J. N. LEWIS.

SEPARABLE AEROPLANE AND GAS BAG.

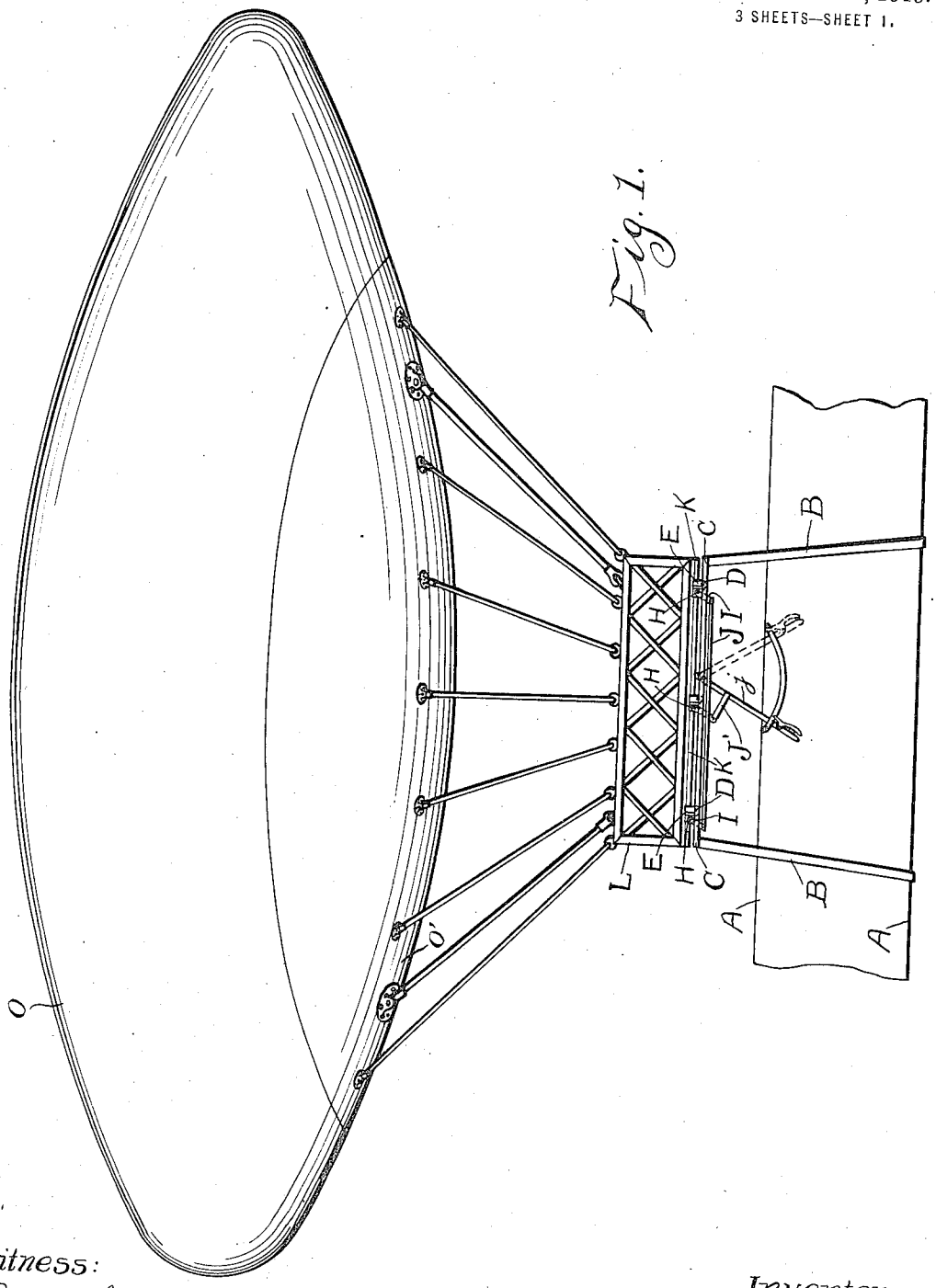
APPLICATION FILED AUG. 18, 1917.

1,306,348.

Patented June 10, 1919.

3 SHEETS—SHEET 1.

Fig. 1.



Witness:
E. Jaeker

Inventor:
JAMES N. LEWIS

By Charles Turner Brown
Atty.

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3 SHEETS—SHEET 2.

Fig. 2.

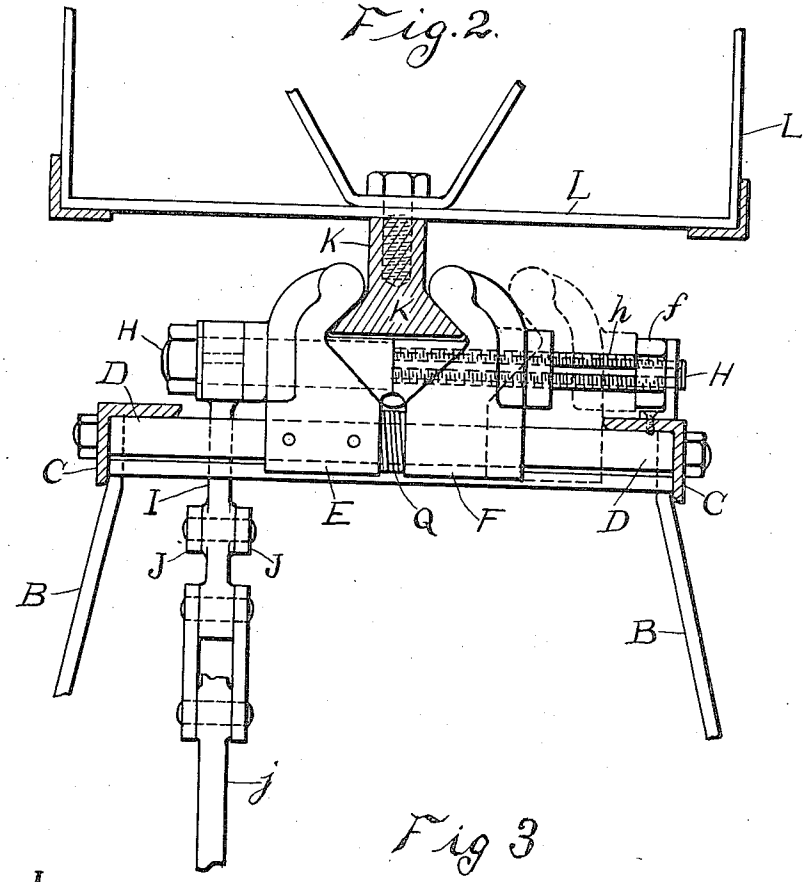
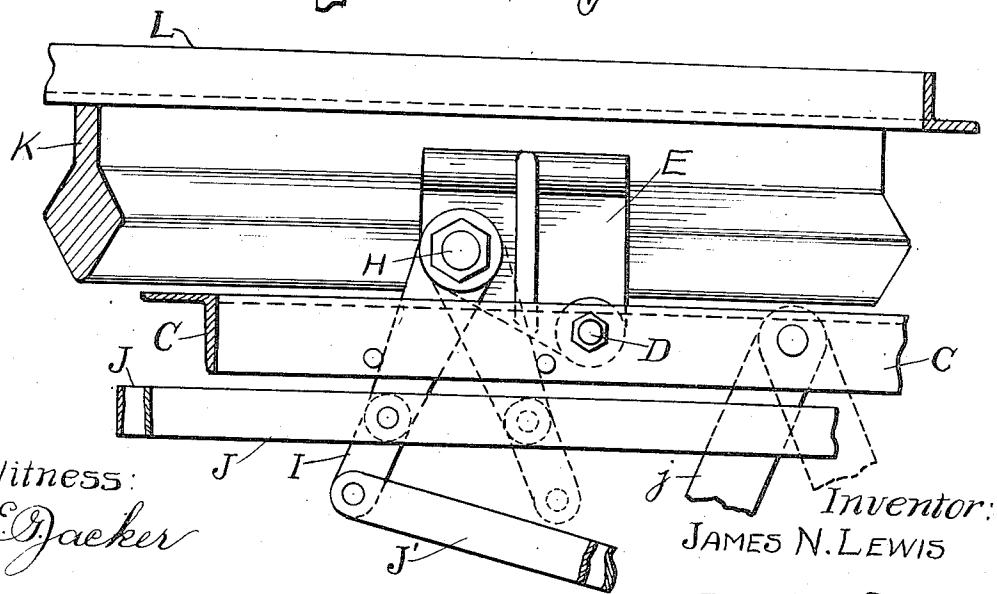


Fig 3



Witness:
E. Jacker

Inventor:
JAMES N. LEWIS

By Charles Turner Brown
Atty.

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3 SHEETS—SHEET 3.

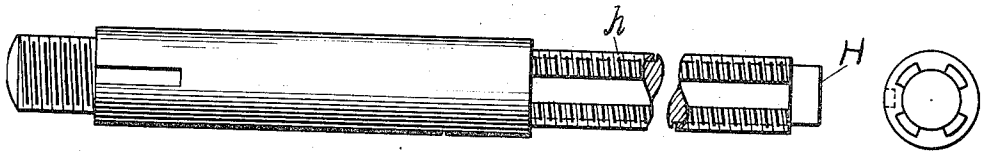


Fig. 4.

Fig. 5.

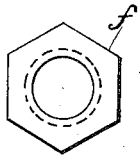


Fig. 6.

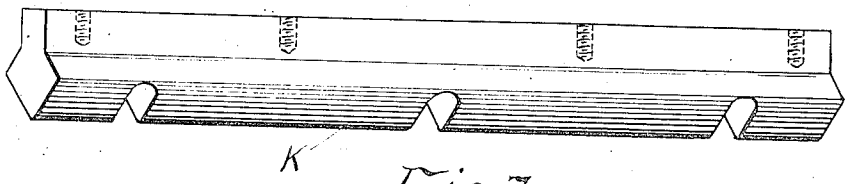


Fig. 7.

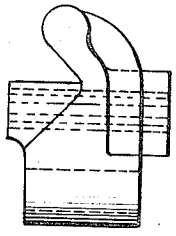


Fig. 9.

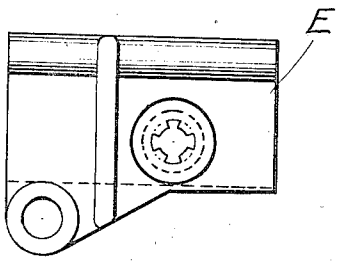


Fig. 8.

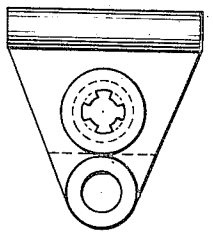


Fig. 10.

Witness:
E. Jaeker

Inventor:
JAMES N. LEWIS
By Charles Turner Brown
Atty.

UNITED STATES PATENT OFFICE.

JAMES N. LEWIS, OF DETROIT, MICHIGAN.

SEPARABLE AEROPLANE AND GAS-BAG.

1,306,348. Specification of Letters Patent. Patented June 10, 1919.

Application filed August 18, 1917. Serial No. 186,900.

To all whom it may concern:

Be it known that I, JAMES N. LEWIS, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Separable Aeroplanes and Gas-Bags, of which the following, when taken in connection with the drawings accompanying and forming a part hereof, is a specification.

This invention relates to means for providing a heavier than air apparatus which is provided with lifting planes, with elevating means additional to the planes thereof, said lifting means comprising a lighter than air construction.

It also relates to means for maintaining heavier than air apparatus elevated from the ground by levitation; and to means for separating said apparatus from the levitation means employed.

And the particular objects of the invention are to provide means for joining any type of aeroplane to any type of gas bag which means shall be so constructed that when the joined aeroplane and gas bag are being used it may be either as a flying device or as an observation station.

Further objects are to obtain means for joining the aeroplane used to the gas bag used, in such manner that they can be separated effectually and quickly, to permit said aeroplane to be operated in the usual manner.

Additional objects are to obtain means for joining an aeroplane to a gas bag in such manner that they will not be liable to become accidentally separated; that the joining means will not be liable to become broken or out of order; and that said joining means will be readily understood and easily operated to effectually join said aeroplane and gas bag.

And I also have for an object to so join an aeroplane to a gas bag that the united elements may be used for substantially all the purposes for which the aeroplane may be used when separated from the gas bag. Looping the loop, as it is termed, may not be done when the aeroplane and gas bag are joined.

I have illustrated a construction embodying this invention in the drawings accompanying and forming a part of this specification, in which—

Figure 1 is a side elevation of a gas bag, means attached to the gas bag and means attachable to an aeroplane which are adapted to join the gas bag and aeroplane, and a diagram indicating an aeroplane.

Fig. 2 is an end elevation, on an enlarged scale, of the joining mechanism which is illustrated in Fig. 1.

Fig. 3 is a side elevation, also on an enlarged scale, of the joining mechanism illustrated in Figs. 1 and 2.

Fig. 4 is a side elevation of an element of the joining mechanism, and of a mutilated screw which forms a member of said element.

Fig. 5 is an end elevation on line 5—5 of Fig. 4, viewed in the direction indicated by the arrows.

Fig. 6 is a front, (plan view) of a nut which is adapted to be used in assembling the aeroplane and gas bag.

Fig. 7 is a side elevation of a longitudinally extending member which forms an element of the joining mechanism, and is permanently attached to the gas bag.

Fig. 8 is an end elevation of a guide shaft and a mutilated internally screw threaded member which forms an element in the joining mechanism, and is permanently attached to the aeroplane.

Fig. 9 is an end view of the member which is illustrated in Fig. 8.

And Fig. 10 is a side elevation of a modification of the element which is illustrated in Figs. 8 and 9.

A reference character applied to a given part is used to indicate said part throughout the several figures of the drawings wherever the same appears.

A, (Fig. 1) are lines diagrammatically indicating the upper and lower planes of a biplane. B, B, are standards which are firmly attached to the aeroplane, and *b*, *b*, are the tie rods or wires to said standards. C, C, are members which join the upper ends of the standards B. D is a shaft which is secured at its ends to the members C. The shaft D forms a base on which is secured, as by pins or bolts *e*, the member E; and F is a member which is movably mounted on said base. Members E and F are grasping members, operable in the same manner as are vise jaws, when closed upon a co-acting member, (lettered K and hereinafter described) as by nut *f*. G is an internal screw thread, in member F, and is mutilated to correspond with the mutilated external screw

threads *h* on member H. Member H is rotatably mounted in member E. The angle of rotation of member H is sufficient to move the mutilated screw threads thereon out of engagement with the internally mutilated screw threads in member F, when the same are engaged, and back into engagement, when disengaged. In the construction illustrated there are a plurality of members D, E, F and H, and the rotatable members are, respectively, provided with an arm I, which is rigidly secured in place as by key I′ in keyway I″ to provide means for a measured turning of said member; and said arms I are connected by links or bars J J′, together and to operating lever *j*, so that operation of said lever operates all said members H. The members D, E, F and H are, as hereinbefore stated, permanently attached to the aeroplane which is to be joined to the gas bag. K′, K′ represent lateral grooves in member K, through which grooves the members H, H, extend.

Member K is rigidly secured to the under side of truss L, as by bolts *k* fitting in screw threaded holes *k′*, and said truss is attached to the gas bag O, as by flexible connections M, *m*. The connections M are illustrated as rods or cylinders, respectively provided with eye bolts N, engaging with eye bolts *n* on truss L, and *n′* on base *n″*. Base *n″* is secured to the plate O′ on the under side of gas bag *o*, as by rivets or bolts *n‴*. The connections *m* are illustrated as wire ropes and they are, also, secured to the truss L and plate O′ of the gas bag, as by eye bolts. Flexibility is attained between the truss and the gas bag O, by the connections M, *m*, and eye bolts N, *n*, constructed as above described; while at the same time the direction of movement of an aeroplane joined to said gas bag controls the direction of movement of said gas bag.

P is a rack over which the lever *j* moves, when operated, and *p* represents a spring actuated locking member which is adapted to engage with the teeth of the rack, to maintain said lever in its predetermined position.

Q (Fig. 2) is a spring between member E and F.

To close members E and F on member K, thereby joining the aeroplane and gas bag, the nut *f* is turned on mutilated screw H into substantially the position in which it is illustrated in Fig. 2, and the lever *j* is put in the position releasing jaw F from said screw. Jaw F is then moved to, say, the position which is indicated by broken lines in said figure. Member K is then placed between jaws E and F, and said jaw F is forced on to member K, (forcing said member K against jaw E), by turning nut *f* on said screw H. When jaws E and F are in close contact with bar K the screw H is turned by lever *j* to lock jaw F in place, and nut *f* is returned to its initial position, (as indicated by the broken lines in Fig. 2).

When the aeroplane and gas bag are joined by the grasping members E, F being forced onto the longitudinally extending member K, and held in grasping position by the mutilated screws described, the aeroplane may be operated in the usual manner to make a flight; the levitation of the gas bag assisting materially in rising. At any time, when above the ground, the engine and propeller of the aeroplane may be stopped, and the gas bag be relied upon for levitation.

When the aeroplane and gas bag are attached together a novice may safely attempt to operate the same; and when sufficient practice has been attained the aeroplane may be separated from the gas bag, by movement of lever *j* and the flight continued in the aeroplane, after said separation. For observation purposes the engine and propeller of the aeroplane may be rotated at reduced speed, or entirely stopped, as best suits the demands of the conditions under which said observation is being made.

I do not claim any particular make of gas bag, or of aeroplane; nor do I claim that the gas bag must or need be sufficiently large to levitate the aeroplane and load thereof independently of the propeller and planes of the aeroplane, as the construction of the aeroplane and gas bag forms no part of my invention.

The spring Q tends to force member F away from members E and K when the mutilated screw bolt H is turned to release said member F.

I claim:

1. In a combined gas bag and aeroplane the combination of a truss member, flexible connections arranged to attach said member to said gas bag, a longitudinally extending member attached to said truss member, members attached to said aeroplane and arranged to register with said longitudinally extending member, latch members adapted to co-act with said longitudinally extending member and with said registering members, and movable into and out of engaging position therewith, and means to hold said movable latch members in engaging position, and operative means comprising a lever and connections joining said lever to said holding means.

2. In a combined gas bag and aeroplane, the combination of a truss member, means to attach said member to said gas bag, and means to separably attach said member to said aeroplane, said attaching means comprising a plurality of members attached to said aeroplane and arranged to register and co-act with said truss member, latch members respectively adapted to co-act with said truss member and said plurality of members, and movable into and out of engaging posi-

tion, means to hold said latch members in engaging position, and operative means to release said latch members from said holding position, said operative means comprising a lever and connections joining said lever to said holding means.

3. In a combined gas bag and aeroplane, a truss member, means to attach said truss member to said gas bag, a latch member, means to attach said latch member to said truss member, in combination with a latch member attached to said aeroplane and arranged to register with said truss member, a latch member adapted to co-act with the first named latch member, means to attach said co-actuable latch member to said aeroplane member, means to join said latch members and means to separate said latch members.

4. In a combined gas bag and aeroplane, a truss member, means to attach said truss member to said gas bag, a plurality of co-acting latch members, means to connect said latch members to said truss member, said latch members attached to said aeroplane and arranged to register with said truss member, and said connecting means comprising a plurality of members adapted to co-act with said latch members, in combination with operable means comprising a lever adapted to actuate said plurality of members to separate said co-acting latch members from said truss member.

5. In an apparatus consisting of a lighter than air and a heavier than air device, separable means for joining said lighter and heavier devices, comprising a longitudinally extending bar attached to said lighter than air device in combination with members, one whereof is movable, attached to said heavier than air device and adapted to engage with said longitudinally extending member, means to force said movable member into engagement with said longitudinally extending member, means to hold said engageable members in engaging position and means to simultaneously release said engaging members.

6. The combination of a gas bag and an aeroplane, comprising a longitudinally extending member below said gas bag and connections attaching said longitudinally extending member in a pre-determined position relative to said gas bag, said connections comprising flexible members, as ropes, and additional members, as rods or cylinders, all said members flexibly attached, as by eye bolts, and an additional member attached to said aeroplane in position to register with said longitudinally extending member and means to join said longitudinally extending member and said additional member.

JAMES N. LEWIS.

In the presence of—
CHARLES TURNER BROWN.