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R. COLE.
FLYING MACHINE.
APPLICATION FILED JULY 23, 1910.
1,011,031. Patented Dec. 5, 1911.
4 SHEETS-SHEET 1.

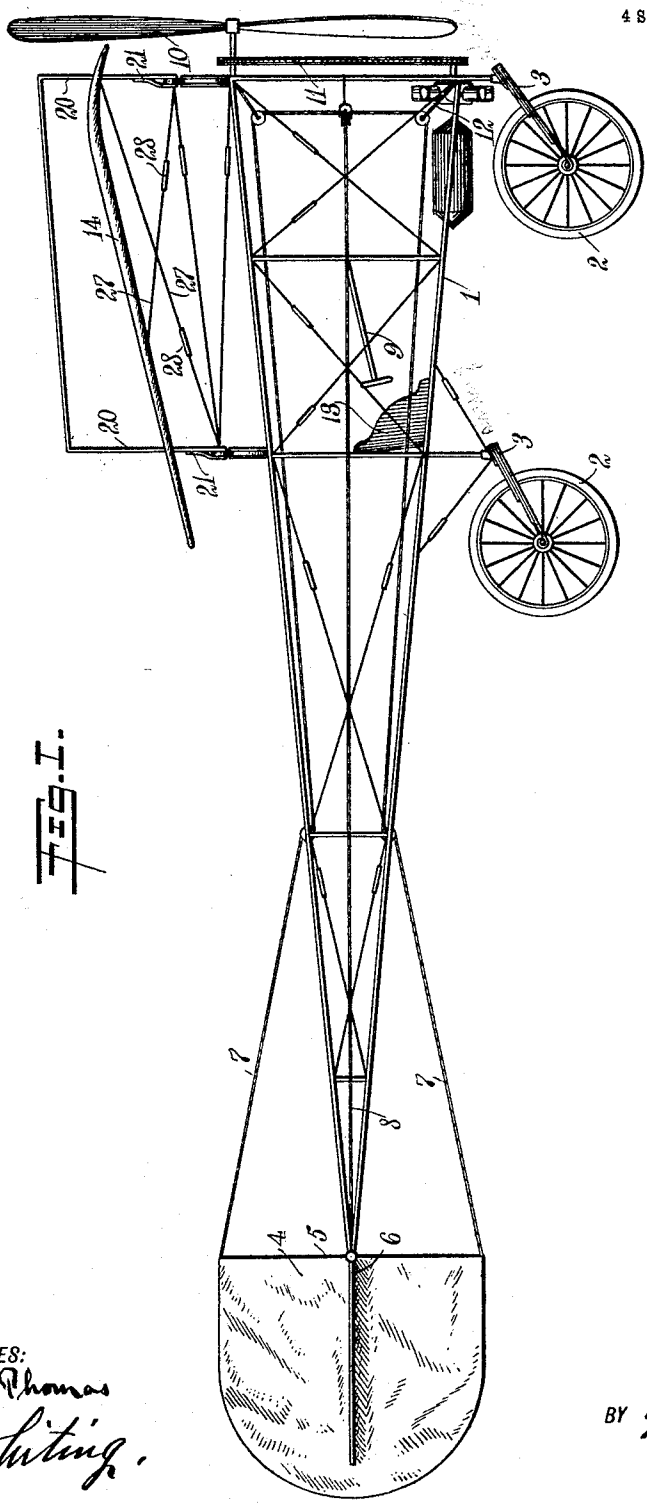


Fig. 1.

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H. Whiting.

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ATTORNEYS

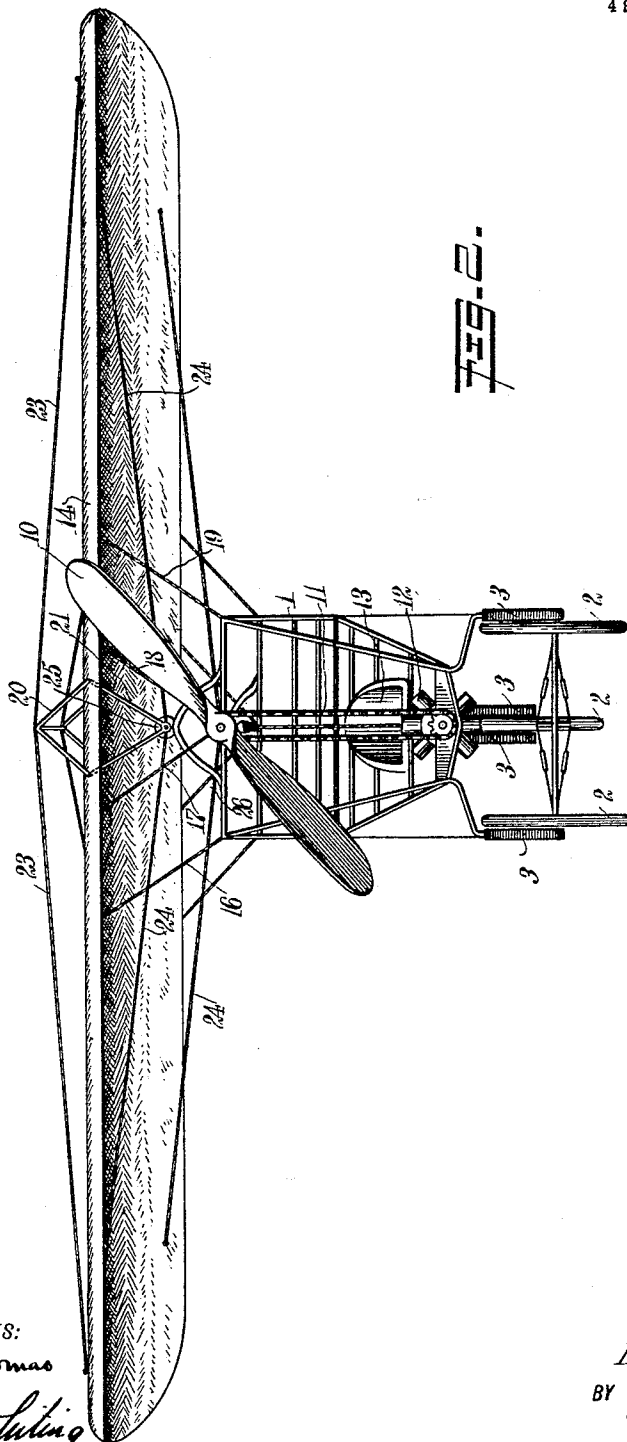
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4 SHEETS-SHEET 2.



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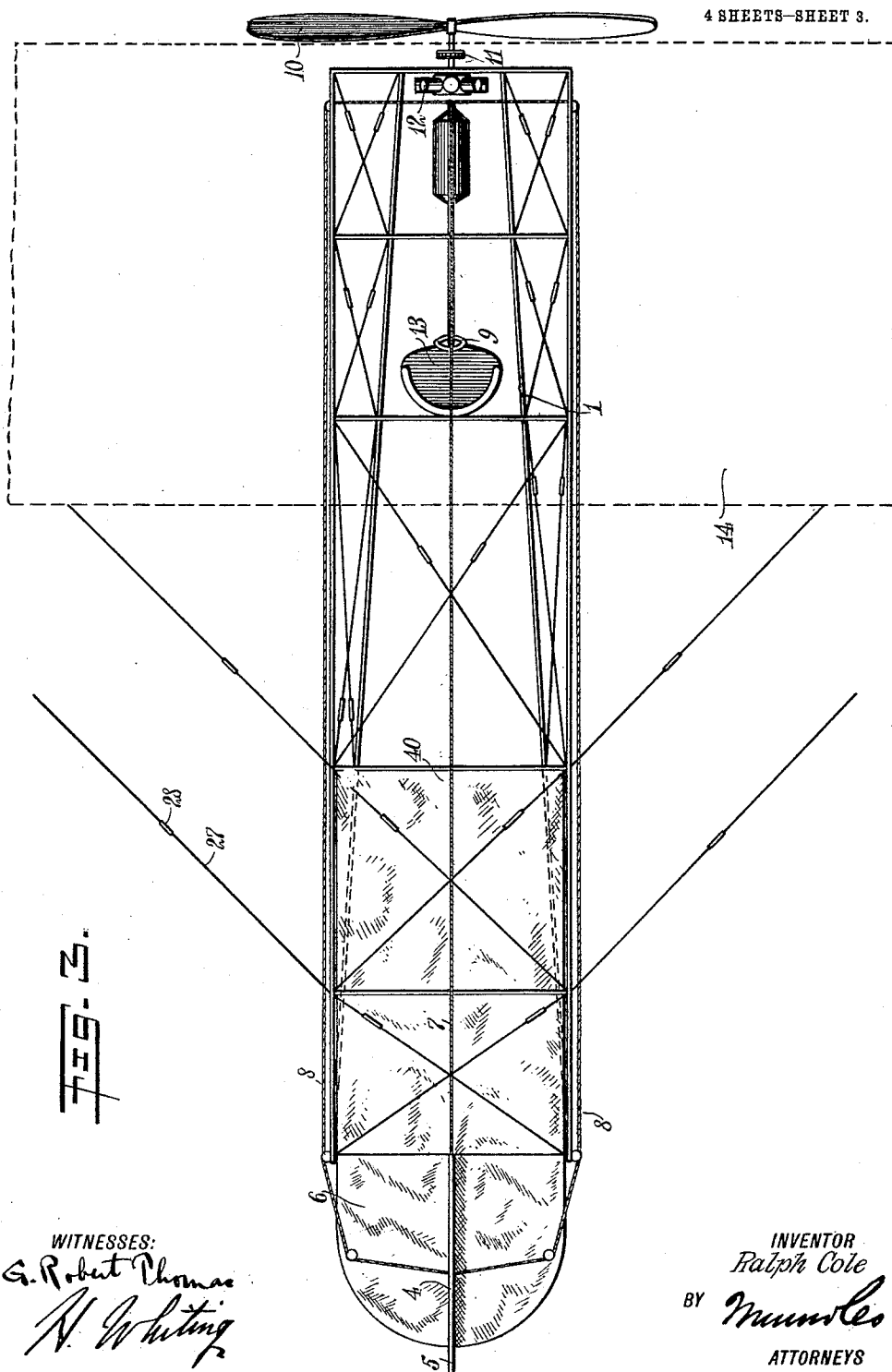
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4 SHEETS—SHEET 3.



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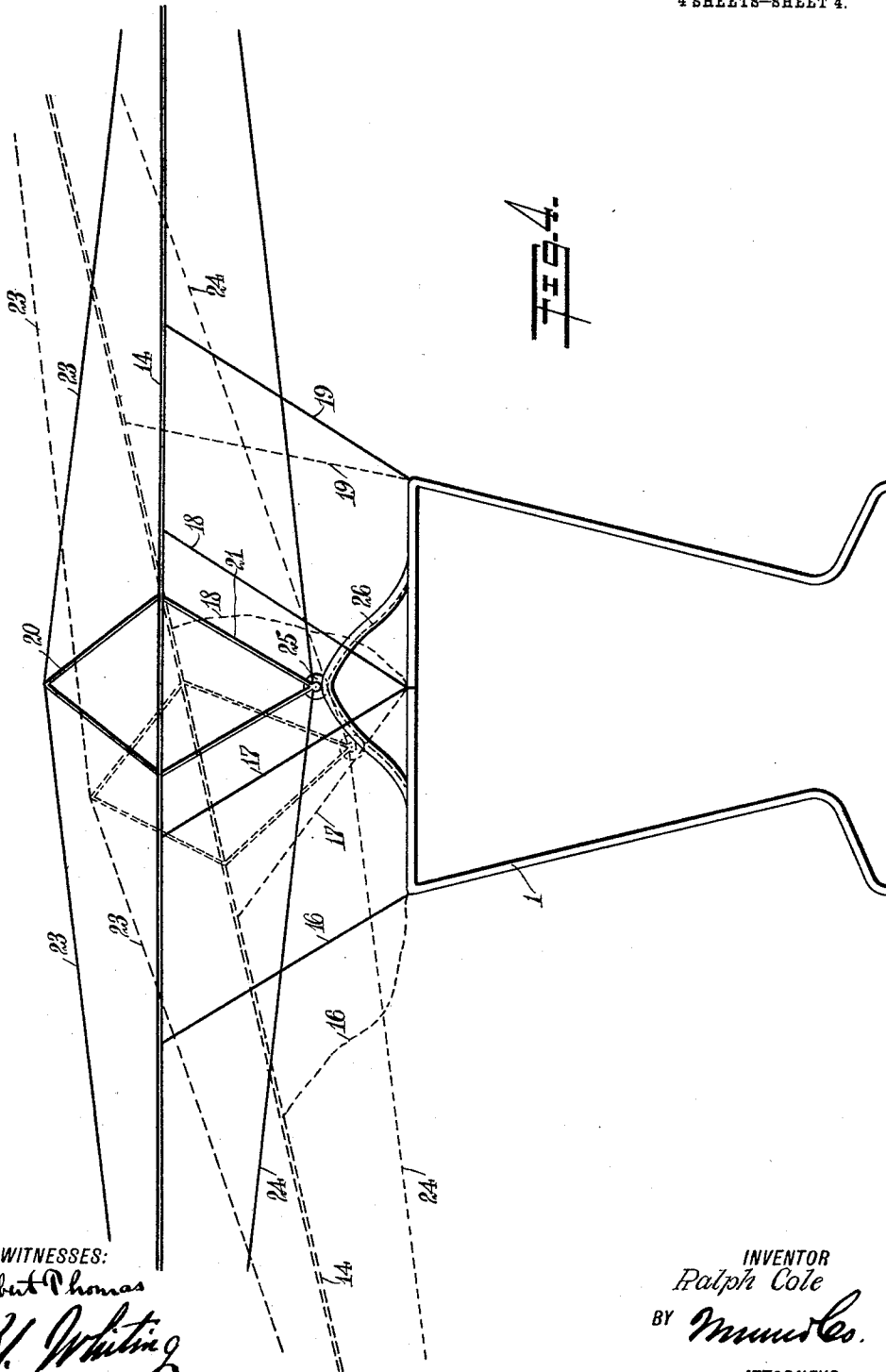
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4 SHEETS-SHEET 4.



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UNITED STATES PATENT OFFICE.

RALPH COLE, OF NORWALK, OHIO.

FLYING-MACHINE.

1,011,031.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed July 23, 1910. Serial No. 573,451.

To all whom it may concern:

Be it known that I, RALPH COLE, a citizen of the United States, and a resident of Norwalk, in the county of Huron and State of Ohio, have invented a new and Improved Flying-Machine, of which the following is a full, clear, and exact description.

This invention relates to a new and improved flying machine, and particularly to that type known as aeroplanes and in which an automatic balance of the equilibrium is obtained.

An object of this invention is to provide a device which will be light in weight, simple in construction, comparatively inexpensive to manufacture, strong, durable, and sensitive in its operation.

A further object of this invention is to provide a flexible connection between the main supporting plane and the frame, whereby the equilibrium of the aeroplane is automatically maintained.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a side view in elevation; Fig. 2 is a front view in elevation; Fig. 3 is a top plan view with the supporting plane removed to show the underlying structure; and Fig. 4 is an enlarged diagrammatic view showing the working of the supporting plane during its movement relative to the frame.

Referring more particularly to the separate parts of the device, 1 indicates the main supporting frame, which, while it may be supported on skids or in any other suitable manner, is shown as supported on rollers or wheels 2, which are connected to the frame by means of resilient members 3 in the form of leaf springs inclining downwardly from their point of engagement with the frame toward the rear, so that the shock of alighting will be automatically absorbed.

The frame 1 may extend rearwardly, where it may be provided with a rudder 4 comprising a vertical plane 5 and a horizontal plane 6, and having preferably a universal connection on the frame 1. The plane 6 may be provided with an extension

extending in alinement therewith, forming an auxiliary supporting plane 40. For the purpose of manipulating this rudder 4, there are provided flexible connections 7 and 8, which pass over suitable guide pulleys to a point where they are connected to a steering wheel 9 having a universal socket support in the frame 1. The machine may be driven through the air by any suitable means, such as a propeller 10 connected in driving relation, as by means of a chain-and-sprocket connection 11, to a motor 12 of any suitable type. On the frame 1, in juxtaposition to the steering wheel 9, there may be provided an operator's seat 13.

For the purpose of supporting the machine in air, there may be provided one or more supporting planes 14 of any suitable light, strong structure. The manner of connecting the supporting plane to the main frame 1, carrying the engine and all the major portion of the weight, is particularly to be noted, in that it forms an important part of this invention. The supporting plane 14 is secured to the frame 1 by means of a plurality of ties in the form of flexible connections, 16, 17, 18 and 19, both at the front and rear and at intermediate points if desired. It is preferable that these flexible connections diverge outwardly from each other from the frame toward the supporting plane, so as to form a unit of resistance, the two flexible connections 17 and 18 extending to a common point and forming a V.

Intermediate the ends of the supporting plane 14, there may be provided one or more brackets 20 and 21, in this case shown as located at the middle point of the supporting plane and forming truss members, which are adapted to relieve the strain on the outer side tips of the supporting plane by means of flexible connections 23 and 24, which extend to points adjacent the sides of the supporting planes 14 and secured thereto in any well known manner. It is to be noted that the brackets 20 extend above the plane and that the brackets 21 extend below the plane, so that the supporting plane is held, by means of the flexible connections 23 and 24, from buckling in either an upward or a downward direction.

For the purpose of maintaining the supporting plane 14 at a given distance from the frame 1 and thus holding the flexible connections 16 to 19 taut under normal conditions, the lower brackets 21 are provided

at their lower ends with rollers 25, which engage cam tracks or guides 26. These cam guides 26 are somewhat in the form of inverted U's and have their highest point located adjacent the longitudinal center line of the frame.

The connection of the supporting plane will be readily seen by reference to Fig. 4. Under normal conditions, when the supporting plane 14 is horizontal, all of the ties 16 to 19 will be fairly taut. If, however, the plane should swing to one side, due to any disturbing cause, such as unequal transverse air currents, some of the flexible connections, as indicated in this case 16 to 19, will slacken up and the others will be stretched out, so as to exert a righting force, which will tend to bring the plane and frame back into their normal relative positions. The supporting planes 14 and various parts of the frame may be prevented from any strained motion by means of suitable braces 27, provided with suitable turn-buckles 28, so that the tension thereon may be varied according to the necessity therefor.

The operation of the device will be readily understood when taken in connection with the above description. The machine is driven by the propeller 10 with sufficient momentum to cause it to rise from the ground, and when once in the air, it may be directed by means of the rudder 4 by manipulating the steering wheel 9. If the equilibrium of the flying machine should be disturbed, as in turning corners, or by reason of the unequal air currents, the flexible ties which connect the supporting plane with the frame will slacken and tighten according to the motion, so as to exert counteracting forces which tend to return the supporting plane and the remaining parts to their normal relative positions.

While I have shown one embodiment of my invention, I do not wish to be limited to the specific details thereof, but desire to be protected in various changes, modifications and alterations which may come within the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. The combination with a frame, of a supporting plane, a track guide on one of said members, a roller on the other of said members, and ties securing said plane to said frame and holding said plane in pivotal relation to said frame.

2. The combination with a frame, of a supporting plane, a bracket on said supporting plane, a roller on said bracket, a guide on said frame adapted to be movably engaged by said roller, and additional connections between said plane and said frame to hold said movably-engaging member in operative position on said guide.

3. The combination with a frame, of a supporting plane, a bracket on said supporting plane, a roller on said bracket, a guide on said frame adapted to be engaged by said roller, and flexible ties for securing said frame to said plane.

4. The combination with a frame, of a supporting plane for said frame, diverging flexible ties adjacent the front and rear of said plane for suspending said frame from said plane, arch guides on said frame, and rollers on said plane engaging said guides to limit the motion of said plane and frame relative to each other.

5. The combination with a frame, of a supporting plane for said frame, flexible ties for forming the sole means of suspending said frame from said plane, and contacting guiding members on said plane and said frame coöperating with each other to form a pivotal fulcrum connection between said plane and said frame, and adapted to control the relative movement of said plane and said frame.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RALPH COLE.

Witnesses:

JACQUES MUELLER,
EDUARD SEIMER.