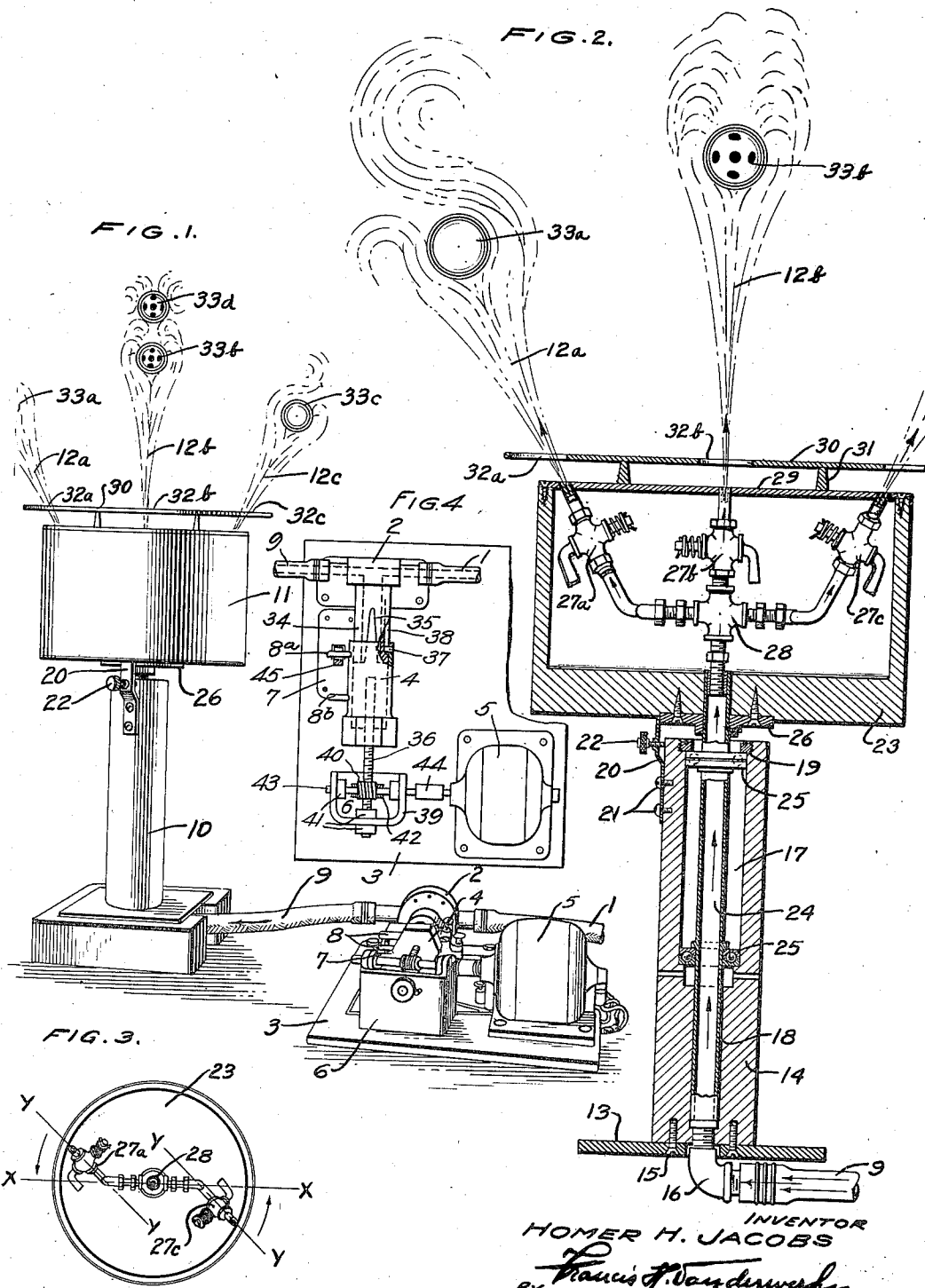


Sept. 29, 1936.

H. H. JACOBS
AERODYNAMIC SUPPORT

2,055,498

Filed Aug. 5, 1933



INVENTOR
HOMER H. JACOBS
BY Francis J. Vanderweiden and Wade Hooty
ATTORNEYS

UNITED STATES PATENT OFFICE

2,055,498

AERODYNAMIC SUPPORT

Homer H. Jacobs, Dayton, Ohio

Application August 5, 1933, Serial No. 683,759

4 Claims. (Cl. 40—127)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

Aerodynamic support

This invention relates to devices adapted to aerodynamically support bodies in space.

It is a principal object of the invention to suspend bodies of various shapes and sizes, in mid-air, without visible means.

A further object of the invention is to accomplish the aforementioned suspension intermittently, to attract attention of passers-by.

It is a still further object of the invention to provide a device, readily adaptable to display tables or cabinets, which may be either hidden or visible, as desired.

Another object of the invention is to effect aerodynamic displays of pre-arranged design form which will attract the attention of those viewing the same.

To further hold attention, the invention is adapted to bodily rotate the aforementioned aerodynamic displays from time of formation to time of discontinuance.

With the aforementioned and other objects in view, which will appear as the description proceeds, the invention consists in certain new and novel improvements in aerodynamic supports, which will be hereinafter more fully illustrated and described in the accompanying drawing and more particularly pointed out in the appended claims.

Referring to the drawing, in which numerals of like character designate similar parts throughout the several views:

Fig. 1 is a side elevation of my invention.

Fig. 2 is a sectional side elevation of the support and rotatable platform of my invention.

Fig. 3 is a plan view of the rotatable platform, with cover removed.

Fig. 4 is a plan view of the fluid pressure supply regulator.

In Fig. 1, a hose 1 is connected at one extremity to a fluid pressure supply (not shown) and at the other extremity to a valve housing 2, fixedly attached to a base 3. A bleeder valve 4 is slidably mounted upon an outwardly extending projection provided upon the housing 2. Backward and forward movement of the valve 4 is accomplished by means of an electric motor 5, transmission 6, and an electrical switch 7, actuated by tripping bars 8 fixedly attached to the valve 4. Outward movement of the valve 4 from the hous-

ing 2 gradually exposes a slotted opening in the outwardly extending projection provided upon the housing 2 and causes varying escapage of air supplied by the hose 1. Through continued reciprocation of the valve 4, varying quantities of air are intermittently caused to flow through the hose 9 into the base of a platform support 10 and from thence to a rotatable platform 11. Diagrammatic representation of the emission of a maximum quantity of air is illustrated by jets of air 12a through 12c.

Referring to Fig. 2, the platform support 10 is comprised of a base plate 13 fixedly attached to a vertical column 14 by means of the screws 15.

A pipe L 16 is threaded into the base of the column 14. The column 14 is provided with a recess 17, a journal 18 and a retaining ring 19. Air is thus caused to flow from the pipe L 16 directly into the journal 18. A leaf spring 20 is fixedly secured to the upper outer extremity of the column 14 by means of screws 21. The upper portion of the leaf spring 20 is provided with an adjustable screw 22, the operation of which will be referred to below.

The rotatable platform 11 is comprised of a body portion 23 to which is fixedly attached a vertical axle 24, adapted at its lower extremity to fit snugly within the journal 18. The axle 24 is further provided with thrust bearings 25, which are held in the recess 17 by means of the retaining ring 19. There is fixedly attached to the body portion 23 and axle 24 a braking drum 26. Inward travel of the screw 22, with reference to the leaf spring 20, frees the upper end of the latter from the drum 26. Through gradual outward adjustment of the screw 22, the upper extremity of the leaf spring 20 is brought into braking contact with the outer surface of the drum 26. Jet nozzles 27a through 27c are provided through employment of conventional petcocks fixedly attached to the upper extremity of the axle 24 by means of suitable piping and a fitting 28. The jet nozzle 27b is coaxially disposed with reference to the axle 24. The jet nozzles 27a and 27c are angularly disposed with respect to the perpendicular. In Fig. 1 their longitudinal axes are shown at acute angles to the longitudinal axis of the axle 24. Reference to Fig. 3 further illustrates the angular disposition of axes $y-y$ with respect to the axis $x-x$. The body portion 23 is provided with a cover plate 29 to which is fixedly attached a body retainer 30 by means of pedestals 31. The retainer 30 is provided with holding loops 32a and 32b, adapted to receive and support the spheres 33a and 33b during absence of

emission of the jets of air 12a and 12b. It will be noted that incoming air from the hose 9 is free to pass through the hollow interior of the axle 24 and from thence through the jet nozzles 27a through 27c in to the atmosphere.

Referring to Fig. 3, it will be noted that jet propulsion of the rotatable platform 11 is effected upon emission of air from the jet nozzles 27a and 27c, due to the angular disposition of the axes $x-x$ and $y-y$. The rate of turn of the rotatable platform 11 is regulated through the quantity of air delivered by the hose 9 and by adjustment of the screw 22. The period of the starting-to-stopping cycle of the rotatable platform 11 is regulated by the valve 4, electric motor 5, transmission 6 and electric switch 7.

In Fig. 4, the housing 2 is provided with an outwardly extending projection 34 having a V shaped slotted opening 35. A cylindrical valve 4 is slidably mounted upon the projection 34, its outer end being threaded to receive the screw 36. A pin 37, secured to the open end of the valve 4, slidably engages a slot 38 provided in the projection 34 to prevent valve rotation with respect to its support. The outer extremity of the screw 36 is journaled to a housing 39 and provided with a worm gear 40 and thrust bearings 41. A worm pinion 42 is mounted directly over the gear 40, upon a shaft 43 provided with thrust bearings 41. The inner end of the shaft 43 is attached to a flexible coupling 44 driven by the motor 5. The valve 4 is provided with tripping bars 8a and 8b. As shown in Fig. 4, the valve 4 has reached maximum outward travel, the tripping bar 8a having thrown a lever 45 of the electrical switch 7. The transmission 6 has momentarily stopped preparatory to reversal of the motor 5. Maximum inward travel of the valve 4 effects reversal of the above switch tripping action through engagement of the tripping bar 8b with the lever 45 of the electrical switch 7.

The operation of my device is as follows:

Referring to Fig. 1, let it be assumed that the screw 22 is adjusted outwardly until the leaf spring 20 exerts its maximum pressure against the drum 26 and that the spheres 33a through 33c are placed in the holding loops 32a through 32c. With the valve 4 in closed position and the electric motor 5 dormant, let a constant fluid pressure supply be delivered through the hose 1. The spheres 33a through 33c will assume and maintain the attitude shown in Fig. 1 as long as there is a steady emission of air from the jet nozzles 27a and 27c. If it is desired, a fourth sphere 33d may be added, provided that the weight of the sphere 33d is appreciably less than that of the sphere 33b for the reason that the latter sphere is in a position to receive uninterrupted buoyancy from the jet of air 12b.

Let it next be assumed that the sphere 33d is removed from the jet of air 12b, and uninterrupted electric energy supplied to the electric motor 5. The valve 4 will pass from the closed position referred to hereinabove to a position of maximum opening, whereupon the fluid pressure supply passing through the hose 1 will escape directly into the atmosphere, through the slotted opening 35 shown in Fig. 4, thus causing the spheres 33a through 33c to return to the holding loops 32a through 32c. With return of the valve 4 to the closed position, the spheres 33a through 33c will again assume the attitude shown in Fig. 1. The foregoing movement of the spheres 33a through 33c reoccurs at regular intervals.

If, during the aforementioned evolutions of the

spheres 33a through 33c, the screw 22 is gradually screwed in an inwardly direction, the rotatable platform 11 will commence to slowly execute a series of counter-clockwise rotations as viewed in Fig. 3, due to the angular disposition of the axes $x-x$ increasing in rate of revolutions and period of time as the magnitude of the pressure of the leaf spring 20 against the drum 26 decreases.

It is to be understood that many structural variations of my invention may be employed without departing from the spirit thereof. For instance, a rotatable platform may be inconspicuously positioned flush with the top surface of a display cabinet, with the holding recesses inconspicuously positioned or totally hidden there-within. The spheres 33b and 33d, of Fig 1, are decorated with small black dots for the reason that the vertically disposed jet of air 12b does not have a tendency to rotate the object suspended with reference to the retainer 30. This decoration may, of course, be varied to depict a globe of the world, moon or other desired body. No decoration has been shown for the rapidly rotating spheres 33a and 33c. As the acute angle between the longitudinal axis of the jets of air 12a and a perpendicular to the cover plate 29 at point of intersection of said longitudinal axis and the top surface of said plate increases in magnitude, the rate of rotation of the sphere 33a increases. There is a limit to the aforementioned angular increase at which point the jet 12a is no longer capable of supporting the sphere 33a.

From the foregoing it is obvious that my invention is adapted to maintain, without visible means, desired groups of heavenly bodies, including appropriate planetary motion thereof. My invention further furnishes ready means for analyzing the movements of spheres rotating in space, including the effect of secondary rotation of the axes thereof.

I claim:

1. Means for aerodynamically supporting a plurality of bodies in prearranged configuration comprising, a support, a plurality of jet nozzles angularly mounted thereon with respect to the perpendicular, body retaining means operatively associated with said jet nozzles, a source of fluid pressure supply, and means for intermittently interrupting emission of streams of fluid from said jet nozzles whereby said bodies are aerodynamically raised from, suspended in mid-air above, and lowered to said retaining means.

2. Means for aerodynamically supporting a plurality of bodies in prearranged configuration comprising, a rotatably mounted support, a plurality of jet nozzles angularly mounted thereon with respect to the perpendicular, body retaining means operatively associated with said jet nozzles, a source of fluid pressure supply, and means for intermittently interrupting the flow of said fluid pressure supply, said plurality of jet nozzles being positioned on said rotatably mounted support such that said support is caused to rotate upon emission of streams of fluid from said jet nozzles whereby said bodies are aerodynamically raised from, suspended in mid-air above, and lowered to said retaining means.

3. In a display device, a plurality of spheres, a support having a vertical member and a horizontal member including sphere holding means, at least one perpendicularly and at least one angularly disposed jet nozzle singly secured beneath said sphere holding means, a source of fluid pressure supply, and means for intermittently interrupting the flow of said fluid pressure such that

streams of fluid from said jet nozzles periodically raise from, sustain at least one and sustain and rotate at least another, and return to said holding means said plurality of spheres.

5 4. In a display device, a plurality of spheres, a support having a fixed vertical member and a horizontal member rotatably attached thereto and including sphere holding means, braking means carried by said vertical member for regulating the rate of rotation of said horizontal member, at least one perpendicular and at least one angularly disposed jet nozzle singly secured

beneath said sphere holding means, a source of fluid pressure supply, and means for intermittently interrupting the flow of said fluid pressure supply, at least one of said plurality of jet nozzles being positioned on said horizontal member such that said member is caused to periodically rotate upon intermittent emission of streams of fluid from said jet nozzles as said spheres are aerodynamically raised from, suspended in mid-air above and lowered to said sphere holding means. 10

HOMER H. JACOBS.