

April 4, 1967

C. D. LENNON ET AL
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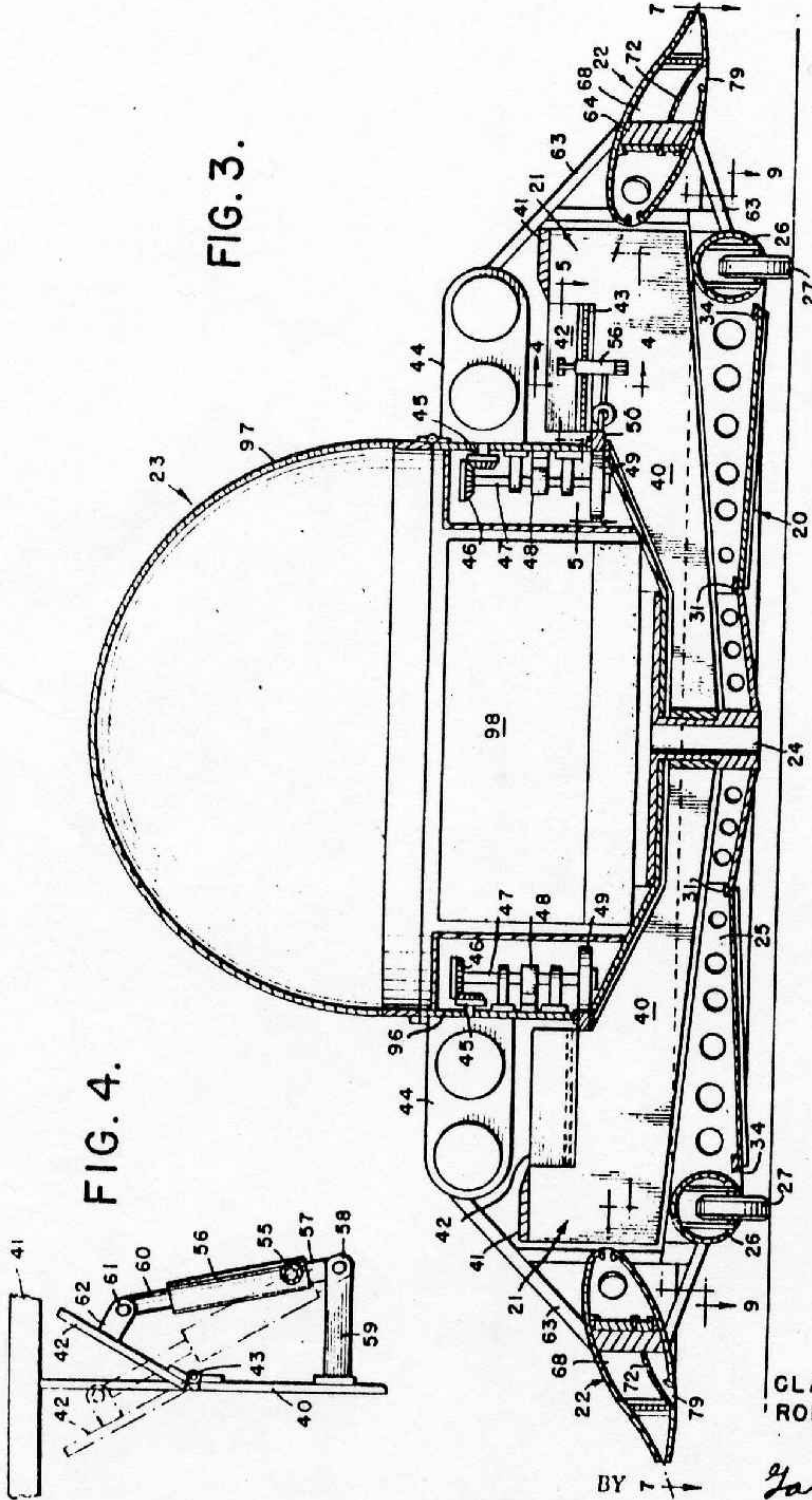


FIG. 3.

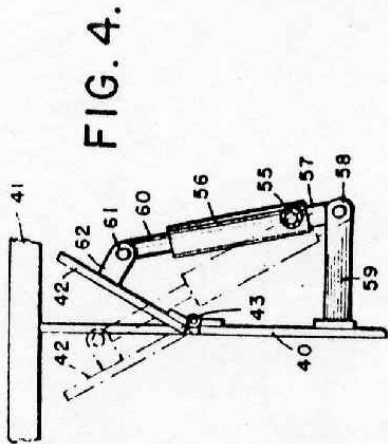


FIG. 4.

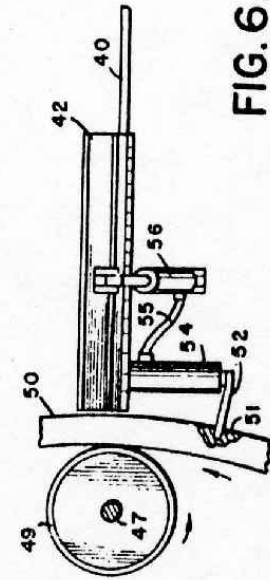


FIG. 5.

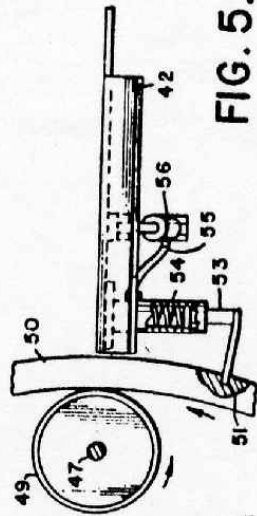


FIG. 6.

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5 Sheets-Sheet 1

FIG. 1.

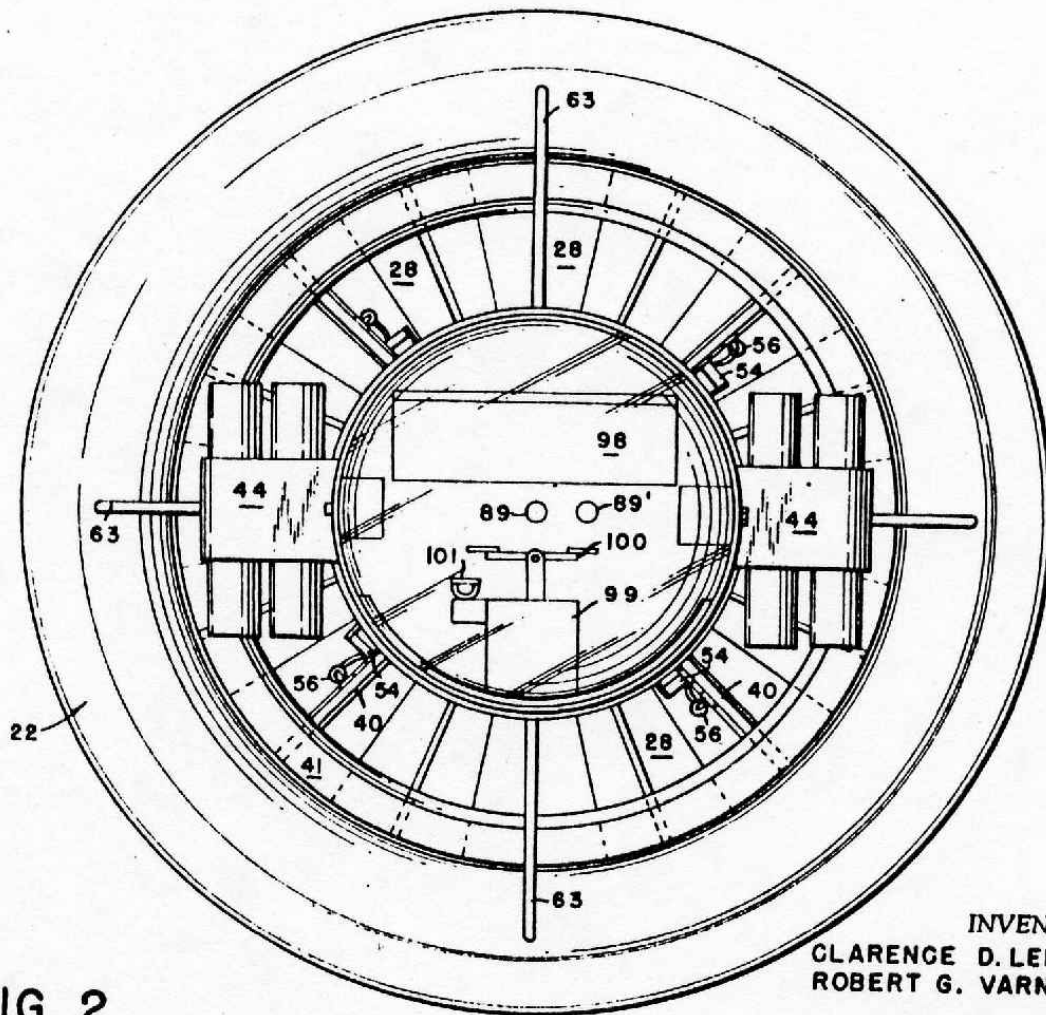
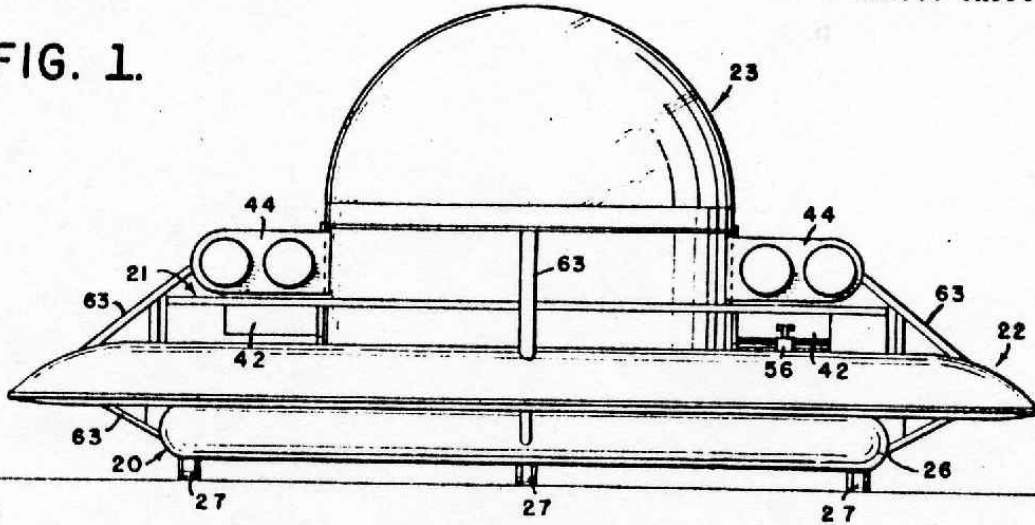


FIG. 2.

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1

3,312,425
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10 Claims. (Cl. 244-12)

This invention relates to aircraft, and more particularly, to aircraft adapted for vertical take-off and landing, an object of which is to effect superior lift characteristics and high lateral speed capability.

Another object is to provide a disc-shaped aircraft including a cabin, a circular, horizontally-disposed, centrifugal impeller assembly around the cabin, and an airfoil embodying a lift and control device mounted circumferentially about, and immediately adjacent to, the impeller assembly, for directing air over and through the airfoil.

Other objects are to provide an airfoil of predetermined shape set at an angle to the horizontal, for effecting optimum lift; to provide an airfoil including a lift and control device having spaced, stationary and movable vanes forming a plurality of air chambers for effecting control, the movable vanes being adjusted to produce directional heading of the aircraft; and to provide an airfoil of the character described having a plurality of orifices selectively opened and closed to produce vertical and lateral thrust components with resultant vertical and lateral movement of the aircraft.

A further object is to provide an aircraft including an impeller assembly and airfoil of the character described, wherein the upper face of the impeller assembly is open and the lower face thereof is normally closed, closure being effected by a system of shutters which are adapted to be opened in the event of failure of the aircraft engines, producing auto-rotation of the impeller, to permit a safe emergency landing.

Other objects of the invention will be manifest from the following description of the present preferred form of the invention, taken in connection with the accompanying drawings, wherein:

FIG. 1 is a front elevational view of an aircraft constructed in accordance with the present invention;

FIG. 2 is a top plan view of the same;

FIG. 3 is a transverse sectional view of the aircraft of the present invention, showing to advantage details of construction;

FIG. 4 is an enlarged sectional view taken along the lines 4-4 of FIG. 3, looking in the direction of the arrows, and showing the movable blade of the impeller assembly forming a part of the present invention;

FIG. 5 is an enlarged sectional view taken on the lines 5-5 of FIG. 3, looking in the direction of the arrows, showing the movable blade of the impeller assembly in inoperative position;

FIG. 6 is a view similar to FIG. 5, showing the movable blade in operative position;

FIG. 7 is a sectional view taken along the lines 7-7 of FIG. 3, looking in the direction of the arrows and showing to advantage the airfoil lift and control assembly forming a part of the present invention;

FIG. 8 is an enlarged horizontal sectional view taken through the airfoil forming a part of the present invention;

FIG. 9 is a sectional view taken on the line 9-9 of FIG. 3, looking in the direction of the arrows, showing to advantage the base of the present aircraft;

FIG. 10 is an enlarged fragmentary plan view of a portion of the base showing to advantage the emergency shutter system forming a part of the present invention;

FIG. 11 is a sectional view taken along the lines 11-11 of FIG. 10, looking in the direction of the arrows, showing in dotted lines, the alternate position of the shutters;

2

FIG. 12 is a schematic showing of the control system for the movable vanes of the airfoil lift and control device; and

FIG. 13 is a schematic showing of the control mechanism for a sliding valve of the airfoil lift and control assembly forming a part of the present invention.

Referring now in greater detail to the drawings, the aircraft of the present invention comprises a base 20 of disc shape on which is centrally mounted a circular, centrifugal impeller assembly 21. An airfoil lift and control assembly 22 is mounted circumferentially about, and immediately adjacent impeller assembly 21 for co-action therewith. A cabin 23 is centrally mounted above base 20 and impeller assembly 21.

As shown to advantage in FIGS. 3 and 9, base 20 includes a central hub 24 from which a plurality of equispaced girders 25 of equal length extend radially. An annular flotation ring 26 is fixed in any suitable manner to the outer limits of girders 25 for buoying the aircraft in water. Base 20 further includes wheel assemblies 27 fixed to, and pending from, flotation ring 26 at 90° intervals for supporting the aircraft on land surfaces.

Base 20 is further provided with a plurality of shutters 28 hingedly connected at 29 to girders 25 intermediate flotation ring 26 and hub 24. As shown in FIG. 11, shutters 28 are preferably hinged to both faces of each girder 25, each shutter extending to a point midway adjacent girders 25, so that a pair of shutters lies between the girders. Each shutter 28 is provided with an extension tab or abutment 30, the tabs of adjacent shutters 28 being so located that they are contiguous when in the lowered position, as shown in FIG. 10. An inboard slidable ring 31 is supported by girders 25 superjacent extensions 30 of shutters 28, said ring being provided with a series of recesses or notches 32 normally non-aligned with shutter extension tabs 30 but adapted to be moved into superjacent relationship with the tabs when it is desired to open shutters 28 to the position shown in dotted lines in FIG. 11. Each shutter 28 is additionally provided with an outer extension tab or abutment 33, which tabs, as shown in FIG. 10, are also adapted to be in contiguous relationship when the shutters are in lowered or closed position. An outboard ring 34 is also slidably supported by girders 25, which ring is also provided with recesses or notches 35 adapted to register with extensions 33 synchronously with the alignment of inboard ring recesses 32 with extensions 30 to permit opening of the shutters.

In accordance with the objects of the present invention, shutters 28 are opened only in case of emergency to effect safe landing of the aircraft, and the opening is effected manually by means of a shutter cable 36 trained over pulleys 37 and 38 to outboard ring 34. A supplemental shutter cable 39 affixed to cable 36 is trained over pulley 37 into engagement with movable inboard ring 31. Cable 36 extends upwardly into cabin 23 for ready access to the pilot. Shutters 28 are normally left in the closed position shown in FIGS. 3 and 9 and are only raised to the open position under emergency conditions to be hereinafter more fully discussed.

Impeller assembly 21 is of the centrifugal type and includes a plurality of vertically-disposed blades 40 extending radially from hub 24 in spaced relationship, a portion of each blade being reduced for interpositioning between base 20 and cabin 23. The height of each blade 40 is increased laterally of cabin 23 and to the outermost portion thereof is affixed a ring 41 in engagement with the upper edge of each blade and extending completely around the aircraft, for shaping and directing the centrifugal flow of air produced by the rotating blades. Adjacent ring 41, a portion of blade 40 is hingedly connected at 43 to the main portion thereof to provide a mov-

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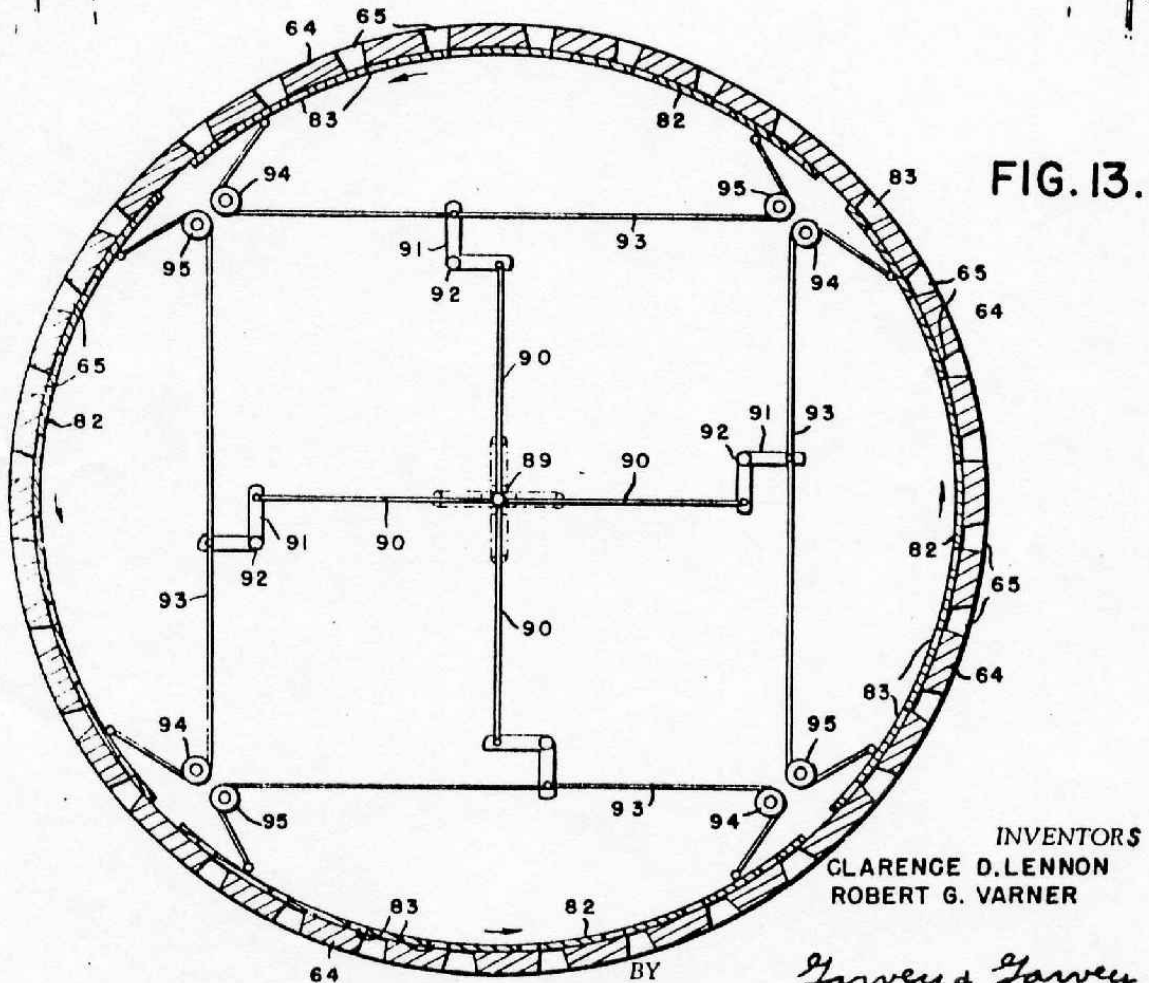
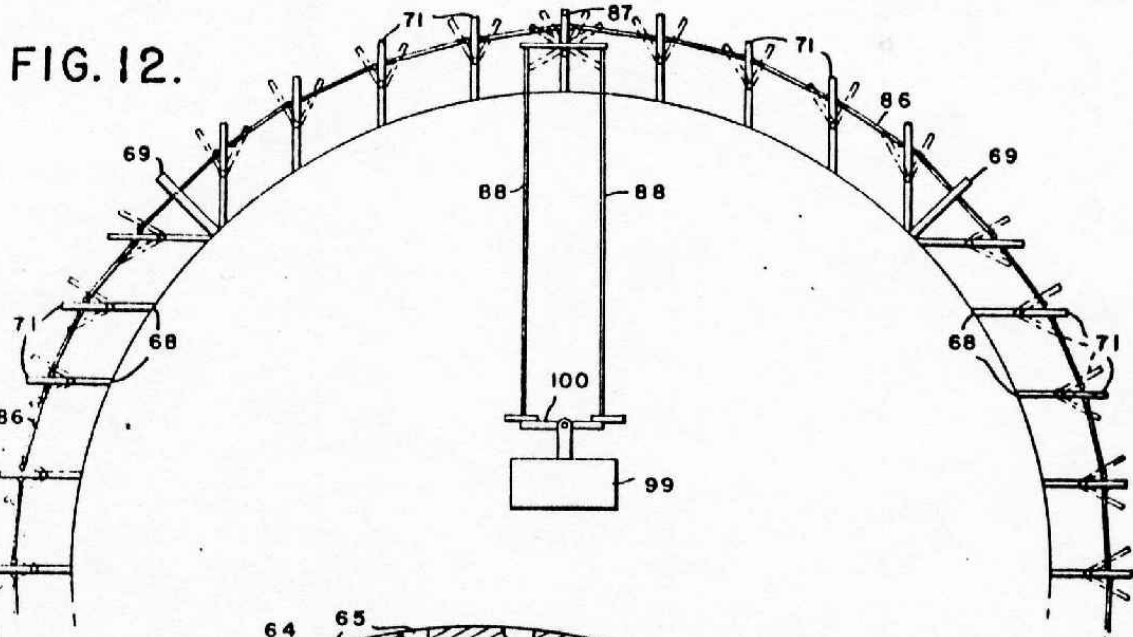
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5 Sheets-Sheet 4

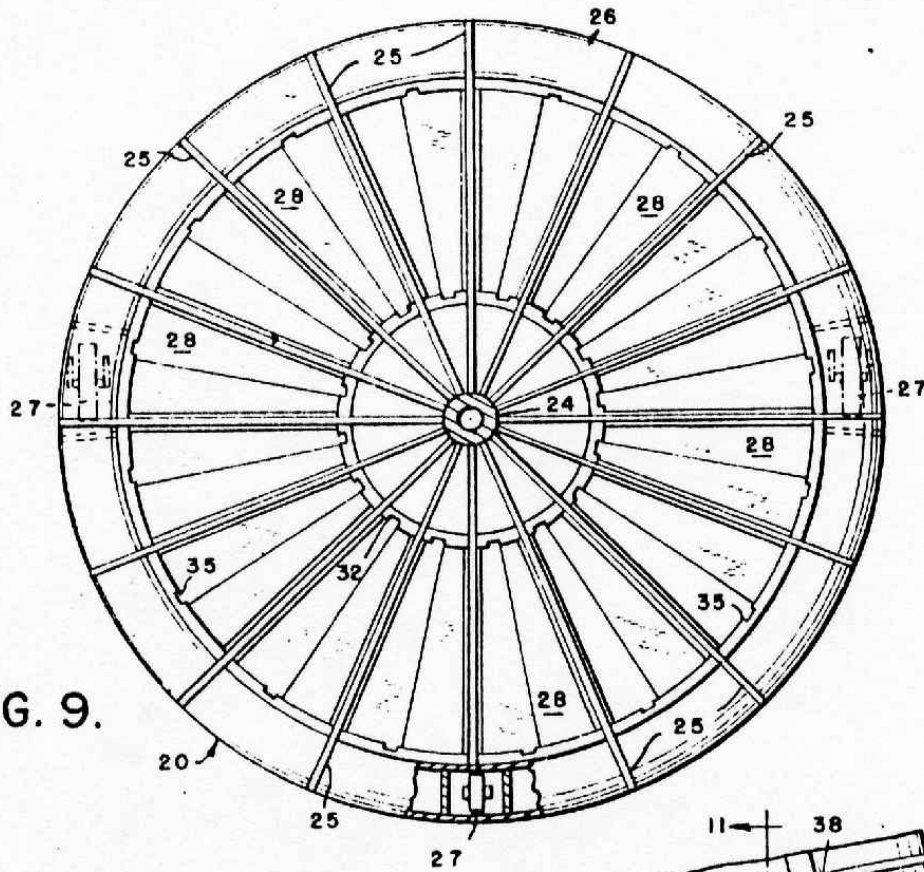


FIG. 9.

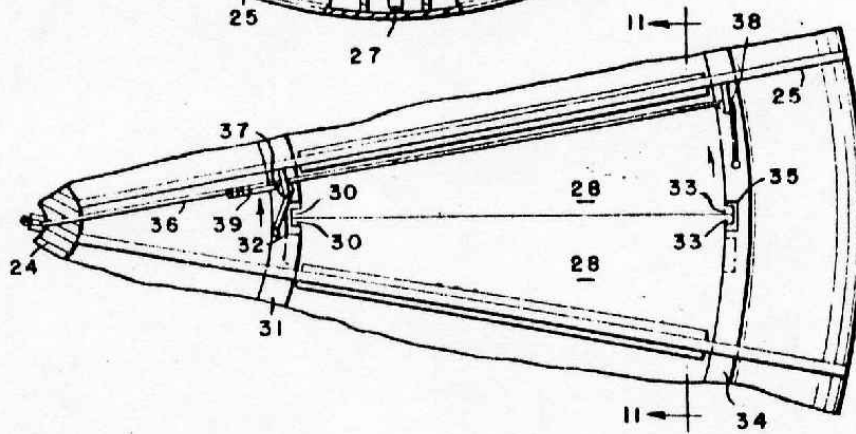
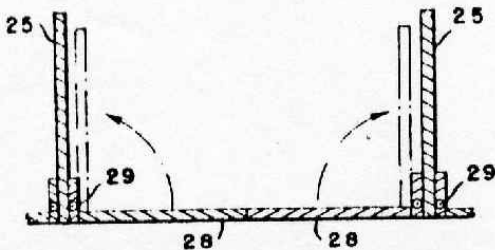


FIG. 11.

FIG. 10.



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5 Sheets-Sheet 3

FIG. 7.

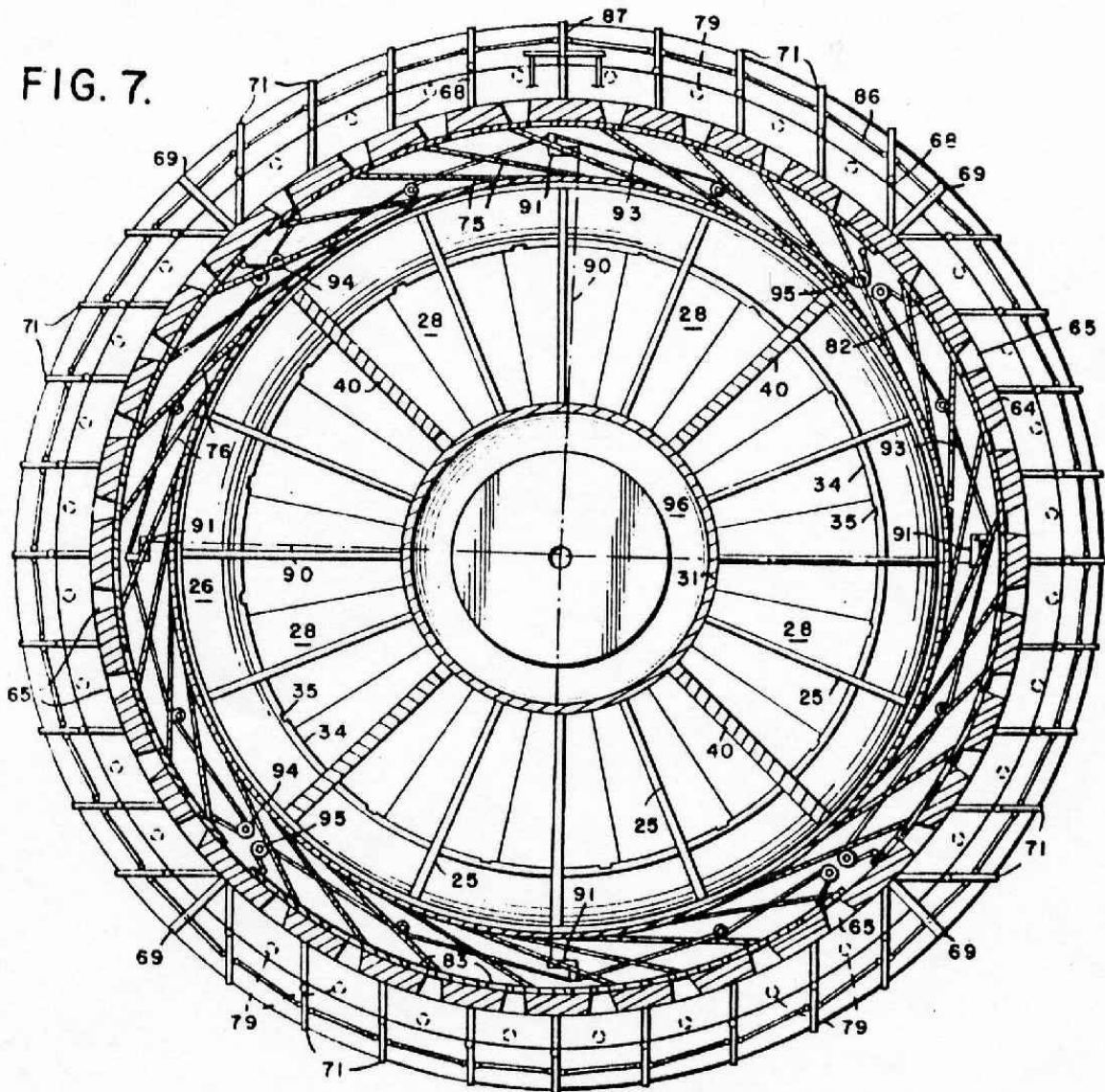
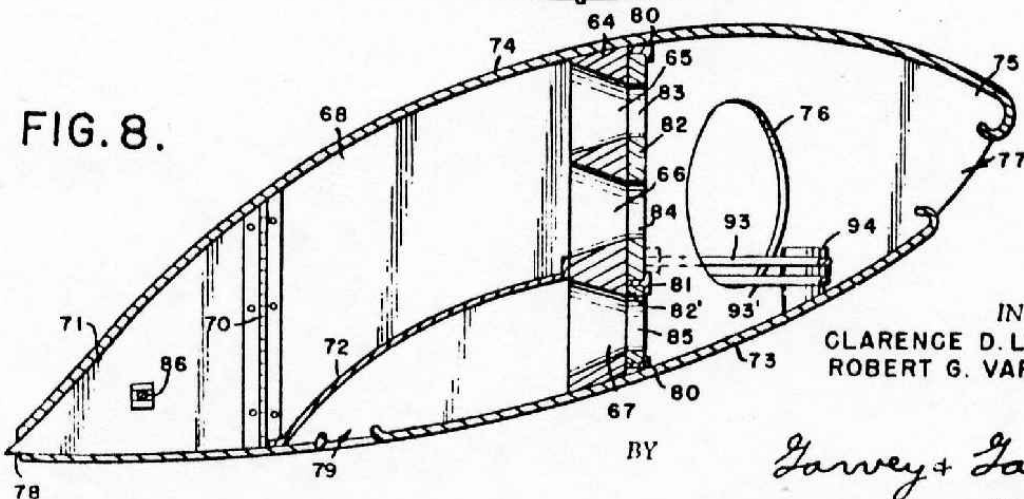


FIG. 8.



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