P. S. DAVIES.

PROPELLER FOR AIR SHIPS.

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903,060. Patented Nov. 3, 1908.

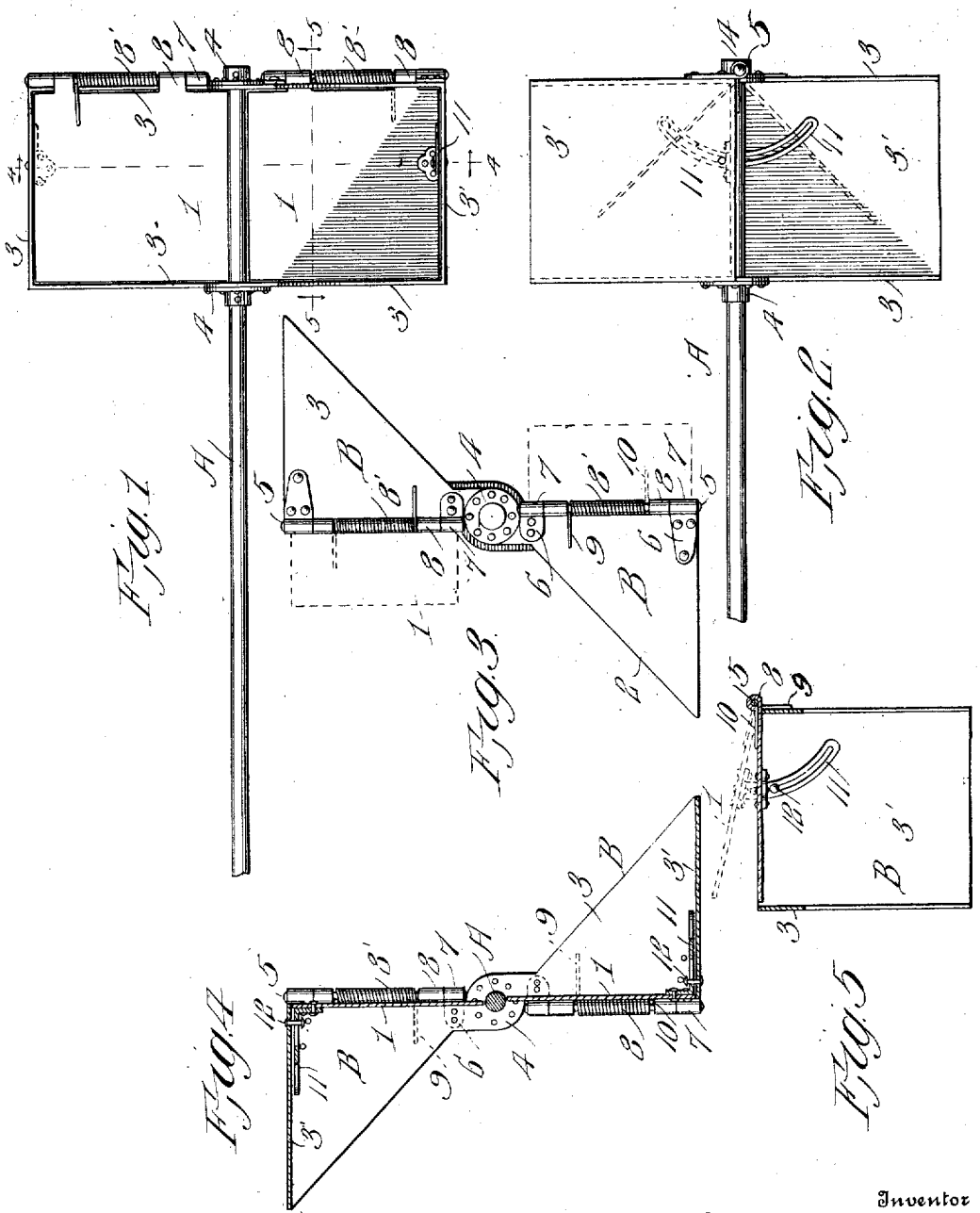


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

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PROPELLER FOR AIR-SHIPS.

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To all whom it may concern:

Be it known that I, PETER S. DAVIES, a citizen of the United States, residing at Pueblo, in the county of Pueblo and State of Colorado, have invented new and useful Improvements in Propellers for Air-Ships, of which the following is a specification.

This invention relates to an apparatus for the propulsion of a vehicle and it is especially adapted for air ships, although it may be used in other connections.

The invention has for one of its objects to improve and simplify the construction and operation of propellers so as to be comparatively easy and inexpensive to manufacture, of durable design, and effective in use.

A further object of the invention is the provision of a propeller having any desired number of blades or buckets mounted on a shaft to rotate at a high speed, each bucket being provided with a plate or vane that is adapted to open automatically by beating the air or other fluid until it reaches an effective angle to the plane of rotation of the buckets to obtain the maximum propelling influence.

Another object of the invention is to provide a propeller bucket of approximately semi-cubical form having a radial wall or vane which is adapted to be deflected to an angle to the plane extending transversely to the axis of rotation, the vane being limited by a stop device when the maximum point of deflection has been reached.

In the accompanying drawing, which illustrates one of the embodiments of the invention, Figure 1 is a side view of the propeller. Fig. 2 is a plan view thereof. Fig. 3 is a front view of the propeller. Fig. 4 is a sectional view on line 4—4, Fig. 1. Fig. 5 is a sectional view on line 5—5, Fig. 1.

Similar reference characters are employed to designate corresponding parts throughout the several views.

In the present instance, I have elected to illustrate a propeller of the two-blade construction but it is to be understood that any desired number of blades or buckets may be employed to meet the requirements of any given case.

Referring to the drawing, A designates the propeller shaft which is adapted to be driven at a comparatively high speed by any suitable mechanism, and mounted on the shaft are buckets B that are correspondingly disposed. As illustrated, the buckets are hollow semi-cubical structures and consist of radially-disposed vanes or plates 1 around each of which is a scoop-shaped hood, the hood comprising two spaced walls 3 extending transversely to the shaft, and a connecting wall 3′ disposed parallel with the shaft and tangentially to the circle described by the outer edge of the vane 1. The hoods of the buckets are secured to the shaft A by having the side walls 3 riveted or otherwise suitably secured to collars. The vanes 1 of the buckets have their forward edges secured to the hoods in such a manner as to permit the vanes to be deflected outwardly to approximately an angle of forty-five degrees with respect to their normal or idle position. One convenient manner of arranging the vanes for this purpose is to hinge them on approximately radially-disposed rods 5 that are secured to the front sides of the hoods by metal pieces 6 formed into eyes 7 for receiving the extremities of the rods, and on the vanes are eyes 8 for receiving the rods and thus hingedly connect the vanes to the hoods of the buckets, and on each rod is a helical torsion spring 8′ arranged with one extremity bearing against the front of the hood, as shown at 9, and the other extremity 10 bearing on the vane 1 so as to hold the latter normally in the full line position.

The vanes are limited in their outward movement by slotted members 11 disposed concentric with the hinges on which the vanes swing, and disposed in the slot of each member is a pin 12 secured to the fixed part or hood of the bucket for permitting the vanes to swing outwardly to an angle of about forty-five degrees. When the shaft A is idle, the vanes or plates 1 of the buckets are in closed position, as indicated by full lines in Fig. 5. As the shaft is driven, the resistance offered by the air as the vanes rotate causes the latter to gradually swing outwardly on their hinges as the speed of rotation increases, the movement being indicated by dotted lines in Fig. 5. Finally the vanes are deflected to their maximum limit as shown by the dotted lines in Fig. 2, and when in this position, the air taken up by the buckets is directed rearwardly by the inclined vanes so as to produce a powerful propelling force whereby the vehicle to which the propeller is attached will be driven in the direction in which the shaft or axis of rotation is pointed.

From the foregoing description, taken in

connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims.

Having thus described the invention, what I claim is:—

1. A propeller comprising a plurality of buckets, each bucket consisting of a relatively fixed part, and a vane mounted thereon to automatically assume a position disposed at an angle to the plane of rotation.

2. A propeller comprising a plurality of buckets, each bucket consisting of a fixed hood, and a vane having one of its radial edges hingedly connected with the hood to swing on an axis disposed transverse to that of the propeller.

3. A propeller comprising a plurality of buckets, each bucket consisting of a scoop-shaped hood, a vane normally closing the hood at its bottom and arranged to swing open automatically upon rotation of the propeller, and means for limiting the opening movement of the vane.

4. A propeller bucket comprising a hood composed of side walls and an end connecting wall, said latter wall being disposed tangentially to the arc of movement of the bucket, and a vane associated with the hood and arranged to automatically assume a position disposed at an angle to the plane of rotation.

5. A propeller comprising a bucket having a vane mounted to move on an axis disposed radially to the axis of rotation of the propeller, means for limiting the movement of the vane, and a yielding device for resisting said movement.

6. A propeller bucket comprising an approximately semi-cubical fixed part, a yielding vane carried thereby and arranged to be deflected outwardly from the said part and at an angle to the plane of rotation of the bucket, and a stop for automatically limiting the opening movement of the vane.

7. A propeller bucket comprising a scoop-shaped hood, a vane, means for connecting one edge of the vane with the hood for swinging movement, a spring pressing on the vane, a slotted member connected with the vane, and a pin on the hood engaging in the slot of the said member for limiting the movement of the vane.

In testimony whereof I affix my signature in presence of two witnesses.

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Witnesses
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