

No. 784,109.

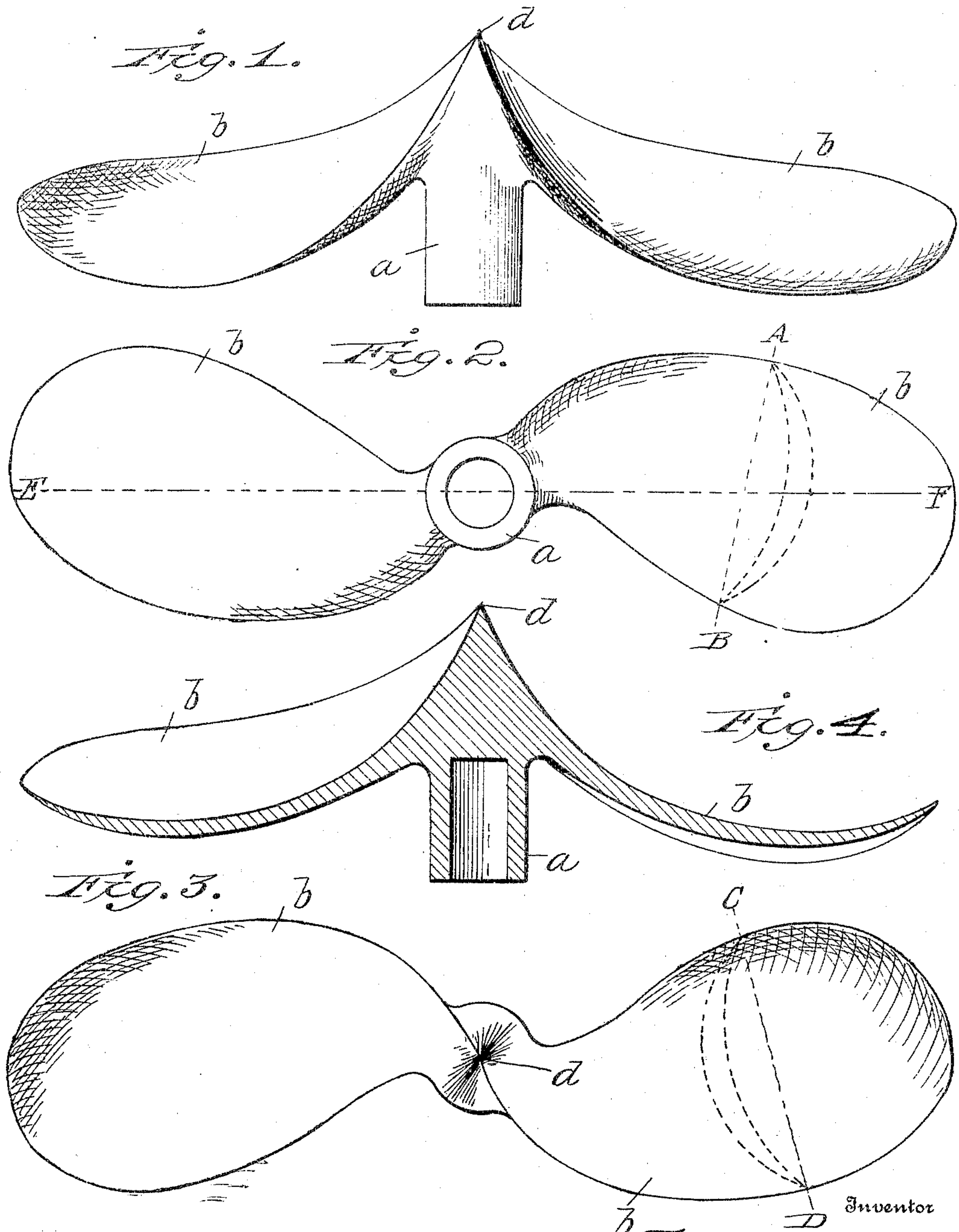
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F. H. GRAWERT-ZELLIN.

SHIP'S PROPELLER.

APPLICATION FILED APR. 4, 1904.

MODEL.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## SHIP'S PROPELLER.

SPECIFICATION forming part of Letters Patent No. 784,109, dated March 7, 1905.

Application filed April 4, 1904. Serial No. 201,592. (Model.)

*To all whom it may concern:*

Be it known that I, FRITZ H. GRAWERT-ZELLIN, a resident of the city of New York, State of New York, have invented certain new  
5 and useful Improvements in Ship-Propellers, of which the following is a full and complete specification.

The object of my invention is to provide a propeller of greater efficiency than has been  
10 hitherto attained for reciprocating engines and which is especially designed for high angular velocity, as is the case with steam-turbines, for which my propeller is particularly adapted.

15 It is generally known that the efficiency of a screw-propeller does not exceed fifty per cent., the lateral displacement of a part of the water by the centrifugal force produced by the revolving screw resulting in a considerable loss. Therefore it has been the object  
20 of all constructors to reduce this lateral displacement by varying the form of the generatrix and the pitch. However, such modifications have not increased the efficiency of  
25 the screw to an appreciable extent.

After years of experiments I have succeeded in designing a screw-propeller with forwardly-inclined concave helicoids merging to a point  
30 erably in speed over other propellers under

like conditions, as has been proven by various tests.

In the drawings, Figure 1 is a plan view of the propeller. Figs. 2 and 3 are rear and front views, respectively, showing in dotted  
35 lines horizontal cross-sections through the right-hand blade, taken on lines A B and C D, respectively, seen from the right. Fig. 4 is a horizontal section on line E F of Fig. 2  
40 looking from above.

*b* represents the forwardly-inclined blades; *a* the hub, the latter merging with the former into a point *d* in the axis of the propeller, as plainly shown in the drawings, thus constituting part of the helicoid. The plane, as shown  
45 in Fig. 2, also indicates the curve which generates said helicoid.

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

A screw-propeller having a plurality of forwardly-inclined concave blades, the working surfaces of which extend to and merge in a point in the axis of the propeller, substantially as described.

FRITZ H. GRAWERT-ZELLIN.

Witnesses:

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