

March 6, 1951

R. H. GODDARD

2,544,420

COMBUSTION CHAMBER IN ROTATING ANNULAR CASING

Filed May 7, 1947

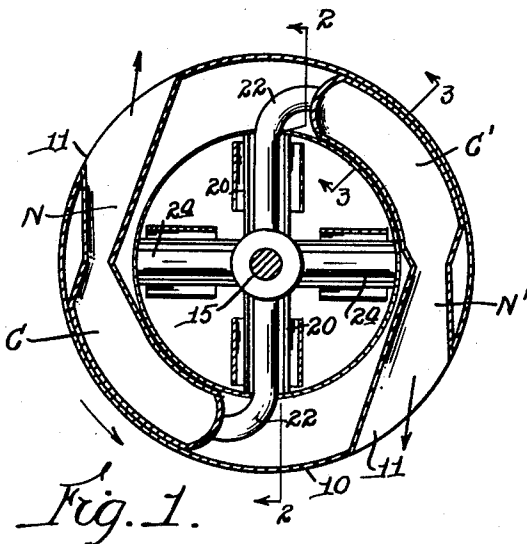


Fig. 1.

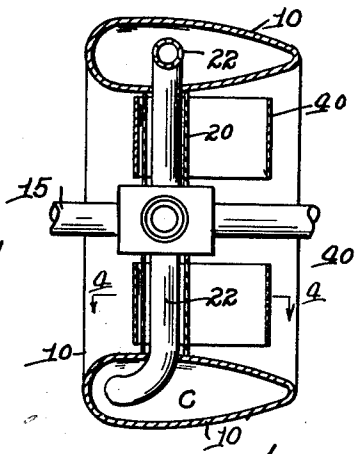


Fig. 2.

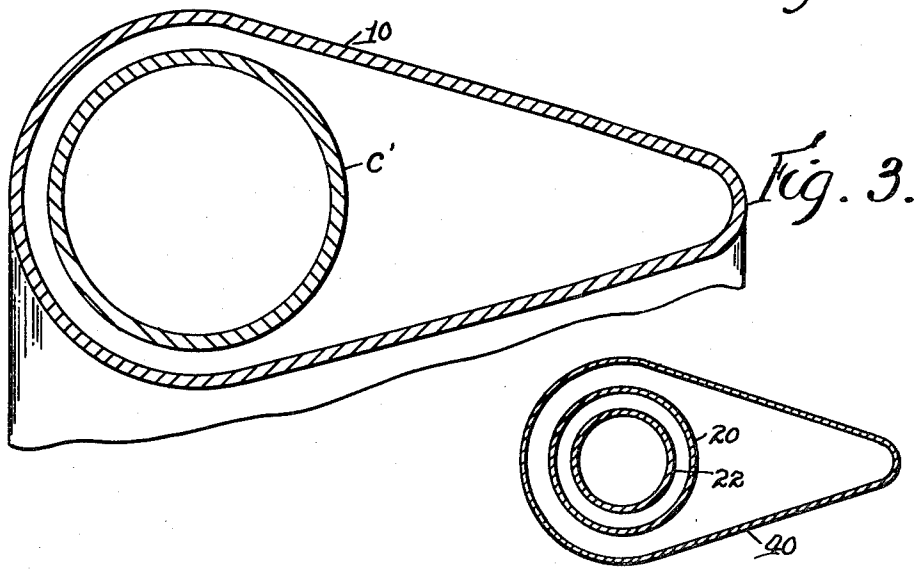


Fig. 3.

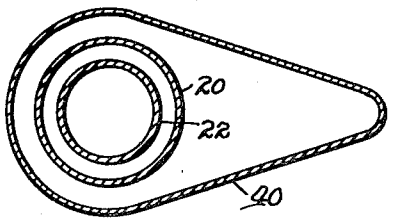


Fig. 4.

INVENTOR,
Robert H. Goddard, Dec'd.
Esther C. Goddard, executrix
BY
Chas. T. Hawley

UNITED STATES PATENT OFFICE

2,544,420

COMBUSTION CHAMBER IN ROTATING ANNULAR CASING

Robert H. Goddard, deceased, late of Annapolis, Md., by Esther C. Goddard, executrix, Worcester, Mass., assignor of one-half to The Daniel and Florence Guggenheim Foundation, New York, N. Y., a corporation of New York

Application May 7, 1947, Serial No. 746,615

1 Claim. (Cl. 60-41)

1

2

This invention relates to combustion chambers used to provide rotational power in propulsion apparatus, as in driving a propeller shaft. Such combustion chambers are exposed to air resistance by travel in a circular path and also by opposing the air stream when in flight.

It is the general object of the present invention to provide a construction by which air resistance in flight may be greatly reduced for such combustion chambers and by which air resistance from rotation may be correspondingly reduced.

To the attainment of these general objects, a plurality of combustion chambers are disposed in a circumferential or annular series, and the longitudinal axis of each separate combustion chamber is curved along its circumferential path. Furthermore, all of the combustion chambers are enclosed in a single annular streamlined casing.

The invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claim.

A preferred form of the invention is shown in the drawing, in which

Fig. 1 is a transverse sectional view of a pair of the improved combustion chambers and their supporting structure;

Fig. 2 is an axial section of the chambers and the enclosing casing, taken along the line 2-2 in Fig. 1;

Fig. 3 is an enlarged cross section, taken along the line 3-3 in Fig. 1; and

Fig. 4 is an enlarged cross section, taken along the line 4-4 in Fig. 2.

Referring to the drawing, two combustion chambers C and C' are shown mounted in an annular streamlined casing 10. The chambers C and C' are longitudinally curved as shown in Fig. 1 and are provided with nozzles N and N' so disposed angularly that the combined chamber and nozzle will be completely enclosed within the casing 10. Port openings 11 are provided for tangential discharge of the combustion gases from the chambers C and C'.

Powerful and rapid rotation of the supporting shaft 15 is thus attained.

Propellers may be mounted directly on the shaft 15, or power may be taken off indirectly for any desired purpose. For larger units, more combustion chambers may be added in series or in parallel.

The annular casing 10 is mounted on tubular arms 20 which enclose feed pipes 22 for the combustion mixture and which may also enclose pipes 24 through which wires or other control devices may be conducted to the combustion chambers.

The casing 10 preferably has the streamlined section shown in Figs. 2 and 3 and is well adapted to enclose the combustion chambers and to shield

the chambers and nozzles from the air stream produced by flight.

In order to reduce the air resistance of the arms 20, a streamlined casing sleeve 40 is desirably mounted on each arm 20 and is free to turn thereon. When in flight, these sleeves assume positions due to the combined effect of rotation and of the air stream, and the positions thus automatically assumed are the positions of least air resistance.

By the use of this invention, combustion chambers may be effectively utilized directly for driving a propeller in an aircraft, and the air resistance of the driving mechanism will be reduced to a minimum.

Having thus described the invention and the advantages thereof, it will be understood that the invention is not to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what is claimed is:

In propulsion apparatus, a rotatable shaft, a coaxial hollow annular casing, means to support said casing for rotation with said shaft but substantially spaced outward therefrom, the leading portion of said casing being substantially semi-circular in radial cross section and the remaining portion being rearwardly tapered for streamlining, a plurality of combustion chambers of circular cross section mounted in equally circumferentially spaced relation in the leading portion of said annular casing and said chambers being curved longitudinally to correspond to the circumferential curvature of said annular casing, said casing having spaced peripheral outer openings and said combustion chambers having rearward discharge nozzles entirely enclosed in said casing and angularly disposed with respect to the associated combustion chambers to facilitate discharge from said nozzles through said peripheral openings.

ESTHER C. GODDARD,
Executrix of the Last Will and Testament of
Robert H. Goddard, Deceased.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,291,273	Tyler	Jan. 14, 1919
2,220,066	Cornell, Jr.	Nov. 5, 1940
2,281,203	Pitcairn	Apr. 28, 1942
2,425,904	Vernon	Aug. 19, 1947

FOREIGN PATENTS

Number	Country	Date
3,561	Great Britain	of 1881
13,019	Great Britain	June 23, 1905