J. G. QUIGG.

SAFETY DEVICE FOR FLYING MACHINES.

APPLICATION FILED FEB. 10, 1911.

1,038,196.

Patented Sept. 10, 1912.

2 SHEETS—SHEET 1.

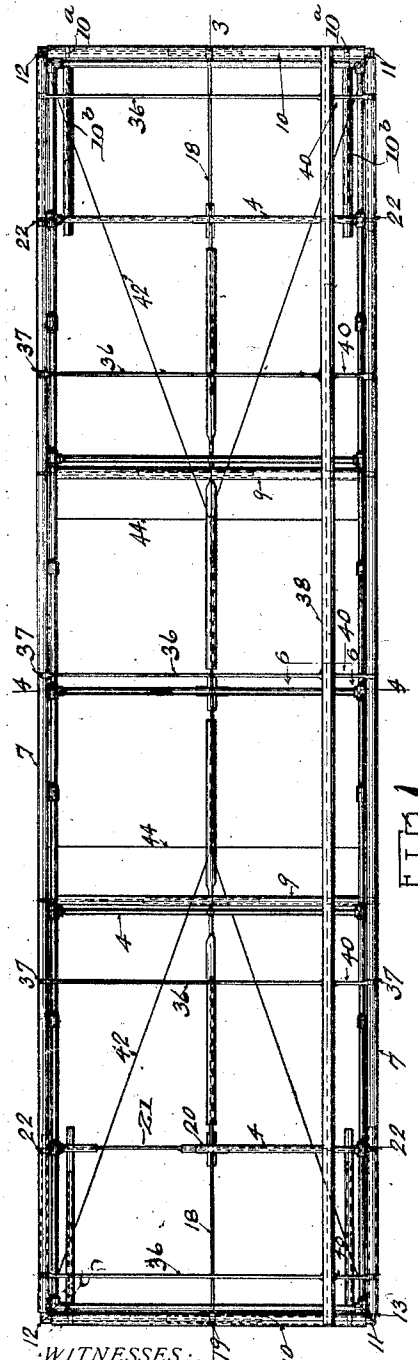


FIG 1

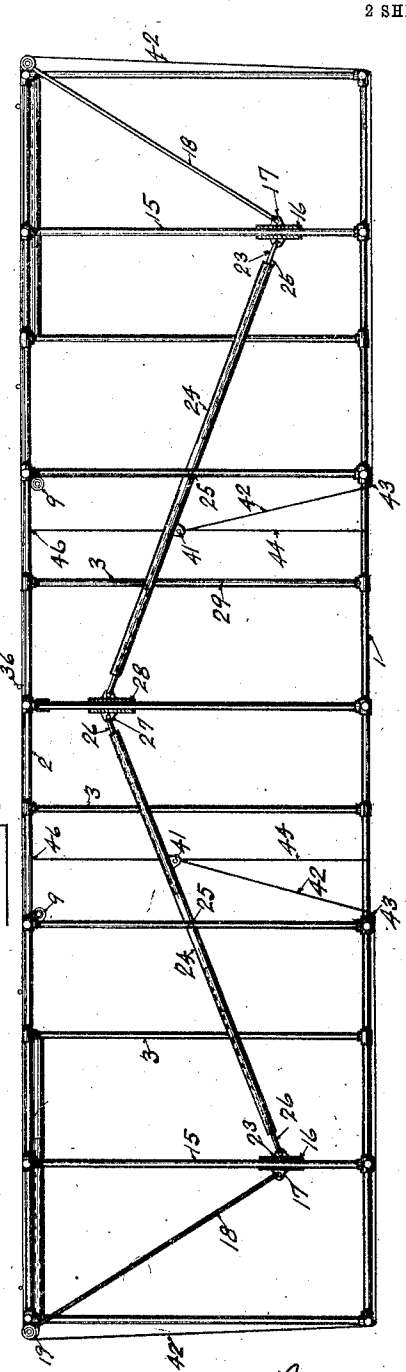


FIG 2

WITNESSES:

Wm. N. Hofer

J. C. Lyon

INVENTOR.

John G. Quigg.

By Fredk W. Winter

ATTORNEY.

J. G. QUIGG.

SAFETY DEVICE FOR FLYING MACHINES.

APPLICATION FILED FEB. 10, 1911.

1,038,196.

Patented Sept. 10, 1912.

2 SHEETS—SHEET 2.

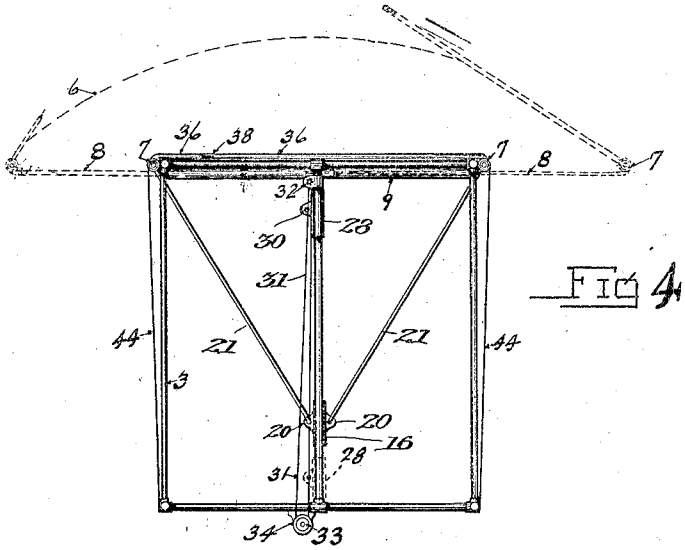


FIG 4

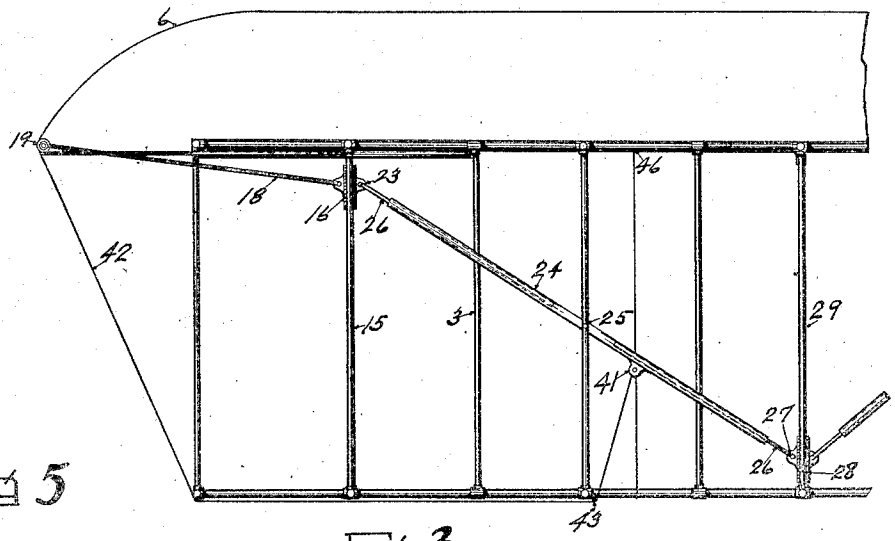


FIG 5

FIG 3

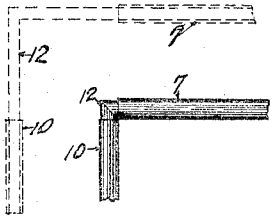


FIG 6

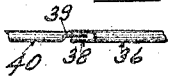
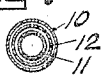


FIG 7



WITNESSES:

Wm. H. Hofer

H. C. Lyon

INVENTOR.

John G. Quigg

BY Frick W. Hunter

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN G. QUIGG, OF PITTSBURGH, PENNSYLVANIA.

SAFETY DEVICE FOR FLYING-MACHINES.

1,038,196. Specification of Letters Patent. Patented Sept. 10, 1912.

Application filed February 10, 1911. Serial No. 607,833.

To all whom it may concern:

Be it known that I, JOHN G. QUIGG, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Safety Devices for Flying-Machines, of which the following is a specification.

This invention relates to safety devices for airships, and more particularly to cars known as heavier than air flying machines.

The object of the invention is to provide means for preventing the machine from dropping at a dangerous velocity when the motor or other parts of the device become deranged or inoperative from any cause.

The invention comprises, generally stated, a canvas or other fabric together with means for expanding or extending the same to form in effect a parachute, as hereinafter described and claimed.

In the accompanying drawings Figure 1 is a plan view of a flying machine with my improvement applied thereto and the canvas omitted; Fig. 2 is a central longitudinal section on the line 3—3, Fig. 1; Fig. 3 shows one end of Fig. 2 showing the frame extended; Fig. 4 is a transverse section on the line 4—4, Fig. 1 indicating in dotted lines the canvas in extended position; Fig. 5 is a detail plan view of one corner of the extensible frame; Fig. 6 is a detail cross sectional view of the holding bar connection on the line 6—6, Fig. 1; and Fig. 7 is a cross section through the telescoping tubes on an enlarged scale.

My improvement may be applied to a heavier than air flying machine of any type, either a monoplane, biplane, or other type of such machines. The drawings indicate generally the framework of a biplane machine, this comprising a lower frame 1 to which the lower plane is secured, an upper frame 2 to which the upper plane is secured, united by suitable verticals 3 and suitable horizontal bars 4. This general framing is constructed preferably of tubes, although other forms of bars may be used if desired. The frame will support the necessary machinery, motor and propellers and controlling mechanism, and will also have attached thereto the usual rudders, etc. As these form no part of the present invention they are not illustrated or indicated, my improvement being applied to the main frame of any machine of this general type, and therefore I have deemed it necessary to illustrate only the main frame portions.

The safety device comprises a canvas 6 or other suitable fabric, together with suitable means for extending the same to form a parachute-like contrivance. The means shown for extending the canvas are arranged to extend the same in all directions, that is on both sides and both ends of the machine. To this end the side edges of the canvas are secured to bars 7, preferably in the form of tubes lying just outside of the top longitudinal members 2 of the frame and secured at intervals to the outer ends of arms or bars 8 which telescope into the tubular top cross members 9, which may, if desired be cross tubes of the main frame. The ends of the canvas are secured to tubes 10 which lie just outside the top end members of the main frame and are secured to the outer ends of bars 10^a which telescope into longitudinal tubes 10^b secured in any suitable way on the main frame. At the corners are angle members 11, 12 which have one of their legs telescoping into the ends of the end tubes 10 and their other legs telescoping into the ends of the side tubes 7. As a consequence the frame formed by the side tubes 7 and end tubes 10 can be extended and contracted sidewise and endwise, the angle shape telescoping bars 11 and 12 at all times filling the corners of the extended or contracted frame, as will be readily apparent. All of these members for the sake of lightness are preferably formed of aluminum or similar tubing. The canvas is secured to the tubes 7 and 10 in any suitable way.

For the purpose of expanding and contracting the frame just described I provide the following means: Slidable upon central uprights 15 near each end of the machine is a sleeve 16 to which is pivoted at 17 an arm 18 extending outwardly and having its outer end secured at 19 to one of the end tubes 10. Also pivotally connected to the sleeve 16 on opposite sides thereof as at 20 are arms 21 extending outwardly and secured at 22 to the side tube members 7. Consequently when the sleeves 16 are moved from the depressed position shown in Fig. 2 to the position shown in Fig. 3, the connecting arms 18 and 21 are straightened out like toggles and push the tube members 7 and 10 outwardly, thereby expanding the frame formed

by said tube members 7 and 10 and extending the canvas, which naturally assumes a parachute shape as indicated in Figs. 3 and 4.

The sleeves 16 are operated by the following means: Pivotally connected to each of said sleeves at 23 is an oscillating lever formed of the main or central portion 24 fulcrumed at 25 to one of the frame members and having telescoping into the same at opposite ends the rods 26, one of which is pivoted to sleeve 16 and the other pivoted at 27 to a sleeve 28 slidable on a central vertical frame member 29. Secured to the sleeve 28 at 30 is an endless belt, chain or like member 31 which passes over a guide sheave 32 mounted in the upper part of the frame and also wound several turns on a drum 33 mounted in the lower part of the frame and connecting directly or otherwise to a suitable reversing motor, shown diagrammatically at 34, so that by driving this motor in one direction or the other the sleeve 28 can be pulled down or up as desired to expand or contract the parachute carrying frame.

When the parachute is folded the bars are in the position shown in Figs. 1 and 2, and in full lines in Fig. 4 with the sleeve 28 in elevated position and the sleeves 16 in lowered position. To expand the parachute the motor 34 is run in such direction as to pull the sleeve 28 downwardly, thereby oscillating levers 24 and elevating the sleeve 16, the latter causing the toggle arms 18 and 21 to straighten out and expand the frame. To contract the frame the motor is run in the opposite direction, when the reverse operation takes place. When contracted the canvas lies in folded condition on top of the machine. It is held against accidentally assuming a parachute form by means of transverse holding bars 36 pivotally mounted at one end, as at 37, to the side frame tube 7 and connected at their free ends with a grooved bar 38 into which slips or telescopes the bar 39 carried by members 40 which are pivotally mounted on the opposite side tube 7, and forming with the bars 36 substantially continuous bars running from side to side and lying on top of the folded canvas and serving to hold the same in position. When the canvas expands the bars 38 and 39 simply slide out of engagement automatically and the parts assume the position shown in dotted lines in Fig. 4. In expanding the device the air begins to rush underneath the canvas as soon as the frame has been only slightly expanded, the air passing up through the space between the bars 7 and the side bars of the main frame. The amount of parachute effect can be varied by expanding the frame more or less, up to its maximum.

In order to form further supports for the canvas when in folded position and also as a limiting means for the expansible frame, I connect to the levers 24 at 41 suitable cords, wires, chains or the like 42 passing through guide eyelets or the like 43 on the bottom frame of the machine and thence upwardly and secured to the corner frame members 11 and 12. Other similar wires, cords or the like 44 are attached to the levers 24 and thence pass through guide eyelets or the like and upwardly, and are secured to the side members 7 of the expansible frame. The point of connection of these cords or wires to the levers 24 can be so chosen that the wires remain tight under all conditions of expansion of the frame; that is, so that the amount of cord taken up in the expansion of the frame is let out by the oscillation of levers 24, and vice versa, as will be readily understood.

The arrangement described can be applied to practically all existing heavier than air flying machines which have general rectangular frames such as illustrated. Most of these machines have the framing constructed of tubes for the purpose of lightness, and therefore the top cross members of the frame can be utilized for the telescoping arms or rods 8. The device described adds very little weight to the machine, and provides a complete safety device which will prevent dangerous drops of the machine in case of accident to the machinery. The controller for motor 34 will be located convenient to the operator or passenger, so that whenever desired the canvas carrying frame can be extended.

In place of having a power driven motor for operating drum 33 the latter may be operated by suitable mechanical means, such as ratchet and pawl mechanism operated by an ordinary lever, as will be readily understood without further description.

What I claim is:

1. In a heavier than air flying machine, the combination of the main frame, an expansible frame secured to the upper portion thereof and expansible symmetrically in the plane of said upper portion of the main frame both transversely and longitudinally thereof, a fabric secured to said expansible frame, and means for expanding said frame.

2. In a heavier than air flying machine, the combination of the main frame, an expansible frame secured thereto and comprising side and end bars and corner angle members telescoping with both of said side and end bars, means for expanding and contracting said expansible frame, and a fabric secured to said expansible frame.

3. In a heavier than air flying machine, the combination of a rectangular expansible frame comprising side and end bars and corner angle members telescopin with both

side and end bars, means for expanding said frame including oscillatory levers and connections therefrom to said side and end bars, and flexible members secured to said angle members and passing over guides and secured to the oscillatory levers.

4. In a heavier than air flying machine, the combination of the frame, telescoping members carried thereby and arranged to expand, some transversely and others longitudinally of the main frame, means for expanding said telescoping members, and a fabric secured to said telescoping members.

5. In a heavier than air flying machine, the combination of the frame, telescoping members arranged to expand, some transversely and others lengthwise of said frame, a fabric secured to said telescoping members, and means for expanding said telescoping members comprising toggle members and oscillating levers for operating the same.

6. In a heavier than air flying machine, the combination of an expansible frame, a fabric secured thereto, and means for expanding said expansible frame comprising sleeves slidable on vertical frame members, toggle arms pivotally connecting said sleeves with the telescoping frame members, telescoping levers fulcrumed to frame members and pivoted to said sleeves, and a vertical movable actuating member connected to the opposite ends of said telescoping levers.

7. In a heavier than air flying machine, the combination of an expansible frame carried by the machine, a fabric secured to said frame and arranged to open to parachute form upon expansion of the frame, holding bars arranged to engage and lock each other and to confine said fabric and prevent opening thereof when the frame is in folded condition and to automatically disengage and release the fabric when the frame is expanded, and means for expanding said frame.

8. In a heavier than air flying machine, the combination of an expansible frame, a fabric secured thereto, means for expanding said frame including oscillatory levers and connections therefrom to said expansible frame, and flexible members independent of the connections from the oscillating levers to the expanding frame and secured to said expanding frame members and passing over guides and secured to the oscillating levers.

9. In a heavier than air flying machine, the combination of an expansible frame carried by the machine, a fabric secured to said frame and arranged to open to parachute form upon expansion of the frame, disengageable holding bars having interlocking portions thereon connected to said frame and arranged when engaged to lock each other and confine said fabric and prevent opening thereof and to automatically disengage and release said fabric when the frame is expanded, and means for expanding said frame.

10. In a heavier than air flying machine, the combination of an expansible frame carried by the machine, a fabric secured to said frame and arranged to open to parachute form upon expansion of the frame, disengageable holding means arranged when engaged to confine said fabric and prevent opening thereof and to automatically disengage and release said fabric when the frame is expanded, said means comprising bars pivoted to oppositely disposed frame members and having telescoping end portions, and means for expanding the frame.

In testimony whereof, I have hereunto set my hand.

JOHN G. QUIGG.

Witnesses:
F. W. WINTER,
MARY E. CAHOON.