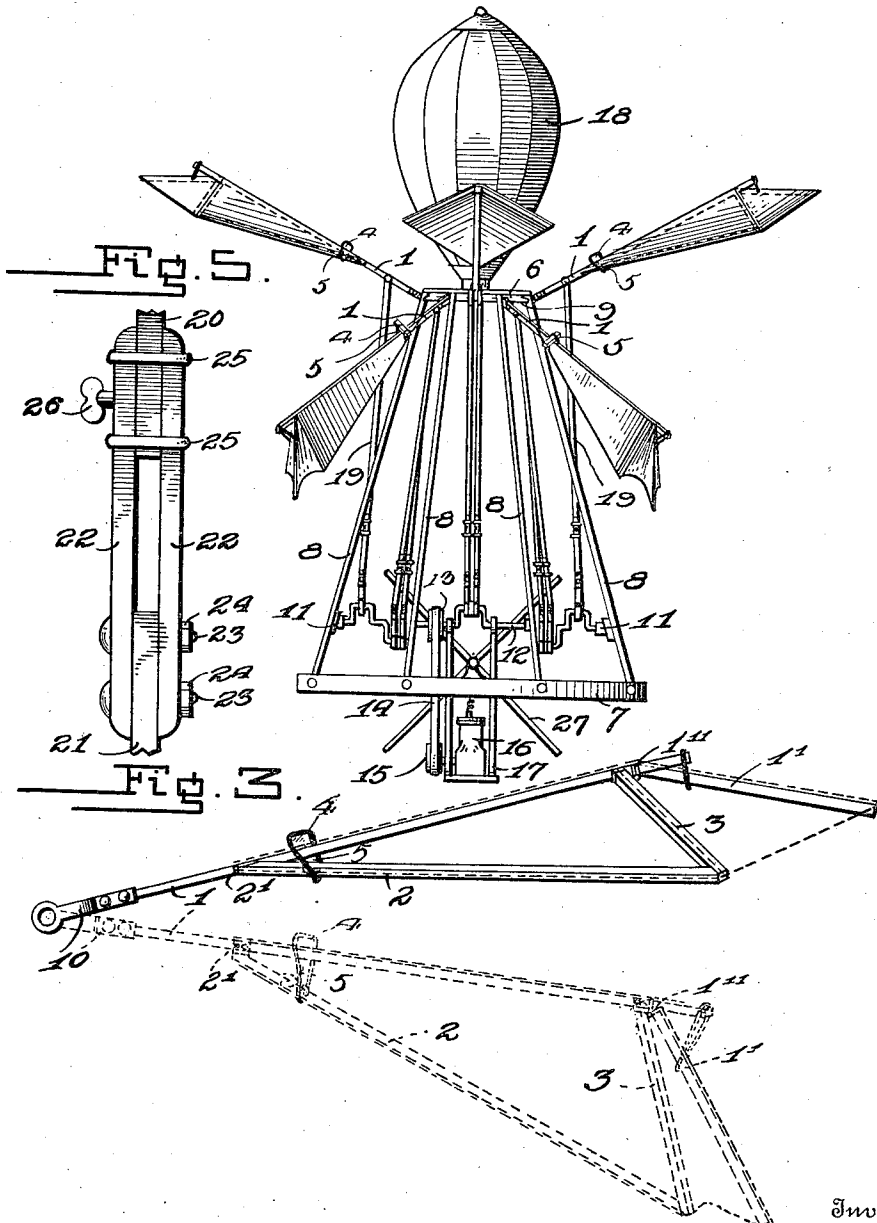


A. S. OUTCALT.
WING FOR FLYING MACHINES.
APPLICATION FILED NOV. 13, 1909.

1,013,560.

Patented Jan. 2, 1912.
2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
C. Everett Lancaster.
E. W. Cady

Inventor
Andrew S. Outcalt,

By E. O. Grooman,
his Attorney.

A. S. OUTCALT.
WING FOR FLYING MACHINES.
APPLICATION FILED NOV. 13, 1909.

1,013,560.

Patented Jan. 2, 1912.

2 SHEETS-SHEET 2.

Fig. 2.

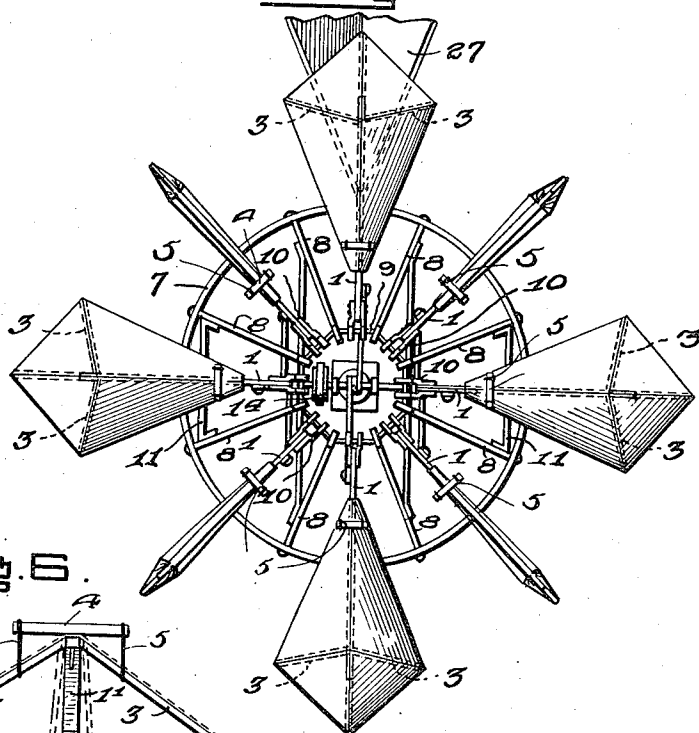


Fig. 6.

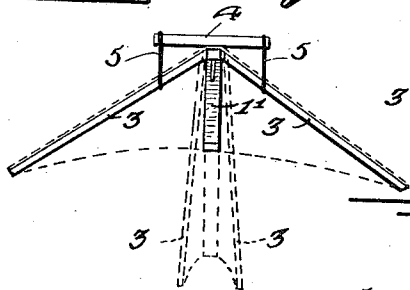
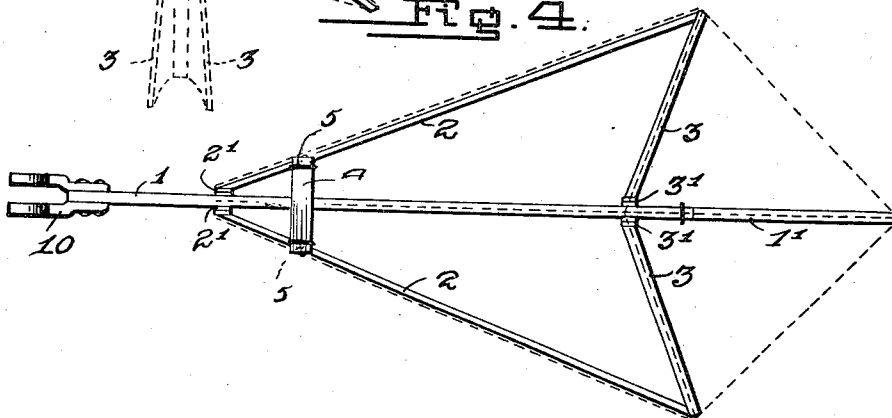


Fig. 4.



Witnesses

Everett Lancaster,
E. W. Cady

Inventor
Andrew S. Outcalt,

By *E. C. Vrooman,*
his Attorney.

UNITED STATES PATENT OFFICE.

ANDREW S. OUTCALT, OF ROCKBRIDGE, WISCONSIN.

WING FOR FLYING-MACHINES.

1,013,560.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed November 13, 1909. Serial No. 527,947.

To all whom it may concern:

Be it known that I, ANDREW S. OUTCALT, a citizen of the United States, residing in the town of Rockbridge, Richland county, Wisconsin, have invented an Improved Wing for Flying-Machines.

This invention relates to flying machines and has special reference to that class of flying machines in which in conjunction with a gas bag, a number of propellers are employed, which are operated by a motor.

The invention has a special reference to an improved wing or propeller for flying machines.

Referring to the accompanying drawings: Figure 1 is a view in elevation of a flying machine with propellers or wings constructed in accordance with this invention. Fig. 2 is a top plan view thereof with the gas bag omitted. Fig. 3 is an enlarged detail side view of a wing or propeller constructed in accordance with this invention, showing it extended in full lines, and folded in dotted lines. Fig. 4 is a plan top view of the wing shown extended. Fig. 5 is an enlarged detail view of a joint employed in connection with the wings. Fig. 6 is an end view of one of the wings.

The wing constructed in accordance with this invention will be first described, and consists of a rod or arm 1 having hinged adjacent to one end thereof on each side, by means of hinges 2', an arm 2, and adjacent to its outer end an arm 1' hinged thereto by a hinge 1'' and adapted to swing downward, and provided with a band of rubber 1''' or other resilient connection, which by its tension automatically helps to open the wing by carrying the weight of the arms of the wing. To the outer end of each of said arms 2 is connected a transverse bar 3 hinged at its inner end, by means of a hinge 3', to the rod or bar 1, at a point adjacent to the outer end of the rod 1. The spaces between the rod 1, and the bars 2, and the end of the rod 1, and the arms 3 are covered by canvas or other suitable flexible material secured thereto so as to be readily folded up as shown in Figs. 1 and 3. In order to aid in opening the wing against the weight of the bars 2, a cross bar 4 is mounted on the rod 1 and has resilient connections 5 at its ends connecting it with the bars 2 and serving to aid in raising the bars 2 when the wing is being expanded. The other end of the bar 1 projects beyond its hinged connection with

the bar 1' and a resilient connection 6'' connects the outer end of the bar 1 with the bar 1' thereby aiding when under tension in lifting the bar 1' when the wing is extended. Referring to Fig. 1, a number of these wings are hinged to a suitable frame, as for example, the frame here shown consisting of an upper ring shaped portion 6, and a lower ring shaped portion 7, said rings being connected by uprights 8 in the form of rods or bars. A number of the wings are hinged to the upper end of said frame, as shown in Figs. 1 and 2, in any suitable manner, as for example, by means of a U-shaped hinge 10, at the end of each rod 1, which is mounted on a ring 9 on the upper end of the main frame of the machine. Mounted across the frame 11, and supported by the uprights 8 is a crank shaft 12 which is operated in any suitable manner and as here shown by means of a pulley 13, which is connected by an endless belt 14, to a pulley 15 on the shaft of a motor 16, supported in a frame 17 and hinged to the crank axle 12. Mounted on the top of the main frame is a gas bag 18 for the purpose of lifting the machine. Each of the wings is connected by a pitman rod 19 to the crank shaft 12, in such a manner that as the crank shaft 12 is rotated, pairs of the wings will be alternately raised and lowered. In order to fold all of the wings up against the frame of the machine, when it is not required for use the pitman rods 19 are made longitudinally adjustable in any suitable manner, as for example by being formed in upper and lower sections 20 and 21, the lower section being clamped between the lower ends of a pair of short bars 22 by means of bolts 23 and nuts 24. The upper section 21 is clamped between the other ends of the bars 22 in any suitable manner as for example by means of the ring clamps 25 and adjustably held therein so as to adjust the length of the pitman rods 19 by means of a set screw 26.

By means of this construction including the resilient connections 5 as the wings are lowered they will expand and act as propellers and when they have reached the lowest position, as shown in Fig. 1, will automatically close up so as to present no resistance to the air when the wings are raised to their highest elevated position. The filling of each bat-shaped wing with air keeps it open until it has reached the lowest position. When it has arrived at that position

the weight of the side arms, and the weight of the end arm closes the wing effectually.

It will be seen that by means of this invention that in addition to the machine being elevated by the gas bag 18 it will also be aided by means of the vibratable wings operated by the motor and the intervening connecting mechanism. The flying machine may also be moved forward in a horizontal plane by tilting the motor which brings the wings into such position that in their movement they will serve to drive the machine forward. The flying machine is provided with the usual form of steering propeller 27 as shown in Fig. 1.

It will be seen that by means of the foregoing construction a very light, simple and serviceable flying machine is provided which is dirigible not only vertically but horizontally by means of vibratable wings in conjunction with the gas bag. These automatic wings form a perfect parachute in case of accidents and will bring the machine safely to the ground.

Having described the invention, what I claim is:—

1. In a flying machine of the character

described, a vibratable wing consisting of an arm, foldable diagonal arms hinged to said arm, transverse foldable arms secured at one end to said diagonal arms and hinged at their other end to said main arm, resilient means connecting said main arm with said diagonal arms and serving to open them to expanded position, and flexible material covering the space between said main arm and said hinged arms.

2. In a flying machine of the character described, a vibratable wing consisting of an arm, foldable diagonal arms hinged to said arm, transverse foldable arms secured at one end to said diagonal arms and hinged at their other end to said main arm, resilient means connecting said main arm with said diagonal arms and serving to open them to expanded position, flexible material covering the space between said main arm and said hinged arms, and a pitman hinged to said main arm.

ANDREW S. OUTCALT.

Witnesses:

Mrs. ERNEST OUTCALT,
IVA OUTCALT.