AIRCRAFT WITH SEPARABLE COCKPIT

Inventor: Manuel Lopez Troitino, Ave. Julio Arjona 40-41, Chitre, Panama

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References Cited

UNITED STATES PATENTS

3,377,037 4/1968 Stewart 244/17.15
3,409,254 11/1968 Nastase 244/138 R

ABSTRACT

An aircraft with a separable cockpit in which the separated cockpit is complete with engine, wings, controls, and landing gear so that it may be flown back to the aircraft carrier or airfield after the major portion of the plane has been damaged sufficient to be inoperative. Apparatus for detachably securing the two portions of the plane together are controlled by the pilot to separate the two portions when the main portion of the plane is damaged. Separable control elements for linking the cockpit controls to the control surfaces of the main portion of the airplane are also provided.

11 Claims, 13 Drawing Figures
1. Field of the Invention
The present invention relates to airplanes which can be separated into a cockpit unit and a main unit when the main unit becomes damaged and inoperative.

2. Description of the Prior Art
The U.S. Pat. to Abreu No. 1,628,098 issued May 10, 1927 provides an aircraft which can be separated into a glider section containing the cockpit and a relatively heavy engine section which has become inoperative. No propulsion means is provided on the cockpit section of the Abreu device. In the U.S. Pat. to Rosenblum No. 1,733,030 issued Oct. 22, 1929, Stewart No. 3,377,037 issued Apr. 9, 1968 and Nastase, No. 3,409,254 issued Nov. 5, 1968 the aircraft is separated into cockpit portions and engine carrying portions with the cockpit portions being lowered by parachute following the separation. The Schmid U.S. Pat. No. 2,654,320 issued Oct. 6, 1953 separates the aircraft into a cockpit section and an engine section with the cockpit section being lowered on a helicopter propeller so as to descend safely.

SUMMARY OF THE INVENTION
The present invention includes a cockpit section detachably connected to an engine section with the cockpit section having an auxiliary engine and controls so that it may be flown following the separation to its base.

The primary object of the invention is to provide a separable aircraft in which the pilot can affect the separation of the aircraft to permit the cockpit portion to be separately flown following damage to the engine portion.

Other objects and advantages will become apparent in the following specification when considered in the light of the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS
FIG. 1 is a perspective view of the invention;
FIG. 2 is a side elevation of the invention with landing gear extended;
FIG. 2a is a side elevation of the invention shown immediately after separation;
FIG. 3 is an enlarged transverse sectional view taken along the line 3—3 of FIG. 2, looking in the direction of the arrows;
FIG. 4 is a fragmentary longitudinal sectional view taken along the line 4—4 of FIG. 3, looking in the direction of the arrows;
FIG. 5 is an enlarged fragmentary sectional view taken along the line 5—5 of FIG. 4, looking in the direction of the arrows;
FIG. 6 is a view similar to FIG. 5 with the cockpit section detached from the engine sections;
FIG. 7 is a top plan view of a modified form of the invention;
FIG. 8 is a side elevation of the aircraft illustrated in FIG. 7;
FIG. 9 is a view similar to FIG. 8 with the aircraft separated into its two sections;
FIG. 10 is a top plan view of another modified form of the invention;
FIG. 11 is a side elevation of the structure illustrated in FIG. 10; and
FIG. 12 is a front view of the aircraft illustrated in FIG. 10.

DESCRIPTION OF THE PREFERRED EMBODIMENTS
Referring now to the drawings in detail wherein like reference characters indicate like parts throughout the several figures the reference numeral 20 indicates generally a separable aircraft constructed in accordance with the invention.

The aircraft 20 includes a cockpit section generally indicated at 21 and an engine section generally indicated at 22. The cockpit section is equipped with conventional pilots compartment 23 having a seat 24, instruments 25, and pilot actuated controls 26. A pair of relatively short wings 27 are mounted on the cockpit section 21 and a small jet engine 28 is also mounted thereon carrying a tail assembly 29 extending upwardly therefrom.

The cockpit section 21 has an air intake 30 leading into an air conduit 31. A flat valve 32 is provided in the air conduit 31 to be lowered to direct air to the jet engine 28 with the cockpit section 21 separated from the engine section 22. Retractable landing gear wheels 33 are mounted beneath the cockpit section 21 to permit the cockpit section 21 to be landed on returning to base.

The fuel for the jet engine 28 is located within the wings 27, the tail assembly 29 and any other portion of the cockpit section 21 desired.

The engine section 22 has an elongate fuselage 34 having a conventional engine 35 mounted therein. A pair of main wings 36 extend outwardly from the fuselage 34 to support the aircraft 20 in normal flight. A tail assembly 37 extends upwardly from the fuselage 34 to control the aircraft in flight. A retractable landing gear 38 is conventionally mounted beneath the fuselage 34 to permit the aircraft 20 to take off and land. The forward end of the fuselage 34 is generally cylindrical and has an inwardly tapering end portion 39 formed thereof. A forward end wall 40 closes the forward end of the fuselage 34 as can be seen in FIG. 4.

The rear end of the cockpit section 21 has an inwardly tapering socket portion 41 formed at the rear end thereof to receive the tapered forward end portion 39 of the fuselage 34. A transverse wall 42 extends across the cockpit section 21 at the rear portion thereof at the forward end of the socket 41. The wall 42 is arranged in close parallel relation to the wall 40 with the aircraft 20 in assembled position.

A plurality of guide pins 43 each have a T-shaped head 44 secured to the wall 40 by a plurality of bolts 45. The guide pins 43 are bifurcated at 46 and have a roller 47 mounted therein on a transverse pivot 48. The guide pins 43 are adapted to engage through guide openings 49 in the wall 42. A keeper plate 50 is associated with each of the guide openings 49 and has a pair of upstanding ears 51, 52 mounted thereon in spaced apart parallel relation. A keeper bolt 53 is slidably mounted in the ears 51, 52 and is biased to extended position by a spring 54. The keeper bolt 53 engages in the bifurcation 46 of the pin 43 under the roller 47 to detachably lock the pin 43 in the guide
opening 49 thus securing the cockpit section 21 to the engine section 22. A spool 55 is journalled on a shaft 56 secured to the wall 42 centrally thereof and a plurality of cables 57 extend from the spool 55 to the keeper bolts 53 being driven over intermediate pulleys 58 journalled on the wall 42. A cable 59 is also trained about the spool 55 and extends over pulleys 60 leading to the pilots compartment 23 to be actuated by the pilot when desired. Movement of the cable 59 causes the spool 55 to rotate and wind the cables 57 thereon to retract the keeper bolts 53 releasing the pins 43 from the guide openings 49.

A plurality of rocket chambers 61 are secured to the wall 40 by means of a plurality of bolts 62 with the chambers 61 extending completely through the wall 40. Electric igniters 63 are mounted in the inner ends of the chambers 61 for reasons to be assigned. A plurality of rocket motors 64 are secured to the wall 42 and are adapted to be housed in the chambers 61 when the cockpit section 21 is secured to the engine section 22 of the airplane 20. The rockets 64 are adapted to be fired by the igniters 63 in the chambers 61 to provide a propulsive force to separate the cockpit section 21 from the engine section 22.

A plurality of gear segments 65 are journaled in the wall 40 projecting toward the wall 42 for meshing engagement with a plurality of identical gear segments 66 journaled in the wall 42. Control cables 67 extending from the pilots compartment 23 are adapted to rotate the gear segments 66 and thereby rotate the gear segments 65 when the cockpit section 21 is secured to the engine section 22. Control cables 68 extend from the gear segments 65 to the control surfaces of the engine section 22. On separation of the cockpit section 21 from the engine section 22 the gears 65 disengage from the gear 66. The walls 42, 40 are provided with openings 69 therebetween to permit air to flow from the air conduit 31 to the jet engine 35.

In the use and operation of the invention illustrated and described in FIGS. 1 through 6 the airplane 20 is flown in the conventional manner until such time as the engine section 22 becomes inoperative due to mechanical failure or outside damage such as anti-aircraft fire. With the jet engine 35 inoperative the pilot pulls the keeper bolts 53 and fires the rockets 64 to cause the cockpit section 21 to disengage from the engine section 22. The valve 32 is automatically lowered and the jet engine 28 is fired so that the cockpit section 21 is propelled under the control of the pilot back to its base flying on the wings 27 and finally landing on the landing gear 33. The engine section 22 crashes and is lost. The cockpit section 21 can be fitted with a new engine section 22 at considerable less cost than the replacement of the complete airplane 20.

In FIGS. 7, 8 and 9 a modified form of the invention is illustrated wherein an airplane is indicated generally at 120 consisting of a cockpit section 121 and an engine section 122. The cockpit section is formed in much the same manner as the cockpit section 21 except that it has a valve 132 in its forward end which can be opened as to permit air to reach the auxiliary jet engine 128 forming part of the cockpit section 121. The engine section 122 has an air intake scoop 130 at its forward end to supply air to the conventional jet engine 135 mounted thereon. The connection of the cockpit section 121 to the engine section 122 is otherwise identical to the form of the invention illustrated in FIGS. 1 through 6.

In FIGS. 10 through 12 another modified form of the invention illustrated wherein an airplane is indicated generally at 220.

The airplane 220 includes a cockpit section 221 and an engine section 222 with an auxiliary jet engine 228 mounted completely above the cockpit section 221 and having its own intake 229. The engine section 222 has a pair of jet engines 235 mounted thereon with each engine having an air intake 230 mounted on the engine section 222. The cockpit section 221 and the engine section 222 are connected together in the same manner as the form of the invention illustrated in FIGS. 1 through 6 and is disconnected in the same manner.

The cockpit sections 21, 121 and 221 are complete airplanes and may be flown as such to return the pilot to his base following the damage of the engine section 22, 122 or 222 respectively.

Having thus described the preferred embodiments of the invention it should be understood that numerous structural modifications and adaptations may be resorted to without departing from the spirit of the invention.

What is claimed is:

1. An aircraft comprising a cockpit section and an engine section, said cockpit section including a pilot's compartment, a pair of oppositely extending relatively short lift wings, having lift capacity sufficient for sustaining the cockpit section alone during powered flight, a tail assembly secured to the cockpit section and an auxiliary jet engine secured to said cockpit section, means for separating said cockpit section from said engine section and upon separation being capable of sustaining powered flight independent of said engine section, said engine section including an elongate fuselage, a pair of relatively long wings extending oppositely from said fuselage for supporting said aircraft, a tail assembly mounted on said fuselage, and jet engine means mounted in said fuselage for driving said aircraft, and means for detachably connecting said engine section to said cockpit section for movement together as an airplane.

2. A device as claimed in claim 1 wherein the means for detachably securing the cockpit section to the engine section includes a plurality of guide pins mounted on said engine section and extending into said cockpit section, and a plurality of keeper bolts detachably engaging with said guide pins for securing said guide pins to said cockpit section.

3. A device as claimed in claim 2 wherein means are provided under the control of the pilot for retracting the keeper bolts out of the guide pins to release the engine section from the cockpit section.

4. A device as claimed in claim 3 wherein each of said guide pins includes an anti-friction roller mounted in a bifurcation in the outer end of said guide pin and said keeper bolt is adapted to extend through said bifurcation in contact with said anti-friction roller to secure the guide pin to the cockpit section.

5. A device as claimed in claim 4 wherein means are provided on said cockpit section for cooperation with means provided on said engine section for controlling the engine section from the pilots compartment.
6. A device as claimed in claim 5 wherein the last named means on said cockpit section is detachable from the last named means on said engine section upon separation of the cockpit section and the engine section.

7. A device as claimed in claim 6 wherein means are provided on said cockpit section for normally directing a flow of air to said jet engine on said engine section and means cooperating with said air directing means for directing the flow of air to said auxiliary jet engine upon separation of said cockpit section and said engine section.

8. A device as claimed in claim 7 wherein said last named means includes a generally flat valve adapted to be automatically swung into a position to direct air to said auxiliary jet engine upon separation of said cockpit section from said engine section.

9. A device as claimed in claim 8 wherein said separating means includes rocket means on said cockpit section cooperating with firing chambers on said engine section for forcing said cockpit section away from said engine section upon release of the means detachably securing said cockpit section to said engine section.

10. A device as claimed in claim 9 wherein means are provided in said firing chambers for igniting said rocket means under the control of the pilot.

11. An aircraft as claimed in claim 1, wherein pilot actuated controls in said cockpit section are provided for controlling powered flight of said aircraft with said cockpit section and said engine section joined, and for controlling powered flight of said cockpit section after separation of said sections.

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