

A. FERNANDEZ.

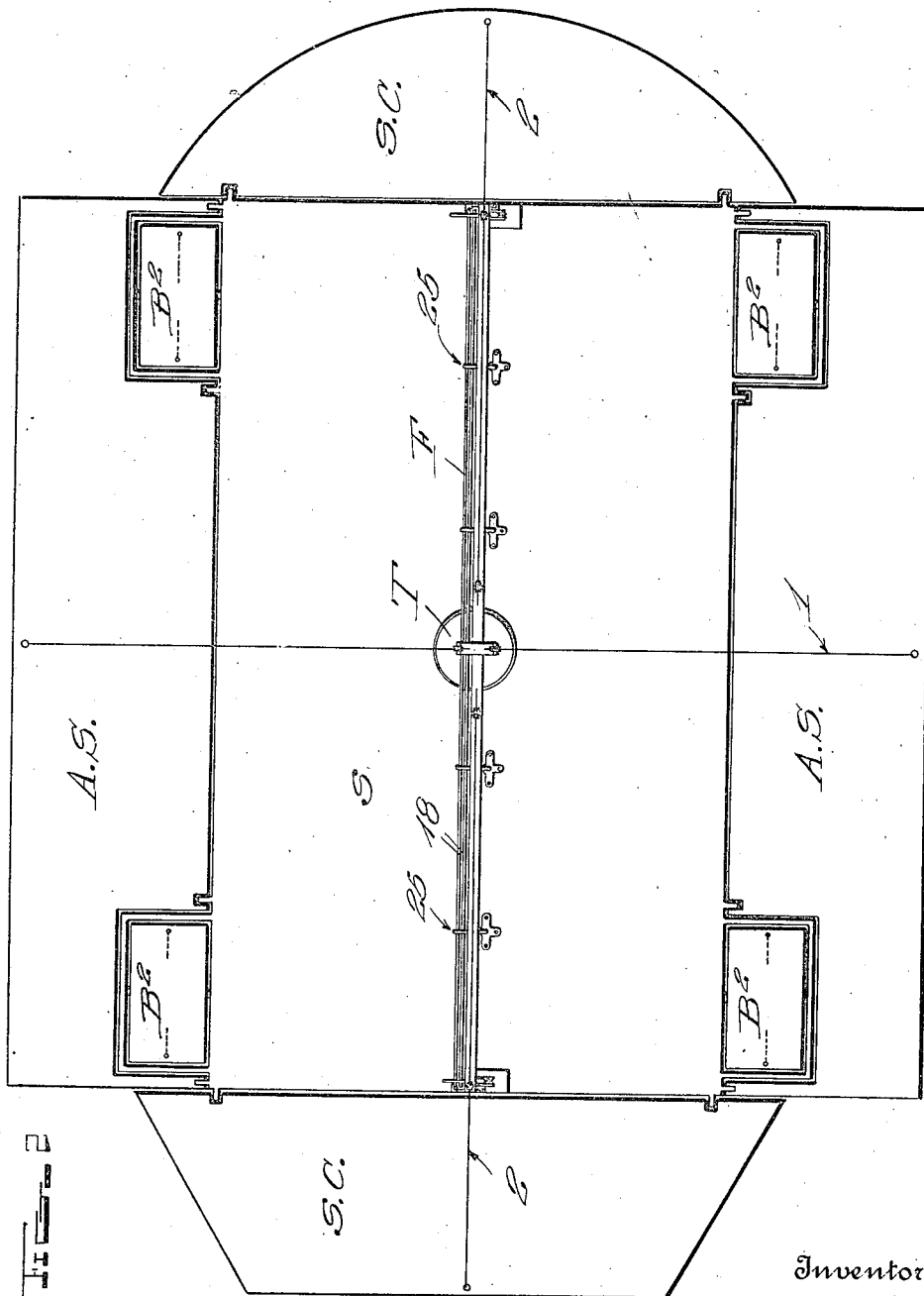
AIRSHIP.

APPLICATION FILED OCT. 14, 1916.

1,237,888.

Patented Aug. 21, 1917.

7 SHEETS—SHEET 2.



Inventor

Alphonse Fernandez

Witness

L. Munko

By

A. B. Wilson & Co.

Attorneys

A. FERNANDEZ.

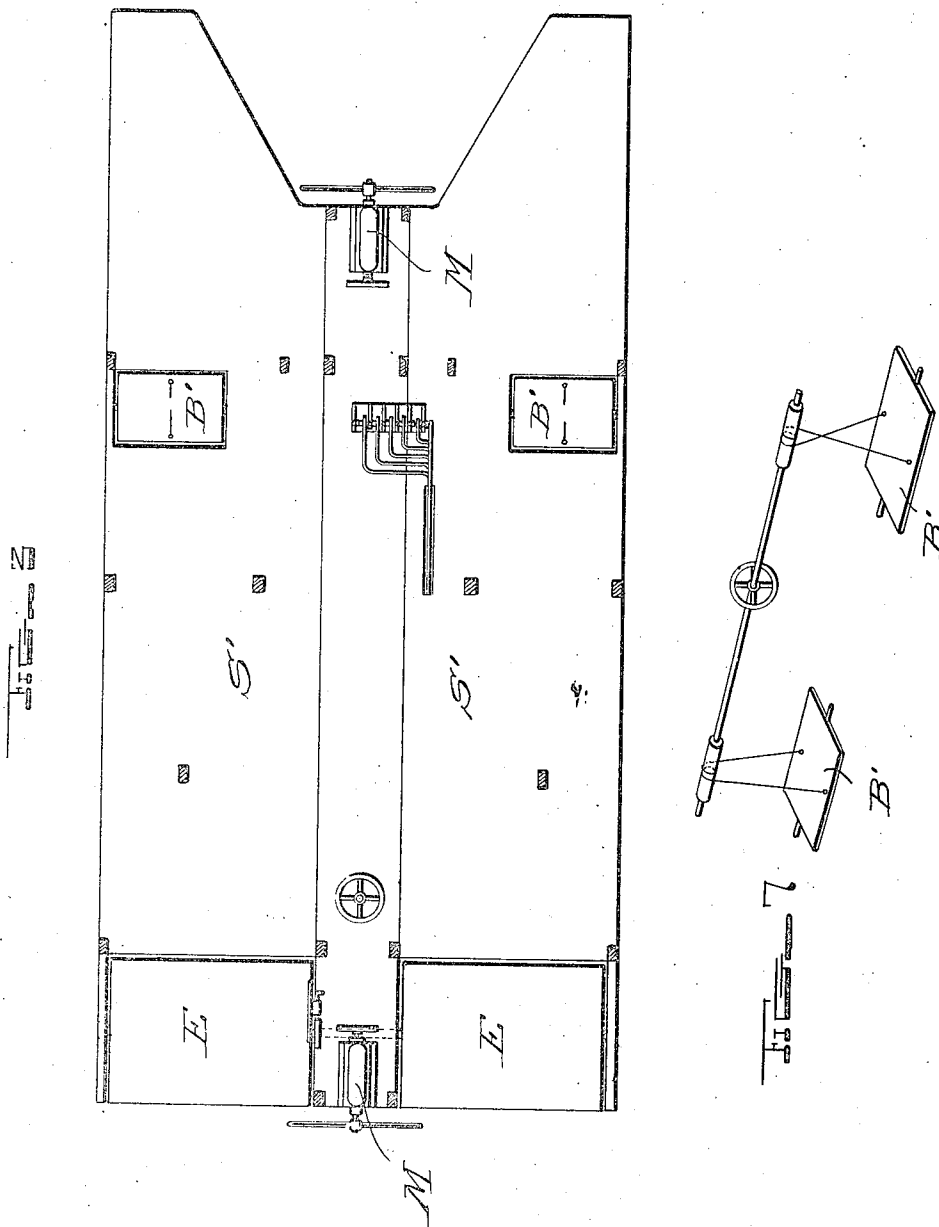
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Witness
E. Munk

Inventor

Alphonse Fernandez

334 *A. Wilson & Co.*
Attorneys

A. FERNANDEZ.

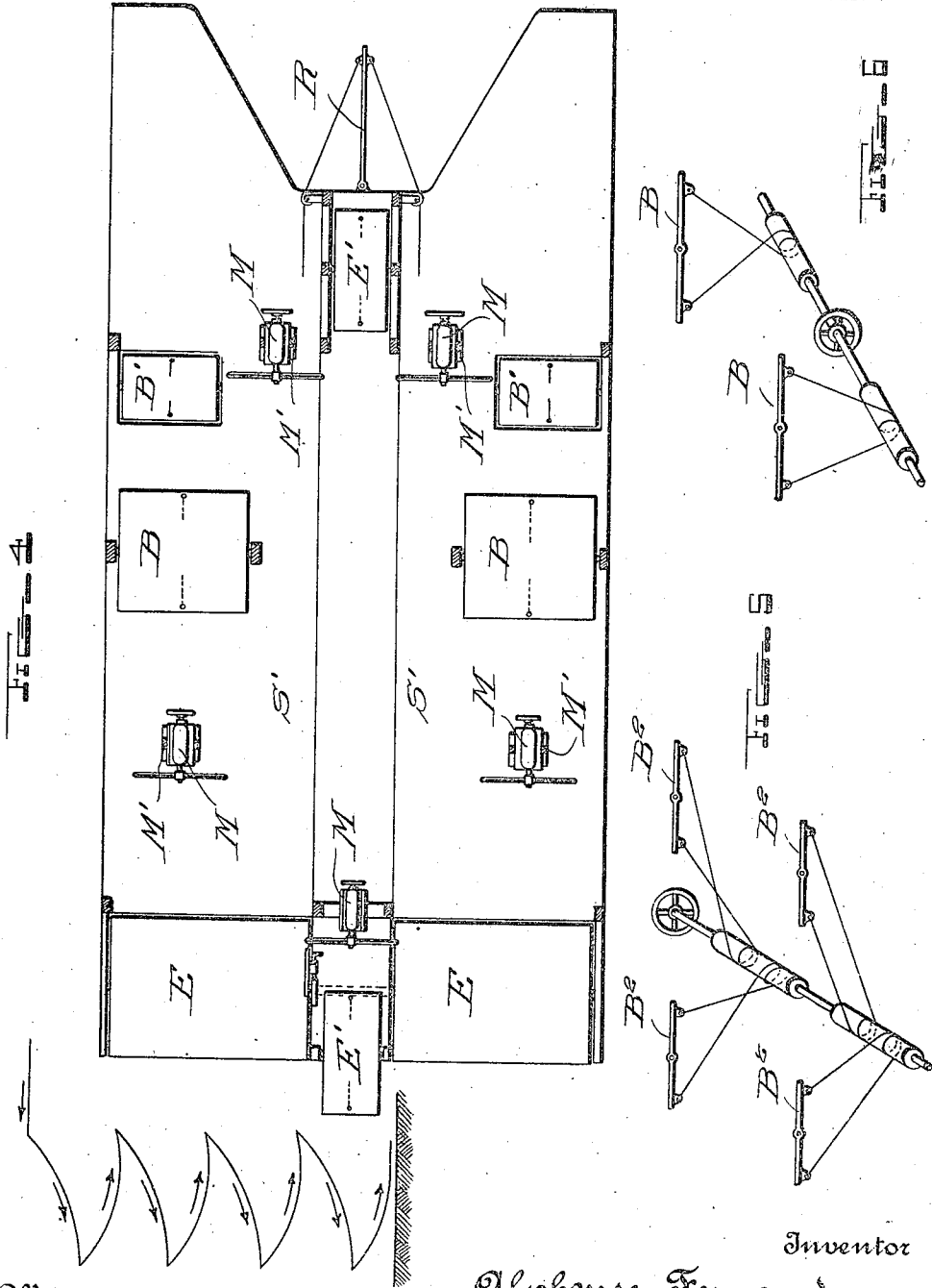
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Inventor
Alphonse Fernandez

By *A. Williams*
Attorneys

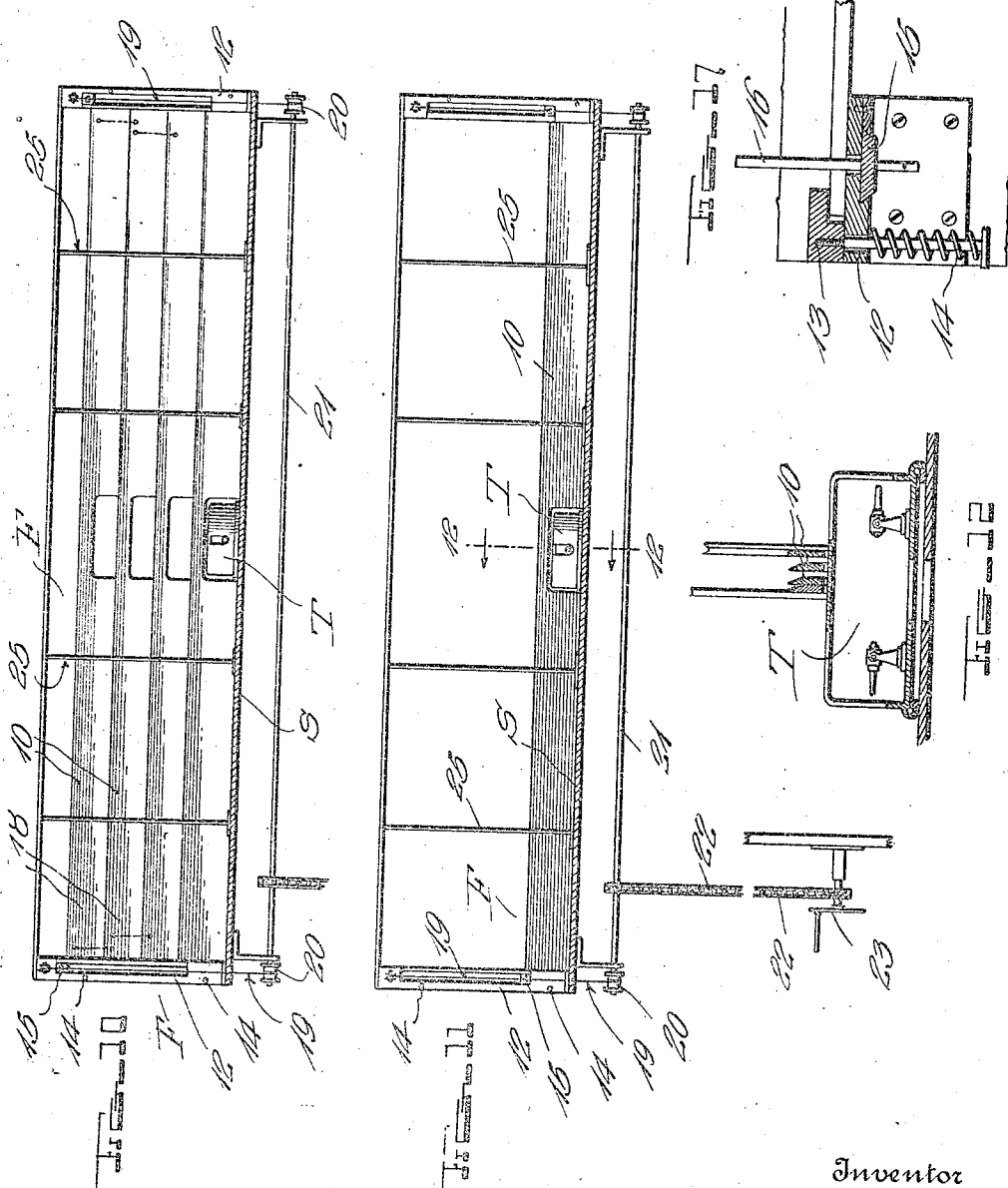
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Witness
C. Munko

Inventor
Alphonse Fernandez

By *A. Williams*
Attorneys

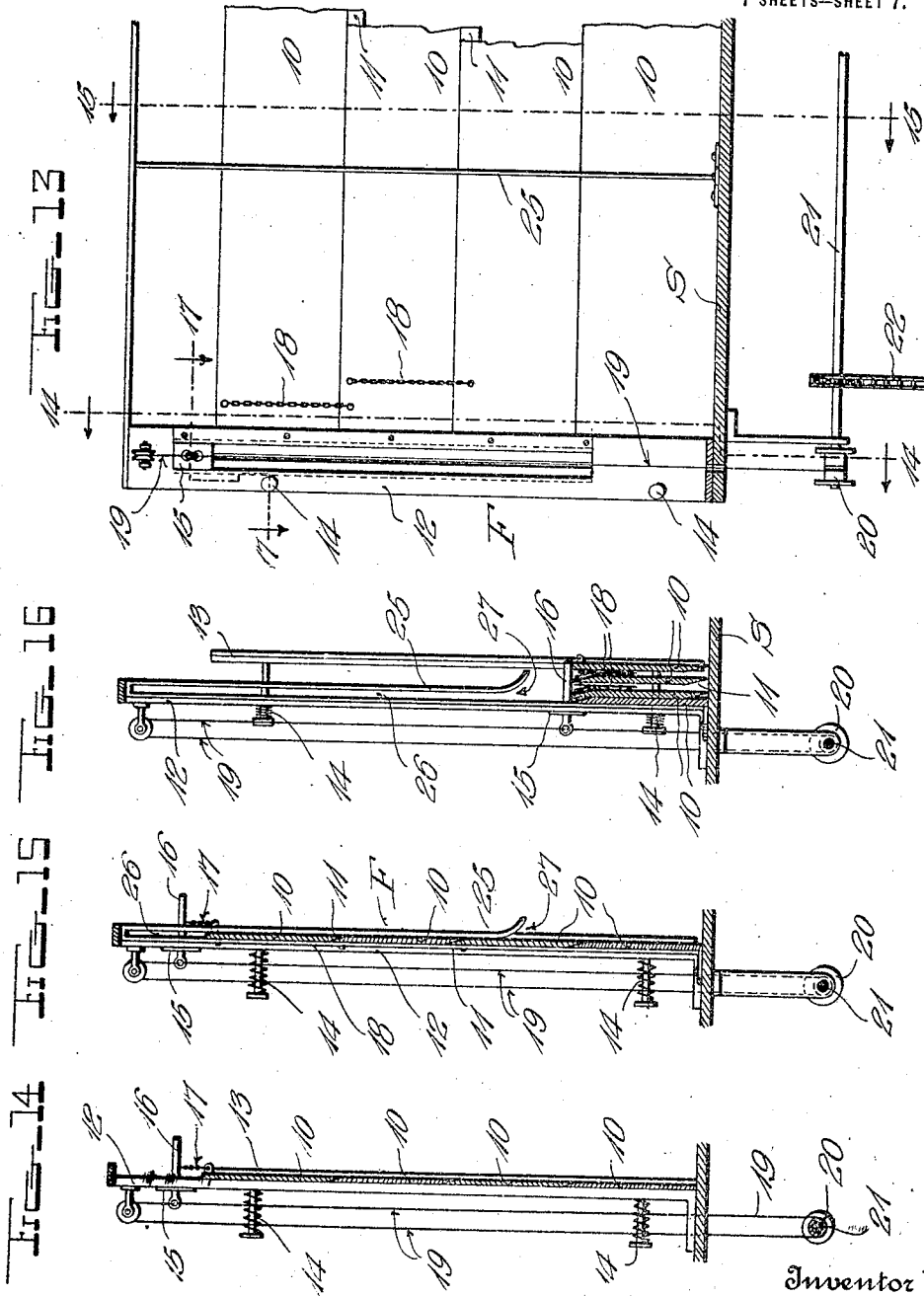
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Witness
E. Munkel

Inventor
Alphonse Fernandez
By *A. B. Williams*
Attorneys

UNITED STATES PATENT OFFICE.

ALPHONSE FERNANDEZ, OF WASHINGTON, DISTRICT OF COLUMBIA.

AIRSHIP.

1,237,888.

Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed October 14, 1916. Serial No. 125,601.

To all whom it may concern:

Be it known that I, ALPHONSE FERNANDEZ, a subject of the King of Spain, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Airships; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates more particularly to aeroplanes and primarily to ships of this class constructed for war purposes.

One object of the invention is to provide one or more auxiliary supporting planes for cooperation with the main supporting plane or planes in case of injury to the latter.

Another object is to provide means whereby the ship is caused to travel slowly to the earth on a zigzag course in case the operator should be wounded or killed or should for other reasons lose control of the machine.

Yet another object is to locate the motors on opposite sides of the longitudinal axis of the ship and to provide means whereby one or more motors on either side of said axis may be dropped from the ship in case the supporting efficiency of the plane or planes on either side of the craft be impaired.

A still further object is to equip the machine with comparatively large balancing and elevating planes for use at slow speed and with smaller planes for performing the same functions at high speed.

Yet another object is to provide an improved type of collapsible fin to extend longitudinally of the ship to offer resistance in case the same should tend to turn side-wise in either direction due for instance to a strong wind blowing against the stabilizing or balancing planes when angled.

With the foregoing general objects in view, the invention resides in certain novel features of construction and in unique combinations of parts to be hereinafter fully described and claimed, the descriptive matter being supplemented by the accompanying drawings which constitute a part of this application and in which:

Figure 1 is a side elevation of the improved air ship;

Fig. 2 is a top plan view thereof;

Figs. 3 and 4 are horizontal sections on the planes designated respectively by the lines 3—3 and 4—4 of Fig. 1.

Fig. 5 is a diagram of the balancing planes shown in Fig. 2;

Fig. 6 is a similar view of the larger balancing planes depicted in Fig. 4;

Fig. 7 is another diagram of the balancing planes shown in Fig. 3;

Fig. 8 is a diagram of the course taken by the ship if falling;

Fig. 9 is a vertical transverse section on the plane of the line 9—9 of Fig. 1;

Fig. 10 is an enlarged side elevation of the collapsible fin in operative position;

Fig. 11 is a similar view with the fin collapsed;

Fig. 12 is a detail transverse section on the plane of the line 12—12 of Fig. 11;

Fig. 13 is an enlarged side elevation of one end of the fin.

Fig. 14 is a vertical transverse section on the plane of the line 14—14 of Fig. 13 with the fin in operative position;

Fig. 15 is a similar view on the line 15—15 of Fig. 13;

Fig. 16 is a duplicate of Fig. 15 with the exception that the fin is shown collapsed;

Fig. 17 is a detail horizontal section on the planes indicated by the line 17—17 of Fig. 13.

The improved ship includes upper and lower main supporting planes S and S' carried by a suitable framework which is preferably equipped with wheels W and pontoons P for landing on either land or water.

Hinged to the longitudinal edges of the upper supporting plane S are two independently operable auxiliary supporting planes AS while similarly hinged to the front and rear ends of said plane S are speed checking planes SC. The planes AS may be provided with any suitable means for shifting them vertically, cables 1 being indicated in Fig. 9 for this purpose. It is essential, however, that the two planes SC be moved in unison in opposite directions in order that they may be swung to the vertical positions indicated in dotted lines in Fig. 1 for a purpose to be described.

For controlling the planes SC in the required manner any suitable mechanism may be provided but cables 2 are preferably connected therewith as depicted in Fig. 1 and so wound around a roller or the like 3 as to move them in the required directions when said roller is turned by means of a hand wheel or the like 4.

When flying over friendly territory, the planes AS and SC may be extended as shown in the drawings but when the vessel is in range of anti-air craft guns of the enemy or is subject to attack otherwise from above or below, the planes AS are swung vertically to the dotted line position depicted in Fig. 9 and thus will be much harder to strike than if they were extended. If now a portion of one of the planes S or S' to one side of the axis of the machine is injured, one of the auxiliary supporting planes AS will be immediately swung downward to the necessary extent to permit it to cooperate with the damaged plane in supporting the load. In this condition the chances are that the ship can at least proceed to friendly territory before landing.

If the pilot should be wounded or killed or should for other reasons lose control of the ship, the latter will descend slowly to the earth in a manner to be described provided the pilot has presence of mind to operate the hand wheel 4 to throw the speed checking planes SC to the positions shown in dotted lines in Fig. 1, it being also necessary that the motors be stopped. With the planes SC in the positions mentioned, they will form such resistance to the air as to cause the ship to travel slowly on a zigzag course as indicated in diagram in Fig. 8, moving alternately in forward and rearward directions.

The motors M for the most part are disposed on opposite sides of the longitudinal axis of the machine although some of said motors will preferably be located on said axis as will be clear from Figs. 3 and 4, and said motors will be releasably held in the mounts M' preferably of the type depicted in my copending U. S. application, Serial Number 125,602. By this arrangement of the motors if the weight carrying efficiency of the machine to either side of its longitudinal axis is impaired by projectiles, bombs or the like, not only can the plane AS on this side of the ship be swung to operative position, but one or more of the motors can be released and dropped from the machine to rid the latter of as much weight as may be necessary on the injured side, or any motor which may be damaged and therefore useless weight may also be dropped and will thus free the ship of an unnecessary load. It is to be understood that when any motor M is released, the ship must first be permitted to list sufficiently to prevent said motor from falling through the lower supporting plane S'.

When elevating or lowering the ship at a low rate of speed, such for instance as that at which the craft travels when leaving or approaching a landing, comparatively large elevating planes E will be employed, said planes being preferably located at or within the front end of the lower supporting plane

S'. When, however, the ship is traveling at a high rate of speed the use of the planes E even though tilted slightly would elevate or lower the ship too abruptly. I therefore provide smaller elevating planes E' disposed at the front and rear of the ship and operated simultaneously in opposite directions by any well known or suitable mechanism. For illustrative purposes cables 5 are shown connected with the planes E', said cables being operated in the required manner by a hand wheel or the like 6.

Comparatively large balancing or equalizing planes B (Figs. 1, 4 and 6) are provided and may be used when the ship is traveling at a comparatively low rate of speed, while smaller balancing planes B' (Figs. 3 and 7) and B² (Figs. 2 and 5) are provided to be employed when the craft is traveling at a high rate of speed. The planes B are by preference located between the supporting planes S and S' and on opposite sides of the longitudinal axis of the ship, being turned simultaneously in opposite directions by any suitable means such as that illustrated conventionally in Fig. 6. The planes B' are located in gaps in the rear ends of the lower supporting planes S' and as depicted in Fig. 7 are also tilted oppositely in unison. The planes B² are carried by the four corners of the upper supporting plane S and as indicated in Fig. 5 the planes on one side of the ship will be tilted upwardly whereas those on the other will be simultaneously tilted downwardly, any suitable operating means being here again employed.

Completing the general structure of the ship is a rudder R for steering from side to side and a fin F extending longitudinally along the center of the upper supporting plane S. The rudder R may be of any of the well known constructions but the fin F is of unique formation yet to be described.

The improved ship is preferably equipped with a turret T in which any number of rapid fire guns or the like may be located, with a bomb dropping mechanism BD illustrated in detail in my copending U. S. application, Serial Number 125,603, and with a novel type of gasoline tank G whose construction constitutes the subject matter of an application filed by me and bearing Serial Number 125,604.

The fin F is formed of a plurality of superimposed horizontally extending flat sections 10 disposed edge to edge and having their contacting edges beveled as shown at 11, the several sections being adapted to be moved downwardly into side by side relation as shown clearly in Figs. 1, 9 and 16. The ends of the sections 10 are mounted in laterally expansible guideways which are preferably formed as shown in the drawings, consisting of rigid standards 12 at the opposite ends of the fin F, vertical bars 13

parallel with said standards, and spring devices 14 which normally move the bars 13 toward the standards, the ends of the sections 10 being located between said bars and standards as shown most clearly in Fig. 17.

Slides 15 are carried by the standards 12 and are shown in the present embodiment of the invention as equipped with laterally extending pins 16 connected by chains or the like 17 with the upper sections 10, the several movable sections being in turn provided with any suitable pick up means such as the chains 18 of Fig. 13 for raising the other sections when the upper section is raised by movement of the slide 15.

For shifting the slides 15 vertically, cables 19 are connected to the pins 16 and pass around drums 20 having a common shaft 21 which may be operated in any preferred manner as by the chain 22 and crank 23 of Fig. 11. When the shaft 21 is so turned as to pull slides 15 downwardly, the beveled edges of the numerous sections 10 will cause them to assume the position shown in Fig. 16, the bars 13 having yielded outwardly to permit this movement.

For the purpose of holding the intermediate portions of the numerous sections 10 in operative relation, vertical guide members 25 (Figs. 13, 15 and 16) are provided, said members having vertical slots 26 to snugly receive said sections, each slot, however, being provided at its lower end with an open throat 27 to permit the sections in question to move laterally and assume the necessary relation when the fin is collapsed. The throats 27 are so shaped, however, as to again guide the several sections of the fin into the slots 26, when the slides 15 are raised, the chains 17 and 18 now coming into play to raise said sections, after which they will be rigidly held in operative relation by the parts 12, 13, 14 and 25.

Under normal conditions the fin F is collapsed as indicated in Fig. 1 but when running toward a strong wind and tilting any of the numerous balancing planes, the tendency is for the entire ship to turn sidewise. When these conditions or similar ones are encountered, therefore, the fin F is immediately thrown up to operative position and is allowed to remain in such position until conditions are again favorable. This counteracts any sidewise tendency as will be clear.

From the foregoing it is believed that the general construction, uses and advantages of the ship will be obvious to those skilled in the art, except that it may be well to explain that if the planes AS need not otherwise be used they will cooperate effectively with the planes SC in bringing the ship slowly to the earth in the manner described, said planes SC serving to prevent lateral tipping or lashing of the ship in its down-

ward course. The fin F may also be used for this purpose if found desirable.

In conclusion I will state that although the drawings are more or less diagrammatic, they are for illustrative purposes only and it is to be understood that the structure shown need not be followed too closely, considerable latitude being allowed within the scope of the invention as claimed. Above all, it is to be understood that the controls for the numerous planes and other moving parts will all be located within easy reach of the pilot and that the parts operated from said controls will be highly sensitive and thus quick in operation.

I claim:

1. In an air ship, the combination of one or more main supporting planes, elevating and balancing planes, and one or more normally retracted independently operable auxiliary supporting planes for projection and cooperation with the main supporting plane or planes when the latter are injured, thereby shifting the center of gravity toward the uninjured parts and restoring equilibrium.
2. In an air ship, the combination of one or more main supporting planes extending to opposite sides of the longitudinal axis of the machine, propeller driving motors on opposite sides of said longitudinal axis of the machine, means for releasing the motor or motors on either side of said axis to permit them to drop from the ship in case of injury to the supporting plane or planes at either side of said axis, and normally retracted auxiliary supporting planes on opposite sides of said axis for projection and cooperation with the main supporting planes when injured.
3. In an air ship, the combination of a main supporting plane or planes extending to opposite sides of the longitudinal axis of the machine, balancing and elevating planes, auxiliary independently projectable supporting planes hingedly connected to the ship and disposed on opposite sides of said axis, said auxiliary planes being normally swung to vertical positions but being capable of swinging toward or to a horizontal position to increase the supporting capacity of either side of the ship when injured.
4. In an air ship, the combination of a main supporting plane or planes extending to opposite sides of the longitudinal axis of the machine, balancing and elevating planes, auxiliary supporting planes hinged to the ship and disposed on opposite sides of said axis, said auxiliary planes being normally swung upwardly to vertical positions but being capable of swinging downward toward or to a horizontal position to increase the supporting capacity of either side of the ship when injured, and front and rear speed-checking planes hinged to the ship in or near the plane of the hinges of said aux-

iliary supporting planes, said speed checking planes being adapted to be swung in opposite directions to vertical positions to retard the downward travel of the ship if falling endwise and to cause the same to alternately move forwardly and rearwardly on a zigzag course as it descends.

5. An aeroplane having front and rear speed checking planes hingedly mounted on transverse horizontal axes at the front and rear edges of a supporting plane and adapted to be swung in opposite directions to vertical positions to retard the downward travel of the machine if falling endwise and to cause the same to alternately move forwardly and rearwardly on a zigzag course as it descends, said planes being independent of the elevating means of the ship.

6. An air ship having one or more elevating planes for use at low speed, one or more smaller elevating planes for use at high speed, one or more balancing planes to be used at low speed, and one or more smaller balancing planes for use at high speed.

7. An air ship having propeller driving motors on opposite sides of its longitudinal axis and means for releasing the motor or motors on either side of said axis to permit them to drop from the ship in case the weight carrying efficiency of the machine is reduced on either side of said axis.

8. The combination with an air ship, of a longitudinally disposed collapsible fin carried thereby and consisting of a plurality of superimposed horizontally extending flat sections disposed edge to edge, said sections being adapted to be lowered into side by side relation when the use thereof is unnecessary, and vertical guides in which the ends of said sections are slidably received.

9. The combination with an air ship, of front and rear standards rising therefrom, a fin consisting of a plurality of superimposed horizontally extending flat sections disposed edge to edge and having their ends disposed adjacent said standards, slides mounted for vertical movement on said

standards and connected with the upper section, means for lowering said slides to lower the several sections, and pick-up means for raising the other sections when said upper section is raised.

10. The combination with an air ship, of front and rear vertically disposed laterally expansible guideways, and a fin consisting of a plurality of superimposed horizontally extending flat sections disposed edge to edge with their ends received in said guideways, said sections being adapted to be lowered into side by side relation and said guideways expanding to permit this movement.

11. The combination with an air ship, of a vertical fin carried thereby and consisting of superimposed flat sections extending horizontally in edge to edge relation and adapted to lower into side to side relation, and one or more vertical guide members each having a vertical slot to receive said fin, each slot having at its lower end an open throat to permit the several sections to leave and enter said slot when respectively lowered and raised.

12. The combination with an air ship, of a vertical fin carried thereby and consisting of superimposed flat sections extending horizontally in edge to edge relation and adapted to lower into side to side relation, and one or more vertical guide members each having a vertical slot to receive said fin, each slot having at its lower end an open throat to permit the several sections to leave and enter said slot when respectively lowered and raised, the adjacent edges of the several sections having contacting inclined faces to shift said sections laterally into the throat or throats when the upper section is shifted downwardly.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALPHONSE FERNANDEZ.

Witnesses:

J. A. GRIESBAUER,
T. A. NOONE.