G. A. OWEN & G. A. BATES.

AERIAL MACHINE.

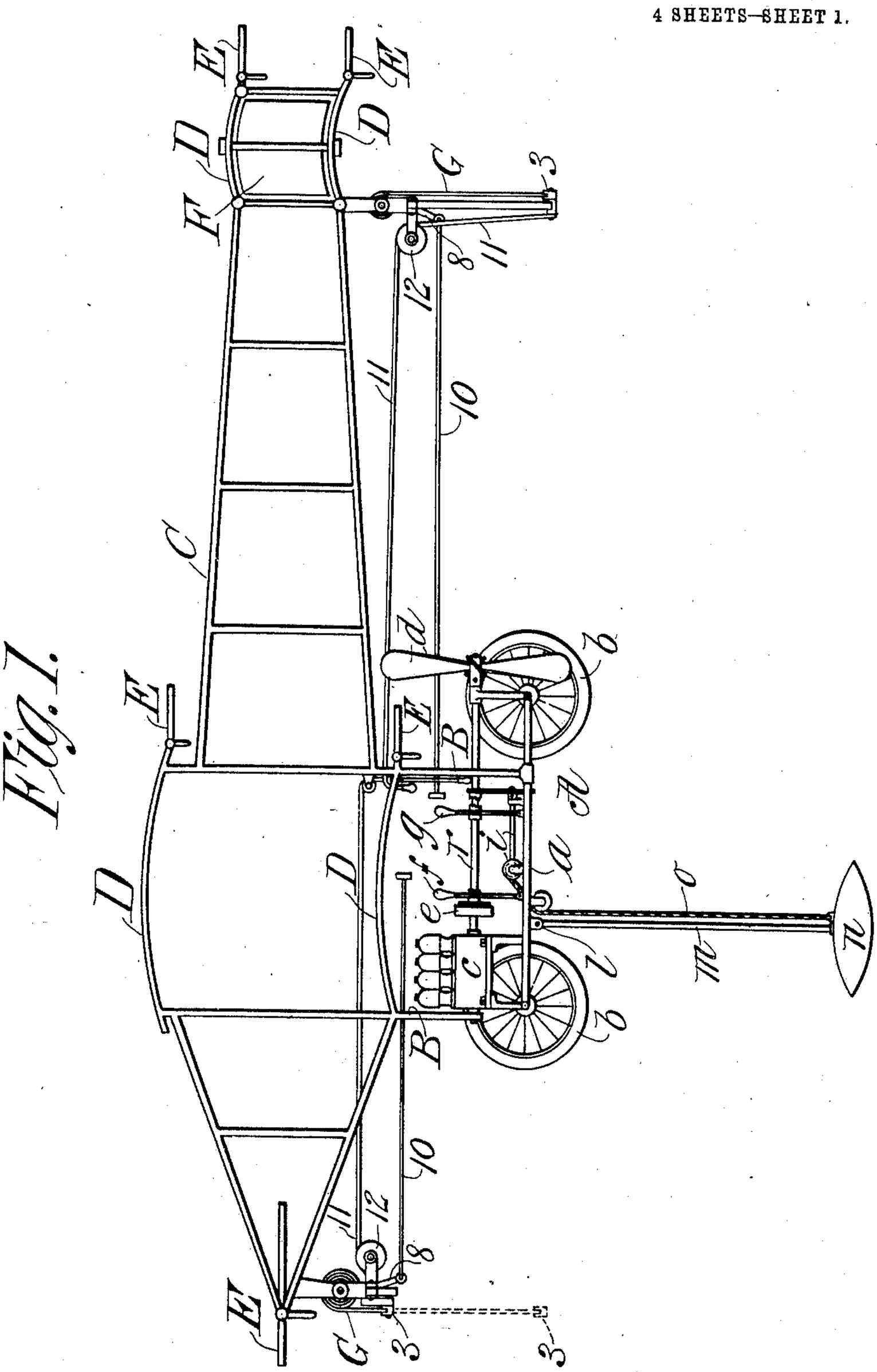
APPLICATION FILED OCT. 17, 1910.

997,001.

Patented July 4, 1911.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

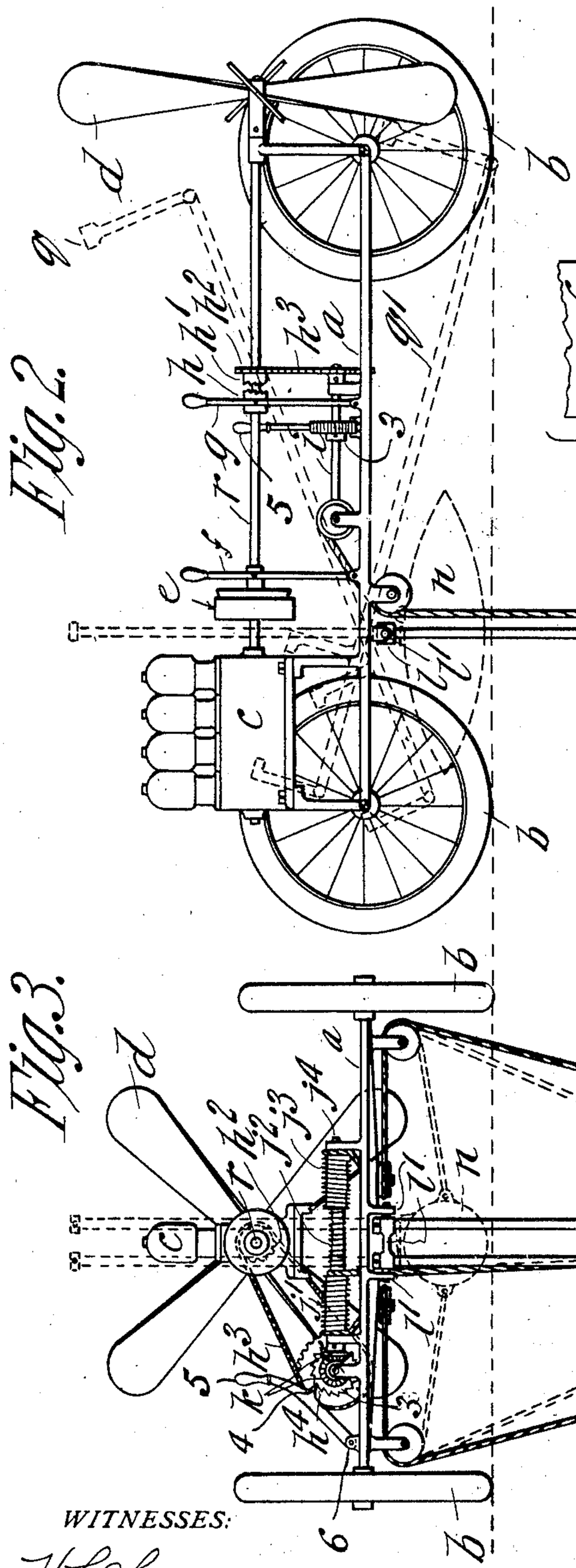

Fig. 2.

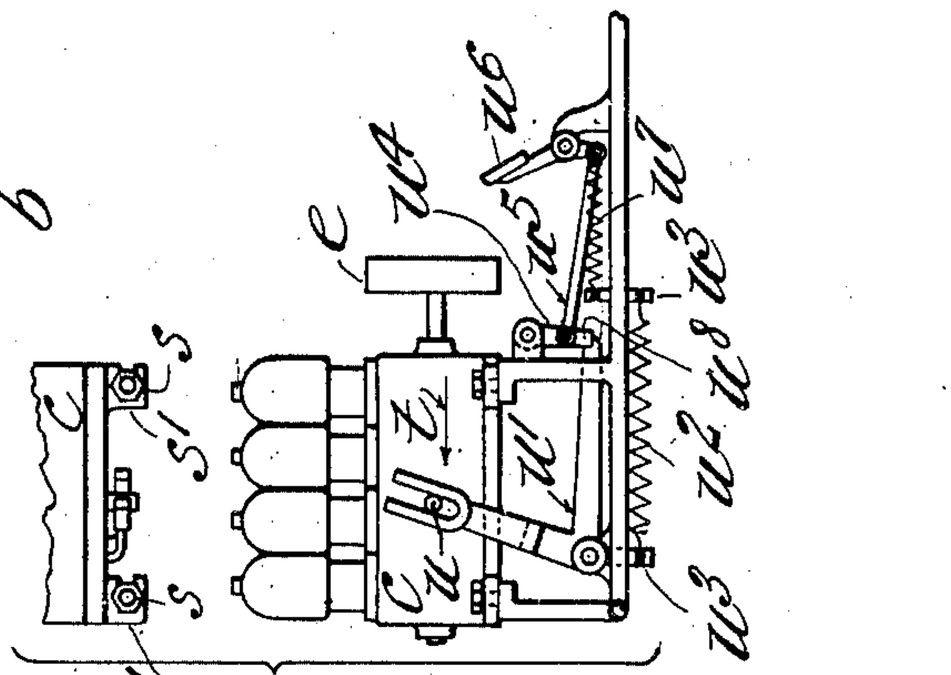

Fig. 4.

Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 4.

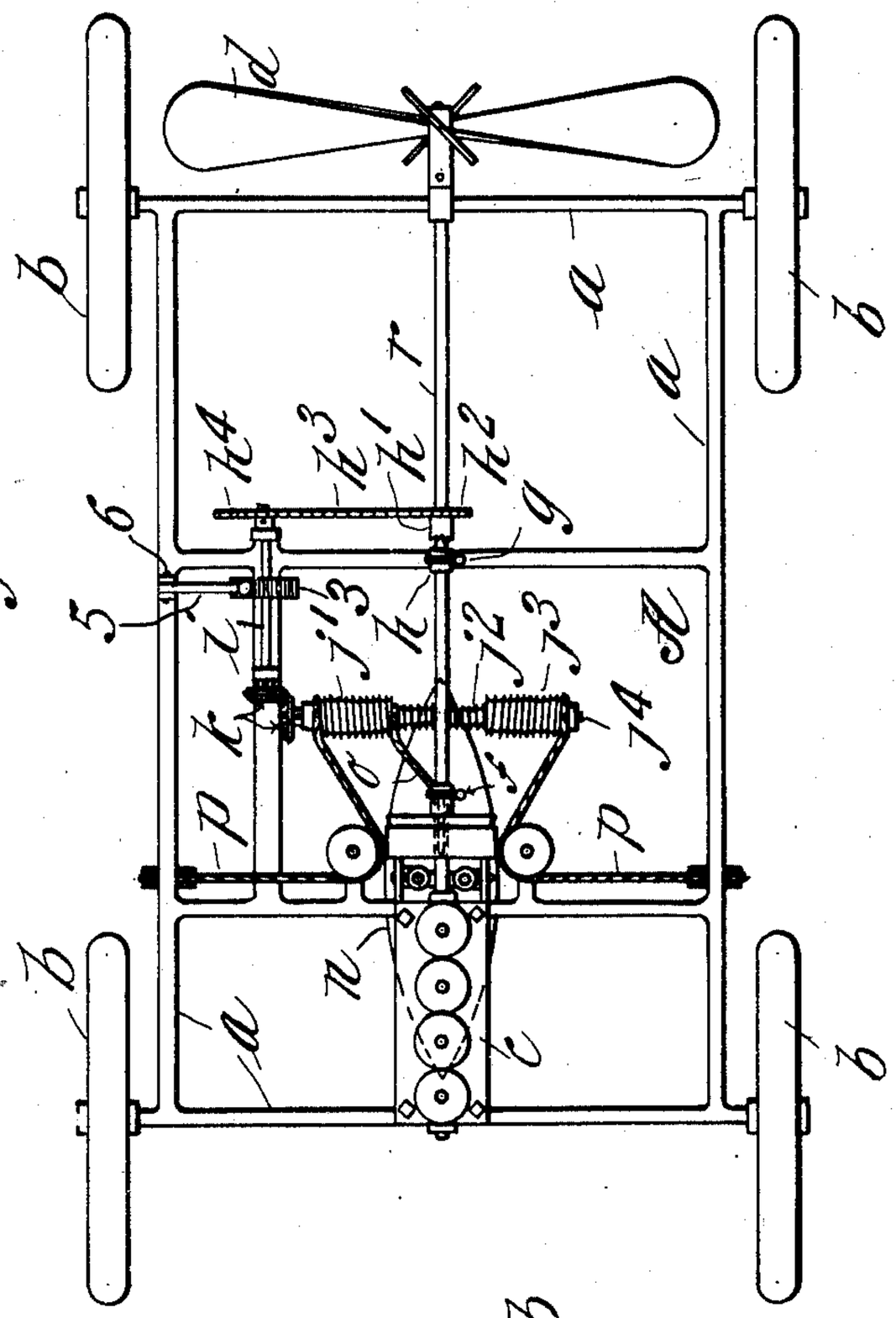
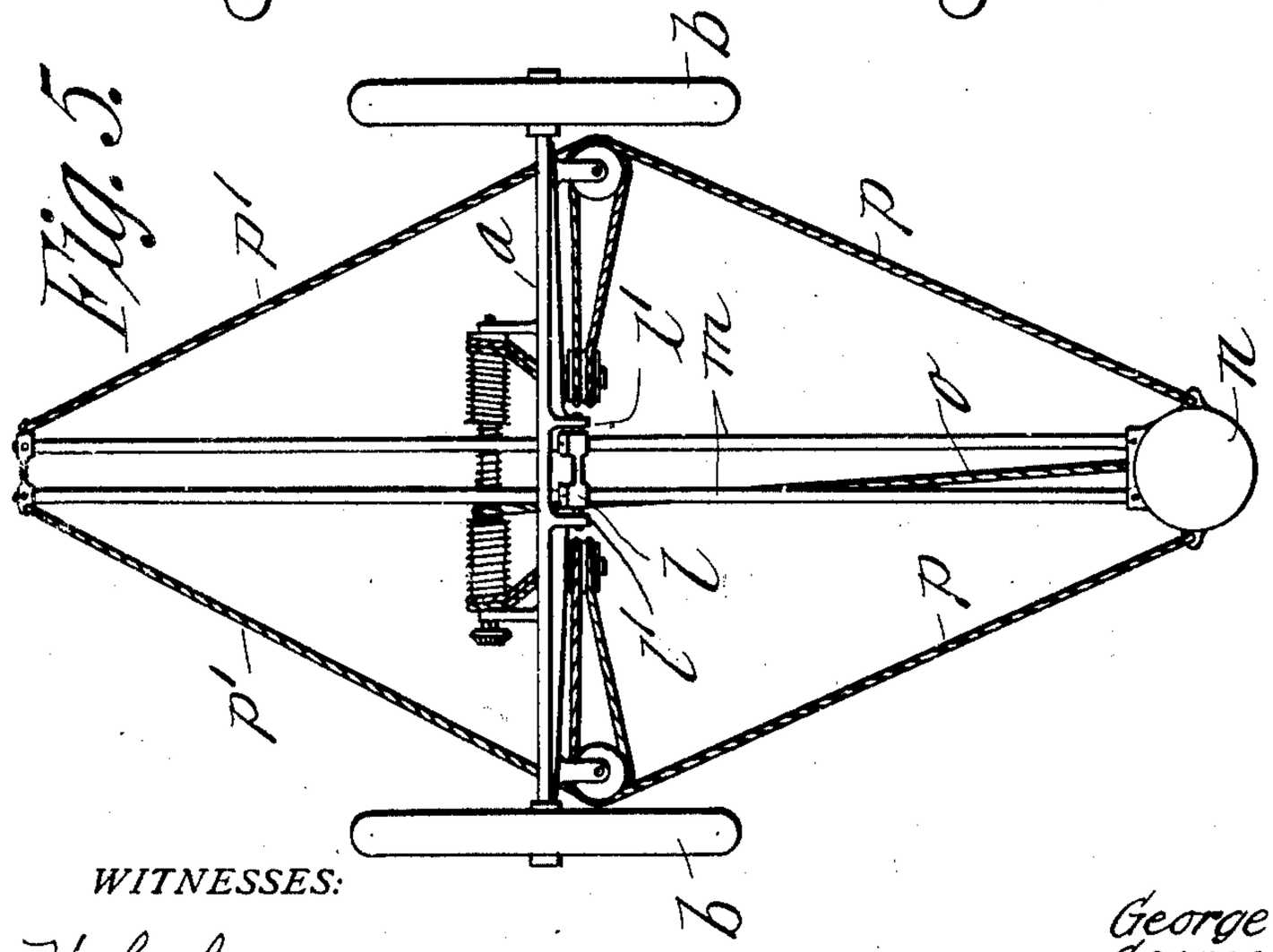


Fig. 5.



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4 SHEETS—SHEET 4.

Fig. 6.

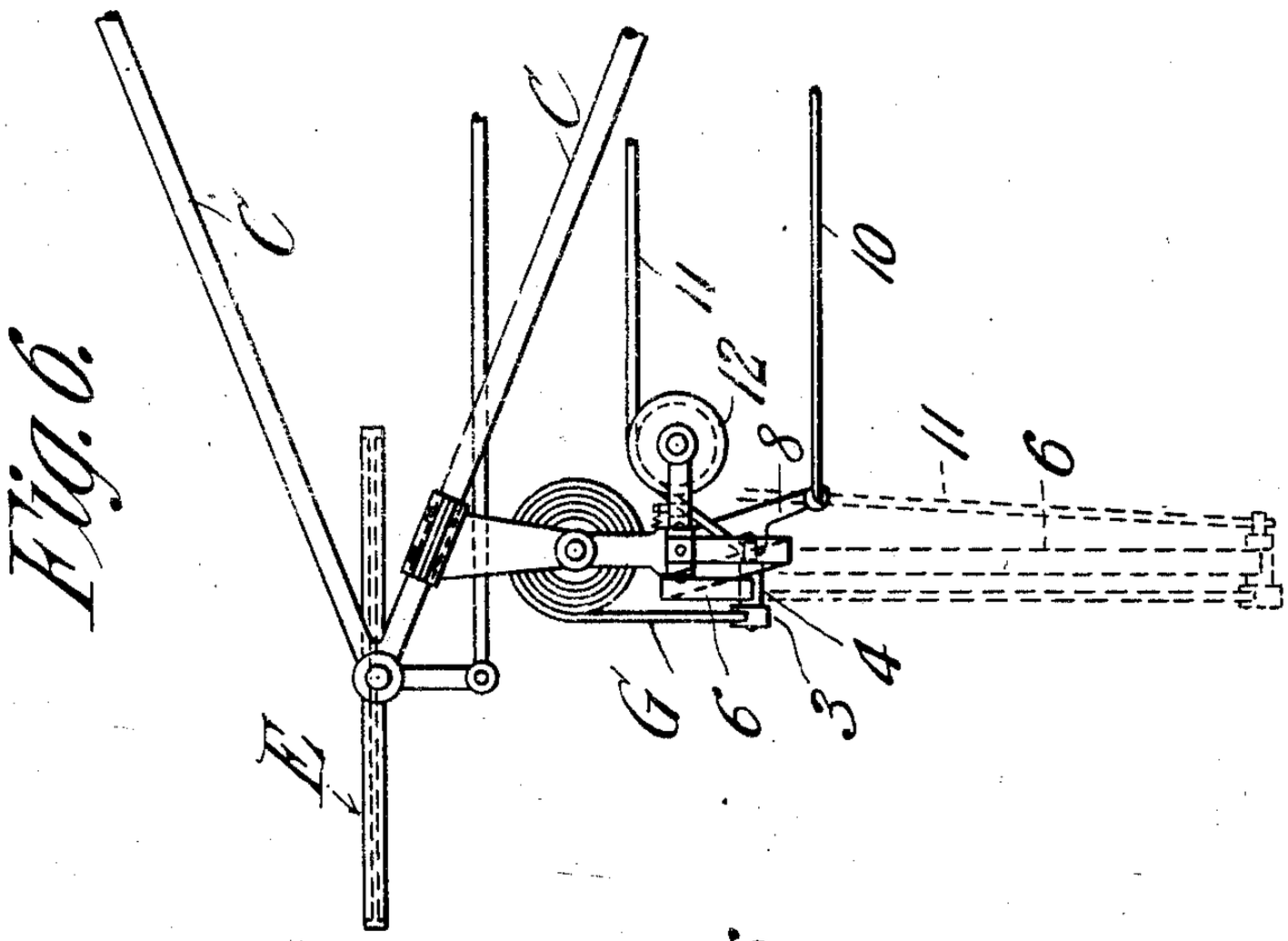


Fig. 7.

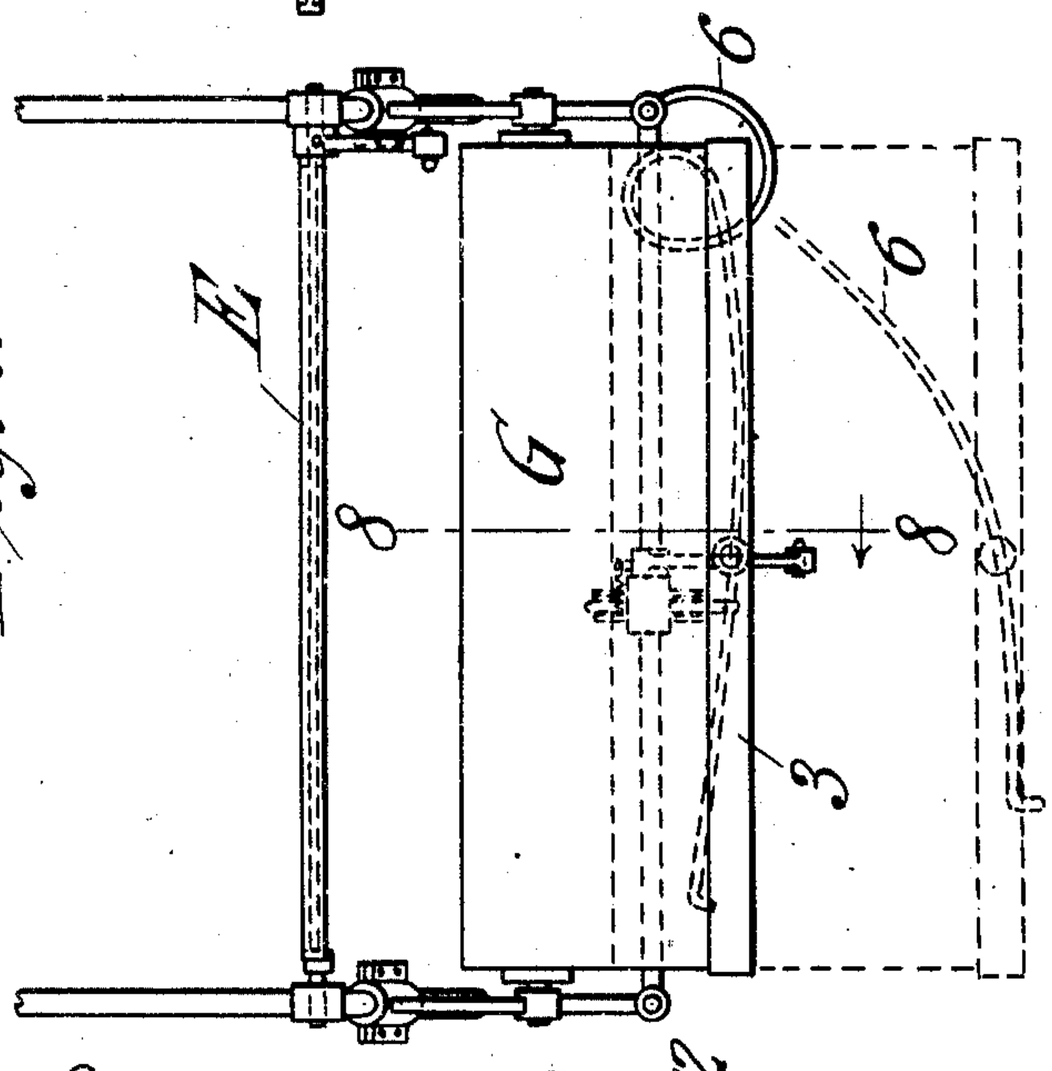
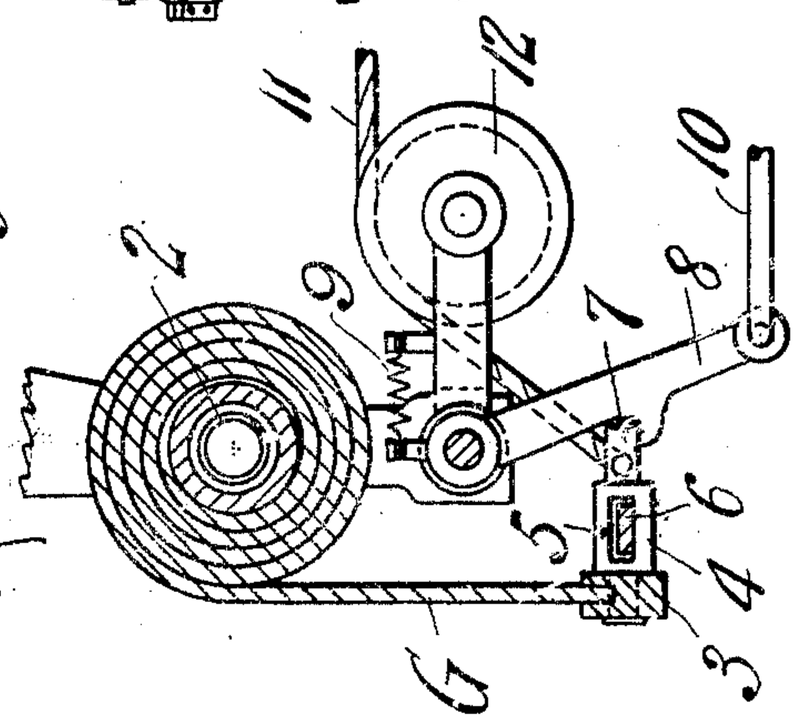


Fig. 8.



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UNITED STATES PATENT OFFICE.

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AERIAL MACHINE.

997,001. Specification of Letters Patent. Patented July 4, 1911.

Application filed October 17, 1910. Serial No. 587,381.

To all whom it may concern:

Be it known that we, GEORGE A. OWEN and GEORGE A. BATES, citizens of the United States of America, and residents of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Aerial Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in mechanisms for controlling and poising aerial machines, and has for its object the provision of means for retaining the machine in the atmosphere in a relatively adjustable position of safety.

The machine is described in conjunction with the accompanying drawings and set forth in the claims.

In the drawings:—Figure 1 is a side elevation of the assembled machine showing the same in its horizontal flying position; Fig. 2 is an enlarged side elevation of the chassis of the machine; Fig. 3 is a front elevation of the same; Fig. 4 is a plan view of the same; Fig. 5 is a view showing a modification of the keel positioning mechanism; Fig. 6 is an enlarged side elevation of the safety sail or parachute mechanism; Fig. 7 is a detail front elevation of the same; Fig. 8 is an enlarged sectional view of the releasing mechanism and adjacent parts taken on line 8—8, Fig. 7; Fig. 9 is a side elevation and partial plan of the motor disconnecting means.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the chassis attached by four upright members B to an aeroplane C of the Paulham type, having the standard planes D, the elevating and lowering planes E and the rudder F, which are peculiar to this type of machine. In addition to these accepted mechanisms, we have installed two safety curtains G with suitably constructed operating means therefor.

For insuring absolute safety should the machine become disabled while in the air, a foot release mechanism is provided for the instantaneous removal of the motor from the machine, as clearly represented in Fig. 9. By the provision of this release mechanism the load on the aeroplane is greatly lessened, permitting a slow and gradual descent in case the motor becomes inoperative or in any way fails to perform its required work, at which time it is disconnected from the aeroplane and precipitated from its support thereon.

Referring to Figs. 2, 3 and 4, it will be seen that the chassis frame *a* has, running in conjunction with the four wheels *b*, a motor *c* connected to the propeller *d* by the clutch *e* and controlled by the operator, at will, by the operating lever *f*. The second lever *g* having attached thereto a sliding clutch member *h* may be thrown into engagement with the loose running clutch member *h'* on the shaft *r*, which has mounted thereon a sprocket h^2 and a sprocket chain h^3 connected to a larger sprocket h^4 which revolves the shaft *i* connected to winding sheaves *j'*, j^2 and j^3, all of which are rigidly mounted on a sheave shaft j^4 which is bevel gear connected to the shaft *i* through the medium of the two bevel gears *k*.

At a relatively convenient point on the shaft *i* is rigidly mounted a ratchet wheel 3' which is caused to revolve by the shaft *i*, elevating the weight *n* in such a direction as to engage the locking teeth 4 of the lever 5 which is in turn mounted on the frame *a* at a point at right angles to the shaft *i* and trunnioned thereto on the pin 6 so that if the operator desires to lower the weight *n* he may manually disengage the locking teeth 4 from the teeth of the ratchet 3 and when the desired position of the weighted keel *n* is reached the same may be again thrown into locked engagement.

At a convenient point upon the lower central portion of the chassis is a trunnion bearing member *l* which is mounted in its bearings *l'*, and carries the two upright keel sustaining members *m;* and to these two keel sustaining members is secured a weighting part *n* which by its relatively high or low position permits the center of gravity of the machine to be changed through the medium of the lifting cable *o* and the two side supporting cables *p*, at the will of the operator. The keel supporting members and keel retain a vertical position relative to the longitudinal axis of the machine, as shown in the dotted positions of the frame *q* and *q'* during the ascension or descent of the aeroplane.

In Fig. 5 is represented a modification of the spring which elevates and lowers the keel, the same as heretofore described except that the keel supporting members are extended above the level of the frame *a* and are controlled by a secondary set of cables

or guide wires *p*, making a much more rigid construction when occasion therefor requires.

Referring to Fig 9, it will be seen that the engine casing is positioned on studs *s* by the forked feet *s'* so arranged that the engine may be removed in the direction of the arrow *t*.

Mounted on the opposite sides of the engine *c* are the studs *u* which are engaged by the fork shaped bell crank lever *u'*, held in tension by the spring u^2 between the studs u^3, and retained in position by the locking dog u^4; and said locking dog through the medium of the link u^5 and foot pedal u^6 is maintained by the spring u^7 and may be withdrawn beyond the locking point u^8, causing the spring u^2 to retract, thereby producing a forward motion of the lever *u*, which results in a hurling of the motor from its mountings, at which time the fly wheel clutch *e* will be automatically withdrawn from the shoe.

In Figs. 6, 7 and 8, a further safety device is illustrated in the form of a quickly operating automatic curtain which, in case of accident to the motor or parts of the machine, has the advantages of a parachute, and when set in operation causes a very slow and safe descent.

To the forward and rear ends of the biplane portion of the machine, running crosswise in the machine, is a spring curtain G, which is by the medium of the spring 2 retained in a rolled-up position.

Mounted on the lower edge of the curtain G is a bar 3 which has thereon a rigid stud 4 provided with an opening 5 which receives the spring 6; and said stud 4 has an extended portion 7 thereon which is in locked engagement with the lever 8 held by the spring 9 which retains the spring 6 in a tensioned position.

By a backward movement of the locking lever 8 on the connector 10 the said lever is removed from the end of the stud 7 at which time the spring 6 thrusts the curtain G to the position as shown by dotted lines in Fig. 7.

If the double breadth of the curtain is such as to cause an extreme retarded descent, the operator may retract the curtain by hauling the cable 11 which passes over the sheave 12 to the stud 4; or if the operator cares to dispense with the use of the curtain entirely during the ascent or descent, he may bring the curtain to its normal position as shown in Fig. 8, and at the same time retain his position in the aeroplane.

We claim:—

1. In an aerial machine, a frame having a driven propeller shaft supported thereon and provided with a sprocket wheel, a countershaft having a sprocket wheel, a chain running around said sprocket wheel and means for clutch connecting the first named sprocket wheel with the propeller shaft, a rocking member on the frame having a vertical guide, a rod like member, carrying a depending weight vertically slidable in said guide, a cord connected to the weight device, a winding drum around which the cord has an engagement, and driving connections between the countershaft and drum.

2. An aeroplane having thereunder and adjacent thereto a roller and a curtain like sail normally wound up thereon and having at its free edge a rigid stiffening bar, provided with a stud and with a catch portion, a spring under tension engaging said stud and reacting in a downward direction thereagainst, a catch-lever for engagement with the catch-portion of said stud having a spring for maintaining it in its engagement therewith, and a member for operating the catch lever.

3. An aeroplane having thereunder and adjacent thereto a roller and a curtain like sail normally wound up thereon and having at its free edge a rigid stiffening bar, provided with a stud and with a catch-portion, a spring under tension engaging said stud and reacting in a downward direction thereagainst, a catch-lever for engagement with the catch-portion of said stud having a spring for maintaining it in its engagement therewith, a member for operating the catch lever, and a sheave-guided cord connected with said stud and operative by draft thereon to elevate the downwardly extended curtain against the reaction of said spring for its rewinding on the said roll.

4. In an aerial machine, a frame and an engine, removably mounted thereon, detachably connected to the driving shaft of the machine, and provided with a stud projecting from its side, an angular lever pivotally mounted and having an arm thereof in a restraining engagement with said stud, a catch-member for engaging the other arm of said angular lever, and means for disengaging the catch-member from such engagement, and a spring serving as a motor which is operative on the release of the restraining means for the engine to force the latter bodily off from its position of support on the frame.

Signed by us at Hartford, Conn., in presence of two subscribing witnesses.

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