March 4, 1941. E. HAWKINS 2,234,120

PROPELLER

Filed May 31, 1939 3 Sheets-Sheet 1

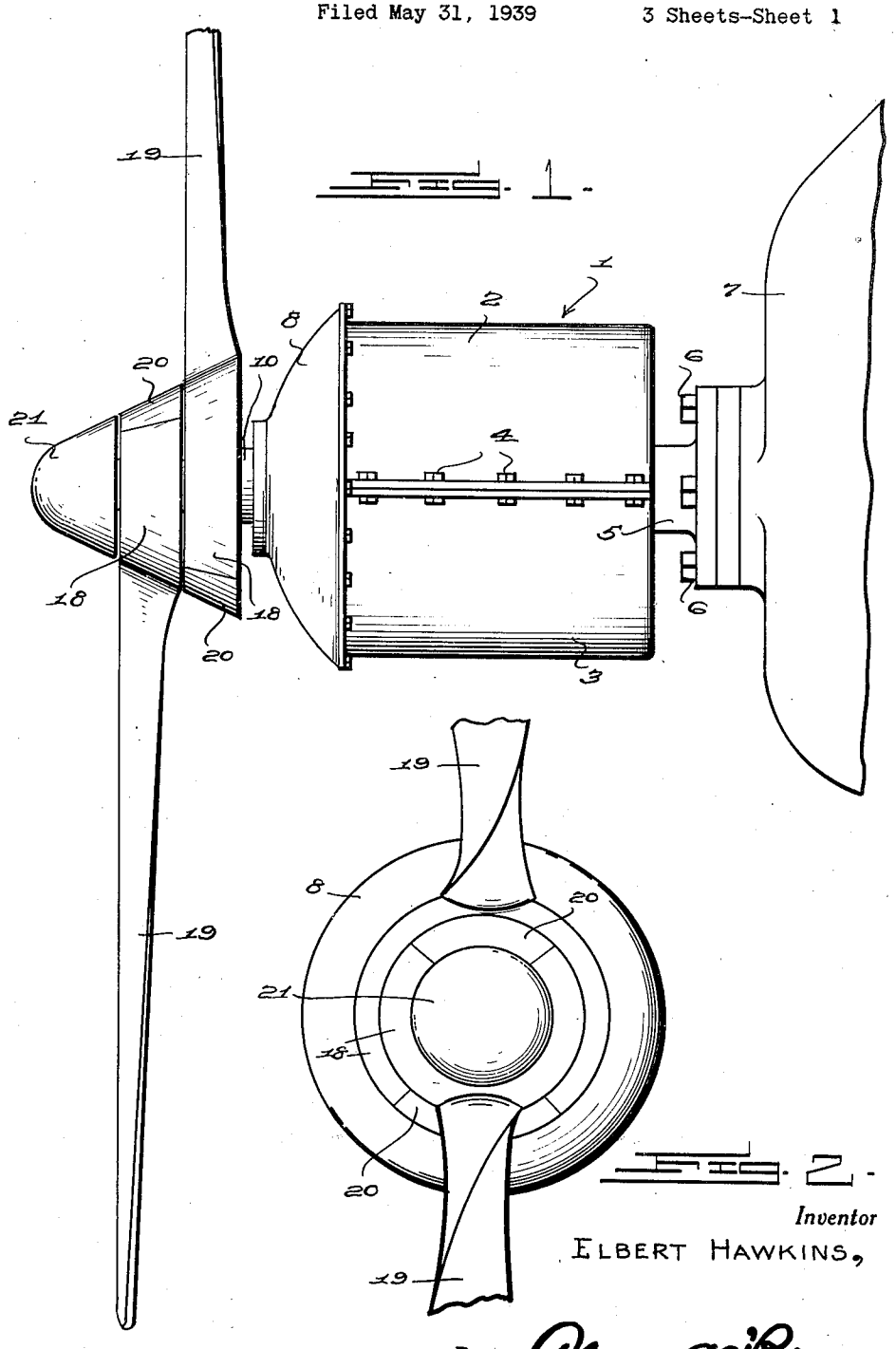


FIG. 1.

FIG. 2.

Inventor

ELBERT HAWKINS,

By Clarence A. O'Brien and Hyman Berman

Attorneys

March 4, 1941. E. HAWKINS 2,234,120

PROPELLER

Filed May 31, 1939 3 Sheets-Sheet 2

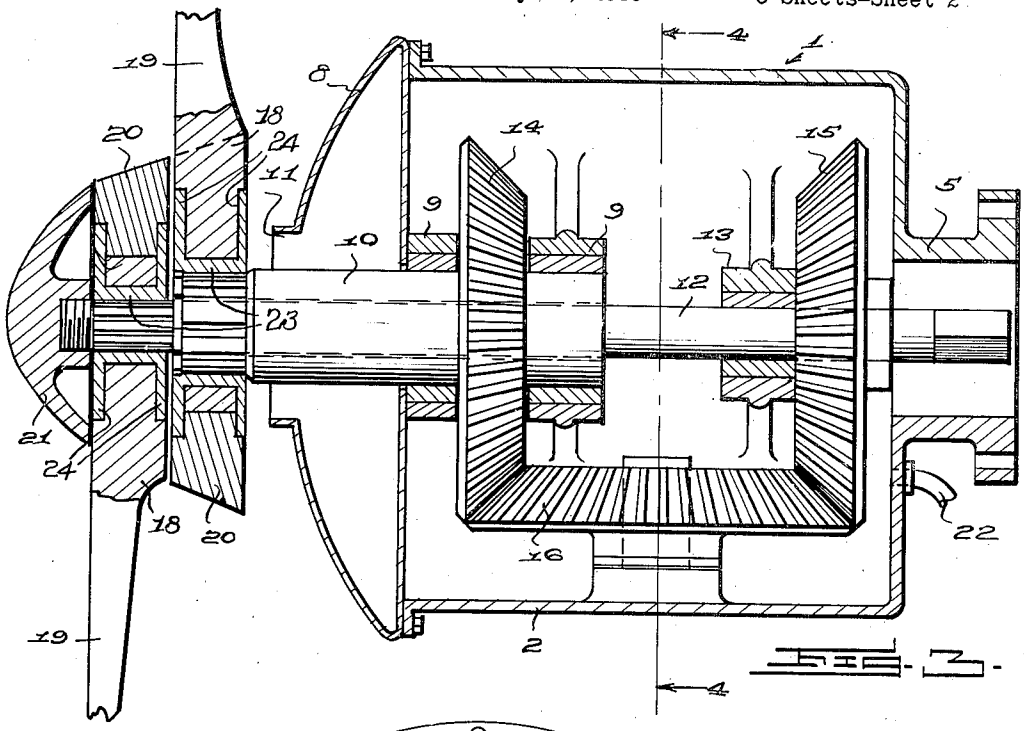


FIG. 3.

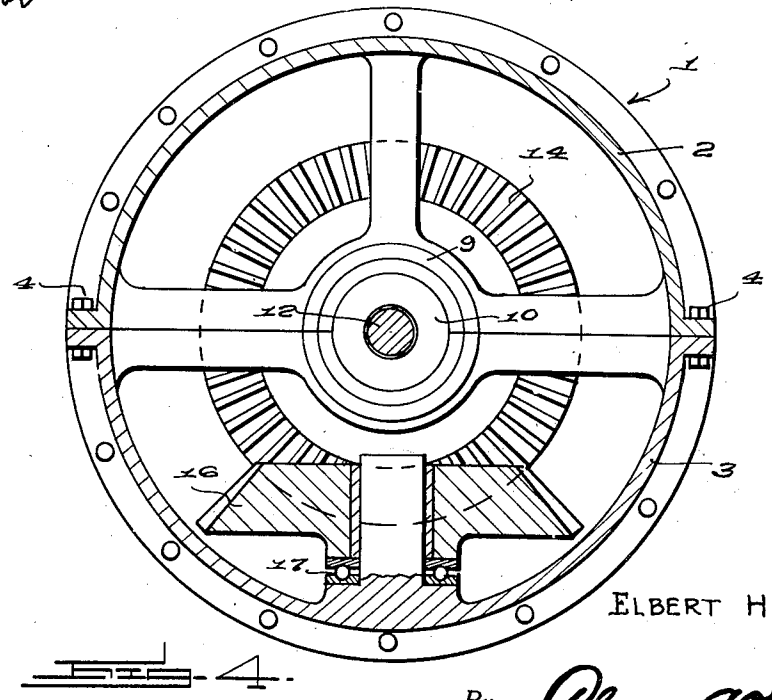


FIG. 4.

Inventor

ELBERT HAWKINS,

By Clarence O'Brien and Hyman Berman

Attorneys

March 4, 1941. E. HAWKINS 2,234,120

PROPELLER

Filed May 31, 1939 3 Sheets-Sheet 3

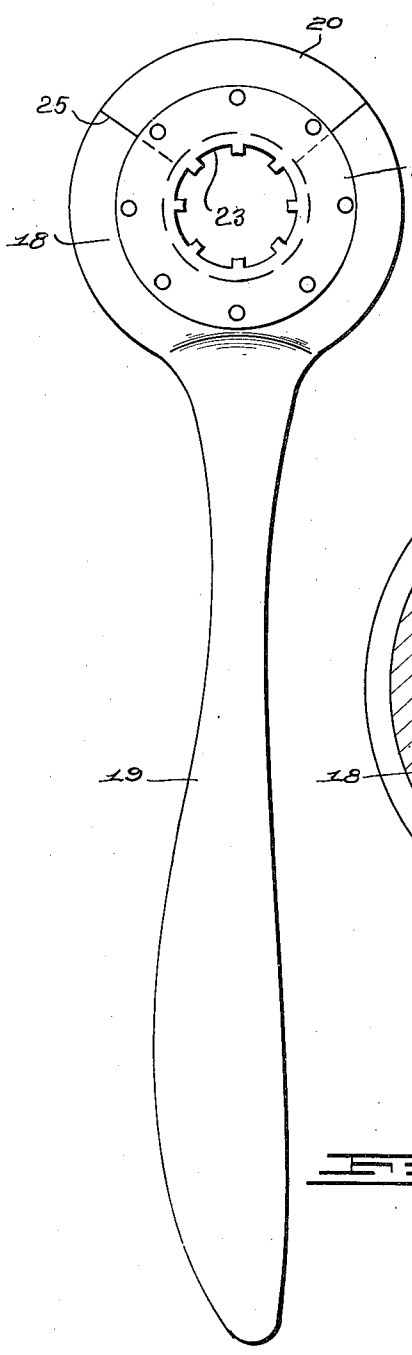
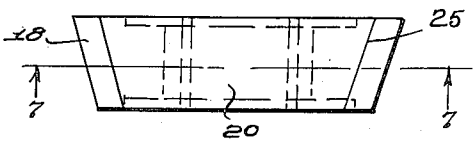


FIG. 6.



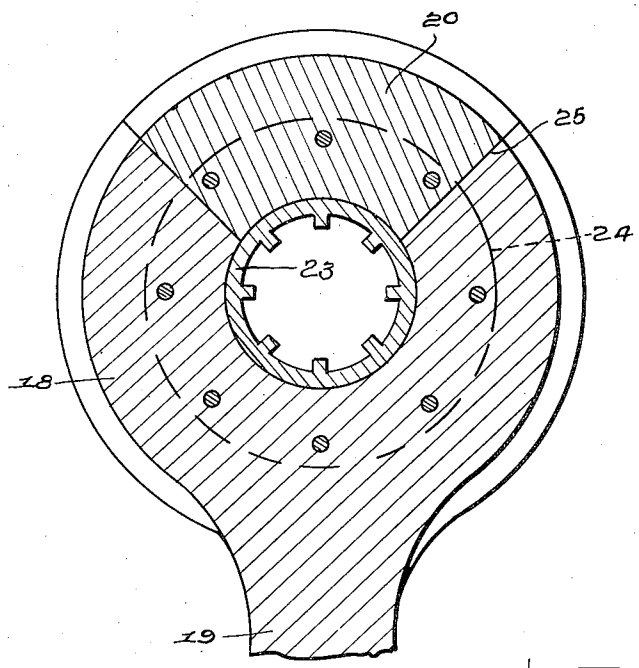


FIG. 7.

FIG. 5.

Inventor

ELBERT HAWKINS,

By Clarence O'Brien and Hyman Berman

Attorneys

Patented Mar. 4, 1941 2,234,120

UNITED STATES PATENT OFFICE

2,234,120

PROPELLER

Elbert Hawkins, Joliet, Ill.

Application May 31, 1939, Serial No. 276,722

1 Claim. (Cl. 170—159)

The present invention relates to new and useful improvements in propellers particularly for aeroplanes, although it will be understood, of course, that the invention may be used for any other purpose for which it may be found adapted and desirable, such as on boats.

The primary object of the invention is to provide, in a manner as hereinafter set forth, a propeller of the character described comprising a novel construction, combination and arrangement of oppositely rotating blades whereby the efficiency and life of the engine will be materially increased.

Other objects of the invention are to provide a propeller of the aforementioned character which will be comparatively simple in construction, strong, durable, compact, light in weight and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in side elevation of a propeller constructed in accordance with the present invention.

Figure 2 is a view in front elevation thereof.

Figure 3 is a view in vertical longitudinal section through the invention.

Figure 4 is a cross sectional view, taken substantially on the line 4—4 of Fig. 3.

Figure 5 is a view in front elevation of one of the blades and its hub.

Figure 6 is a plan view of one of the hubs.

Figure 7 is a vertical sectional view through one of the hubs, taken substantially on the line 7—7 of Fig. 6.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a casing of suitable metal which is designated generally by the reference numeral 1. The casing 1 is stationary and includes a pair of complemental sections 2 and 3 which are bolted together, as at 4. The casing 1 further includes an extension 5 on its rear end which is bolted, as at 6, to the forward end of an engine 7. The forward end of the casing 1 is closed by a housing 8 of the construction shown to advantage in Fig. 3 of the drawings.

Journaled in aligned bearings 9 which are provided therefor in the forward portion of the casing 1 is a tubular shaft 10 which projects forwardly through the housing 8. An opening 11 is provided in the housing 8 which accommodates the tubular shaft 10. Journaled in the tubular shaft 10 is an inner shaft 12 which extends forwardly and rearwardly from said tubular shaft. A bearing 13 is provided in the rear portion of the casing 1 for the rear end portion of the inner shaft 12. It may be well to here state that the inner shaft 12 is adapted to be connected, at its rear end, to the crank shaft of the engine 7.

A beveled gear 14 is fixed on the tubular outer shaft 10 between the bearings 9 and a similar gear 15 is fixed on the inner shaft 12 rearwardly of the bearing 13. The gear 14 is connected to the gear 15 for actuation thereby through a pinion gear 16 which is journaled horizontally on a suitable bearing 17 which is provided therefor in the lower section 3 of the casing 1. Thus, the shafts 10 and 12 are operatively connected together for rotation in opposite directions.

Fixed on the forward end portions of the shafts 10 and 12 are hubs 18. The hubs 18 include bushings 23 which are splined on the shafts 10 and 12, said bushings having flanges 24 on their ends. Mounted on the hubs 18 and projecting in opposite directions therefrom are single blades 19. The hubs 18 are provided, in diametrically opposite sides from the blades 19, with recesses 25 which accommodate substantially segmental counterweights 20, said counterweights being secured between the flanges 24. These counterweights are shown to advantage in Figs. 5 and 7 of the drawings. The reference numeral 21 designates a nose which is mounted on the forward end portion of the shaft 12.

It is thought that the operation of the invention will be readily apparent from a consideration of the foregoing. The shaft 12, which is driven directly from the engine, rotates in one direction with its blade 19 and the tubular shaft 10, which is driven from the shaft 12 through gears 15, 16 and 14, rotates in the opposite direction with its respective blade 19. Thus, the single blades 19, being located in different vertical planes, travel in their own paths and do not follow preceding blades, as is the case with propellers of the multi blade type in widespread use at present. The counterweights 20 in the hub structures 18 reduce vibration to a minimum. Further, by reason of the fact that the blades 19 rotate in opposite directions torque is reduced. The reference numeral 22 designates an oil conduit connected to the casing 1.

It is believed that the many advantages of a propeller constructed in accordance with the

present invention will be readily understood and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

A propeller of the character described comprising a hub having a substantially segmental recess in its periphery, a bushing extending centrally through the hub, integral flanges on the ends of said bushing, a single blade projecting from the hub on the diametrically opposite side thereof from the recess, and a substantially segmental counterweight mounted in the recess on the bushing and secured between the flanges, the periphery of said counterweight being flush with that of the hub.

ELBERT HAWKINS.