June 21, 1927. 1,633,238

F. H. BASSETT

DIRIGIBLE BALLOON

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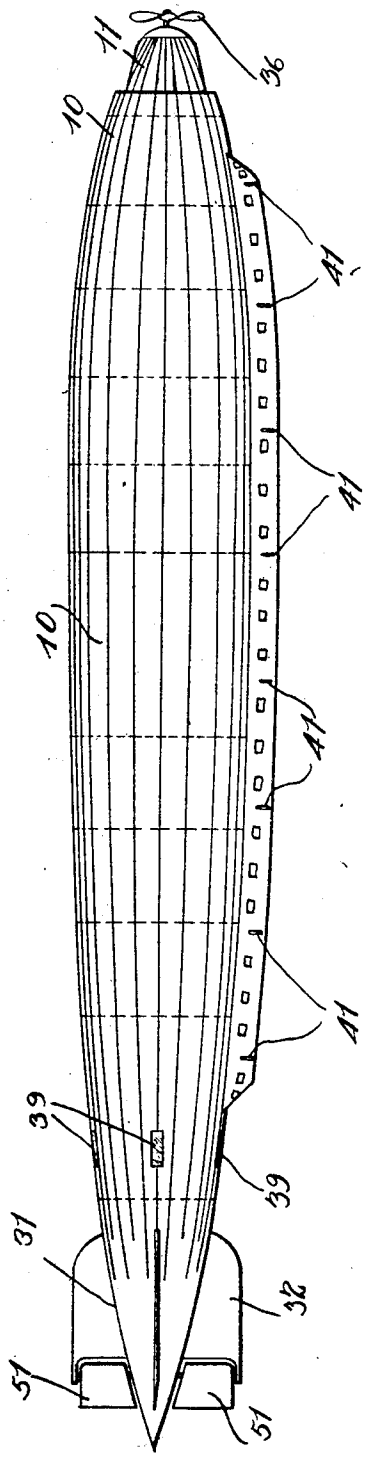



FIG. 1.

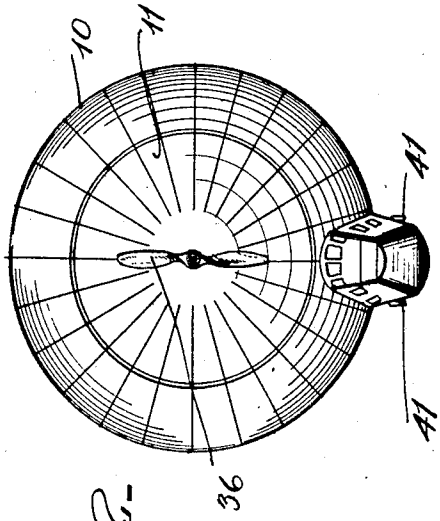



FIG. 2.

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Fig. 3.

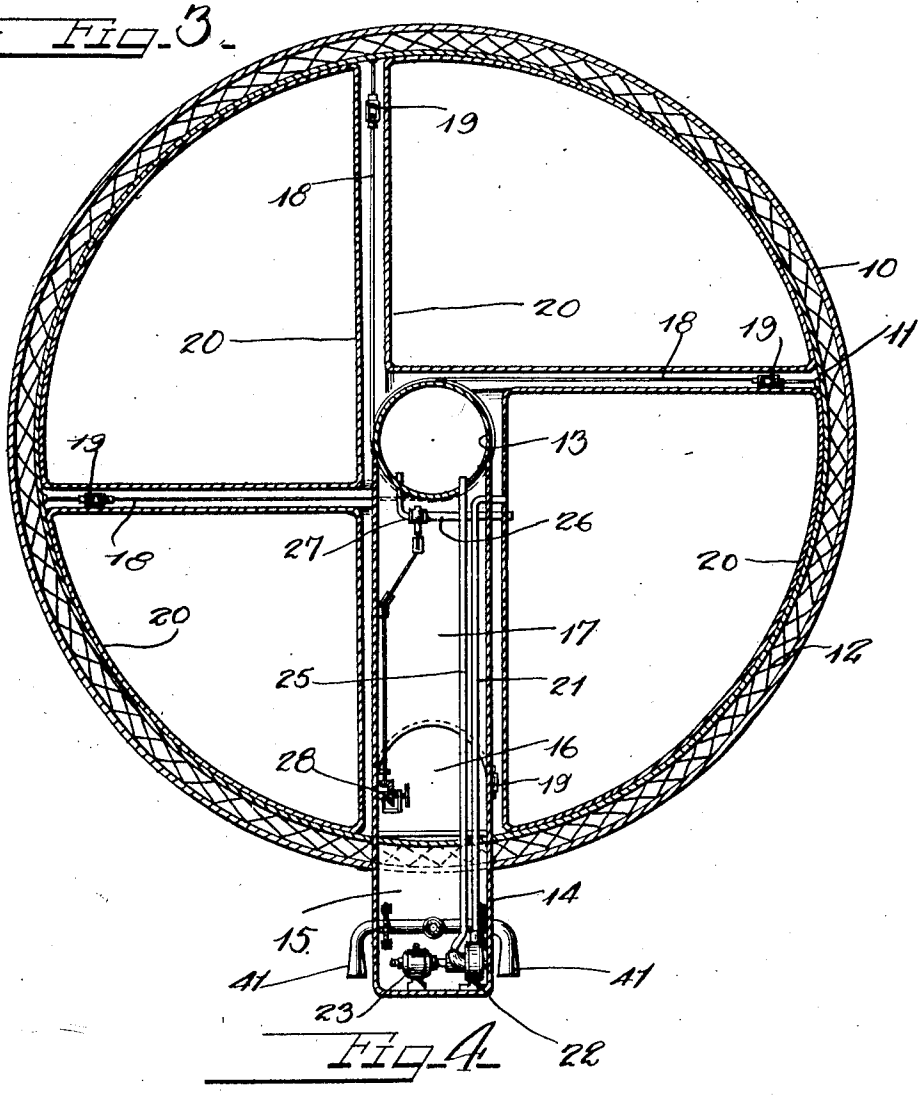
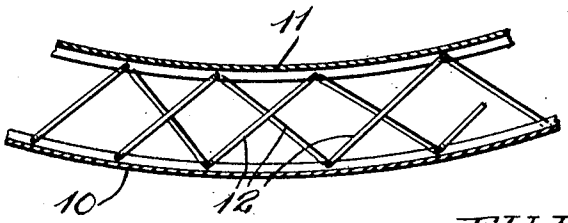



Fig. 4.




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Fig. 5.

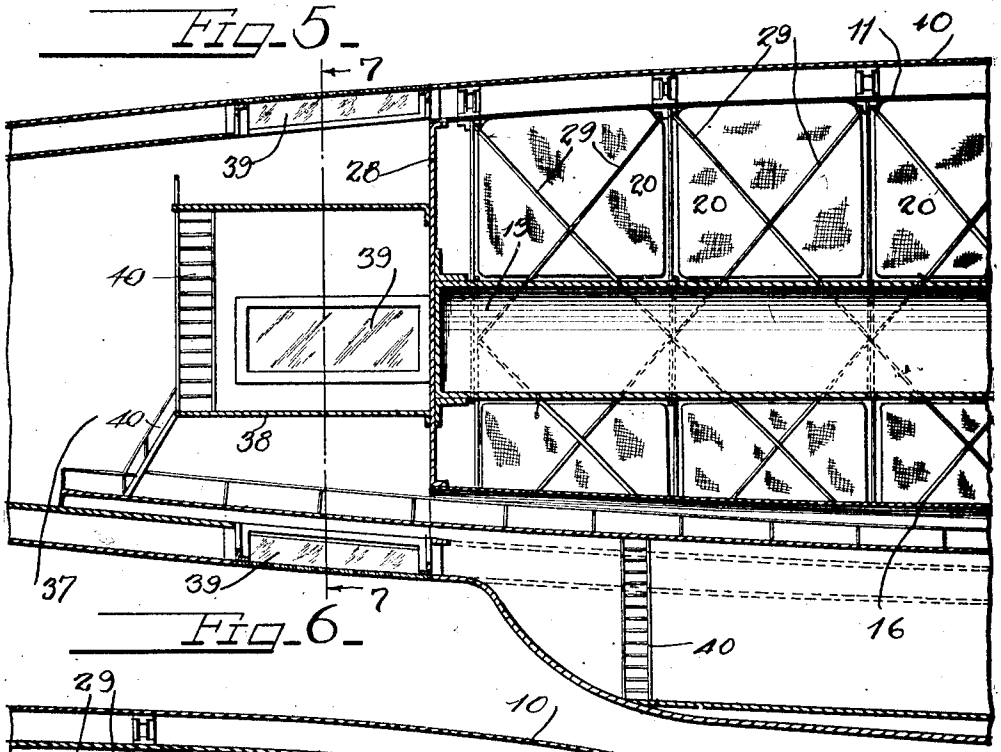
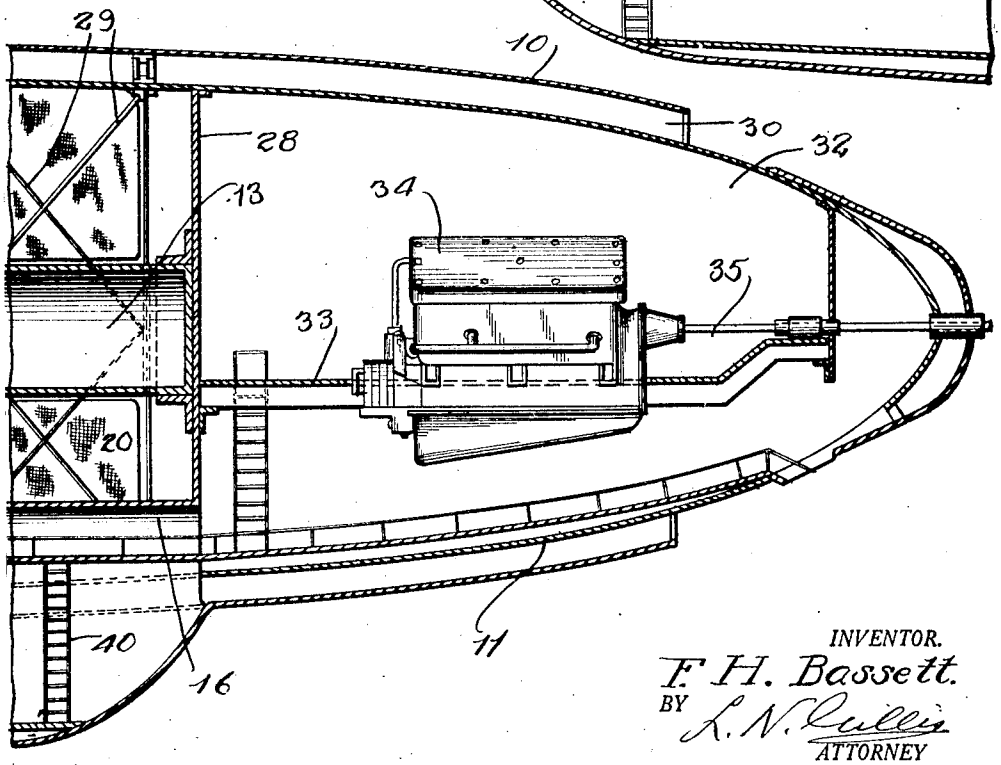



Fig. 6.




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DIRIGIBLE BALLOON

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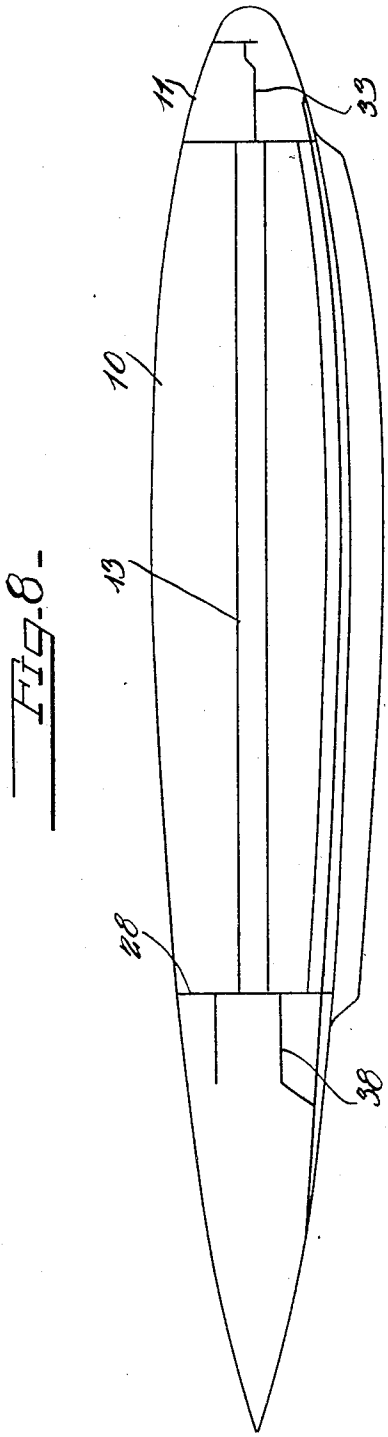



FIG. 8.

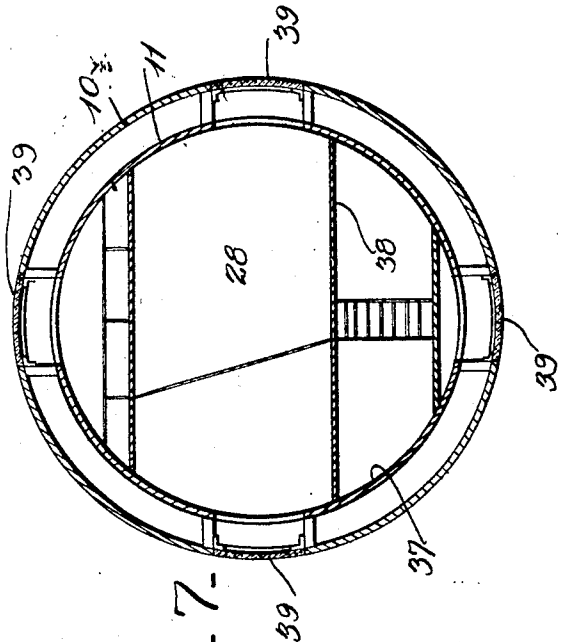



FIG. 7.

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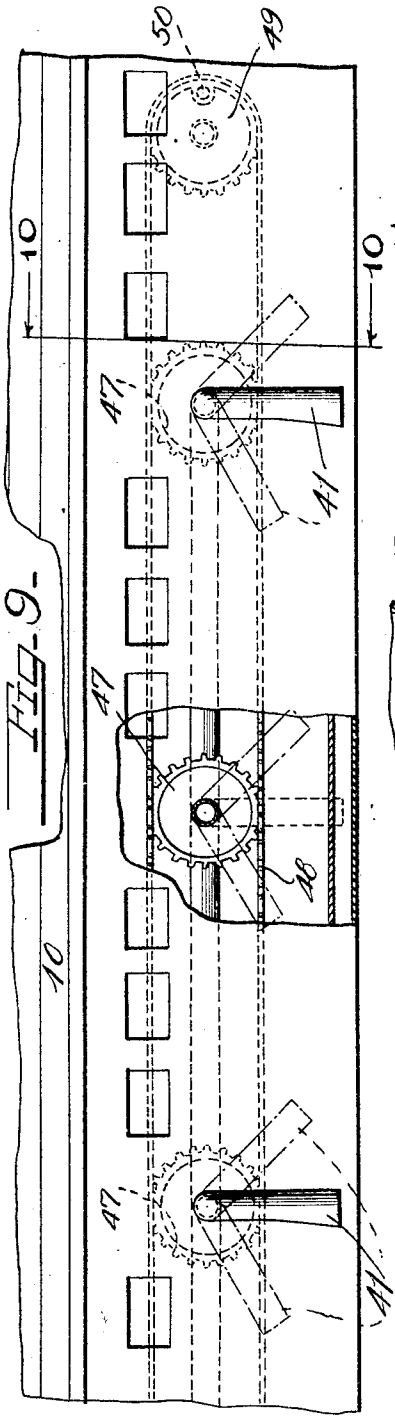



FIG. 9.

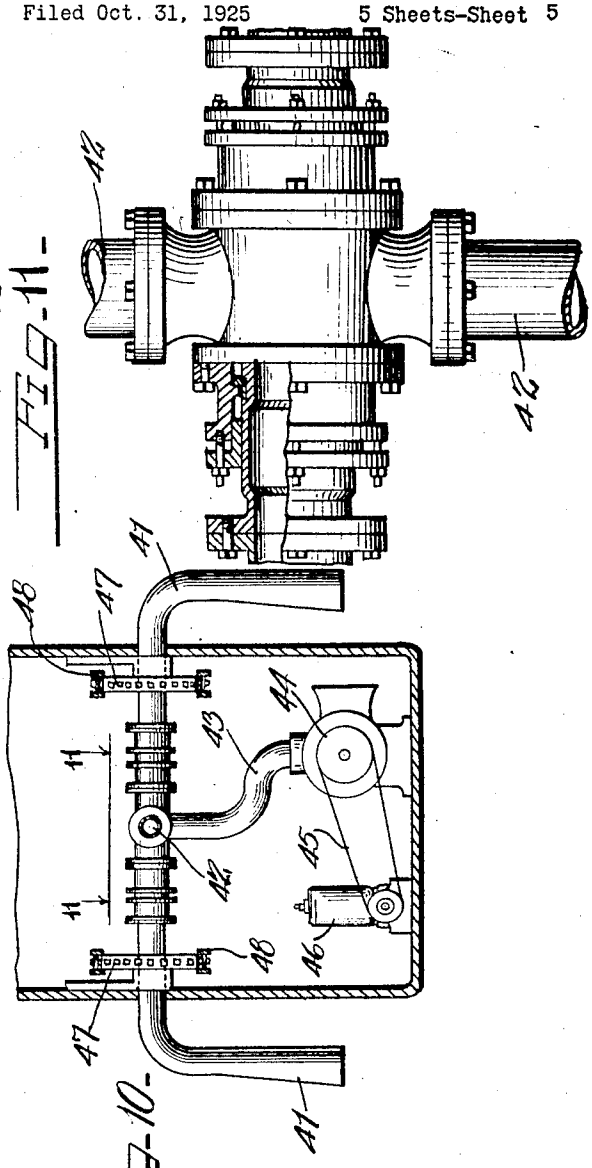



FIG. 11.

FIG. 10.

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Patented June 21, 1927. 1,633,238

# UNITED STATES PATENT OFFICE.

FRED H. BASSETT, OF WASHINGTON, DISTRICT OF COLUMBIA.

## DIRIGIBLE BALLOON.

Application filed October 31, 1925. Serial No. 66,064.

This invention relates to dirigible balloons, by which is meant, lighter than air machines peculiarly adapted for navigating the air.

In machines of this class it is well known that the gas bags, being subjected to variations in the exterior temperature such as is caused by the sun's rays, have the gas bags expanded or contracted without regard to the lifting powers thereof.

One important object of the present invention is to provide means whereby the lifting power of any gas bag may be regulated by the persons navigating such a machine.

A second important object of the invention is to provide means whereby the levitation efficiency of any gas bag may be regulated from within the device.

It is also known that exposure to the sun's rays so heats and expands the gases within the levitation elements and yet it becomes impossible to control the balloon or other aerostat within reasonable limits.

A third important object of the present invention is to provide means whereby the gas bags, which effect the levitation will be prevented from the heat effects of sunlight.

It is also well recognized that when machines of this class approach the earth, as in a suitable landing field, they must be kept from striking violently against the landing field.

A fourth important object of the invention is to provide, in a dirigible balloon means whereby an improved character of mechanism may be used to prevent unintentional landings.

It is known that cellular construction of the gas bags of dirigible balloons is very important in the structure of such devices.

A fifth important object of the present invention is to provide means whereby a dirigible balloon may be constructed with a series of cellular gas bags each of which may be controlled, as to inflation or deflation, from the directional part of such dirigible.

A sixth important object of the invention is to provide means whereby the various gas bags, within the balloon, may be inflated or deflated at will.

A seventh important object of the invention is to provide means whereby a cooling current may be constantly maintained between the inner and outer shell of such a dirigible.

An eighth important object of the invention is to provide means whereby the entire dirigible may be driven from a compartment within the dirigible.

A ninth important object of the invention is to provide means whereby observations may be made from any desired compartment in the balloon.

A tenth important object of the invention is to provide means whereby air draughts or blasts may be directed downwardly, forwardly or rearwardly to control the balloon.

With the above and other objects in view as will be hereinafter apparent, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings and specifically claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views, and:

Figure 1 is a side elevation of a dirigible constructed in accordance with this invention.

Figure 2 is a front elevation thereof.

Figure 3 is an enlarged detail section taken through the middle of Figure 1 and at right angles thereto.

Figure 4 is a partial section showing the bracing as illustrated in Figure 3.

Figure 5 is a vertical longitudinal section through the rear part of Figure 1 showing the observation element.

Figure 6 is a view similar to Figure 5 showing the front of the dirigible and illustrating the motor room.

Figure 7 is a section on the line 7—7 of Figure 5.

Figure 8 is a diagrammatic view showing the arrangements of the various parts in the dirigible.

Figure 9 is an enlarged view partly in side elevation and partly in section showing the blast apparatus.

Figure 10 is a large detail section on the line 10—10 of Figure 9.

Figure 11 is a still further enlarged view showing in top plan the device as shown in Figure 10, but partly in section, the view

being taken on the line 11—11 of Figure 10.

In the present embodiment of the invention there is shown a dirigible balloon having an outer skin 10 and an inner skin 11 which are held apart from each other by lattice work ribs 12. Centrally disposed of these inner and outer balloons is a tube 13. Below the outer shell 10 is a gondola 14 which communicates through a passage 15, with a tubular or arched passage 16 running from one end to the other of the gondola. At intervals there are provided vertical tubes 17 which extend upward to the tube 13.

The tube 13 is carried by tangential rods or wires 18 which are wrapped around the tube and are provided with turn buckles 19 between their connection with said tube and their connections with the inner skin or shell 11. Quadrantal gas bags 20 suitable for holding hydrogen or other lighter than air gas are arranged around the tube 13 as shown in Figure 3 and each of these gas bags is connected by a pipe 21 with a pump 22 driven by a suitable motor 23. The pump 22 is also connected by a pipe 25 with the tube 13. Furthermore, each gas bag is connected by a tube or pipe 26 with the tube 13, this last tube having a valve 27 controlled by suitable mechanism as shown at 28 from the passageway 16. Thus it will be seen that the tube 13 is supported in the manner of the tangential spokes of an ordinary bicycle. At each end the tube 13 is connected to a partition 28 and diagonal brace rods 29 are provided to hold the tube from vibration longitudinally.

At the forward end of the device it will be seen that the outer shell 10 and the inner shell 11 are so arranged as to provide an air receiving space 30 so that as the machine is driven through the air the cool air will enter in the space 30 and prevent heating of the inner shell, this cool air escaping through the parts 31 at the rear of the dirigible. Forwardly of the machine there is provided a compartment 32 having a floor or deck 33 whereon is connected a motor 34, driving through the shaft 35 a propeller 36. At the rear end of the machine there is provided an observation compartment 37 having decks 38 and observation windows 39 which may be reached, both in front and rear by the ladders 40.

Spaced along the sides of the gondola are blast nozzles 41 which are swiveled to a main blast pipe 42 receiving air through a pipe 43 from the fan or blast arrangement 44 which is driven, as by a belt 45 from a motor 46. The nozzles 41 each having a gear 47 and all of these gears are connected by a sprocket chain 48 with a directing gear 49 provided with a driving gear 50.

The balloon is of course provided with the usual rudders 51 and controlling fins 52.

It will be observed that by means of this construction the gas bags may have the gas withdrawn therefrom and compressed in the central tube, the bags partially collapsing under these conditions so that the central compartment, occupied by said bags becomes more or less filled with air in accordance with the degree at which certain said bags are exhausted. Consequently the operation of the gas compressor in compressing gas in the central tube acts to destroy more or less of the levitating effect of the gas and the dirigible sinks in the air. When it is desired to elevate the dirigible the valves 27 may be opened so that the gas bags are again filled with gas and expanded, the air being forced out of the shell by such expansion. Thereby the balloon is caused to rise. The nozzles 41 may be directed rearwardly to drive the balloon forward or forwardly to back the balloon up. Also they may be directed downwardly in landing to provide a series of air cushions beneath the balloon.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit thereof. It is not, therefore, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

Having thus described the invention, what is claimed as new, is:

1. In a dirigible, an inner shell, an outer shell, said inner shell being spacedly supported within the outer shell, the outer shell terminating rearwardly of the inner shell and being open at its forward end to receive cooling air and having openings at its rear end to allow the escape of such cooling air.

2. In a dirigible balloon, a double shell consisting of spaced inner and outer shells, partitions extending across said inner shell adjacent the ends thereof to provide a forward compartment, a central compartment, and a rear compartment, and a tubular backbone forming a tank for compressed levitating gas and extending between said partitions.

3. In a dirigible balloon, a shell, a pair of partitions extending transversely of the shell adjacent the front and rear ends thereof, a tubular gas receiving tank extending between said partitions, braces connecting the tank to the shell, gas bags arranged around said tank, a gas compressor, means affording communication between said tank and bags through said compressor, and independent valve controlled means affording communication directly between said tank and bags.

4. In a dirigible balloon, a shell, a pair of

partitions extending transversely of the shell adjacent the front and rear ends thereof, a tubular gas receiving tank extending between said partitions, braces connecting the tank to the shell, certain of said braces being arranged tangentially of the tank and in planes at right angles to the axis thereof and others of said braces being arranged in diagonal relation to the first named braces, gas bags arranged around said tank, a gas compressor, means affording communication between said tank and bags through said compressor, and independent valve controlled means affording communication directly between said tank and bags.

In testimony whereof I affix my signature.

FRED H. BASSETT.