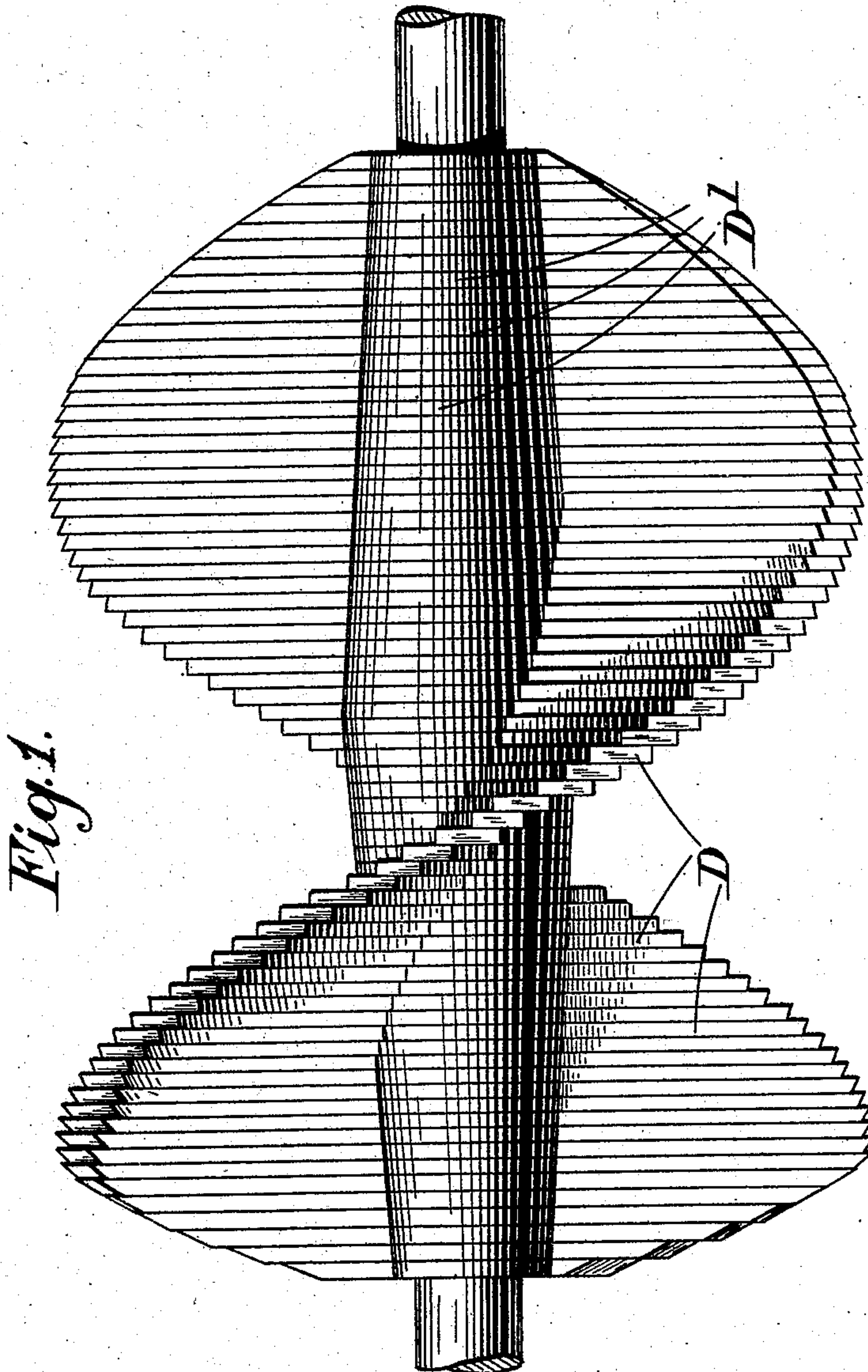


No. 885,109.

PATENTED APR. 21, 1908.

T. F. J. TRUSS.
SCREW PROPELLER.
APPLICATION FILED NOV. 2, 1905.

2 SHEETS—SHEET 1.



Witnesses:

W. K. Boulton

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Inventor:

Thomas F. J. Truss,

By *W. K. Boulton*

attorney

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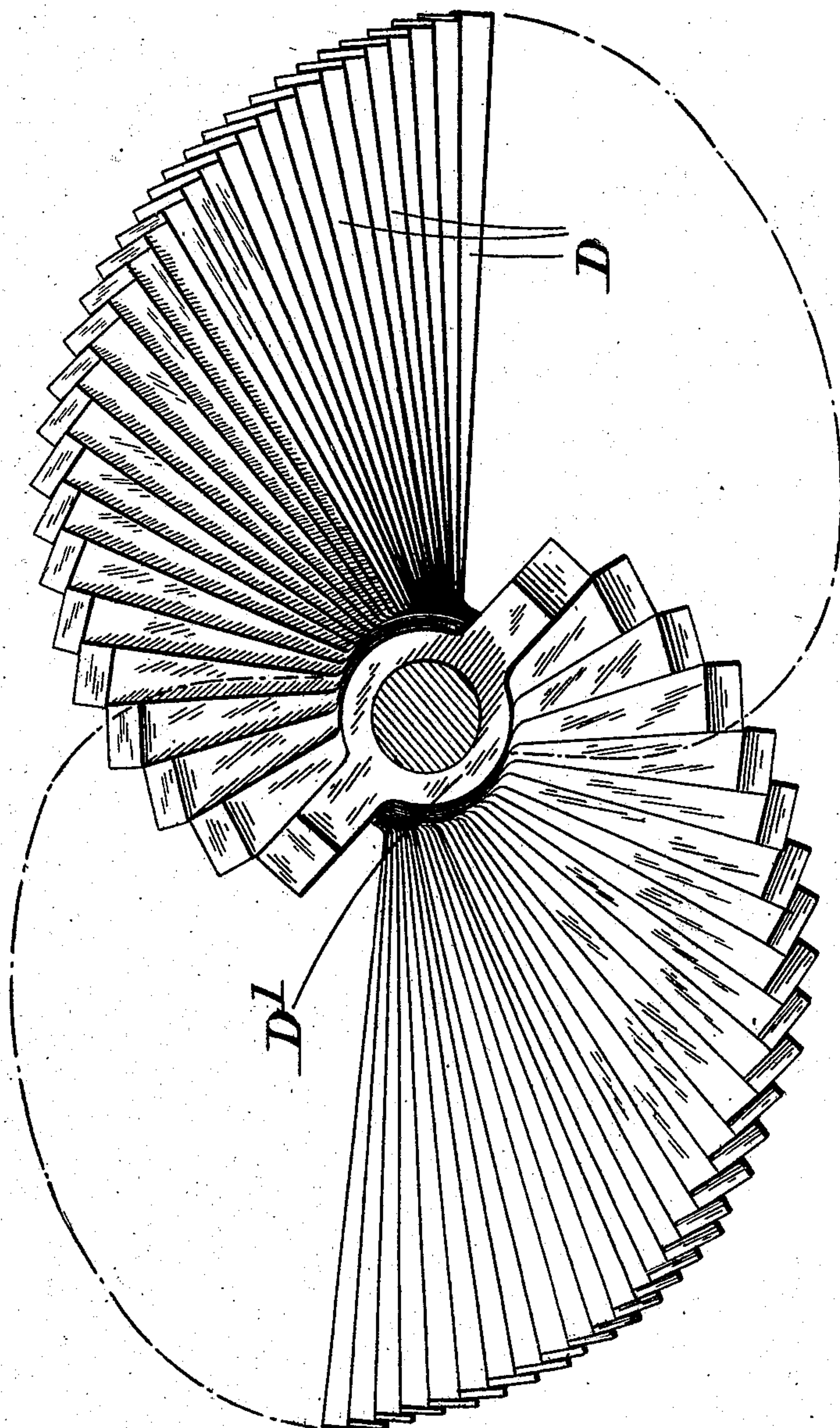
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2 SHEETS—SHEET 2.

Fig. 2.



Witnesses:

H. K. Boulton

[Signature]

Inventor:

Thomas F. J. Truss,

By *[Signature]*

Attorney

UNITED STATES PATENT OFFICE.

THOMAS FREDERICK JOHN TRUSS, OF LONDON, ENGLAND.

SCREW-PROPELLER.

No. 885,109.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed November 2, 1905. Serial No. 285,571.

To all whom it may concern:

Be it known that I, THOMAS FREDERICK JOHN TRUSS, a subject of the King of England, and a resident of London, in England, have invented certain new and useful Improvements in Screw-Propellers, of which the following is a specification.

This invention relates to a screw propeller which at its periphery has a greater area of blade than has heretofore been customary, combined with an elongated boss having a spherical or barreled central portion with pointed or tapered ends and serving to direct the stream lines from the forward end of the boss outward towards the circumference of the blade. This boss also acts to increase the efficiency of the propeller by affording a surface by means of which the stream lines closing in upon the after end of the propeller will exert a forward thrust on the boss and incidentally reduce the resistance of the propeller to rotation. Moreover, the employment of a boss of this kind with a continuous blade or two or more such blades thereon will tend to prevent or partially prevent cavitation.

According to this invention the improved propeller comprises the combination with an elongated boss having tapered ends of a screw blade thereon that is continuous through at least a greater angle than that which an individual blade on an ordinary propeller occupies; preferably in the improved propeller the blade should be continuous for a complete turn or more. Such a propeller may have two or more such blades thereon. Each blade may be of gradually diminishing radius at the leading end or at both ends, or curved at its leading end or at both ends, or otherwise modified at different parts of its length in pitch or in diameter or in both.

A feature of this invention is that the blade is constructed of sheets or laminae one behind another to produce a blade of a thickness that is stepped or graduated from the tip towards the boss, the several laminae being preferably flanged near the boss and the several flanges being concentric with one another and all bolted or otherwise secured to the boss.

When two or more of the improved propellers according to this invention are applied to the same ship, they are preferably

set out of phase with one another so as to prevent undue vibration.

In the accompanying drawings—Figure 1 is a side view, and Fig. 2 an end view of a propeller illustrating a method of construction according to this invention.

The propeller is built up of sheets or laminae D placed one behind another. Each lamina is tapered from the tip towards the boss and the laminae are set at an angle to one another so as to form the helix in the well known way. Each lamina has a portion D¹ of increased width at the center so as to form a boss through which the shaft may pass, and in order that this boss may be tapered in accordance with this invention the boss sections are formed of increasing diameter towards the center of the propeller. To render the blades curved at the ends, the laminae decrease in length towards the ends and in order that the pitch of the screw may be modified, for example, so as to increase the pitch towards the after end, the angle between the successive laminae may be increased, as shown at the left in Fig. 1 and in Fig. 2, or decreased as shown at the right in Fig. 1.

The elongated boss has a tapered end at the forward end which serves to direct the stream lines from the leading end of the boss towards the circumference of the blade. The effect of this is that the water entering the propeller will be directed towards the circumference where its component of pressure on the blade in a circumferential direction will have the maximum effect in balancing the rotational resistance of the water on the other side of the propeller. Certain stream lines also will impinge directly on the propeller and will operate with angular velocity on the non-propelling faces of the blades, to counterbalance the rotational resistance of the propeller. In order that fluid may not pass through between the blades of the propeller without impinging on the non-propelling faces, the blades are of such dimensions that there is no complete interval between the turns of blades in end view. The boss has also a tapered end at the after end which acts to increase the efficiency of the propeller by affording a surface of which the stream lines closing in upon the after end of the propeller will exert a forward thrust on the boss and incidentally reduce

the resistance of the propeller to rotation. The term elongated employed in this specification as applied to the boss, indicates that the boss is of considerable length compared
5 with the boss of an ordinary propeller.

The blades may be more or less inclined to the axis of the propeller at one or both ends. The laminæ may be flanged near the boss and the several flanges may be concentric with
10 one another and all bolted or otherwise secured to the boss. The edges of the laminæ may be trimmed so as to produce a propeller having smooth surfaces tapering towards the periphery. If it be desired to produce
15 more than two blades, say three or four blades, the laminæ are formed with three, four or more arms, as required.

It is to be understood that the propellers constructed in accordance with this invention may be used in any medium and their
20 application is not confined to ships.

What I claim as my invention and desire to secure by Letters Patent is—

1. In a screw propeller the combination of
25 an elongated boss tapered at the ends and screw blades thereon of such a length that there is no complete interval between the turns in end view, such boss and blades comprising a series of laminæ each having arms
30 and central shaft-receiving boss portions secured together in such relation to one another as to form helicoidal blades, each lamina being tapered from the tip toward the boss.

35 2. In a screw propeller the combination of an elongated boss tapered at the ends and a plurality of screw blades thereon of such a length that there is no complete interval between the blades in end view, such boss
40 and blades comprising a series of laminæ each having as many arms as there are blades to the propeller and central shaft-receiving boss portions of varying diameter secured together to form the tapering boss, each
45 lamina being tapered from the tip toward the boss.

3. In a screw propeller the combination of an elongated boss tapered at the ends and screw blades thereon that are varied in pitch
50 towards the end and are of such a length that there is no complete interval between the turns in end view, such boss and blades comprising a series of laminæ each having arms

and central shaft-receiving boss portions secured together in such relation to one
55 another as to form a helicoidal blade, each lamina being tapered from the tip toward the boss.

4. In a screw propeller the combination of an elongated boss tapered at the ends and a
60 plurality of screw blades thereon that are varied in pitch towards the end and are of such a length that there is no complete interval between the blades in end view, such boss and blades comprising a series of laminæ
65 each having as many arms as there are blades to the propeller and central shaft-receiving boss portions of varying diameter secured together to form the tapering boss, each lamina being tapered from the tip toward the
70 boss portion.

5. In a screw propeller the combination of an elongated boss tapered at the ends and screw blades thereon that are varied in pitch
75 towards the end and inclined to the axis of the propeller at the end and are of such a length that there is no complete interval between the turns in end view, such boss and blades comprising a series of laminæ each
80 having arms and central shaft-receiving boss portions secured together in such relation to one another as to form a helicoidal blade, each lamina being tapered from the tip toward the boss.

6. In a screw propeller the combination of
85 an elongated boss tapered at the ends and a plurality of screw blades thereon that are varied in pitch towards the end and inclined to the axis of the propeller at the end and are of such a length that there is no complete
90 interval between the blades in end view, such boss and blades comprising a series of laminæ each having as many arms as there are blades to the propeller and central shaft-receiving boss portions of varying diameter
95 secured together to form the tapering boss, each lamina being tapered from the tip toward the boss.

In testimony whereof I have signed my name to this specification in the presence of
100 two subscribing witnesses.

THOMAS FREDERICK JOHN TRUSS.

Witnesses:

H. D. JAMESON,
FREDK. L. RAND.