

J. FLEWES.
PROPELLING WHEEL.
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995,562.

Patented June 20, 1911.

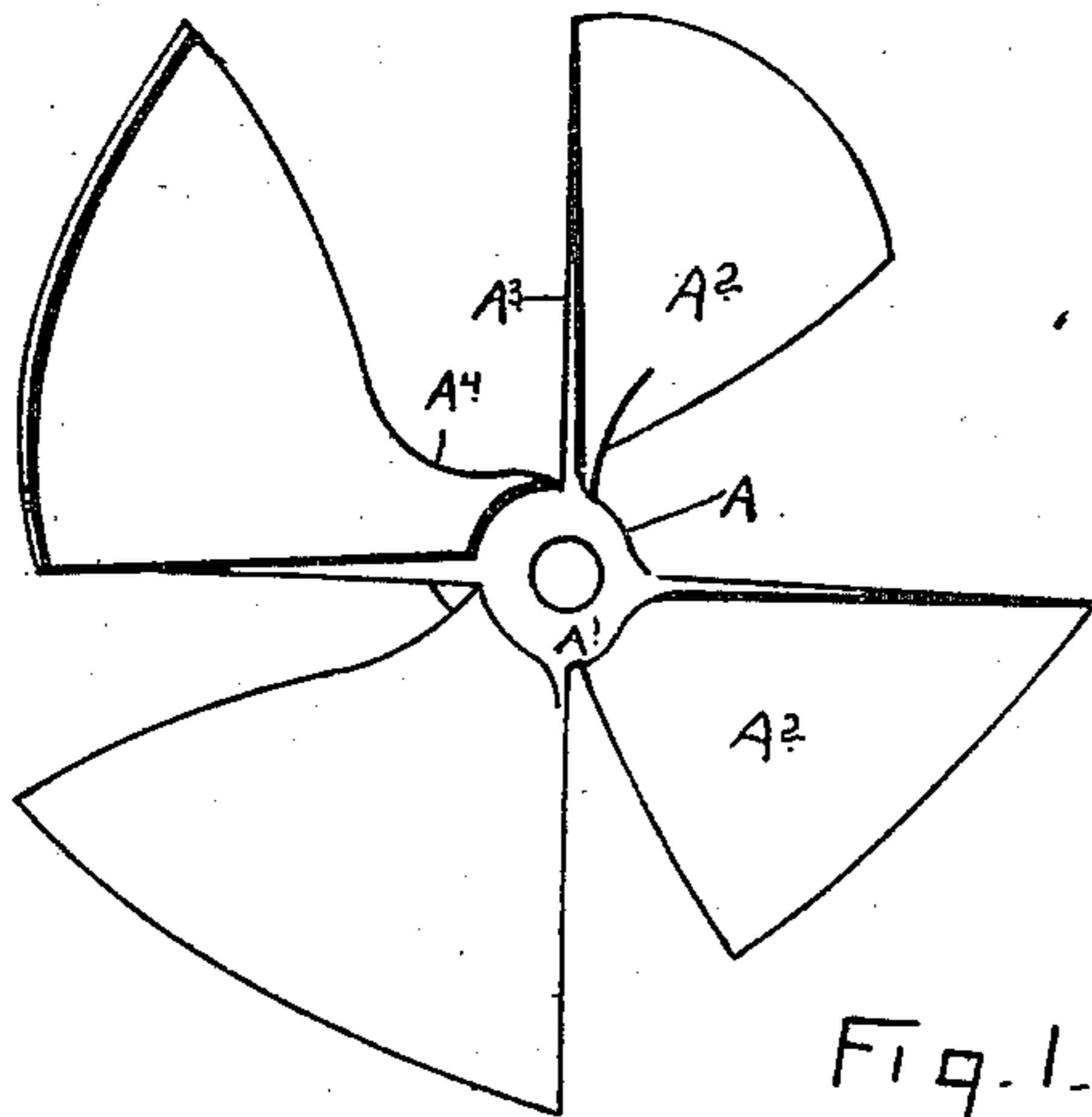


Fig. 1.

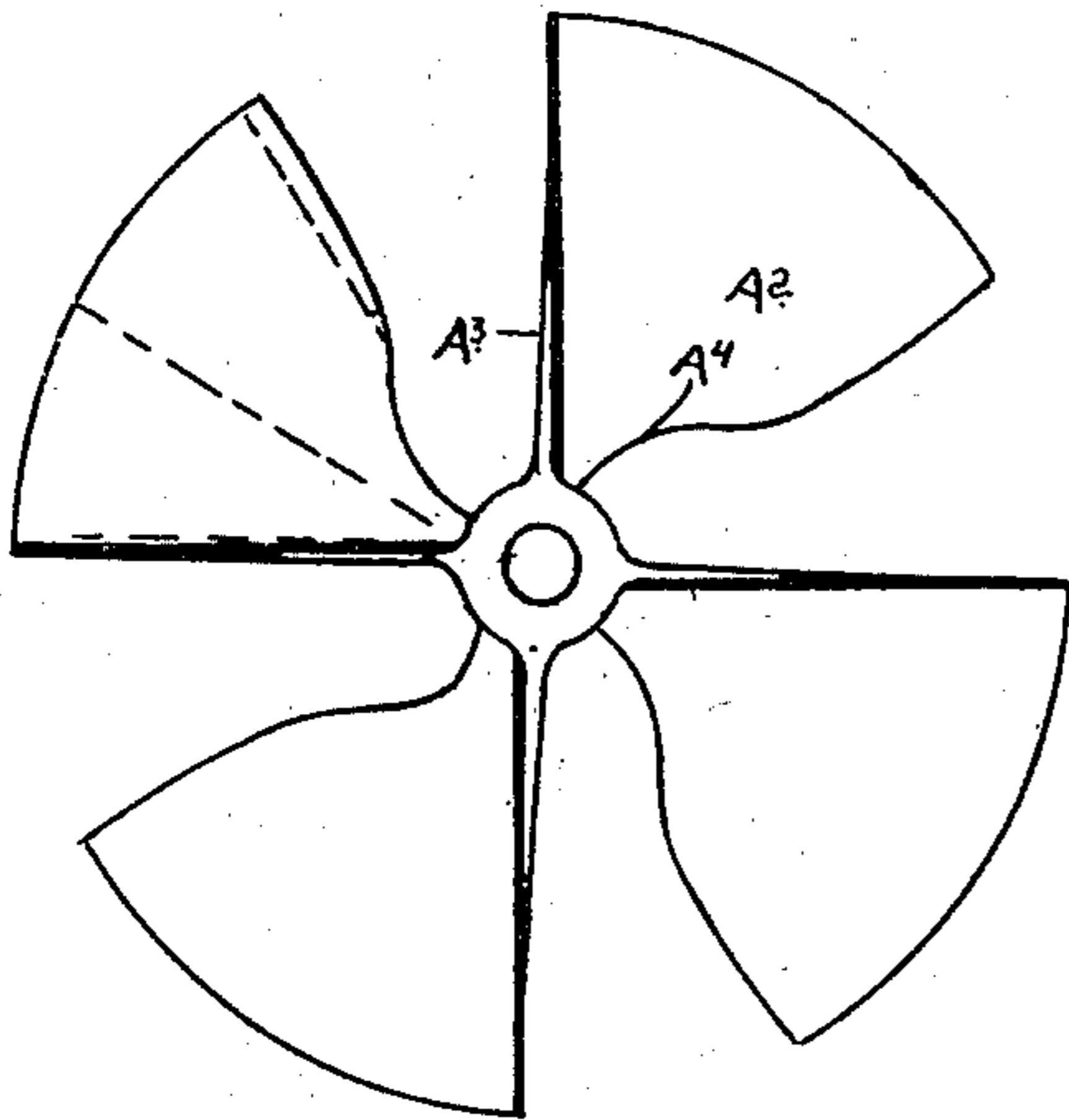


Fig. 2.

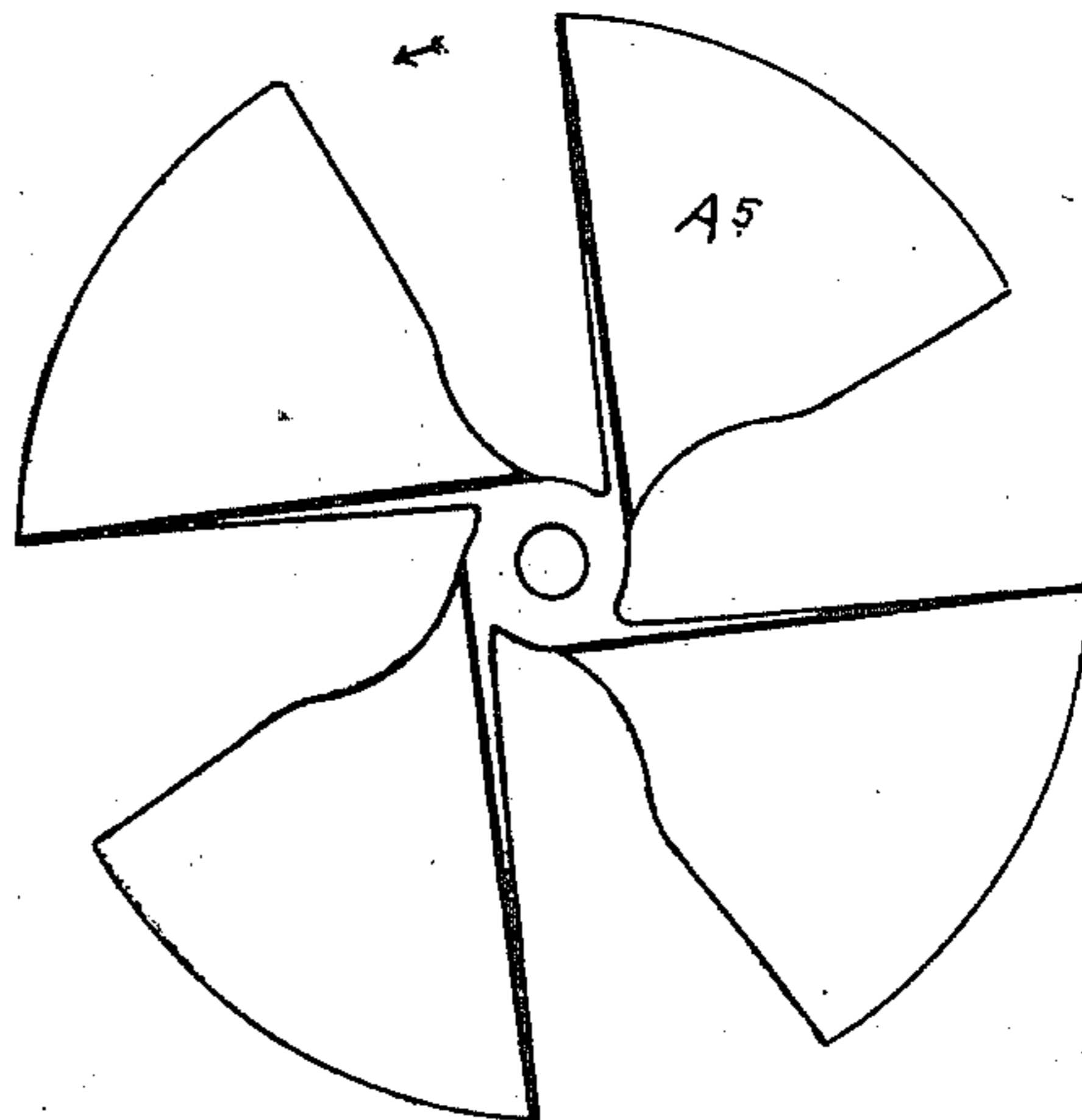


Fig. 4.

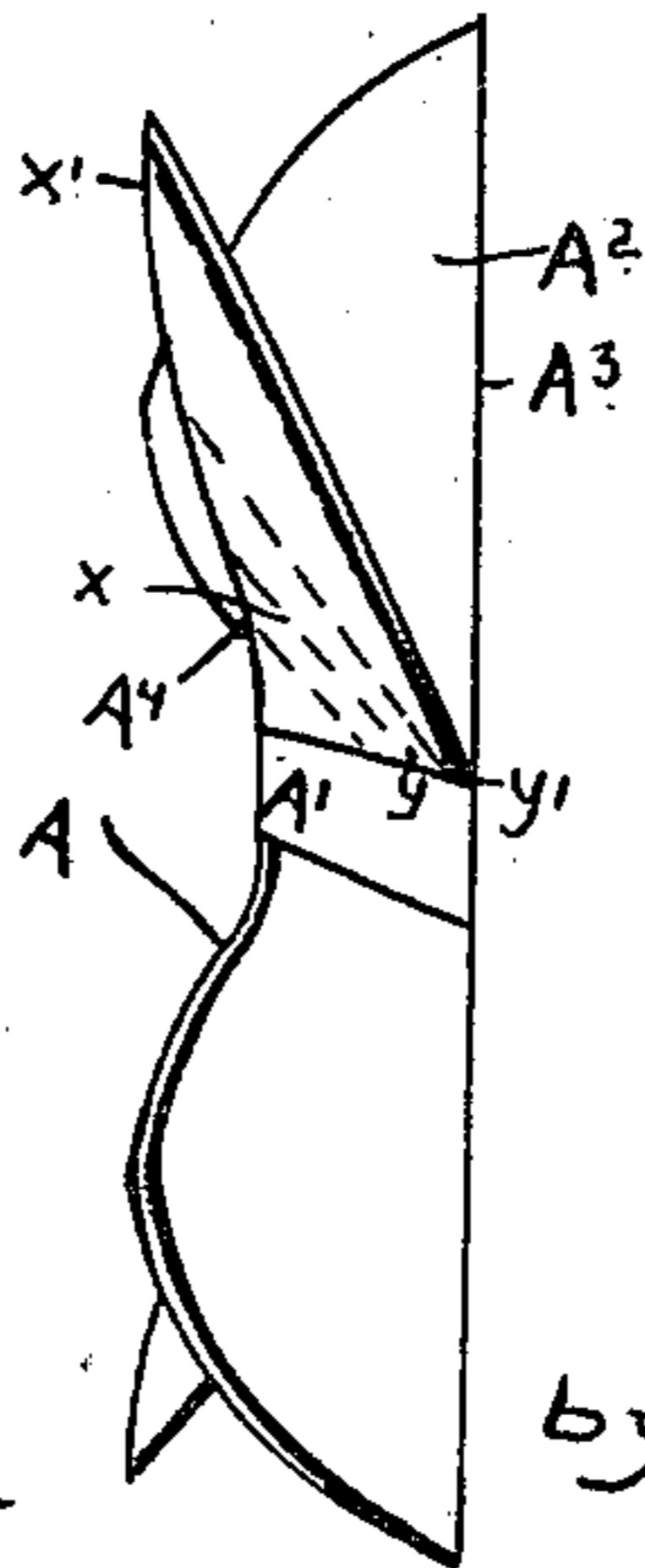


Fig. 3.

WITNESSES

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PROPELLING-WHEEL.

995,562.

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To all whom it may concern:

Be it known that I, JOHN PLEWES, of the town of Kimberly, in the county of Grey, in the Province of Ontario, Canada, have
5 invented certain new and useful Improvements in Propelling-Wheels, of which the following is the specification.

My invention relates to improvements in propelling wheels, and the object of the invention is to devise a wheel of this class in which the pitch, size, lead and form of the blades are so arranged that there will be a minimum slip, no churning of the water and a maximum freedom of discharge of
10 the water behind the wheel and thus consume not only less power but produce an increase of speed by a wheel constructed in accordance with my invention as compared with wheels of the same diameter as at
20 present constructed. To effect this object I have constructed my propelling wheel with blades having a straight front edge and the pitch of the blade arranged on a series of straight lines decreasing in pitch but increasing in length from the hub outwardly,
25 the back end of the blade near the hub being cut away so as to produce approximately an equally proportionate discharge from the hub to the outer ends of the blades, which
30 are concentric and otherwise arranged as hereinafter more particularly explained.

Figure 1, is a perspective view of a propelling wheel constructed in accordance with my invention. Fig. 2, is a face view of the
35 propelling wheel. Fig. 3, is a side or edge view. Fig. 4, is a face view of an alternative form.

In the drawings like letters of reference indicate corresponding parts in each figure.
40 A is the wheel, which is provided with the usual hub A' and blades A² having straight edges A³ radially arranged and parallel to or flush with the plane of the front face of the hub. Each blade A² has the greatest
45 pitch inside next to the hub, such pitch being represented by a line $x-y$ as indicated by dotted lines in Fig. 3. The pitch decreases from the hub outwardly as indicated by the remaining line $x'-y'$. The length of
50 these dotted lines is shown in this figure to gradually increase from the hub outwardly. The outer edge of the blade is concentric.

Each blade it will be seen has a flat-like twist, that is to say, the blade is so formed
55 that if a line be drawn from one side of the blade to the other at points of equal radius

that such line will be substantially straight and coincide with the face of the blade from one side to the other. This is true of any part of the blade so long as the points taken
60 to each side of the blade are equally distant from the center of the wheel. Each blade is also cut away in curved form as indicated in the drawings at A⁴, so as to provide a discharge at the inner end next the hub in
65 proportion to the discharge at the outer ends of the blades, such discharge being graduated to allow of a maximum equal freedom of discharge from hub to the outer edge of
70 the blade. The width of each blade at any one point is substantially equal to the distance between this point and the center of the wheel.

The forms shown in Figs. 1, 2 and 3 are designed particularly for a wheel running
75 at an ordinary speed but where a high speed is required I preferably arrange the front edge of the blades A⁵ as indicated in Fig. 4, so that the inner end is tangential to a circle drawn from the center of the axis of the
80 wheel. This as the wheel will revolve in the direction indicated by arrow will prevent the centrifugal force in high speed wheels from throwing the water outwardly. In fact this form will draw the water inwardly within
85 the periphery of the wheel and thus prevent the water out beyond the periphery being dragged around and using up more power, which it is, of course, desirable to avoid. The pitch angle of the blade is proportioned
90 to gradually decrease from the center toward the outer edge of the blade, so that the propelling power obtained from the blade from inside to outside is rapidly increased
95 from hub to periphery. Again as the wheel is made with four blades I find that there is practically no vibration.

I am aware that wheels have been made with blades increasing in width from inside to outside and with the outside having the
100 greatest width. I am also aware that it is not new to make the outside concentric to the axis of rotation or to make a throat in the blade next the hub in order to assist in the freedom of discharge. I also know that
105 the pitch of the blade has been made to decrease from the hub to the outer edge. I, therefore, do not claim any of such constructions in themselves. I have, however, found that by constructing a wheel including the
110 above forms so related to each other and combined as hereinbefore described, that I

produce a very superior wheel having such results in speed as have not been accomplished by any wheel of which I am aware.

In my invention also, I have found out, 5 that in order to produce the results, which I have obtained it is necessary that the wheel be so constructed as to the diameter or area that the cubic feet or bulk of water passing through the rotating wheel must be greater 10 than that displaced by the boat when being driven and this results in practically no churning, and a smooth wake behind the boat.

What I claim as my invention is:

15 1. A propelling wheel comprising a hub, four blades each having a straight front edge radiating from the center of the hub, a peripheral edge concentric with the axis of rotation and the back edge cut away or 20 hollowed in compound curve form in proximity to the hub and with a straight edge from the end of the curve to the concentric outer edge, and each blade increasing in width from the hub to the concentric outer 25 edge, so that a line drawn at any point across the width of the blade is equal in length to the radial distance to such line and the pitch of each blade being so ar-

ranged as to have an even graduated decrease from the hub to the outer edge. 30

2. A propelling wheel comprising a hub, four blades each having a straight front edge radiating from the center of the hub, a peripheral edge concentric with the axis of rotation and the back edge cut away or 35 hollowed in compound curve form in proximity to the hub and with a straight edge from the end of the curve to the concentric outer edge, and each blade increasing in width from the hub to the concentric outer 40 edge, so that a line drawn at any point across the width of the blade is equal in length of the radial distance to such line and the pitch of each blade being so arranged as to have an even graduated decrease from the 45 hub to the outer edge, the impelling area of the wheel being such that the cubic feet or bulk of water passing through the rotating wheel is greater than that displaced by the boat when being driven as and for the purpose specified. 50

JOHN PLEWES.

Witnesses:

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L. WHEELER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
