

Feb. 12, 1924.

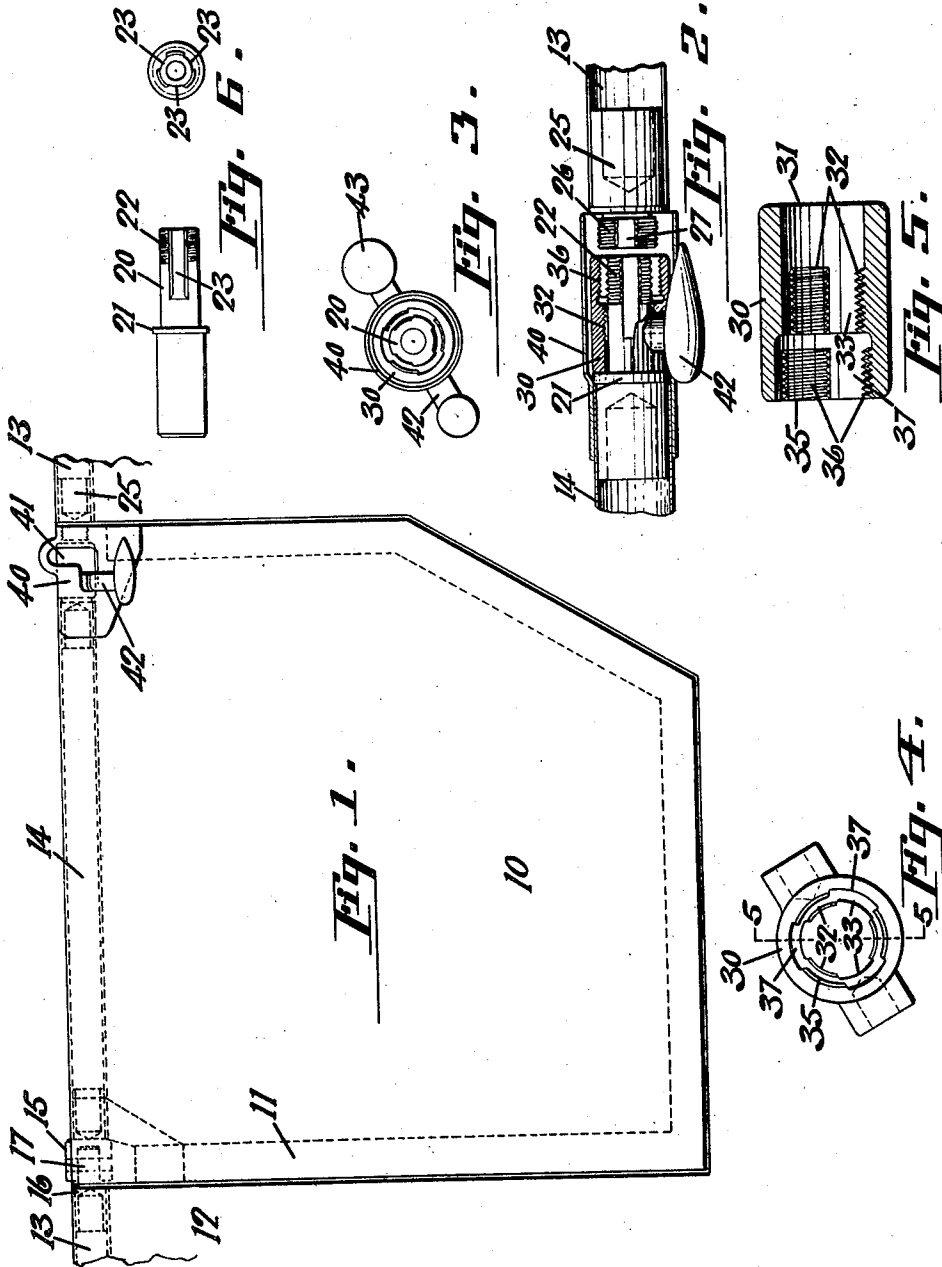
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DOOR FOR AIRCRAFT BODIES

Filed Oct. 12, 1921

2 Sheets-Sheet 1



Witnesses.

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2 Sheets-Sheet 2

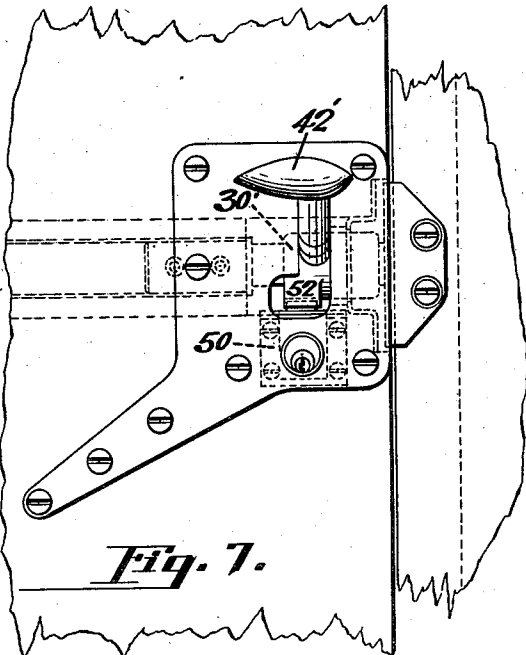


Fig. 7.

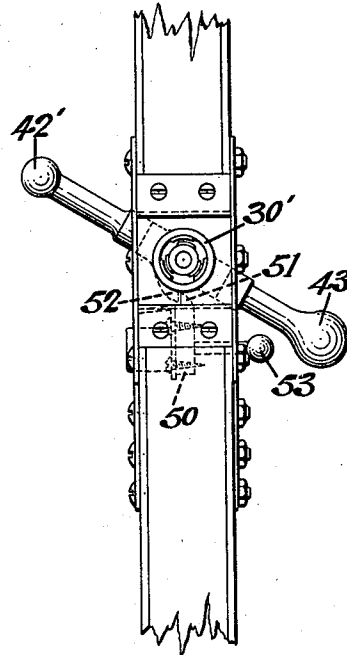


Fig. 8.

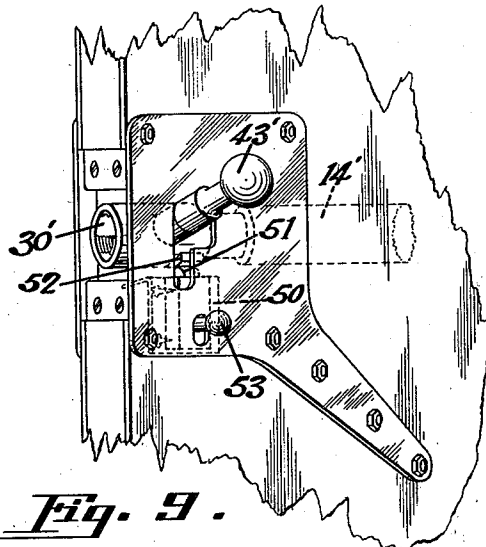


Fig. 9.

Witnesses.

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UNITED STATES PATENT OFFICE.

IVAN H. DRIGGS, OF DAYTON, OHIO, ASSIGNOR TO DAYTON-WRIGHT COMPANY, OF DAYTON, OHIO, A CORPORATION OF DELAWARE.

DOOR FOR AIRCRAFT BODIES.

Application filed October 12, 1921. Serial No. 507,238.

To all whom it may concern:

Be it known that I, IVAN H. DRIGGS, a citizen of the United States of America, residing at Dayton, county of Montgomery, and State of Ohio, have invented certain new and useful Improvements in Doors for Aircraft Bodies (Docket No. 38), of which the following is a full, clear, and exact description.

10 This invention relates to doors in braced structures and is especially adaptable to doors in the bodies of aircraft since in these structures it is of great importance that all main stress members be in effect continuous.
15 Among the objects of this invention is the provision of a door having means thereon for completing the cut away section of a main stress member passing through the door way when the door is in closed position
20 and thus in effect rendering the stress member continuous.

Another object is to provide a quick latching means between the stress member section carried by the door and the main stress member of the body whereby tension as well as compressive stresses may be carried across the door way.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of embodiment of the present invention is clearly shown.

In the drawings:

35 Fig. 1 is a side elevation of the door illustrating my invention in closed position and a portion of the fuselage of an airplane upon which the door is mounted.

Fig. 2 is a detail view of the door latch showing certain parts in longitudinal section.

Fig. 3 is an end view of the part of the latch attached to the door.

Fig. 4 is an end view on a large scale of the rotatable sleeve of the latch.

Fig. 5 is a section on line 5—5 of Fig. 4.

Fig. 6 is a detail side and end view of the door stud.

Fig. 7 shows a modified form of door latch having a safety locking means and showing the same in locked position.

Fig. 8 is an end view of the door latch of Fig. 7.

Fig. 9 is a perspective view showing the side opposite that shown in Fig. 7.

In the drawings similar reference characters refer to similar parts throughout the several views.

The numeral 10 represents the door in its entirety, which is hinged at the edge 11 to the side of the fuselage 12. The top longeron 13 of the fuselage is herein shown of metal tube construction and is cut away at the door way as shown. The door 10 has built therein a similar tubular section 14 which is aligned with the longeron 13 when the door is in closed position. At the hinged side of the door the section 14 and the longeron 13 have rigidly secured thereto, preferably by welding, the female and male hinge members 15 and 16. The hinge pin 17 fits snugly so that there will be no loose play when tension or compressive stresses are put upon the door.

At its other end the tubular section 14 has a quick detachable connection to the longeron 13 which may transmit both tension and compression stresses and at the same time avoid any looseness at this point. In the drawings I have shown the section 14 provided with a stud 20 which is rigidly secured thereto by being inserted therein up to the flange 21 and welded to the section 14. The projecting end of stud 20 is provided with threads 22 for a portion of its length and grooves 23 spaced uniformly around the periphery thereof, said grooves being just slightly wider than the remaining threaded portions. The abutting end of the longeron 13 is likewise provided with a projecting stud 25, which may be rigidly attached thereto in the manner described for attaching stud 20 to tube 14. The projecting end of stud 25 is of larger diameter than stud 20 and is provided with screw threads 26 and grooves 27 evenly spaced around its periphery and of slightly greater width than the remaining threaded portions thereof. A sleeve 30, having its smaller diameter portion 31 provided with threaded and grooved segments 32 and 33 respectively corresponding to the threaded and grooved portions

of stud 20, fits over the stud 20 and is slidable thereon, the threads 32 running in grooves 23 and the threads 22 running in grooves 33. The sleeve 30 has also a larger diameter portion 35 which is provided with threads 36 and grooves 37 corresponding to the threads 26 and grooves 27 of the longeron stud 25. Now when the sleeve 30 is slid to the right, as seen in Fig. 2, the threads 36 run in grooves 27 and threads 26 run in grooves 37. When sleeve 30 has been slid to the right until the corresponding threads 22 and 32 are fully opposite one another the threads 36 will also be fully opposite threads 26, therefore upon the rotation of sleeve 30 a fraction of a revolution these corresponding threads will engage and thus lock the section 14 to the longeron 13. Preferably I make the threads on stud 20 of slightly smaller pitch than those on stud 25 so that when sleeve 30 is rotated the fractional part of a revolution to bring the threaded segments in full mesh, the binding of the threads will give a very tight fit and thus avoid any loose play at the joint.

In order to get a smooth engagement of the threads I preferably offset the threaded portions so that one set of threads will engage slightly before the other set (see Figs. 4 and 3). Also the threads are beveled at their leading edges to facilitate their meshing in case of a small variation in the clearance between the studs 20 and 25. Preferably the movable sleeve 30 and studs 20 and 25 are all enclosed in a stationary sleeve casing 40 which is rigidly secured to the door by any suitable means as by welding or riveting. The sleeve 40 is provided with a guide slot 41 (see Fig. 1) for the handle 42 of the movable sleeve 30. The sleeve 30 has also the weighted handle 43 extending oppositely from the handle 42, as shown in Fig. 3, and extending through a slot (not shown) similar to the slot 41 in sleeve 40. This weighted handle is in its lower position when the threads are engaged and hence aids in preventing accidental disengagement of the latch.

In Figs. 7, 8 and 9 I have shown a modified form of door lock in which the locking sleeve 30' is provided with a latch to positively prevent accidental disengagement of the sleeve. Immediately below the sleeve 30' there is provided the spring latch mechanism 50 which has the beveled spring latch 51 extending upwardly therefrom. The sleeve 30' is provided with a cooperating lug 52 which engages the spring latch 51 when the threads of sleeve 30' are fully engaged and thus prevents the opposite rotation of the sleeve. The back side of lug 52 is cammed as shown in Fig. 8 so that it will automatically depress latch 51 during the clockwise rotation of sleeve 30'. The latch mechanism 50 has a release handle 53 by

which the operator may depress latch 51 when it is desired to open the door. If desired the latch mechanism may also have a key lock by which the door may be locked in closed position and the key withdrawn, it then being impossible to depress latch 51 by means of the handle 53. This key lock is desirable for preventing any one from disengaging sleeve 30' during flight as well as to prevent meddlers from opening the door or entering the cock pit when the aircraft is left unattended.

While I have shown a particular form of sliding bolt many other forms or variations of the illustrated form may be used with my invention. For instance, the sleeve 30 and studs 20' and 25 may have cooperating lugs or cams instead of the screw threads shown, or there may be screw threads for engaging one of these studs and cams or lugs for engaging the other stud. Also instead of having a sleeve as the rotatable and slidable member I may employ a rotatable and slidable bolt which will engage female threads in members substituted for studs 20 and 25 and in a manner similar to the engagement of sleeve 30.

While the forms of mechanism herein shown and described, constitute preferred forms of embodiment of the present invention, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What I claim is as follows:

1. An aircraft body having a stress member therein, a door in the body, said stress member having a section cut away at the door, a brace carried by the door to lie in alignment with the ends of said stress member and complete the cut away section when the door is closed, and hinge means and bolt means for securing the brace to the stress member, whereby the stress member is rendered continuous in effect, said hinge means and bolt means lying in direct alignment with said stress member.

2. A door for aircraft bodies and a quick-latching means therefor, said quick-latching means comprising a stud on the door, a second stud on the door jamb and aligned with the first named stud when the door is closed, a sleeve slidable over the ends of the aligned studs and rotatable thereon to lock said studs in their aligned position.

3. A door for aircraft bodies and a quick-latching means therefor, said quick-latching means comprising a stud on the door, a second stud on the door jamb and aligned with the first named stud when the door is closed, said studs being threaded and having longitudinal grooves thereon, and a sleeve having cooperating threads and grooves and slidable over the ends of the aligned studs and rotatable thereon to interlock the corresponding threads on the sleeve and studs.

4. An aircraft body having a tubular metal stress member therein, a door in the body intercepting said stress member, said stress member being cut away at the doorway, a tubular metal brace carried by the door and positioned to lie in alignment with said stress member when the door is closed; and hinge means and bolt means aligned with said stress member for securing the brace to the ends of said stress member to carry both tension and compression stresses through said member when the door is closed.

In testimony whereof I hereto affix my signature.

IVAN H. DRIGGS.

Witnesses:

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R. K. LEE.