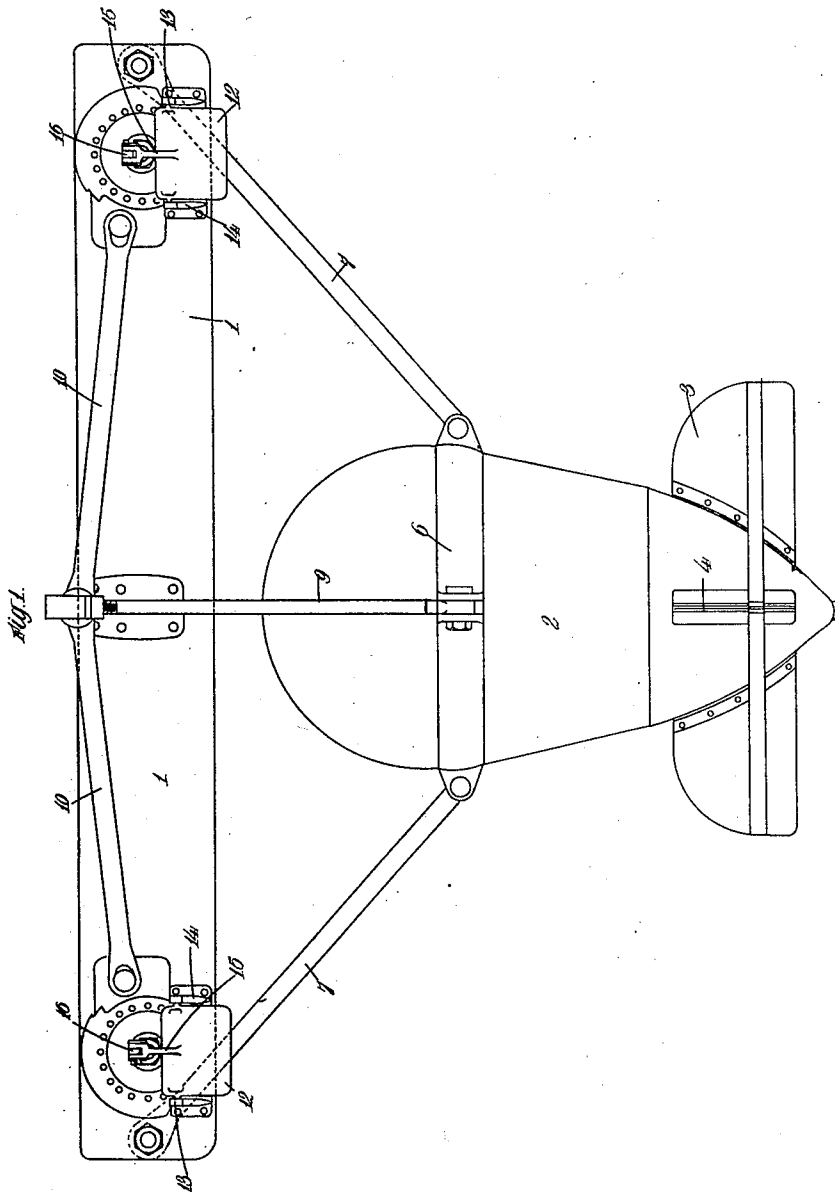


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APPLICATION FILED JULY 22, 1919.

1,358,360.

Patented Nov. 9, 1920.
3 SHEETS—SHEET 1.

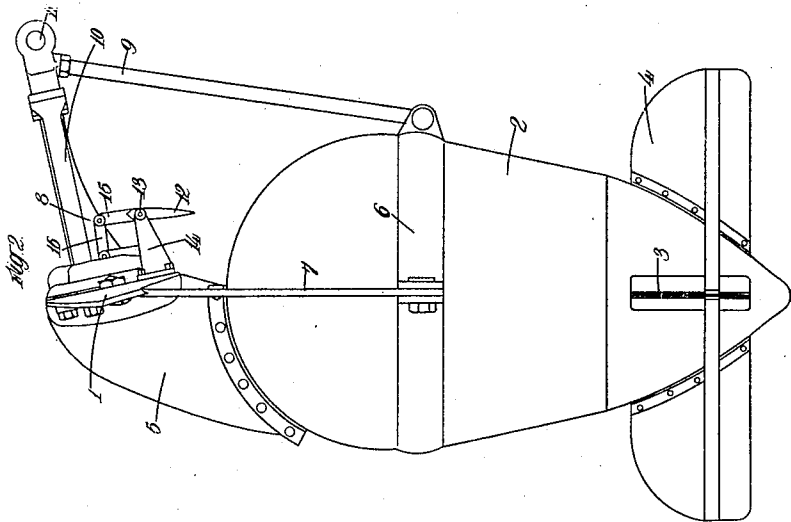


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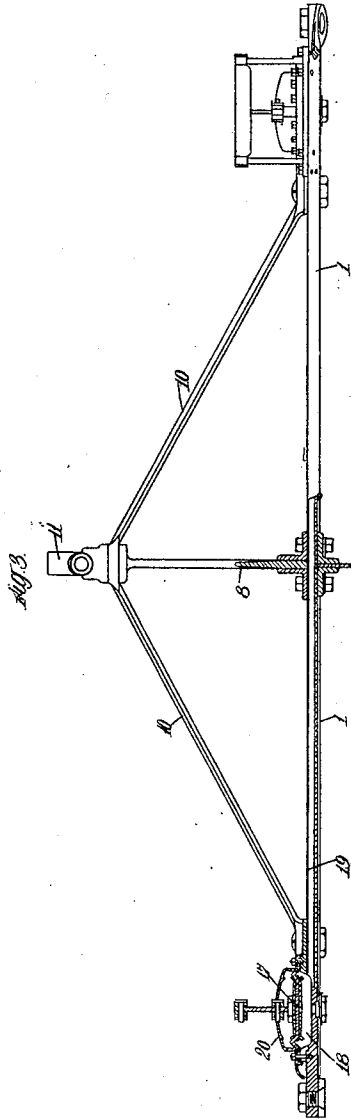


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UNITED STATES PATENT OFFICE.

CHARLES DENNISTON BURNEY, OF ALRESFORD, ENGLAND.

TOWED BODY.

1,358,360.

Specification of Letters Patent.

Patented Nov. 9, 1920.

Original application filed September 18, 1917, Serial No. 192,019. Divided and this application filed July 22, 1919. Serial No. 312,592.

To all whom it may concern:

Be it known that I, CHARLES DENNISTON BURNEY, a subject of the King of Great Britain, residing at Dean Holme, Kilmes-ton, Alresford, in the county of Hants, Eng-land, have invented certain new and useful Improvements in or Relating to Towed Bodies, of which the following is a speci-fication.

This invention relates to towed bodies more especially intended as a defense against submarine mines and also available for purposes of attack, such bodies being now known under the term "paravanes," the chief object of the invention being to provide a simple construction of such bodies adapted when towed to descend to a prede-termined depth.

According to this invention the towed body comprises a transverse depresser plane or plate, which may be flat or cambered, to which plate is attached by a suitable frame a rearwardly extending float, prefer-ably of stream line form, which float may carry an explosive charge. The depresser plane or plate, which is set at an angle to the paravane axis, is preferably provided with a rudder at each end under the con-trol of a gravity and hydrostatic device which varies the angle of the rudders in order to maintain substantially the same depth or to take out any tilt. For this pur-pose a channel filled with mercury extend-ing along the plate and communicating with diaphragm chambers may be provided, the diaphragms differentially operating the rudders through levers. A second member subject to the pressure of the water also controls the lever connection so that the rudders are under the joint control of the water pressure and of the mercury device.

In order that the said invention may be more clearly understood and readily carried into effect the same will now be described more fully with reference to the accompany-ing drawings in which:—

Figure 1 is a plan of a paravane em-bodiment of this invention.

Fig. 2 is a side view of the same appara-tus, and

Fig. 3 is a part elevation and part section of the depresser plane and the controlling rudders.

1 is the depresser plane. 2 is the buoyant body or float, which may carry an explosive

charge and is provided with horizontal and vertical rudders 3 and 4 at its tail, the body having a rounded nose and tapering off to form a relatively sharp tail piece. 5 is a bracket mounted on the front of the float 2 and supporting the plate 1, which is also connected at its ends to a band 6, fitted around the float, by the tie rods 7. A mem-ber 8 projects from the center of the plate in an upward direction and is connected to the band 6 by the tie rod 9 and to the de-presser plate 1 by the stays 10. The member 8 carries at its upper end a towing eye 11 to which the towing cable is attached, so that the paravane is towed from a point situated some distance above the depresser plane 1, which as shown in Fig. 2 is set at an angle to the axis of the float so that when towed from the eye 11 the plate or plane 1 causes the paravane to tow down-ward.

This construction of paravane is espe-cially intended to be towed from the stern of a ship and keeps directly astern and low down so that any mines which may be missed by mine sweeping paravanes which are deflected outwardly from the stem of the ship, as described in the specifications of my co-pending applications Nos. 192018 and 192019, may be caught by the depresser paravane which may, as in the other forms of paravane, be associated with cutting mechanism for the mine cable.

At each side or end of the depresser plane 1 is fitted a small rudder 12 pivoted at 13 to the brackets 14 secured on the plane and provided with a lever arm 15 connected to a control rod 16 which is attached to the diaphragm 17 of a mercury control valve. The diaphragm 17 is secured at its edges as shown in Fig. 3 and closes the upper side of the mercury chamber 18, the two cham-bers 18 being connected by the mercury channel 19 extending along the depresser plate. Should the paravane be tilted the mercury exercises a pressure against the diaphragm 17 which is at the lower side and the corresponding rudder 12 is so ar-ranged as immediately to set itself to give a re-action which brings the paravane level, the reduction of pressure at the opposite diaphragm causing its rudder to set itself so as to assist in the leveling effect.

The rod 16 is also connected to the outer member or case 20 of the control device and

this is subject to the hydrostatic pressure of the water which therefore is adapted independently of the mercury device to cause simultaneous operation of the two rudders

- 5 12. The control device is set to a predetermined depth and the rudders automatically correct for any variation from that depth so as to maintain the paravane, within comparatively small limits of oscillation, at the
10 set depth for any given speed of tow. The rudders 12 may also if desired be given an initial setting in which they are secured.

For purposes of attack, especially against submarines, the buoyant body or float 2 may,
15 as already described, be provided with an explosive charge adapted to be fired electrically or otherwise as described in connection with the paravane of my two copending applications Nos. 192018 and 192019 already referred to.
20

What I claim and desire to secure by Letters Patent of the United States is:—

1. A towed body or paravane comprising a depresser plate extending transversely of
25 the paravane and provided with adjustable rudders and a buoyant body or float connected to the said plate at its rear.

2. A towed body or paravane comprising a buoyant body, a transverse depresser plate
30 situated in front of the said body, a framework connecting the depresser plate and buoyant body so that the plate is held at an angle to the axis of the paravane, a towing connection situated above the depresser
35 plate and an adjustable rudder provided at each end of the said plate.

3. A towed body or paravane comprising a buoyant body, a depresser plate connected to the said buoyant body and extending
40 transversely and a rudder at each end of

the said plate provided with gravity controlled mechanism by which the rudders operate to take out any tilt of the paravane during the tow.

4. A towed body or paravane comprising a buoyant body, a depresser plate connected to the said buoyant body and extending transversely and a rudder at each end of the said plate provided with a hydrostatic device adapted to operate the rudder on any
5 variation from a predetermined depth of immersion.

5. A towed body or paravane comprising a buoyant body, a depresser plate connected to the said buoyant body and extending transversely and a rudder at each end of the said plate provided with a gravity control device and a hydrostatic device adapted to exercise simultaneous control on the rudders so as to take out tilt of the paravane
6 and to correct for variation in depth of tow.

6. A towed body or paravane comprising a buoyant body, a depresser plate connected to the said buoyant body and extending transversely and a rudder at each end of the
6 said plate provided with control diaphragm mechanism supplied with mercury, the diaphragm mechanisms for the two rudders being connected by a mercury channel which permits the mercury to act by gravity so as
7 to operate the rudders differentially, on tilting of the paravane, in order to take out the tilt.

7. A towed body or paravane comprising a depresser plate extending transversely of
71 the paravane and provided with adjustable rudders and a buoyant body or float connected to the said plate at its rear, and carrying an explosive charge.

CHARLES DENNISTON BURNET.