

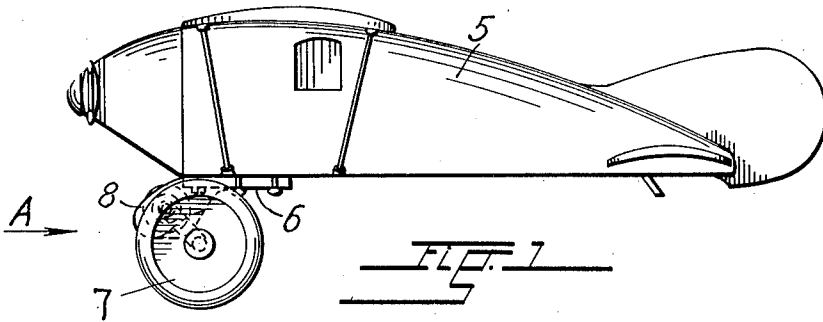
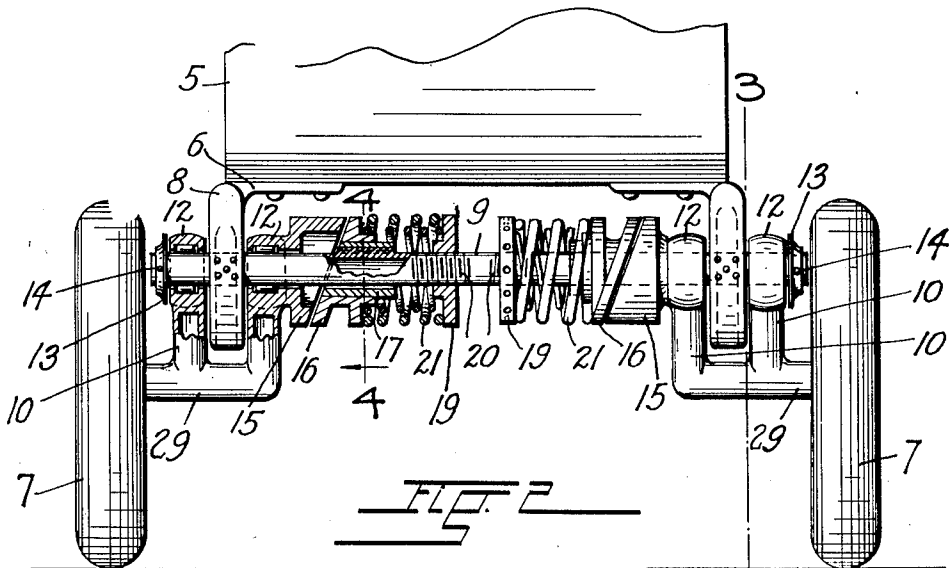
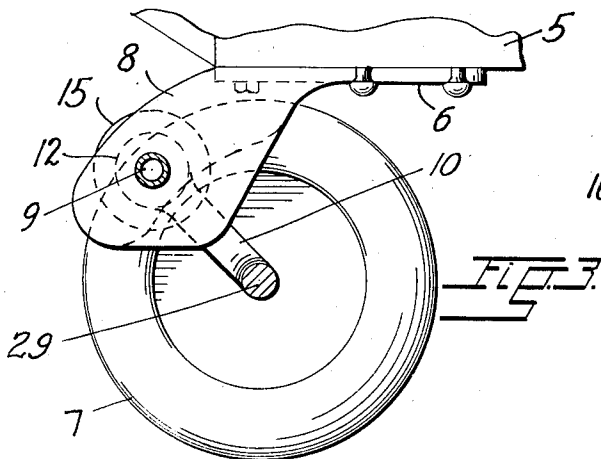
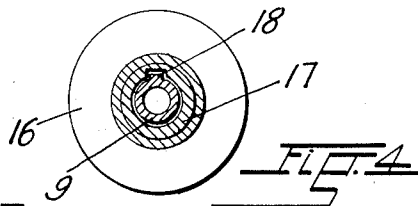
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MACHINE FOR AERIAL NAVIGATION

Filed Sept. 16, 1927



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MACHINE FOR AERIAL NAVIGATION

Application filed September 16, 1927. Serial No. 219,981.

This invention relates to machines for aerial navigation and more particularly to certain new and useful improvements in the landing or running gears by which the machines are supported and moved in rising from or returning to the surface of the earth.

It is an object of the present invention to provide in a landing gear for air ships, means for absorbing the shocks incident to the impact of the machines with the ground upon landing or to obstructions and irregularities of the surface over which it moves, in a deflected direction relative to the upward thrust upon the body of the ship.

As a result of this accomplishment, the detrimental and harmful effects of sudden and violent jars upon both the mechanism and the occupants of the air ship caused by direct upward thrusts in its contact with, and movement along the ground, are avoided to a point of elimination and the life and riding qualities of the machine are correspondingly increased.

A further object of the invention resides in the provision of resilient means by which the upward thrust upon the body of the vehicle is opposed by a yielding resistance at an angle to the direction of the impulse and still other objects reside in the construction and arrangement of parts by which the above-stated results are attained, as will be fully set forth in the course of the following description.

An embodiment of the invention has been illustrated in the accompanying drawings in which like characters of reference designate corresponding parts throughout the views and in which

Figure 1 represents a side elevation of an air ship to which the invention has been applied,

Figure 2, an enlarged partially sectional front elevation of the landing gear of the air ship looking in the direction of the arrow A in Figure 1,

Figure 3, a section along the line 3—3 Figure 2, and

Figure 4, a section taken on the line 4—4, Figure 2.

Referring further to the drawings, the body 5 of an air ship of conventional form and construction is shown in Figure 1 as supported upon a landing gear 6. The landing gear comprises as usual a pair of rubber tired ground wheels 7 rotatably mounted beneath the body of the machine in suitable bearings such as the forwardly projecting horns 8.

In the present construction the horns support a preferably hollow shaft 9 fixed against rotation and extending at opposite sides of the horns for the support of the ground wheels 7. The latter are mounted on stub axles 29 provided with pairs of arms 10 projecting at right angles to the axis of rotation of the wheels and carrying at their upper extremities, anti-friction bearings 12 for their rotary connection with the shaft.

Collars 13 at the ends of the shaft secured by cotter pins 14 hold the outer arms of the wheel axles against lateral displacement. The arms of the axles innermost with relation to the vertical axis of the air ship body, are provided with relatively fixed cam heads 15, the oblique end faces of which are contiguous to correspondingly slanting faces on the heads 16 of sleeves 17 which are slidably supported on the shaft, but held against relative rotation by splints or feathers 18.

The cam heads of the sleeves are spaced from tensioning abutment collars 19 that are adjustably supported on the shaft through the medium of screw-threads 20, and helical springs 21 disposed between the collars and the heads of the respective sleeves provide the resilient elements that absorb the stresses to which the air ship is subjected by its collision with or movement along the ground.

The arms on the spindles 29 of the wheels extend slantingly forward to the shaft with

which their ends are rotatably connected and it will be evident that any upward thrust of the wheels resulting either from their violent contact with the ground upon landing of the air ship, or from their movement across obstructions or uneven surfaces will result in a rotary movement of the wheels about the axles through an arc proportionate to the force of the impulse. The rotary movement of the arms causes a corresponding movement of the cam heads and these cam heads by their engagement with the sliding sleeves compress the respective springs against the stationary abutment collars.

The springs thus provide a yielding opposition to the rotary motion of the arms caused by the upward movement of the wheels and they thereby absorb the recoil in a direction at an angle to the direction of the up-thrust to the body, caused by impact of the wheels. The body of the air ship is thus relieved from the effect of the up-thrusts and the shocks to which the body would be ordinarily subjected are mitigated to the extent of substantial prevention of detrimental and injurious consequences.

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

1. In an air ship, a body, a shaft on the body, a ground wheel pivotally mounted on the shaft, an abutment on the shaft, a spring against the abutment, and a cam for compression of the spring by movement of the wheel.

2. In an air ship, a body, a shaft on the body, a ground wheel, an axle for the ground wheel, having an arm pivoted on the shaft, an abutment on the shaft, a spring against the abutment, a cam member slidable on the shaft, in engagement with the spring, and a cam member on the arm cooperative with the first-mentioned member to compress the spring by movement of the wheel.

3. A landing gear for aeroplanes or the like including an element adapted to be engaged with the ground and yieldable means for taking up the shock due to said engagement, said yieldable means including axially aligned cooperating cam members, one of which is rotatable relative to the other about said axis by the ground engaging element.

4. A landing gear for aeroplanes or the like including an element adapted to be engaged with the ground and yieldable means for taking up the shock due to said engagement, said yieldable means including cooperating cam members, a supporting shaft for one of said members whereby the same may be rotated axially of the shaft against the other member.

5. A landing gear for aeroplanes or the like including an element adapted to be engaged with the ground and yieldable means for taking up the shock due to said engage-

ment, said yieldable means including axially aligned cooperating cam members, one of said cam members being rotatable about said axis by engagement of the element with the ground while the other cam member is slidably mounted for movement by the rotatable cam.

6. A landing gear for aeroplanes or the like including an element adapted to be engaged with the ground and yieldable means for taking up the shock due to said engagement, said yieldable means including a slidably mounted cam, a spring engaging said cam, and a rotatable cam in axial alignment with the slidable cam and rotated about said axis by engagement of the element with the ground to operate the slidable cam against action of the spring.

7. A landing gear for aeroplanes or the like including a ground wheel having a cam member associated therewith and adapted for rotatable movement about an axis, and a second cam member aligned with said first mentioned cam and slidably mounted on said axis and yieldably held in engagement with the first mentioned cam.

8. A landing gear for aeroplanes or the like including an element adapted to be engaged with the ground and having bodily movement longitudinally of the aeroplane, and yieldable means for taking up the shock due to said engagement, said yieldable means extending transversely of the aeroplane and operable by movement of the ground engaging element.

9. A landing gear for aeroplanes or the like including a yieldably suspended member adapted for engagement with the ground, and means extending transversely of the aeroplane and operable by bodily swinging movement of the yieldably suspended member for taking up shock when said member engages the ground.

10. A landing gear for aeroplanes or the like including a shaft extending transversely of the aeroplane, ground engaging wheels suspended from said shaft and adapted for bodily swinging movement longitudinally of the aeroplane and yieldable means supported by the shaft and operable by movement of the ground engaging wheels for taking up shock due to engagement of the wheels with the ground.

11. A landing gear for aeroplanes or the like including ground engaging wheels yieldably suspended from a transverse axis, and means supported by said axis and operable by movement of the ground wheels in a direction longitudinally of the aeroplane to take up shock due to engagement of the wheels with the ground.

12. A landing gear for airplanes or the like including a shaft extending transversely of the airplane, ground engaging wheels suspended from said shaft and adapted for bod-

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ily swinging movement longitudinally of the
airplane, an abutment carried by the shaft,
a cam member slidably mounted on the shaft,
a spring interposed between and engageable
5 with the abutment and the slidable cam mem-
ber, and a second cam member engageable
with the first mentioned cam member and op-
erable by movement of the ground wheels to
slide the first mentioned cam member and
10 compress the spring to take up shock due to
engagement of the wheels with the ground.

In testimony whereof I have affixed my
signature.

BENJAMIN F. SEYMOUR.

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