Sept. 24, 1940. G. E. RASK 2,215,564

PROPELLER

Filed July 5, 1939 2 Sheets-Sheet 1

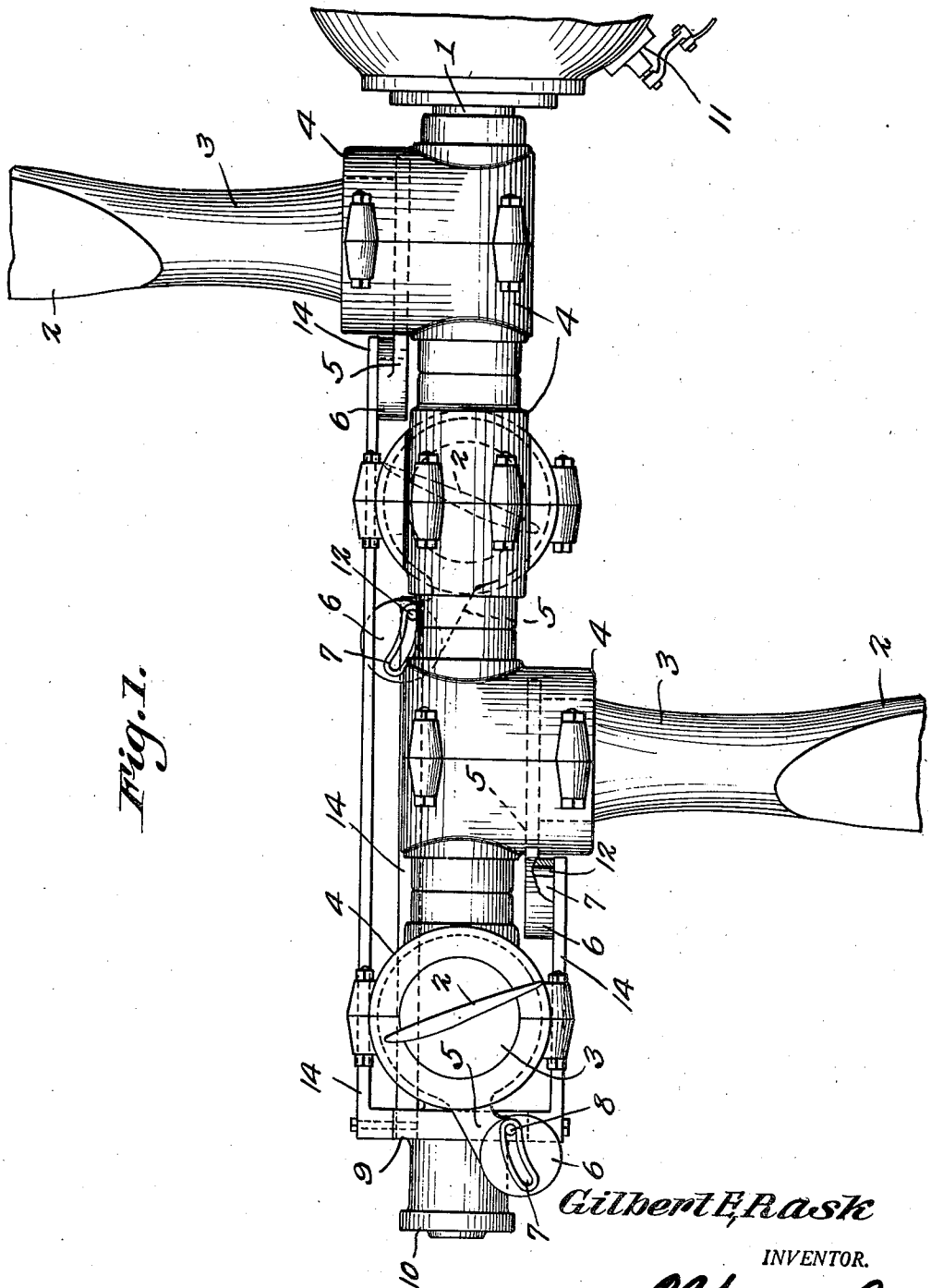


Fig. 1.

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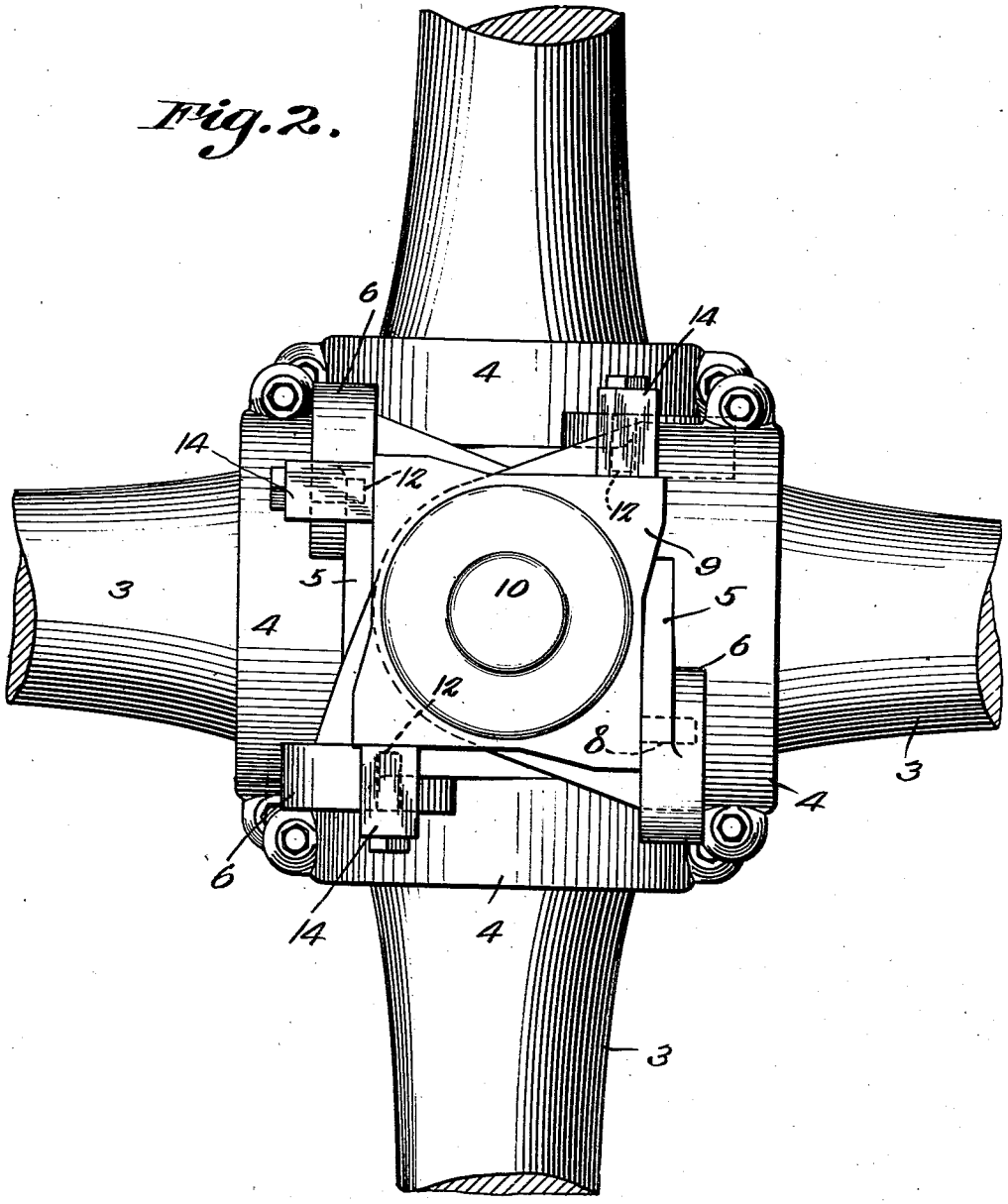
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Fig. 2.



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PROPELLER

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Application July 5, 1939, Serial No. 282,890

1 Claim. (Cl. 170—163)

It is well known that the utility of a propeller for an airplane or other similar craft is impaired by air disturbances, due to the fact that the blades of the propeller, generally stated, are located in a common plane, at right angles to the axis of the propeller shaft.

This invention aims to provide a simple but useful construction wherein each shaft propeller blade moves, generally stated, in its own quantum of air, one blade being located abaft the other, longitudinally of the shaft.

Another object of the invention is to provide a device of the class described which is adaptable to standard controlling mechanisms for varying the pitch of the propeller blades.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:

Fig. 1 shows in elevation, a device constructed in accordance with the invention;

Fig. 2 is an end elevation wherein parts are broken away.

The numeral 1 marks the shaft of an engine of an aircraft, and with the shaft 1 are assembled, either fixedly or controllably, any desired number of blades 2. The blades 2 are spaced apart, transversely, and longitudinally of the shaft 1. Therefore, each blade turns in its own body of air, there is a minimum amount of air disturbance, and unusual efficiency results. There may be as many or as few of the blades 2 as is required, four of them being shown in the present embodiment of the invention, although that number is not rigidly insisted upon. Although the propeller has been shown as adapted to promote longitudinal movement of the aircraft, it is of equal utility as a lifting propeller.

It should be understood that the invention is not confined to a mechanism in which the blades 2 are fixed. The invention may be employed, with equal utility, in the event that it is desired to have the blades controllable. The invention has been shown as incorporated in the well-known Hamilton controllable propeller, wherein the control forces are carefully calculated, so as to be ample for the purpose, with no possibility of reaching sufficient magnitude to cause failure of any of the parts. In operation, oil pressure is used to move the blades toward the low pitch position; whereas the blades are moved toward the high pitch position by centrifugal forces acting on the counterweights attached to the propeller blade brackets. With the controllable propeller, the oil pressure is obtained from the engine, and the flow of this oil is controlled by a manually operated valve. In one position, the valve permits the oil to flow from the engine through the transfer rings to the front end of the engine shaft and out to the propeller cylinder. In another position, it shuts off the flow from the engine, and allows the oil in the propeller cylinder to drain back to the engine pump.

In view of the foregoing explanation, those skilled in the art will understand how the invention may be used when it is desired that the blades shall be controllable.

The shank 3 of each blade 2 has rocking movement about an axis transverse to the axis of rotation of the engine shaft 1, in a bearing 4 assembled with the shaft 1. To the shank 3 of each blade 2 is connected, by a bracket 5, a counterweight 6 having an arcuate slot 7, the slot of the outermost counterweight being adapted to receive a projection 8 carried by a yoke 9 forming part of a member 10 movable longitudinally of the shaft 1, responsive to the inertia of the counterweight 6, or under oil pressure, responsive to a valve 11 under the control of an operator, as has been set forth hereinbefore.

Circumferentially spaced, rigid connections or arms 14, of different lengths, form part of the yoke 9 and carry projections 12, functioning like the projection 8, the projections 12 being received in the slots 7 of the counterweights, other than the one immediately adjacent to the yoke 9. The construction is such that a controllable change in the pitch of the propeller blades is brought about when the structure including the member 10, the yoke 9 and the connections 10 is shifted longitudinally of the engine shaft 1.

The device is simple in construction, and whether embodied in a controllable mechanism, or in any other device, will be found thoroughly efficient to prevent air disturbances, and will consummate the objects set forth in the opening portion of this specification.

Having thus described the invention, what is claimed is:

In an aircraft propeller, a shaft, a plurality of blades, means for assembling the blades with the shaft, in transversely spaced relation longitudinally of the shaft, a member movable longitudinally of the shaft, arms of different lengths attached to the movable member and extended longitudinally of the shaft, counterweights connected to the blades and extended longitudinally of the shaft, the counterweights being provided with slots which are acutely disposed with respect to the direction of movement of said member and the arms, and projections on the arms and slidably received in the slots of the counterweights, to rotate the blades about axes at right angles to the axis of rotation of the shaft, when said member is moved longitudinally of the shaft.

GILBERT E. RASK.