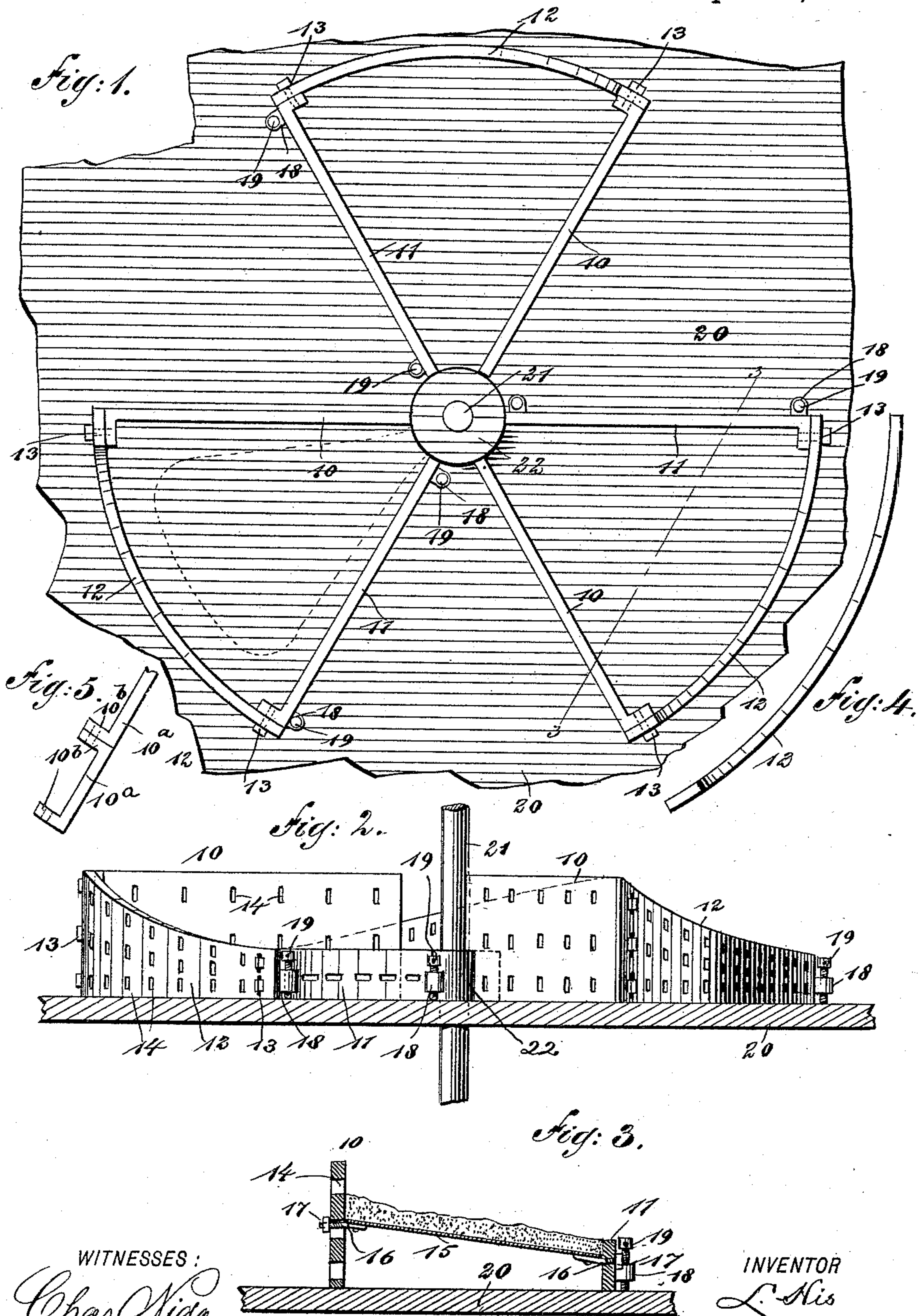


(No Model.)

L. HIS.  
APPARATUS FOR MOLDING PROPELLERS.

No. 495,804.

Patented Apr. 18, 1893.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

LOUIS HIS, OF NEW YORK, N. Y.

## APPARATUS FOR MOLDING PROPELLERS.

SPECIFICATION forming part of Letters Patent No. 495,804, dated April 18, 1893.

Application filed April 26, 1892. Serial No. 430,762. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS HIS, of New York, in the county and State of New York, have invented a new and Improved Apparatus for Molding Propellers, of which the following is a full, clear, and exact description.

My invention relates to improved means for constructing molds for propellers such as are used on marine vessels, and the object of my invention is to obviate the necessity of using patterns in casting the propeller blades. It will be readily understood that an enormous expense in the construction of propellers will thus be saved, as the patterns are heavy and costly and moreover they are hard to handle. A further object of my invention is to provide means for molding the propellers with the greatest accuracy and facility.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the flasks embodying my invention, showing them arranged around a propeller spindle or shaft. Fig. 2 is a side elevation of the same. Fig. 3 is a cross section on the line 3—3 in Fig. 1. Fig. 4 is a detail plan view of one of the end pieces of the flasks; and Fig. 5 is a broken detail view of an extensible side piece for a flask.

In carrying out my invention, I provide a flask for each blade of the propeller, the flasks being of an approximately triangular shape so that the mold for the propeller blade may be conveniently made in them, and each flask is provided with a relatively high side piece 10, a relatively low side piece 11, and a curved end piece 12, having an inclined upper surface, the height of the end piece being gradually reduced from the higher side piece 10 to the lower side piece 11. The flasks are left open at their inner ends so that they may be properly adjusted around the spindle or shaft as hereinafter described. The side pieces are united to the end pieces by suitable bolts 13, and sufficient play is left at the joints to en-

able the several parts to be adjusted vertically in relation to each other, and the flasks may also be adjusted longitudinally to suit the size of the propeller blade to be cast, and to this end, short sections 10<sup>a</sup> of the side pieces are used, these having abutting flanges 10<sup>b</sup> at the ends, which may be bolted together. It will be understood that as the side pieces are lengthened, a correspondingly longer end piece 12 will be used, and several sizes may be provided so as to facilitate the easy regulation of the sizes of the flask. The side and end pieces are provided with rows of perforations 14, to facilitate the attachment and adjustment of the flask bottoms 15, these being adapted to be held at an inclination, as shown in Fig. 3, and on the sides of the bottom are projecting bolts 16, which are adapted to be thrust through the perforations 14, and the bolts are provided with nuts 17, by means of which the bottoms may be clamped in place.

The object of the perforations and the inclined bottom is to save sand, as by inclining the bottom, as shown in Fig. 3, it may be made to approximate the inclination of the propeller blade, and consequently the proper mold may be made for the blade with the use of comparatively little sand.

To further facilitate the adjustment of the flask so that the mold may be quickly formed and with little sand, the lower side piece 11 is provided with lugs 18, in which are held vertical screws 19, these being adapted to impinge on the bed 20 upon which the flasks rest while the mold is being formed, and by turning the screws up or down the side pieces may be moved in relation to the rest of the flask and the pitch of the blades regulated in a measure.

To form the mold, the spindle or shaft 21 of the propeller is placed in a vertical position upon the bed 20, the hub block 22 is placed upon the spindle in the bed, and the flasks are disposed circumferentially around the spindle and at equal distances apart, the inner open ends of the flasks being made to abut against the hub block. The flasks are then rammed and the mold is scraped out to the desired shape, and to facilitate this, a knife is preferably employed, such as is shown

in an application for Letters Patent of the United States, Serial No. 430,761, filed April 26, 1892. After the mold is formed, the spindle and flasks may be rearranged upon a perfectly smooth and substantial bed, and the flasks for the opposite sides of the propeller blades having been molded in the manner described, are placed upon the lower flasks, and the pouring is done in the usual way. The flasks for the two sides of the propeller blades are approximately alike, except that they have an opposite inclination, that is, the higher side piece of one part of the flask will register with the lower side piece of the opposite part of the flask, and this construction enables the two parts of the flask to fit nicely together. Any ordinary means may be employed to hold the flasks in position for pouring.

From the foregoing description it will be seen that the mold may be easily formed, and after being formed the flasks may be handled separately and arranged as described upon a suitable bed for pouring. Before the molds are scraped out in the flasks, the sand is rammed in the usual way so that the molds will retain their shape.

It is to be understood that the flask described above, serves the double purpose of a

flask and guide board, as the curved and inclined end piece 12 takes the place of the ordinary guide board which extends laterally from the spindle. Thus, the ordinary sweeping apparatus traveling along the end of the flask will sweep the surface of the blade cavity.

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

1. The flasks comprising side pieces of dissimilar heights, inclined pieces connecting the side pieces, and vertically-adjustable bottoms for the flasks, the bottoms being adapted to be held at an inclination, substantially as set forth.

2. A flask, comprising side pieces of dissimilar height, the said side pieces having rows of perforations therein, an inclined end piece connecting the outer portions of the side pieces, said end piece being also perforated, and an adjustable bottom having fastening bolts to enter the perforations in the sides and end of the flask, substantially as described.

LOUIS HIS.

Witnesses:

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EDGAR TATE.