

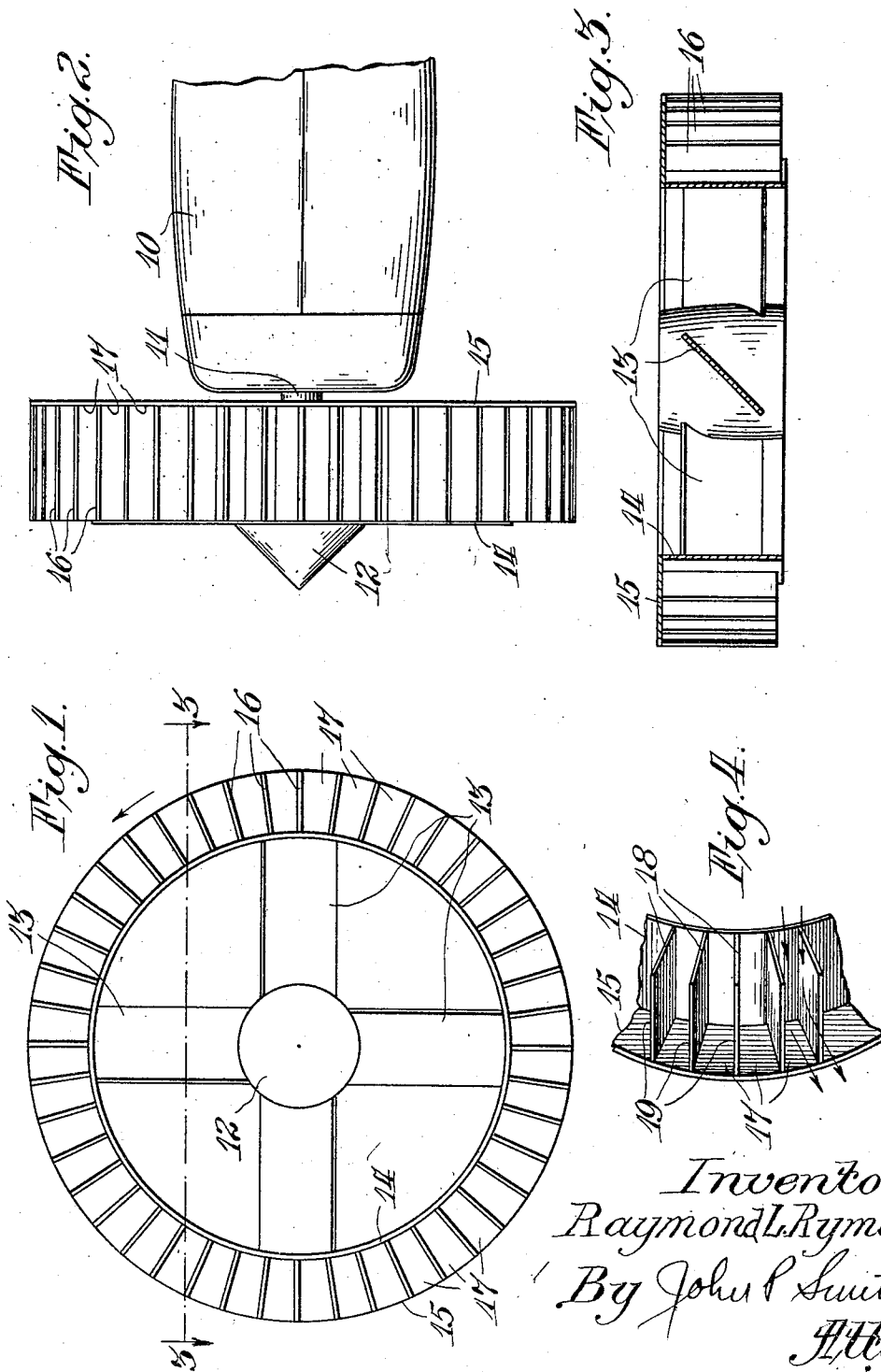
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AEROPLANE PROPELLER

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UNITED STATES PATENT OFFICE

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AEROPLANE PROPELLER

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This invention relates to an aeroplane propeller.

One of the objects of the present invention is to provide a novel and improved construction of an aeroplane propeller which utilizes the atmospheric pressure in such a way to effect greater lifting power.

A still further object of the invention is to provide a novel and improved form of aeroplane propeller which utilizes the centrifugal action of the propeller for dispelling the air in such a manner so as to create a partial vacuum in advance of a revolving flange of the aeroplane propeller.

These and other objects are accomplished by providing a construction and an arrangement of the various parts in the manner hereinafter described and particularly pointed out in the appended claims.

Referring to drawings: Fig. 1 is a front elevational view of my improved aeroplane propeller.

Fig. 2 is a top plan view of the same.

Fig. 3 is a cross-sectional view taken on the lines 3—3 in Figure 1, and

Fig. 4 is a fragmentary perspective view of a portion of my improved aeroplane propeller showing the manner in which the blades are arranged on the propeller so as to form pockets therebetween.

In illustrating one form of my invention I have shown the same in connection with a fragmentary portion of the body or front part of an aeroplane 10 in which is usually housed the engine or motor for transmitting the power to the propeller.

Extending forwardly and operatively driven by the motor is a shaft 11. Secured to the shaft 11 is a hub 12 of the propeller.

Extending in radial directions from the hub and positioned at substantially 90 degrees apart about the hub are four spoke-like arms 13 which in effect are blades positioned at an angle to the plane of rotation of the propeller. Secured to the outer end of the arms 13 in any well known manner is an annular rim 14 which is located concentrically with the axis of rotation of the propeller. Secured to the annular rim 14 and on the rearward edge thereof is a pressure

ring or flange 15. This flange or ring 15 is located in a plane transverse to the axis of the rotation of the propeller and extends from the periphery of the rim 14 for a slight distance outwardly. Located in spaced relation about the periphery of the rim 14 are a plurality of fins or blades 16 which extend radially from the periphery of the rim to the outer edge of the ring or flange 15. The rear edges of these fins or blades 16 are secured to the flange 15 in any well known manner. With this arrangement of the blades 16 spaced apart about the periphery of the rim 14, a plurality of pocket members 17 is formed about the periphery of the propeller.

The theory of the operation of my improved propeller is as follows:

Let us assume that the propeller is driven in a direction indicated by the arrow in Fig. 1, the centrifugal action of the rotating propeller causes each of the pocket members 17 to discharge the air therein in a radial direction thereby creating a partial vacuum in each of these pocket members or in other words, removing the major portion of the atmospheric pressure on the front side of the flange 15 with the atmospheric pressure remaining constant or substantially so on the rear side of the flange 15 thereby giving the propeller the lifting power determined by the difference in the air pressure between the opposite sides of the flange 15. As this propeller revolves at a predetermined high speed of rotation, the air will be drawn in on the front side of the pocket members 17 between the front edges 18 of the blade 16 and dispelled or discharged outwardly at the peripheral edges 19 of these blades 16 by the centrifugal action of the rotating propeller. In order to further facilitate the lifting power of the propeller, the spoke-like blades 13, by reason of their angular position, draw the air from in advance of the propeller and dispel it rearwardly thereby rarifying the air in advance of the propeller and in effect creating a less air pressure on the front side and adding to the atmospheric pressure on the rear side.

From the above description it will be seen that I have provided a very simple and efficient aeroplane propeller and one in which the atmospheric pressure is principally relied upon to effect the lifting power. It will also be seen that various modifications may be made of the form of propeller here shown and disclosed and still be within contemplation of my invention.

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

1. An aeroplane propeller comprising a hub, arms extending outwardly from said hub, an annular rim secured to the outer ends of said arms and a plurality of pocket members formed on the outer side of said rim having axial and radial openings whereby the air pressure is reduced on the forward side of said pockets.

2. An aeroplane propeller comprising a hub, arms projecting therefrom and centrifugally air discharging pocket members carried by said arms having axial and radial openings for rarifying the air pressure in advance of said propeller.

3. An aeroplane propeller comprising a hub, radially projecting arms extending therefrom and centrifugally air discharging pocket members carried by said arms having axial and radial openings for reducing the air pressure in advance of said propeller.

4. An aeroplane propeller comprising a hub, arms projecting therefrom, an annular rim secured to said arms and pocket members formed on the periphery of said rim having forward and peripheral openings whereby said pocket members discharge the air therefrom setting up a reduced air pressure in advance of said propeller.

5. An aeroplane propeller comprising a hub, arms projecting therefrom, an annular rim secured to said arms and arranged concentrically with respect to the axis of rotation of said propeller, pocket members carried by said rim having forward and peripheral openings whereby the centrifugal force of said rotating propeller discharges the air from said pocket members for reducing the air pressure in advance of said propeller.

6. An aeroplane propeller comprising a hub, angularly disposed blades extending from said hub and a plurality of pocket members carried by said blades adjacent the outer ends thereof and having air receiving and air discharging openings therein whereby said pocket members discharge the air therein by the centrifugal force of the rotating propeller for reducing the air pressure in said pocket.

7. An aeroplane propeller comprising a hub, angularly disposed and radially extending blades secured to said hub, an annular rim secured to the outer ends of said blades, an annular flange secured to one

edge of said rim, said flange occupying a plane transverse to the axis of rotation of said propeller, and a plurality of blades secured to said flange and rim forming pockets therebetween for centrifugally discharging the air from said pockets and reducing the air pressure on the front side of said flange.

8. An aeroplane propeller comprising a hub, a plurality of angularly disposed and radially extending blades secured to said hub, an annular rim secured to said blades and having its cylindrical surface parallel to and concentric with the axis of rotation of said propeller, and a plurality of pockets mounted on said rim and each having a lateral and radial opening therein for receiving and dispelling the air by the action of the rotation of said propeller.

9. An aeroplane propeller comprising a hub, a plurality of angularly disposed and radially extending blades secured to said hub, a cylindrical rim secured to said blades and positioned concentrically with respect to the axis of rotation of said propeller, an annular flange secured to said rim and located in a plane transverse to the axis of rotation of said propeller, a plurality of spaced apart blades secured to said rim and flange forming pockets therebetween whereby the centrifugal action of said propeller discharges the air from said pockets thereby setting up a partial vacuum in advance of said flange.

In testimony whereof I have signed my name to this specification, on this 12th day of September, A. D. 1927.

RAYMOND L. RYMAL.