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WHEEL MOUNTING FOR AIRCRAFT

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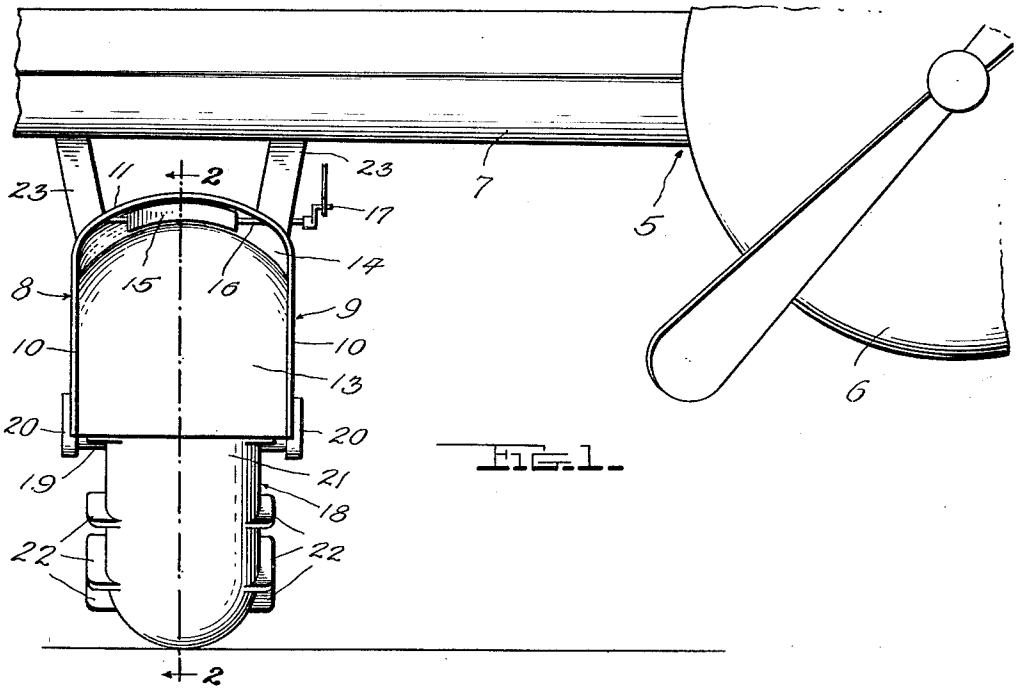


FIG. 1.

FIG. 2.

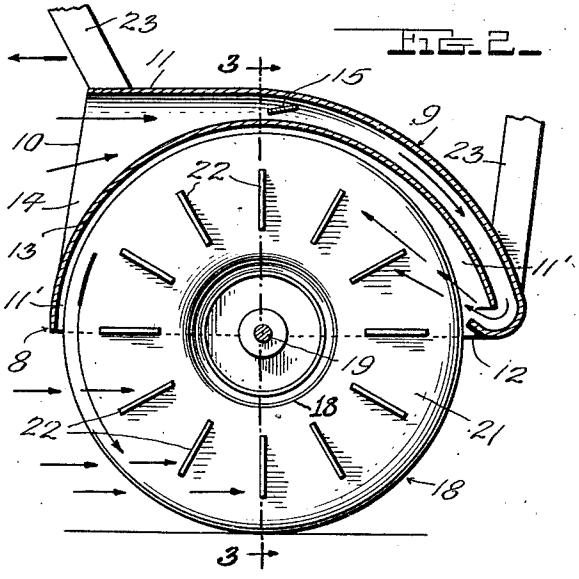
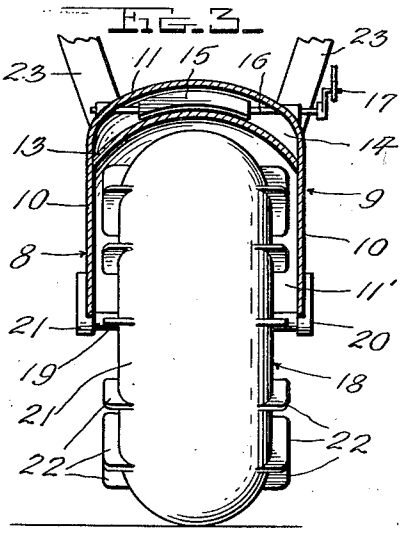


FIG. 3.



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WHEEL MOUNTING FOR AIRCRAFT

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4 Claims. (Cl. 244—103)

My invention relates to wheel mountings for air craft, such as aeroplanes, gliders, or dirigibles.

An important object of the invention is to provide means to rotate the landing wheel in the direction of travel of the air craft and at approximately the speed of travel of the same.

A further object of the invention is to provide means for subjecting the lower portion of the wheel to the action of a rearwardly traveling air current while subjecting the upper portion of the wheel to the action of a forwardly traveling air current, thus utilizing, to the maximum extent, in rotating the wheel, air pressure due to the travel of the air craft.

A further object of the invention is to provide means to reverse the direction of travel of the air current to drive the wheel.

A further object of the invention is to provide means to regulate the action of the air current upon the wheel, to regulate its speed of rotation.

A further object of the invention is to provide means of the above mentioned character which are of simplified construction and will not materially increase the air resistance of the air craft during flight.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompaniyng drawing forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a front elevation of a wheel mounting for air craft embodying my invention,

Figure 2 is a transverse section taken on the line 2—2 of Figure 1, upon an enlarged scale and with parts broken away, and,

Figure 3 is a transverse section taken on the line 3—3 of Figure 2, parts broken away.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates an air craft, shown as an aeroplane, having a fuselage 6 and main sustaining planes 7.

Arranged beneath each plane 7 is a wheel mounting 8 secured to the plane. These wheel mountings are arranged upon opposite sides of the fuselage 6 and are equi-distantly spaced therefrom. The invention is not restricted to the wheel mountings being attached to the planes 7 as they may be attached to the fuselage.

Each wheel mounting comprises an air receiving hood or casing 9, extending longitudinally of the direction of flight of the air craft, and comprising laterally spaced sides 10, connected by a top 11. These parts form a main chamber 11'. The top 11 is transversely curved or arched, as shown in Figure 3, and is longitudinally curved and extends downwardly toward its trailing end and is then bent to provide a forwardly and upwardly directed extension or lip 12, as shown in Figure 2. Arranged between the sides 10 and rigidly secured thereto is a web or wall 13, which is transversely curved or arched and longitudinally curved and generally semi-cylindrical in longitudinal section. At its forward end, the wall 13 diverges forwardly from the top 11, while its rear portion is generally concentric with the top 11 and the rear end of the wall 13 is disposed above the curved extension 12, spaced therefrom, and arranged rearwardly of the free forward end of the extension 12. The wall 13 forms with the hood or casing 9 an air passage 14, arranged between the wall 13 and top 11. This air passage flares toward its leading end while its rear end discharges into the extension 12. It is thus seen that the passage 14 is exteriorly of the main chamber 11', and discharges into the trailing end of the main chamber 11'. The passage 14 and main chamber 11' both extend longitudinally of the direction of travel of the air craft.

Means are provided to regulate the volume of air passing through the passage 14, including a damper or valve 15, arranged within the passage 14 and carried by a pivoted rod 16, having a crank 17, operated by suitable remote control.

The numeral 18 designates a wheel, carried by a spindle or shaft 19, journaled in suitable bearings 20, attached to the sides 10. The wheel 18 is equipped with a pneumatic tire 21. This tire has its upper portion operating within the main chamber 11', beneath the web or wall 13, and the periphery of the tire is suitably spaced from the web 13, to provide a proper clearance, and is spaced a greater distance from the sides 10. The tire also projects downwardly beyond the chamber 11', as shown. It is preferred that about one half of the tire be within the chamber 11'. The tire 21 is preferably provided upon its opposite sides, near its tread with radio vanes or projections 22, which may be made integral therewith or may be made separate therefrom and secured thereto by any suitable means.

The hood or housing is rigidly connected with struts 23, in turn rigidly attached to the plane 7.

The operation of the mounting is as follows:

With the valve 15 in the open position, and the air craft in flight, a rearwardly traveling current of air is impinging upon the lower portion

or half of the tire 21, engaging the tread portion of the tire and the vanes 22, thus rotating the tire in the direction of travel of the air craft. A rearwardly traveling current of air enters the leading end of the air passage 14 and travels rearwardly therein until it reaches the extension 12, at which position its direction of travel is reversed and it then enters the trailing end of the main chamber 11' and travels in a forward direction within the chamber 11' beneath the web or wall 13, about the tread of the tire and in contact with the vanes. This forwardly traveling current of air now engages the tread of the tire and the vanes, within the chamber, and rotates the tire in the direction of travel of the air craft. It is thus seen that the currents of air caused by the flight of the air craft are utilized to the maximum extent for rotating the wheel. By adjusting the valve 15, the volume of the air current traveling through the passage 14 may be regulated or reduced, so that the wheel will travel at substantially the speed of the air craft.

It is thus seen that at the instant that the tires contact with the ground or the like in landing, they are rotating in the direction of travel of the air craft, at a proper speed. This will effect an easy and proper landing and will reduce the wear upon the tires.

While I have shown the tire 21 as equipped with vanes to aid in its rotation, yet some degree of success may be had by omitting these vanes, as the frictional engagement between the air currents and the tire are sufficient to rotate the tire.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the size, shape, and arrangement of parts, may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A wheel mounting for aircraft, comprising a wheel having a continuous ground engaging tread and a substantially horizontal axis of rotation when engaging the ground, a casing arranged above the wheel and having a main chamber extending longitudinally of the direction of flight of the aircraft for receiving the upper portion of the wheel, the wheel projecting downwardly below the sides of the casing, means forming with the casing an air passage separate from the chamber, the air passage extending longitudinally of the direction of flight and having its forward end open so that air currents travel rearwardly through the passage, means for discharging the air currents from the passage in a forwardly direction into the main chamber, an axle for the wheel substantially horizontally arranged when the tread of the wheel engages the ground, and means to mount the casing and axle upon the aircraft and hold the axle substantially horizontal when the tread of the wheel engages the ground.

2. A wheel mounting for aircraft, comprising a wheel, a tire carried by the wheel, said tire and wheel having a substantially horizontal axis of rotation when the tread of the wheel engages the ground, said tire being provided with vanes to rotate the same, a casing arranged above the tire and having a main chamber extending longitudinally of the direction of flight of the aircraft to receive the upper portion of the tire, said tire projecting downwardly below the sides of the casing, means forming an air passage with the casing separate from the main chamber and extending longitudinally of the direction of flight of the aircraft and having its forward end open, means discharging air from the air passage into the main chamber in a forwardly direction, an axle for the wheel arranged substantially horizontal when the tire engages the ground, and means to mount the casing and axle upon the aircraft and holding the axle substantially horizontal when the tire engages the ground.

3. A wheel mounting for aircraft, comprising a wheel, a tire carried by the wheel, the wheel and tire having a substantially horizontal axis of rotation when the tire engages the ground, said tire being provided upon its sides with vanes to rotate the same, a casing arranged above the tire and having a main chamber extending longitudinally of the direction of flight of the aircraft to receive the upper portion of the tire, the sides of said casing and chamber terminating at substantially the elevation of the axis of rotation of the wheel, means forming an air passage in the top of the casing and above the main chamber and separate from the main chamber and extending longitudinally in the direction of flight of the aircraft, the air passage having its forward end open, means discharging air from the trailing end of the air passage in a forwardly direction into the trailing end of the main chamber near the elevation of the axis of rotation of the wheel so that such forwardly traveling air passes throughout substantially the entire length of the main chamber, an axle for the wheel, and means to mount the axle and casing upon the aircraft and holding the axle substantially horizontal when the tire engages the ground.

4. A wheel mounting for aircraft, comprising a wheel, a tire carried by the wheel, said tire and wheel having a substantially horizontal axis of rotation when the tread of the tire engages the ground, said tire being provided with vanes to rotate the same, a casing arranged above the tire and having a main chamber extending longitudinally of the direction of flight of the aircraft to receive the upper portion of the tire, said tire projecting downwardly below the sides of the casing, means forming an air passage within the casing separate from the main chamber and extending longitudinally of the direction of flight of the aircraft and having its forward end open, means discharging air from the air passage into the main chamber in a forwardly direction, means for controlling the rearward travel of the air through the air passage, an axle for the wheel arranged substantially horizontal when the tire engages the ground, and means to mount the casing and axle upon the aircraft and holding the axle substantially horizontal when the tire engages the ground.

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