucket or blade *g*² at the extremity of each pair of radial arms *f* serves as a cross-piece to connect the two arms, and at the same time serves as a propeller, as will be obvious.

Attached to the walls of the hull A, adjoining the outer side of each chamber *b*, is a downward-extending plate *j*, which is partly circular in shape and is of size to completely cover the outer side of the propeller. The propeller-shaft *d* has its outer end *d'* in a bearing *d''* on said downward-projecting plate *j*.

As will be seen by reference to Figs. 1 and 2, the joiner at *k* of the forward portion of the partly-circular plate *j* and hull A is flush or even with the side of the hull, and owing to the convexity of the hull at *l* the lower portion *j'* of the partly-circular plate projects straight down below said point *k*, where the parts join. By this construction the flat side of the partly-circular plate is in parallel line with the keel *m* of the hull and the said plate does not interfere with the forward movement of the vessel. At the same time as the vessel moves forward the water at the side of the hull has free access through the passage *n* below the joiner *k* to the wheel or propeller C. This plate *j*, it will be observed, serves as a guard or shield to protect the propeller from injury and also prevents a lateral slippage of the water from the propeller-blades *g*. The whole force of said blades on the water will therefore be exerted to propel the vessel forward, and the advantage of the full action of the propeller is in this manner obtained.

It will be observed that the propeller constructed to offer the least resistance and yet give the advantage of a full action of its blades is thoroughly protected by the partly-circular plate, which also confines the water and prevents its lateral or outward escape and insures that the force of the propeller is concentrated, as previously explained. The propellers and guard-plates may be located wherever they will operate most effectively.

It is the design that the size of the propel-

lers with respect to that of the hull shall be so proportioned and that the shaft shall be so located with respect to the water-line when the vessel is loaded that when the vessel is rolling the propeller on the high side will not get out of water, the object in view being to avoid the objectionable "racing" of the wheel.

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

1. The combination of the hull of a vessel having at each side a chamber *b* within the hull, a downward-extending partly-circular plate *j*, attached to the hull on the outer side of each chamber, a shaft having its ends in bearings on said downward-extending plates, and propeller-wheels mounted on said shaft, each wheel having its upper part housed in one of the chambers and completely covered on the outside by the said downward-extending

plates, in the manner and for the purpose set forth.

2. The combination of the hull of a vessel having at each side a chamber within the hull-wall, a partly-circular plate with a flat surface attached to the hull and projecting downward from the outer side of each chamber, the lower portion *j'* of the said plate extending below the point *k* of its joinder with the hull and forming a front water-passage *n*, and propeller-wheels *C*, mounted so that their lower portions will be entirely covered on the outer side by said plates, as set forth.

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

ALFRED COOPER.

Witnesses:

JNO. T. MADDIX,

F. P. DAVIS.