H. T. KRAFT.

CONTROLLING SYSTEM FOR FLUID CRAFT.

APPLICATION FILED JULY 17, 1919.

1,412,807. Patented Apr. 11, 1922.

Fig. 1.

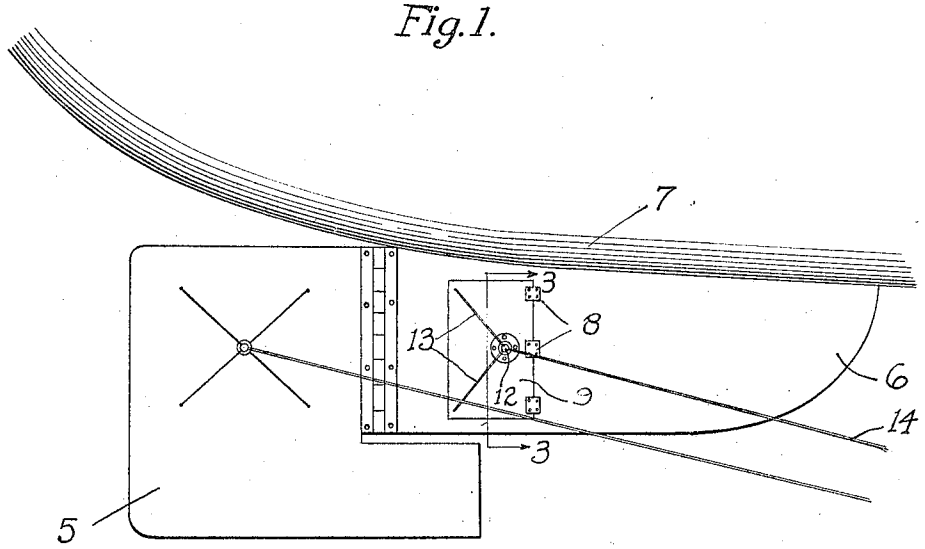


Fig. 2.

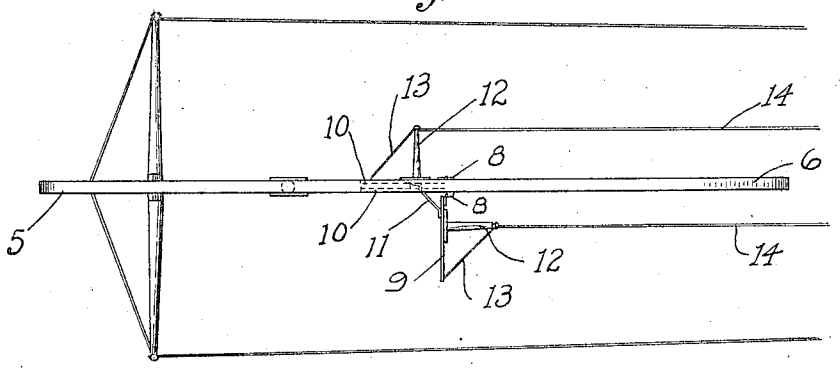


Fig 3

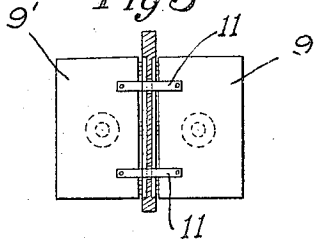
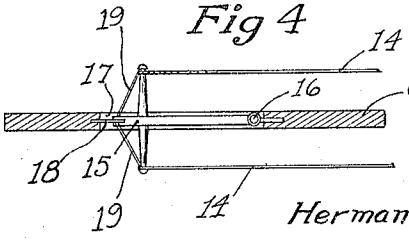


Fig 4



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UNITED STATES PATENT OFFICE.

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CONTROLLING SYSTEM FOR FLUID CRAFT.

1,412,807. Specification of Letters Patent. Patented Apr. 11, 1922.

Application filed July 17, 1919. Serial No. 311,442.

To all whom it may concern:

Be it known that I, HERMAN T. KRAFT, a citizen of the United States, and resident of Akron, Ohio, have invented new and useful Improvements in Controlling Systems for Fluid Craft, of which the following is a specification.

My present invention relates to improvements in the controlling system of any fluid craft and has particular reference to an auxiliary or emergency device, adapted to be brought into use upon temporary inoperativeness of the usual controlling apparatus of such craft.

In fluid craft,—by which I mean to include boats, air ships, that is to say, air planes or dirigibles, hydroplanes, and in fact any craft travelling through water or air,—a rudder or the like is commonly utilized for steering the craft. It frequently happens, however, that the rudder or mechanism associated therewith becomes inoperative, by accident or otherwise, in which case it becomes difficult to maneuver the ship as desired.

The principal object of my invention is, therefore, to provide a device which is built in a craft of the type referred to and which may be used in emergency for controlling the craft.

More particularly it is an object of my invention to provide a device which may be utilized as an auxiliary or emergency rudder of a dirigible, in the event that the usual or regular rudder becomes inoperative or fails to operate as it should.

The above and additional objects of a similar nature, which will be hereinafter more specifically treated are preferably accomplished by such means as are illustrated in the accompanying drawings, described in the following specification, and then more particularly pointed out in the claims which are appended hereto and form a part of this application.

In the drawings, wherein I have illustrated the preferred embodiment of my device as applied to a relatively stationary vertical stabilizing fin of a dirigible:

Figure 1 is an elevation of the device of my invention associated with the usual steering system of a dirigible;

Figure 2 is a bottom view of the structure;

Figure 3 is an enlarged section taken on the line 3—3 of Figure 1 showing both auxiliary rudders in open position; and

Figure 4 is a bottom view of a modified form of the device.

Referring now to the drawings, the numeral 5 designates the usual or ordinary construction of rudder, hingedly connected to the lower vertical stabilizing fin 6 of a gas bag 7.

To the sides of the fin 6, which, of course, is relatively stationary, are secured, by any suitable means, such as hinges 8, a pair of doorlike elements or planes 9 and 9′, one on either side of the fin 6. These elements 9 and 9′, which act as auxiliary or emergency rudders, as will presently appear, are thus hinged at their forward ends and are normally held in inoperative position within recesses 10, formed in the sides of the fin 6, by means of elastic cords or other resilient devices 11 connected to their inner faces, and thus lie normally flush with respective surfaces of the fin 6.

Projecting from the outer face of each element 9 and 9′ is a post 12, having suitable guy wires 13 supporting and strengthening the same, and provided with control wires 14 extending therefrom to the pilot's car for manipulation of the elements 9 and 9′ as and when desired.

In Figure 4 I have shown a modified form of my invention, which consists in substituting a single door-like element or plane 15 in place of the two elements 9 and 9′. This element 15 is pivoted at 16 within an opening 17 formed in the fin 6, and is normally held so that its surfaces coincide with the respective surfaces of the fin 6, by means of an elastic cord 18, or other resilient device. The element 15 is provided with outwardly projecting posts, one supported on each surface of the element 15, which are strengthened by guy wires 19, in a manner similar to the posts 12 of the modification shown in Figures 1–3, and which are provided with the control wires 14.

The purpose and operation of the device of my invention are as follows:

If for any reason the main rudder 5 should fail to operate or should operate improperly, as by the breaking or damage of any parts associated therewith, the pilot will then manipulate the control wires 14 to bring into play the elements 9 and 9′ or the element 15 in Figure 4. The wind thrusts

on the surfaces of these elements will act precisely the same as on the usual rudder to steer the ship in either direction. Either one or both of the elements 9 and 9′ may be operated and to any degree, to obtain the desired steering action.

When the elements 9 and 9′, or 15, are not in use, they lie flush with fin, so that normally the stabilizing function of the latter is not interfered with by their presence.

While I have shown and described these elements 9 and 9′, and 15 disposed for use as emergency rudders, it will readily be understood that their position and use are not limited to this particular function, for instead of arranging them in the vertical stabilizing fin, they may be arranged in analogous relation to horizontal fins or other planes and thus act as emergency elevator planes. Nor, as I have explained above, is the device restricted to use in air craft. It may, with equal advantage be applied to the stabilizing fin of a boat, to be used in case the rudder of the same becomes inoperative.

Hence, changes and modifications as to structure, use, and location may be made which come within the scope of the appended claims without in any manner departing from the essence of the invention as defined thereby.

What I claim is:

1. In a controlling system for craft of the type described, a relatively stationary plane carried by said craft, and having oppositely disposed recessed portions on each surface thereof, a main controlling plane mounted on said stationary plane, an auxiliary controlling plane hinged to the corresponding edge of each recessed portion, means for manually operating said auxiliary planes, and resilient means for normally holding said auxiliary planes in inoperative position in said recessed portions.

2. In the controlling system of a dirigible, a relatively stationary fin having a recess in the surface thereof, a controlling vane hinged to said stationary fin at the edge of said recess, means for manually operating said vane, and means for normally holding said vane in inoperative position within said recess whereby its surface is flush with the surface of said stationary fin.

3. In the controlling system of a dirigible, a relatively stationary fin, a main controlling plane associated with said fin, an auxiliary controlling plane hingedly secured to said fin, means for manually operating said auxiliary plane, and means for returning and holding said auxiliary plane in inoperative position with its surface substantially coincident with the surface of said fin.

4. In the controlling system of a dirigible, a relatively stationary vertical stabilizing fin, a rudder associated therewith, an auxiliary rudder, hinged to said fin, means for operating said auxiliary rudder, and resilient means for returning and holding said auxiliary rudder in inoperative position with its surface substantially coincident with the surface of said fin.

5. In the controlling system of a dirigible, a relatively stationary vertical stabilizing fin, a rudder associated therewith, an auxiliary rudder, hinged to each side of said fin, means for operating said auxiliary rudders, and resilient means for returning and holding said auxiliary rudders in inoperative position with their surfaces substantially coincident with the respective surfaces of said fin.

6. In the controlling system of a dirigible, a relatively stationary vertical stabilizing fin, having a recess in its surface, a rudder associated with said fin, an auxiliary rudder hinged to said fin at the edge of said recess, means for manually operating said auxiliary rudder, and resilient means for normally holding said auxiliary rudder in its inoperative position in said recess.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

HERMAN T. KRAFT.

Witnesses:
L. M. HARTMAN,
E. C. LEADENHAM.