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A. MAYER.

CONTROLLING MECHANISM FOR AIRSHIPS.

APPLICATION FILED JAN. 12, 1912.

1,083,550. Patented Jan. 6, 1914.

2 SHEETS—SHEET 1.

Fig. 7.

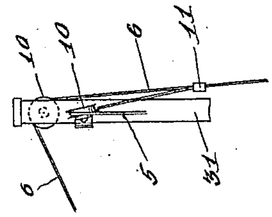
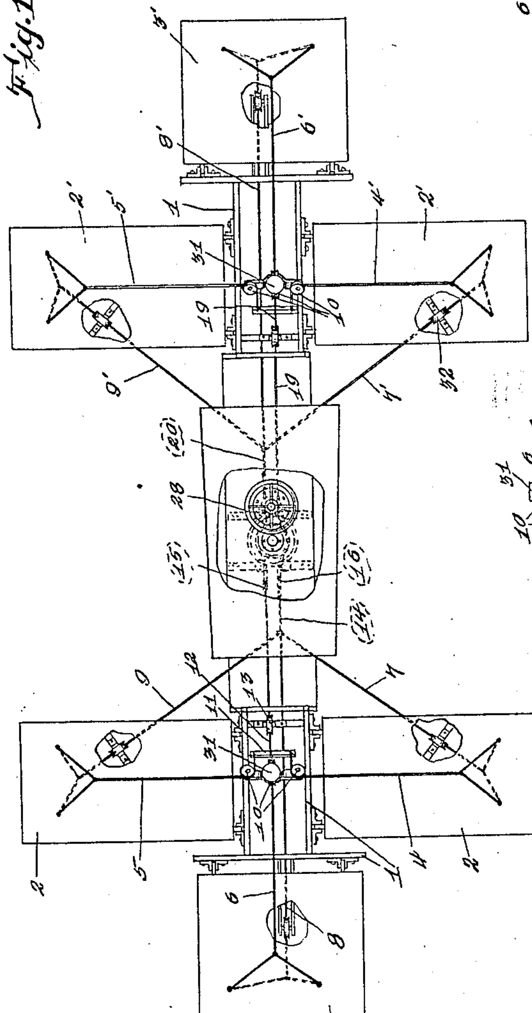


Fig. 1.



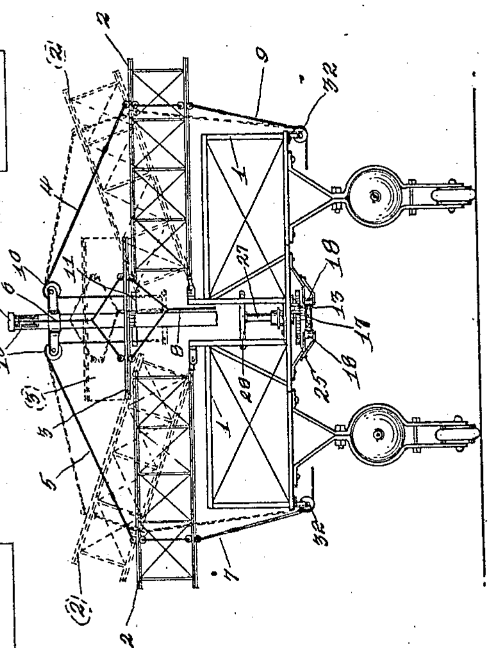


Fig. 2.

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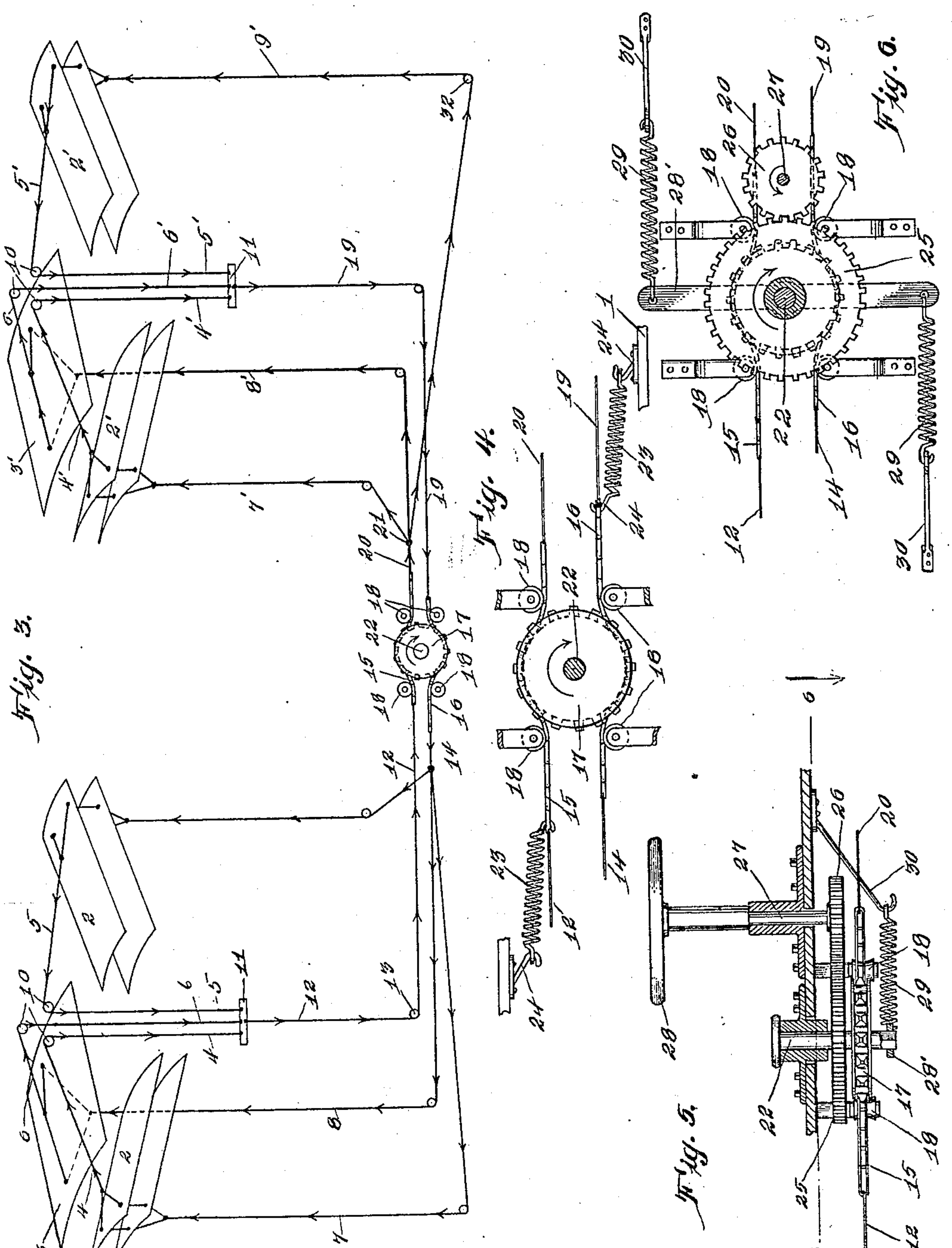

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CONTROLLING MECHANISM FOR AIRSHIPS.

1,083,550. Specification of Letters Patent. Patented Jan. 6, 1914.

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To all whom it may concern:

Be it known that I, ANTON MAYER, a citizen of Bavaria, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Controlling Mechanisms for Airships, of which the following is a full, clear, concise, and exact specification.

My invention relates to the class of airships having a plurality of planes pivoted to the framework.

It consists of a novel arrangement for manipulating or controlling the angle of the tiltable planes whereby any desired group of the same may be moved simultaneously without resorting to conplicated and heavy mechanisms.

My invention may be applied to any airship having planes which are to be moved simultaneously, such as the front and rear elevating and depressing planes on the type of air ships commonly known as biplanes. It is particularly applicable to the multi-planed type shown in my pending application filed December 20th, 1911, Serial #666,927, as it offers an improved and much simplified method for enabling the operator to manipulate the tilting planes.

My invention is shown in some of its preferred embodiments in the accompanying drawings forming a part of this specification.

In the drawings, Figure 1 is a plan view showing the mechanism of my invention as applied to an airship having a single decked tilting plane and a pair of double decked tilting planes at each end of the structure. Fig. 2 is an end view of the same. Fig. 3 is a diagrammatic view of the same, showing the controlling mechanism of my invention. Fig. 4 is an enlarged view of a portion of the controlling mechanism, showing one arrangement of auxiliary springs. Fig. 5 is a vertical section of a geared form of the same portion of the controlling mechanism, showing an alternative arrangement of auxiliary springs. Fig. 6 is a plan view of the mechanism shown in Fig. 5. Fig. 7 is an enlarged side view of the guide post shown in Fig. 2.

To simplify the drawings, the propelling mechanism and other details, well known to those familiar with airship practice, are omitted.

In the drawings, 1 is a framework having biplanes 2—2 and monoplanes 3 pivoted to the same at one end of the structure and corresponding planes 2′ and 3′ pivoted to the other end of the structure.

4, 5 and 6 are flexible members fastened to planes 2 and 3, so that a draft on these flexible members will tend to tilt the planes 2 and 3 in an upward direction. Likewise 7, 8 and 9 are flexible members fastened to planes 2 and 3, by which members these planes may be pulled in an opposite or downward direction. After passing over guide pulleys 10, the flexible members 4, 5 and 6 are coupled by a cross bar 11 to a single flexible member 12, which is guided over a pulley 13. Likewise the downward pulling flexible members 7, 8 and 9 are coupled to a flexible member 14. The flexible members 12 and 14 are fastened to link chains 15 and 16, meshing with teeth on opposite sides of a gear 17, there being idlers 18 to hold the chains in positive engagement with the teeth of the gear. At the other end of the structure the planes likewise have upwardly pulling flexible members 4′, 5′ and 6′ connected to the same and coupled to a flexible member 19, which is fastened to the other end of the link chain 16. Likewise these planes have upwardly pulling flexible members 7′, 8′ and 9′ coupled to a single flexible member 20, which is fastened to the other end of the link chain 15. Instead of using a cross bar for coupling the three flexible members 7′, 8′ and 9′ to the single flexible member, these may be joined at a knot, as shown at 21.

22 is a shaft by which the gear 17 may be rotated. It will be evident from Fig. 3 that if the gear 17 is rotated in the direction of the arrow, this turning will cause a draft on the flexible member 12 and a corresponding releasing of the flexible member 14, whereby planes 2 and 3 are tilted upwardly. Likewise the flexible members 19 and 20 will simultaneously operate the tilting planes 2′ and 3′, thereby enabling the operator to manipulate all of these pivoted planes simultaneously by means of two link chains intermeshing with a single gear.

In practice the weight of the airship in pressing downwardly will cause the air to exert an upward pressure on the tilting planes, so that it will require more power for the operator to move these downwardly than upwardly. I therefore preferably provide springs 23, fastened to the links 15 and 16, as shown in Fig. 4 for assisting the operator in moving the flexible members to tilt the planes in a downward direction, these springs being fastened at their other ends to hooks 24 bolted to the framework of the airship. Instead of fastening the operating hand wheel direct to the shaft 22, I preferably fasten a gear 25 to the shaft 22 and provide a pinion 26, meshing with the same. This pinion 26 is fastened to a controlling shaft 27, carrying the operating wheel 28, thereby giving the operator the benefit of the leverage, due to the difference in diameter between the gear 25 and the pinion 26. With such a geared arrangement, I preferably fasten a cross-bar 28′ to the shaft 22 and connect the ends of this cross-bar by springs 29 to hooks 30 fastened rigidly to the framework of the airship, which springs then serve to aid the operator in downwardly tilting the planes. The guide pulleys 10 are preferably fastened to posts 31 rigidly secured to the framework 1, while the guide pulleys 32 are preferably fastened directly to the framework 1, as shown in Fig. 2.

It will be obvious from Fig. 3, that by increasing the number of flexible members coupled to the members 13 and 20, any desired number of tiltable planes can be simultaneously raised by the mechanism of my invention. Also, that by omitting the members 4, 5, 4′ and 5′, the tilting action will be confined to the two planes 3 and 3′, which in common practice would be oppositely disposed on the framework of the airship. When thus confined to operating two oppositely disposed planes 3 and 3′, the two link chains 15 and 16, together with the members 12, 6, 8, 14, 19 and 20 constitute an endless flexible member intermeshed with the operating gear 17, which endless member will remain taut at all times, but will be movable in either direction by rotating the gear 17. While the portions of the endless member connected to each plane may be led off at an angle with the same, it will be evident from Fig. 3 the action is substantially as if this portion passed vertically through the plane to which it is fastened. By thus connecting the upwardly leading flexible members from one of the two oppositely disposed planes on the airship to the downwardly leading member fastened to the oppositely disposed plane, I am able to manipulate both with a single gear, thereby avoiding the complications heretofore required for simultaneously controlling a series of planes and reducing the weight of the controlling mechanism.

While I have shown the device of my invention in its preferred embodiment, I do not wish to be limited to the exact mechanism shown, as numerous modifications could be made in the same without departing from the spirit of my invention.

What I claim as new and desire to cover by Letters Patent is:

1. In an air ship, separate sets of side and end tiltable planes, and mechanism for controlling the tilt of said planes including separate stretches of flexible connections, manually operable means located between and coacting with the flexible connections at points between the ends thereof to reciprocate the same simultaneously in opposite directions, and extensions connected with the said flexible connections and each having three branches, the branches of one extension of each flexible connection leading to and connected with the under side of the planes of one set, and the branches of the extension at the other end of said flexible connection leading to and connecting with the upper sides of the planes of the other set.

2. In an air ship, separate sets of side and end tiltable planes, and mechanism for controlling the tilt of said planes including a manually operable gear element, separate independent stretches of sprocket chains meshing with the gear element at opposite sides thereof, extensions connected with the said stretches of chains and each of said extensions having three branches, the branches of one extension of each stretch of chain leading to and connected with the under side of the planes of one set, and the branches of the extension at the other end of such stretch of chain leading to and connected with the upper sides of the planes of the other set.

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Witnesses:
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