A.D. 1861, 3rd AUGUST. N° 1929.

Aerostatic Apparatus.

LETTERS PATENT to Gustave Louis Marie Viscount de Ponton D'Amécourt, of Paris, France, for the Invention of "IMPROVEMENTS IN APPARATUS CONNECTED WITH AEROSTATION."

Sealed the 28th January 1862, and dated the 3rd August 1861.

PROVISIONAL SPECIFICATION left by the said Gustave Louis Marie Viscount de Ponton D'Amécourt at the Office of the Commissioners of Patents, with his Petition, on the 3rd August 1861.

I, GUSTAVE LOUIS MARIE Viscount DE PONTON D'AMÉCOURT, of Paris, France, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN APPARATUS CONNECTED WITH AEROSTATION," to be as follows:—

The Invention consists in making the atmosphere subservient as a prop or point of support for aerostatical apparatus, and doing away with balloons or other similar aerostatical apparatus deriving their ascending power only from being provided with gas of less specific gravity than that of the atmosphere. In my Invention the ascensional and the impulsory and directing motions are imparted to the aerostatical apparatus by the effect produced on the air by the rapid revolving motion of suitable helixes or propeller screws. The required ascensional motion is given to my aerostatical apparatus (which I intend denominating aeronef or helicoptere,) by means of two or more superposed horizontal helixes combined together, and revolving in such manner in respect to each other, that the resistance offered to them by the air being the result of

two forces, viz., one vertical, and the other horizontal, the several vertical components combine their efforts for raising the apparatus, whilst the horizontal components keep each other in proper equilibrium, and prevent the apparatus from receiving a giration motion, which would be prejudicial to the aeronaut or driver of the aeronef. The propulsory motion is imparted to the apparatus by a vertical revolving helix, whilst a vertical rudder acting in the manner of a ship's rudder, and a horizontal one acting in a manner similar to a bird's tail, serve for directing the apparatus; the vertical rudder provides also for any deficiency in the equilibrium existing between the ascending helixes, the inclined position of one of which latter may be shifted at pleasure by the aeronaut by means of a proper regulator, and so as to allow him of transforming the apparatus into an inclined plane, or a parachute. The helixes or screws may receive their revolving motion from any suitable prime mover, and the working principle of the apparatus be applied to toys or playthings for children.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Gustave Louis Marie Viscount de Ponton D'Amécourt in the Great Seal Patent Office on the 3rd February 1862.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, GUSTAVE LOUIS MARIE Viscount de PONTON D'AMÉCOURT, of Paris, France, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Third day of August, in the year of our Lord One thousand eight hundred and sixty-one, in the year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Gustave Louis Marie Viscount de Ponton D'Amécourt, Her special licence that I, the said Gustave Louis Marie Viscount de Ponton D'Amécourt, executors, administrators, and assigns, or such others as I, the said Gustave Louis Marie Viscount de Ponton D'Amécourt, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN APPARATUS CONNECTED WITH AEROSTATION," upon the condition (amongst others) that I, the said Gustave Louis Marie Viscount de Ponton D'Amécourt, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and

seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Gustave Louis Marie Viscount de Ponton D'Amécourt, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

These improvements relate to apparatus connected with aerostation, and they consist in making the atmosphere subservient as a prop or point of support for such apparatus, and doing away with balloons or other similar hitherto used aerostatical apparatuses deriving their ascending or floating power from being provided with gas of less specific gravity than that of the atmosphere; whereas, in my Invention, the ascensional as well as the propelling motions are imparted to the aerostatical apparatus by the effect produced on the air by the rapid revolving motion of suitable helixes, blades, or propeller screws. In my Invention the aerostatical apparatus has consequently a greater density than the air in which it is intended to navigate, and in this respect is different from any of the apparatuses hitherto proposed for aerostatical purposes, which latter, on the contrary, were based on the employ of a gas, or of air of less specific gravity than that of the air in which the apparatus is to move. I consequently entirely do away with the balloon, whereas in my apparatus this latter is caused to rise and is directed merely by means of mechanical power, the air being thereby made subservient as a prop or point of support, whilst any suitable motive power may be made use of for driving the mechanism, which latter consists of two principal or main parts, viz., those for imparting the rising or ascensional motion to the apparatus, and those for giving the propulsive and directing motions thereto, the first consisting of two helixes or parts of helixes, or propeller screws, vanes, or blades, and the second of a helix or suitable parts thereof, and one or more rudders, all or part of which are suitably connected to and driven by a steam engine, or other suitable prime mover. In making use of a helix or helixes, or suitable parts thereof, it is merely because I consider the same to be fittest for properly acting on so fugitive a resting point as is the atmosphere; but I wish it to be understood that various other mechanical devices might be made use of instead of the said helixes or propeller screws, such as suitably inclined wings, paddle, or other suitable wheels, and so on, and I consequently do not wish to restrain or restrict myself to the exclusive use of any of these parts, but intend to vary this part of the Invention according to circumstances.

D'Amécourt's Improvements in Apparatus connected with Aerostation.

The apparatus I make use of for properly ascertaining the principle of my Invention, and which, consequently, I may here give a description of, in order to make the nature of the Invention better understood, is represented in elevation view in Fig^e. 1 of the annexed Drawings, the remainder of the Figures of which Drawings show various views of detached parts of the apparatus, in all of which Figures corresponding parts are indicated by the same letters of reference.

The apparatus consists of a strong vertical or main shaft or arbor A, to the lower part of which is firmly secured a box B containing a small steam engine or other suitable prime mover, and also the seat for the aeronaut or driver of the apparatus or other persons accompanying him; Fig. 2 represents a front, and Fig. 3 a side view of the shaft A, provided with forked parts or slits, in which the pulleys a, a^1, a^2, and a^3, revolve by means of their spindles b, b^1, b^2, in suitable bearings, motion being transmitted by any suitable means from the steam engine to the driving spindle b^1; in A^1 the shaft A forms a hollow cylindrical part, through which are conducted the straps c and c^1 for connecting together the pulleys a and a^1, and those a^2 and a^3, and round this part A^1 fits and revolves the boss of a cast-iron circle or wheel d (shown in plan view in Fig. 4), to the periphery of which circle are fixed the stretchers or ribs R, (Figs. 4, 5, 6,) for two, three, or more vanes or blades D of a helical or other suitable form, situated at suitable distances apart round the said periphery, in such manner that the entire forms a helix or propeller screw E, about in a similar manner as those made use of for propelling steam boats, or in the manner of the arms or sails of the ordinary vertical windmill; the said vanes or blades D consisting of a suitable framework covered with canvass, sheet metal, or any other suitable light and resisting material, suitable provisions being made for allowing the aeronaut to reef these sails, or vary the inclination of the vanes according as might be required. The arbor or shaft A is provided with two of such helixes or propeller screws E and E^1, situated horizontally above and parallel to each other, whilst, for causing them to revolve in opposite directions to each other, tooth wheels G are fixed to each end of the spindle b of the pulley a, (see Figs. 1, 2, and 5,) which wheels G are in gear with the indented parts e of the circles d and d^1 respectively of the upper and lower helixes E and E^1, and as a suitable revolving motion is transmitted from the steam engine or other prime mover to the spindle b^1, this motion will be transmitted by the pulleys a^2 and a^1, and the straps c^1 and c to the pulleys a^3 and a, and by the spindle b of this latter to the wheels G, and consequently to the helixes E and E^1 driven by these wheels G, but so as to cause the helix E to revolve in one and the other helix E^1 in the opposite

direction. In order to prevent the helixes E and E¹ to alter their position in respect to each other, a cross *g* (Fig. 5) revolves freely round the shaft A, and has at the end of each of its arms g^1 a small friction wheel *m* revolving between a circular plate *n* (fixed to the shaft A) and the top of the circle *d*; a similar arrangement is provided from underneath for the lower helix E¹. The revolving motion in contrary directions might also be transmitted to the helixes E and E¹, by means of the arrangement represented in side elevation view in Fig^s. 7. A is the shaft, round which fits a boss H with conical wheel I and a cross part J for the lower helix E to be fixed to, whilst the shaft A is also provided with a conical wheel I¹ and cross part J¹ for the upper helix E¹, both wheels I and I¹ are in gear with a pinion K, the spindle K¹ of which turns in suitable bearings K², and is provided with a crank arm K³ connected by a rod K⁴, or other suitable arrangement with the prime mover for receiving a suitable revolving motion therefrom, which will thus cause the wheels I and I¹, and consequently the helixes E and E¹ to revolve in opposite directions; it will be readily understood that many other arrangements might serve for obtaining a similar result; but what I consider to be a distinguishing feature or principle of this part of the Invention is to have the two helixes E and E¹, or other parts made use of in lieu of them, acting as vertical helixes or propeller screws, but revolving in opposite horizontal directions, so as to cause the horizontal components of the forces keep each other in proper equilibrium, in order to prevent any giration motion to be imparted to the aerostatical apparatus, whereas the vertical components of the forces unite together, and thus serve for imparting the proper ascending motion to the apparatus; it will be understood that provision must be made for allowing the aeronaut at any time to vary either the degree of inclination of the blades, sails, or vanes of each of the helixes E and E¹ separately, or the amount of canvass or other surface they offer to the air, in order to allow of suitably regulating the equilibrium that ought constantly to exist between the horizontal components of the forces. The mechanical parts for imparting the propulsive and directory motions to the apparatus consist of a set of blades or vanes forming a vertical revolving helix N, Fig. 1, and acting in the air in the same manner as the helixes made use of for propelling vessels in water or the arms of a windmill. The spindle P of this propeller screw or helix N revolves in proper bearings in the arbor or shaft A, and the same is driven by the pulley *a*; the same as has been said in respect to the helixes E and E¹, proper provisions must be made for allowing the aeronaut to vary, at pleasure, the speed of the revolution of the propelling helix N, or the inclination of its arms or the amount of surface they are to offer to the air. For directing the apparatus

a vertical rudder L, acting in the manner of a fish tail, is provided thereto, whilst provision is made for allowing the aeronaut to vary, at pleasure, the angular position of this rudder; the manner of acting of which corresponds with that of the ordinary ship's rudder; if required, a similar rudder M, situated in the horizontal position in the manner of a bird's tail, might be likewise adapted to the apparatus and be under the command of the aeronaut; these rudders consequently allow of varying the progress of the apparatus, as well in the horizontal as in the vertical direction.

From the description here above given it may be understood that in respect to the mechanical arrangements or details of parts made use of for imparting to the apparatus the required vertical or ascending, and the horizontal or propelling motions, and for directing the same, the apparatus above described must only be considered as an exemplification of the general arrangement of such aerostatical apparatus; but what forms the leading feature or principle of this arrangement is, the mode described of imparting a proper vertical or ascending motion to the apparatus, thereby effectually preventing any giratory or horizontal revolving motion of the same, which I obtain, as has already been explained, by means of two superposed horizontal propellers, driven by any suitable prime mover, and combined together and revolving or acting in opposite directions to each other, and in such manner that the resistance offered to them by the air, being the result of two forces, viz., one vertical and the other horizontal, the several vertical components unite their efforts for rising the apparatus, whereas the horizontal components keep each other in proper equilibrium, and thus prevent the apparatus from receiving a giratory motion, which latter would prove very prejudicial to the aeronaut or driver of the apparatus; the apparatus thus deriving its ascending power solely from any suitable prime mover with which the same is provided, consequently allows of doing away with the use of balloons or other apparatus having less specific gravity than that of the air. As regards the propulsive and directive motions, these may be imparted to the apparatus either by the above-described propeller N and rudders L, M, or by any other suitable means, and this propeller N and rudders L, M, may be driven also by the prime mover, and be under the command of the aeronaut or driver of the aerostatical apparatus.

Having thus described and particularly ascertained the nature of the Invention, and the modes in which the same is or might be put into practical effect, I wish it to be understood that I do not intend to restrain or restrict myself to the precise details of the apparatus, or parts thereof above described, as many variations may be made therefrom without departing from the main features or principles of the Invention; but what I consider to be novel and original,

and therefore claim as the Invention secured to me by the herein-before in part recited Letters Patent is, imparting to aeronautical apparatus of a specific gravity exceeding that of the air, and by means solely of any suitable prime mover, such as a steam engine or others, the ascending power required for causing the said apparatus to rise in the air by the effect exerted on this latter by suitable revolving helixes, propelling blades, or vanes, or other suitable mechanical arrangements acting in so far in a contrary direction to each other as to cause the vertical components of their forces unite their efforts for rising the apparatus, whereas the horizontal components keep each other in proper equilibrium, and thus prevent the apparatus from taking a giratory motion, whilst one or more revolving helixes, propeller blades or vanes, or other suitable mechanical arrangements are made use of for propelling, and one or more rudders, wings, or other suitable devices for directing the apparatus.

In witness whereof, I, the said Gustave Louis Marie Viscount de Ponton D'Amécourt, have hereunto set my hand and seal, this Twenty-ninth of January, Eighteen hundred and sixty-two.

GVE. LS. MIE. VTE. DE PONTON D'AMÉCOURT. (L.S.)

Witness,

A. G. BRADE.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1862.

FIG. 8.

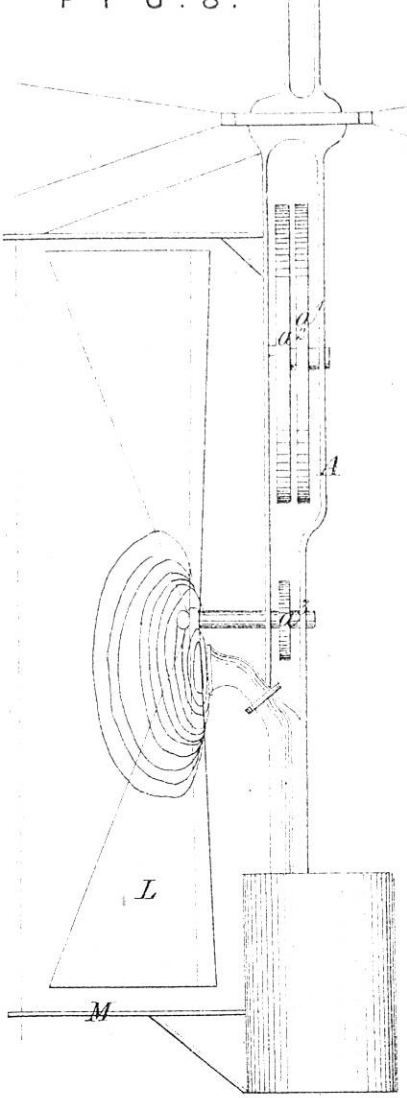


FIG. 6.

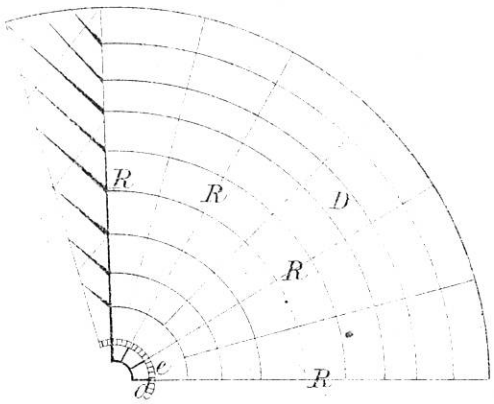
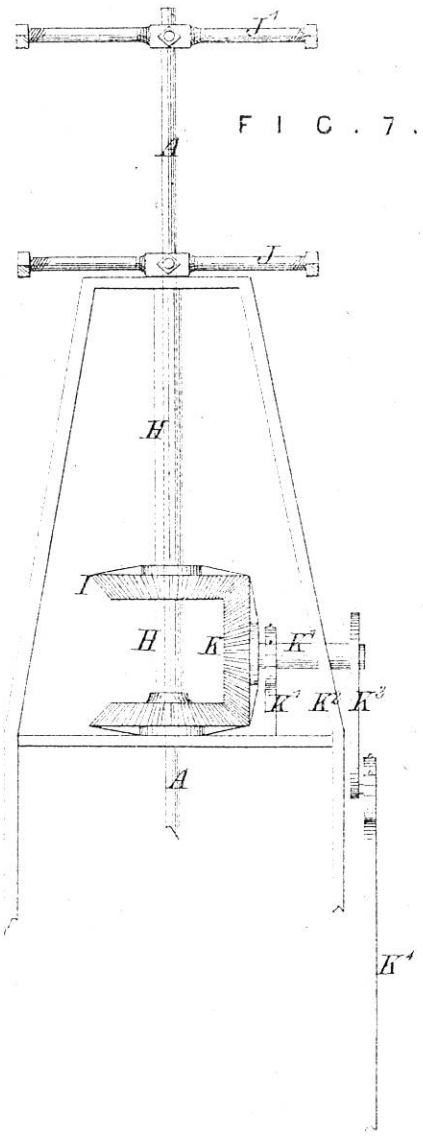


FIG. 7.



The filed drawing is not colored.

FIG. 1.

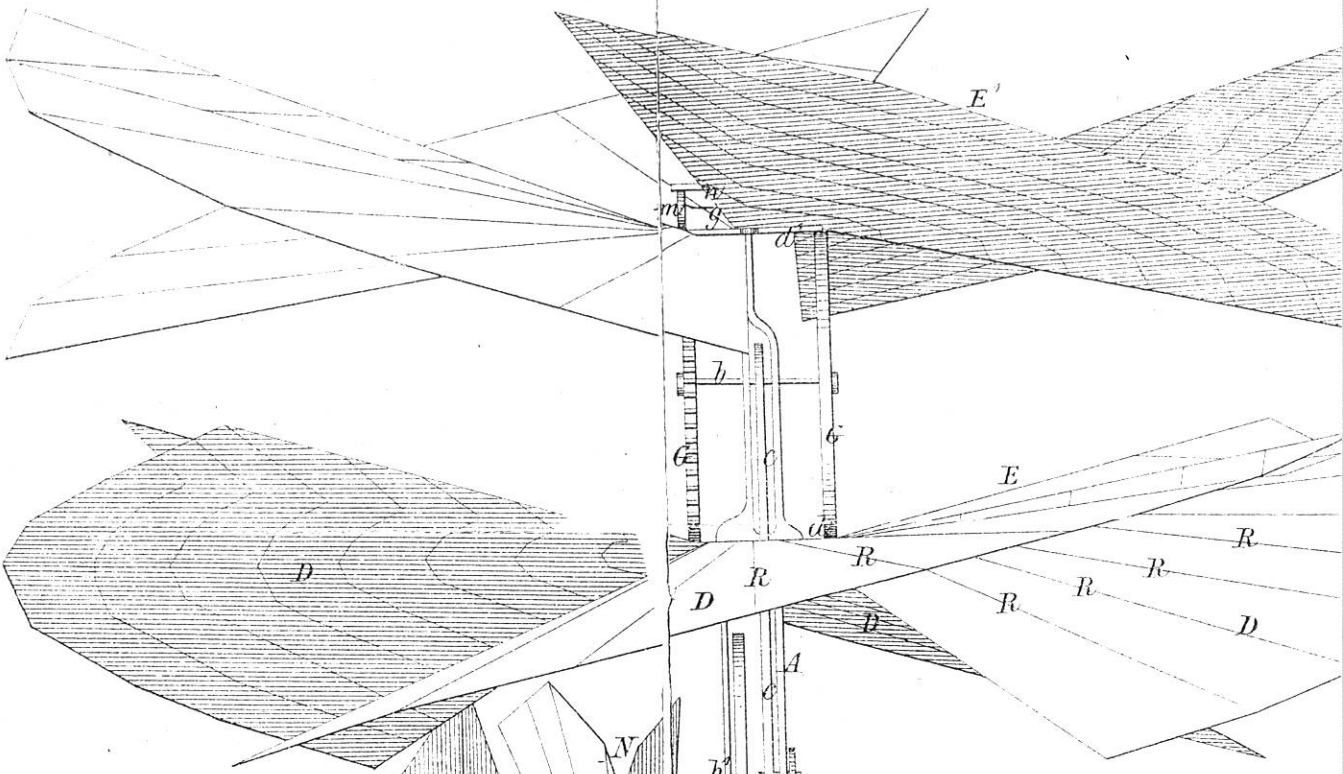


FIG. 7.

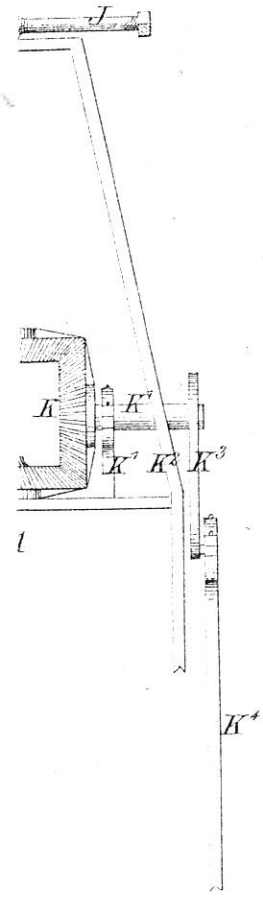


FIG.

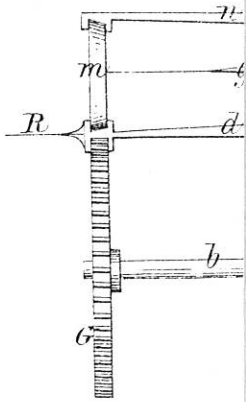


FIG.

LONDON: Printed by GEORG
Printers to
EDWARD EYRE and WILLIAM SPOTTISWOODE
ens most Excellent Majesty. 1862

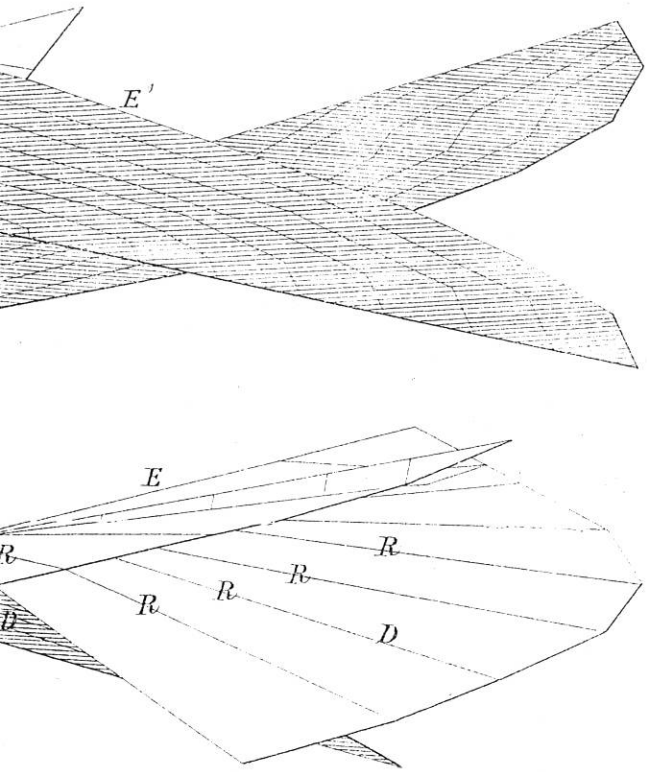
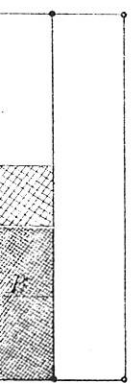


FIG. 5.



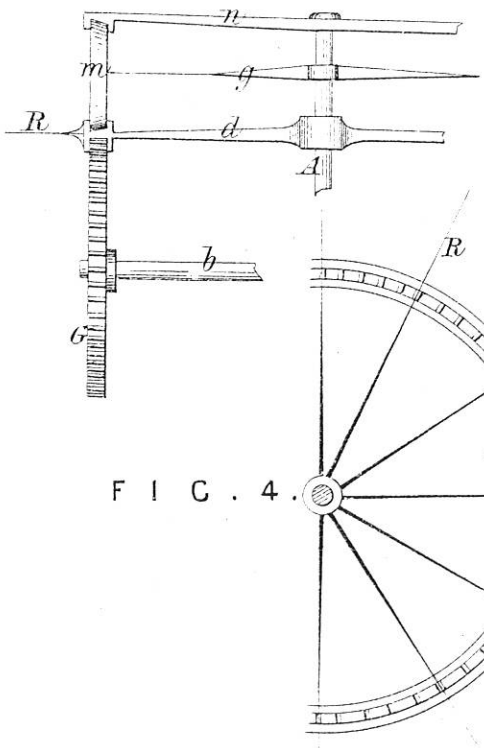


FIG. 4.

FIG. 2.

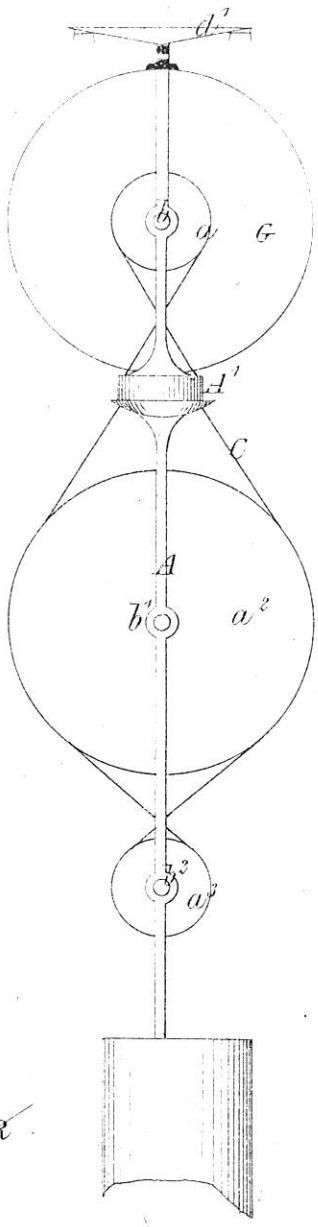


FIG. 3.