May 29, 1923. 1,457,044

J. C. SHERRY

SAFETY DEVICE FOR FLYING MACHINES

Filed Dec. 16, 1922

FIG. 1

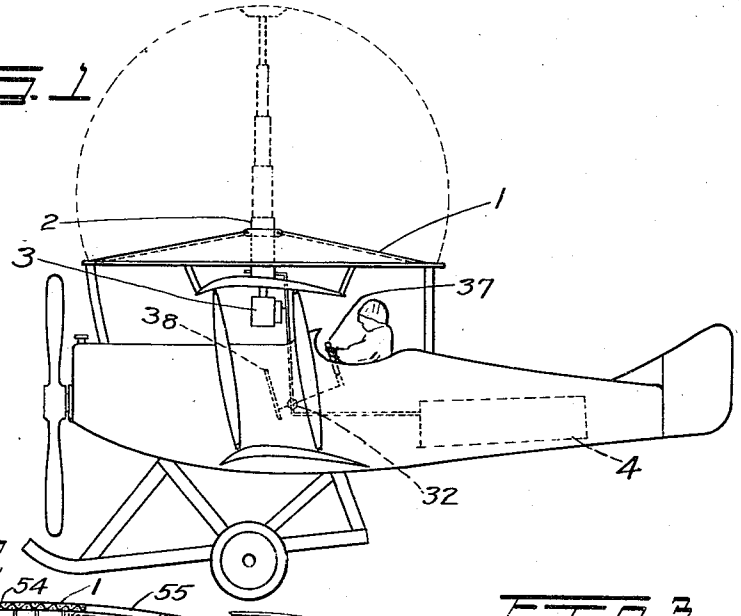


FIG. 2

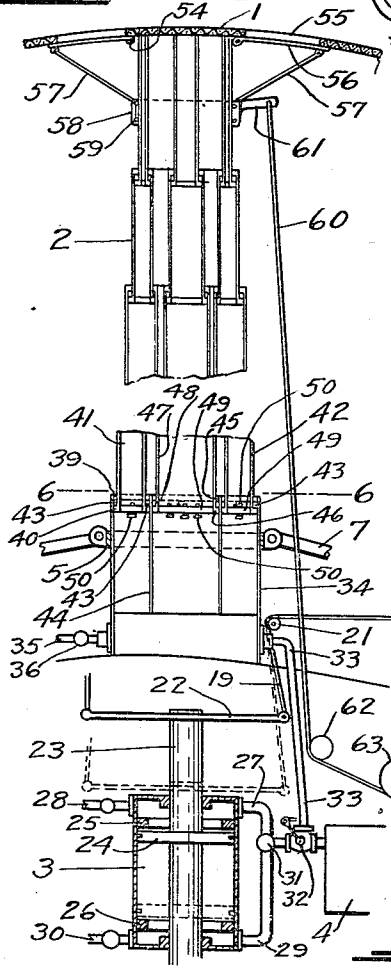
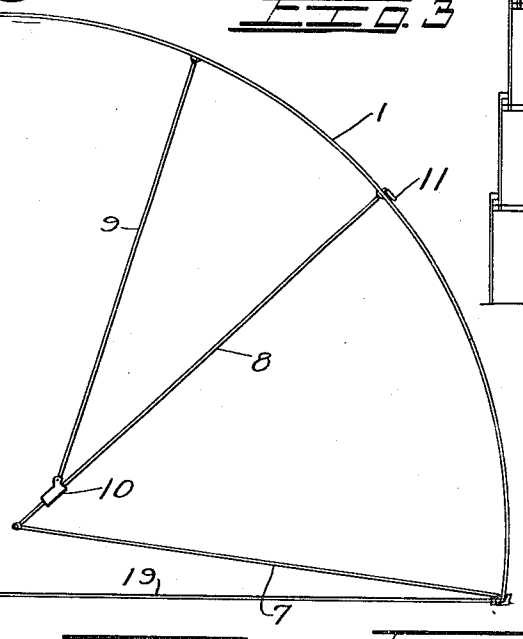


FIG. 3



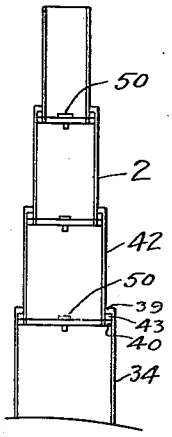


FIG. 4

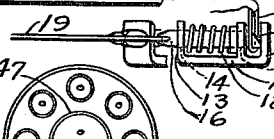


FIG. 5

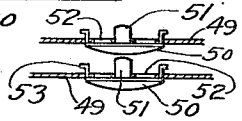
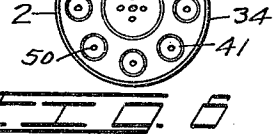


FIG. 6



INVENTOR
John C. Sherry
Harry Bowen
ATTORNEY

Patented May 29, 1923. 1,457,044

UNITED STATES PATENT OFFICE.

JOHN C. SHERRY, OF SEATTLE, WASHINGTON.

SAFETY DEVICE FOR FLYING MACHINES.

Application filed December 16, 1922. Serial No. 607,269.

To all whom it may concern:

Be it known that I, JOHN C. SHERRY, a citizen of the United States, residing at Seattle, county of King and State of Washington, have invented a new and useful Safety Device for Flying Machines; and I do hereby declare that the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention is a device that may be attached to flying machines which may be opened by the moving of a lever and which when open will support the machine or retard its downward movement.

The object of the invention is to provide a device similar to the parachute which will prevent the falling of a flying machine when it is disabled.

Another object of the invention is to provide a device similar to a large parachute which may be positively opened by a single movement.

Another object of the invention is to provide a device similar to a large parachute which may be attached to a flying machine which has a telescoping member in its center for first raising and then stabilizing the device.

And a further object of the invention is to provide a device similar to a large parachute that may be attached to flying machines with a telescoping member in its center and a means for releasing the device first and then raising the telescoping member.

With these ends in view the invention embodies a large ring suitably attached to a flying machine, a telescoping member with air chambers and valves in it in the center of the ring, a covering with suitable ribs in it and a relief valve in its center, clasps for holding the cover in the downward position, a cylinder with a piston in it for releasing the clasps, and a suitable means for operating the cylinder and the telescoping member.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:—

Figure 1 is a side elevation of a flying machine showing the device attached to it.

Figure 2 is a cross section on the center line of the device showing the telescoping member and cylinder on an enlarged scale and the covering with its ribs and supports on a somewhat smaller scale.

Figure 3 is a view showing an alternate construction of the telescoping member which shows it as it would be constructed for a light machine.

Figure 4 is a detail showing the clasp that holds the link with the inner end of the next clasp behind it.

Figure 5 is a detail showing the valves in the telescoping member.

Figure 6 is a cross section on line 6—6 of Figure 2.

In the drawings I have shown my device as it would be constructed wherein numeral 1 indicates the covering, numeral 2 the telescoping member, numeral 3 the cylinder, and numeral 4 the compressed air tank.

The covering 1 is supported on a band 5 which may be mounted on the telescoping member 2 at the center and upon the ring 6 at its outer edge. The ring 6 may be constructed of spruce or any desirable material and may be secured to the machine in any desired manner. This ring may be connected to the band 5 by members 7 and between these members are the ribs 8 that are attached to the covering midway between the outer edge and the center and on these ribs are slidably mounted the braces 9 through the sleeves 10. On the outer side of the covering at the ends of the ribs 8 are links 11 by which the covering is held downward in the clasps 12. These clasps are constructed as shown in Figure 4 with a brace 13 extending inward from the ring 6 and in the brace 13 is a hole 14 which is in line with a similar hole 15 in the inner side of the ring 6. Oval pins 16 with collars 17 on them are slidably mounted in the holes 14 and 15 and when in the position shown in Figure 4 they will hold the links 11 in the ring 6. A spring 18 may be placed around the oval pin 16 in order to hold it in the position shown in full lines until it is drawn backward by a cord 19 which is attached to the rear end of the pin. At the front end of the pin is a beveled surface 20 which will make it possible to push the link 11 down into the clasp and force the pin 16 backward

until the link has passed it at which time the spring will return the pin to the position shown so that it will hold the link.

The cord 19 extends in toward the center and passes over a pulley 21 and then passes downward to one end of a spider 22 which is attached to the end of the piston rod 23 that extends upward from the cylinder 3. Inside of the cylinder is a piston 24 which is fixedly mounted on the rod 23 and this piston travels from the position shown in full lines to that shown in dotted lines in Figure 2. At the upper end of the stroke is a ring 25 which stops the piston at this end and at the lower end is a ring 26 which stops the piston at the bottom. Above the ring 25 is an inlet connection 27 and an outlet connection 28 and below the ring 26 is another inlet connection 29 and another outlet connection 30, and it will be seen that if compressed air is admitted to the cylinder through the connection 27 the piston 24 will be forced downward and this will draw the spider 22 from the position shown in full lines to that shown in dotted lines and it will be seen that as the spider moves downward it will draw the cords 19 inward so that the links 11 will be released from the clasps 12. The piston may then be forced upward by reversing the three-way valve 31 and admitting the compressed air to the cylinder through the connection 29. It will also be seen that as air is admitted through the connection 29 the exhaust outlet 30 will be closed and the exhaust outlet 28 opened; and when air is admitted through the connection 27 the exhaust outlet 28 will be closed and the outlet 30 opened.

One port of the three-way valve 31 is connected to another three-way valve 32 and this valve is connected to the tank 4 and also through the connection 33 to the lower section 34 of the telescoping member 2. An exhaust connection 35 with a valve 36 in it may also be placed in the section 34 in order to release the air from the telescoping member 2 when it is desired to close the device. The three-way valve 32 may be so constructed that as it is opened it will first admit air to the cylinder 3 and then to the telescoping member 2 so that the covering 1 may be released before the telescoping member 2 is forced upward. The valve 32 may be connected by levers or any suitable means to a hand lever 37 or a foot lever 38 so that the operator may operate the valve by a single movement with either his hand or foot. The compressed air tank 4 may be incorporated in the body of the machine as shown in Figure 1, or suspended from it in any desired manner or it may be built in the body in the form of tubes which may take the place of members of the frame, and it will be connected to one port of the valve 32 in any desired manner.

The lower section 34 of the telescoping member 2 is in the form of a cylinder with its lower end curved to fit the top of a wing as shown in Figure 2 and it has a ring 39 on the inside of its upper end to engage a ring 40 on the outside of the tubes 41 which form the outer portion of the adjacent section 42. Piston rings 43 may be placed between the rings 39 and 40 to insure an air tight joint. In the center of the telescoping member 2 is another cylindrical shaped section 44 having its lower end open and a ring 45 on the inner side of its upper end. This ring 45 engages another ring 46 on the outer surface of a smaller cylindrical shaped section 47 as it reaches the position shown in Figure 2. These rings also have a piston ring 48 between them to prevent air escaping through the joint.

In the lower ends of the tubes 41 and the sections 47 are diaphragms 49 in which are valves 50 as shown in detail in Figure 5. These valves are opened as the section reaches the top of the section below it, as at this time the pressure will increase and the diaphragm will bend upward so that the stem 51 of the valve will engage the lower side of the valve above it and open the valve. The compressed air will then pass through the openings 52 into the section above and this section will then move upward. The valves have legs 53 on them to prevent them falling backward through the diaphragm. It is understood that the valve 50 may be constructed as shown or may be made and operated in any desired manner. It is also understood that any desired number of the sections 42, which are composed of the tubes 41 and the cylinder 47 each having valves 50 in their lower ends, may be used to form the telescoping member 2 and it is further understood that these sections may be of any desired size or length.

At the top of the telescoping member is a ring 54 by which it may be attached to the covering 1 and around this ring is an opening 55 in the cover which has hinged doors 56 under it to form a relief valve by which the operator may lower the flying machine. These doors are operated by rods 57 from a band 58 which is mounted on roller bearings 59 on the outside of the top section of the telescoping member and this band is pulled downward by a cord 60 that is attached to it through an arm 61. The cord 60 extends downward over a pulley 62 and then inward to any suitable location in the cock pit where it may be attached to an automatic spring roller 63. It will be seen that as the telescoping member 2 rises the cords 60 will unwind from the roller 63 and allow the doors 56 to remain in the closed position and when the operator desires to open them he may pull on the cord 60; and it will also be seen that when the device

returns to the normal position the slack in the cord 60 will be taken up by the roller 63.

In the design of the telescoping member 2 that is shown in Figure 3 it will be seen that only one casing is used and this is made up of cylindrical shaped sections telescoping in one another, and each of these sections, with the exception of the lower one, have valves 50 in their lower ends so that air will only be admitted to them when they have reached the end of their upward movement. It will be seen that this design will be suitable for small machines where it is not necessary to use the rigid double walled member as shown in Figure 2.

It will be understood that changes may be made in the construction without departing from the spirit of the invention. One of which changes may be in the means for raising and lowering the telescoping member as this may be operated electrically, by a series of levers or cables, or in any desired manner. Another change may be in the means for operating the valves between the telescoping sections or in the omission of the valves, another may be in the type of clasp used or in the means for releasing it, and still another may be in the design of the cover 1 as this may be made in any desired shape and may have as many ribs, which may also be of any desired shape, as desired.

The construction will be readily understood from the foregoing description. To use the device it may be attached to a flying machine as shown in Figure 1 with the ring 6 secured to the body of the machine in any desired manner, the telescoping member 2 placed on top of the wing or a short distance above it, the cylinder 3 below the wing or in any desired position below the telescoping member, and the tank 4 or other means for operating the telescoping member, either embodied in the body or attached to it in any desired manner. When the machine is disabled from any cause whatever the operator will move either the foot lever 38 or the hand lever 37 and either of these will operate the valve 32 and the valve will automatically admit compressed air first to the cylinder 3, which will cause the clasps 12 to release the covering 1, and then to the lower section 34 of the telescoping member 2; and the telescoping member will then raise the center of the covering 1 which will open the parachute and check the fall of the machine. Should the operator desire to increase the speed with which the machine is descending he may pull the cord 60 which will open the valves in the top of the covering and as the air pressure will close the valves as soon as he releases the cord the descending speed of the machine may be readily regulated. Then when the machine has reached the ground the valve 36 may be opened and the telescoping member will return to the closed position.

Having thus fully described the invention what I claim as new and desire to secure by Letters Patent, is:—

1. A safety device of the class described embodying a large bag which when opened will conform to a little more than half of a sphere, said bag having its outer edge secured to a large ring that is attached to the top of an airplane, and its inner edge attached to a telescoping member in the center; means for holding the folded bag downward; a cylinder below the telescoping member with suitable attachments for releasing the means that holds the bag downward when air is admitted to the cylinder; a valve within easy access of the aviator by which air may be admitted to the cylinder and telescoping member; and a ventilator in the bag around the telescoping member with means for regulating it from the cock-pit.

2. A parachute embodying a large bag which when open will conform to a little more than half of a sphere; a ring for holding the outer edge of the bag to the top of an airplane; latches in the ring for holding the bag in the closed position; suitable means for automatically releasing the latches as the bag is opened; a double telescoping member in the center of the bag; a ventilator in the top of the bag that may be regulated from the cock-pit; and a suitable means for raising the telescoping member when it is desired to open the parachute.

3. A parachute for any type of flying machine comprising a large bag in the shape of half a sphere; a ring for attaching the lower edge of the bag to the body of the machine; ribs in the bag for holding it open; clasps in the ring at the edge for holding links on the bag; cords connecting the clasps to a spider on a piston rod; a cylinder with a piston in it from which the rod projects upon which the spider is mounted; said cylinder being provided with inlets and outlets so that air may be admitted to or released from either end and being so arranged that as air is admitted to one end the piston will move and release the clasps through the spider and cord; a telescoping member having tubular and cylindrical shaped sections sliding in one another and valves in the ends of some of the sections with means for operating the valves; a three-way valve having suitable levers for operating it from the cock pit, said valve being so constructed that when it is opened it will first admit air to the cylinder that operates the clasps for releasing the bag and then admit air to the telescoping member which raises the center of the bag; a compressed air tank with suitable

connections between it and the three-way valve; and an opening in the top of the bag around the telescoping member with doors under it that may be opened from the cock pit which forms a relief valve.

4. A parachute for airplanes comprising a large bag in the shape of a little more than one-half of a sphere having openings in it with suitable coverings over them that may be operated from a remote point to form a relief valve, and having its outer edge attached to a ring from which latches project to hold the bag in the closed position, said ring being attached to an airplane; a double telescoping member in the center of the bag; valves in the telescoping member which are held in diaphragms so that as the telescoping member raises the distance of one section the valves will open and admit the air under pressure which is raising the member to the section above; and a cylinder with a piston in it for operating the latches that hold the bag in the closed position.

5. A parachute of the class described having suitable means for attaching it to an airplane; a double telescoping member with valves between the sections which automatically admit air that is raising the member from one section to another as the telescoping member raises the distance of one section; clasps around the outer edge of the parachute for holding it in the closed position; automatic means for releasing the clasps; and a suitable relief valve in the upper side of the parachute that may be operated from the cockpit.

JOHN C. SHERRY.