

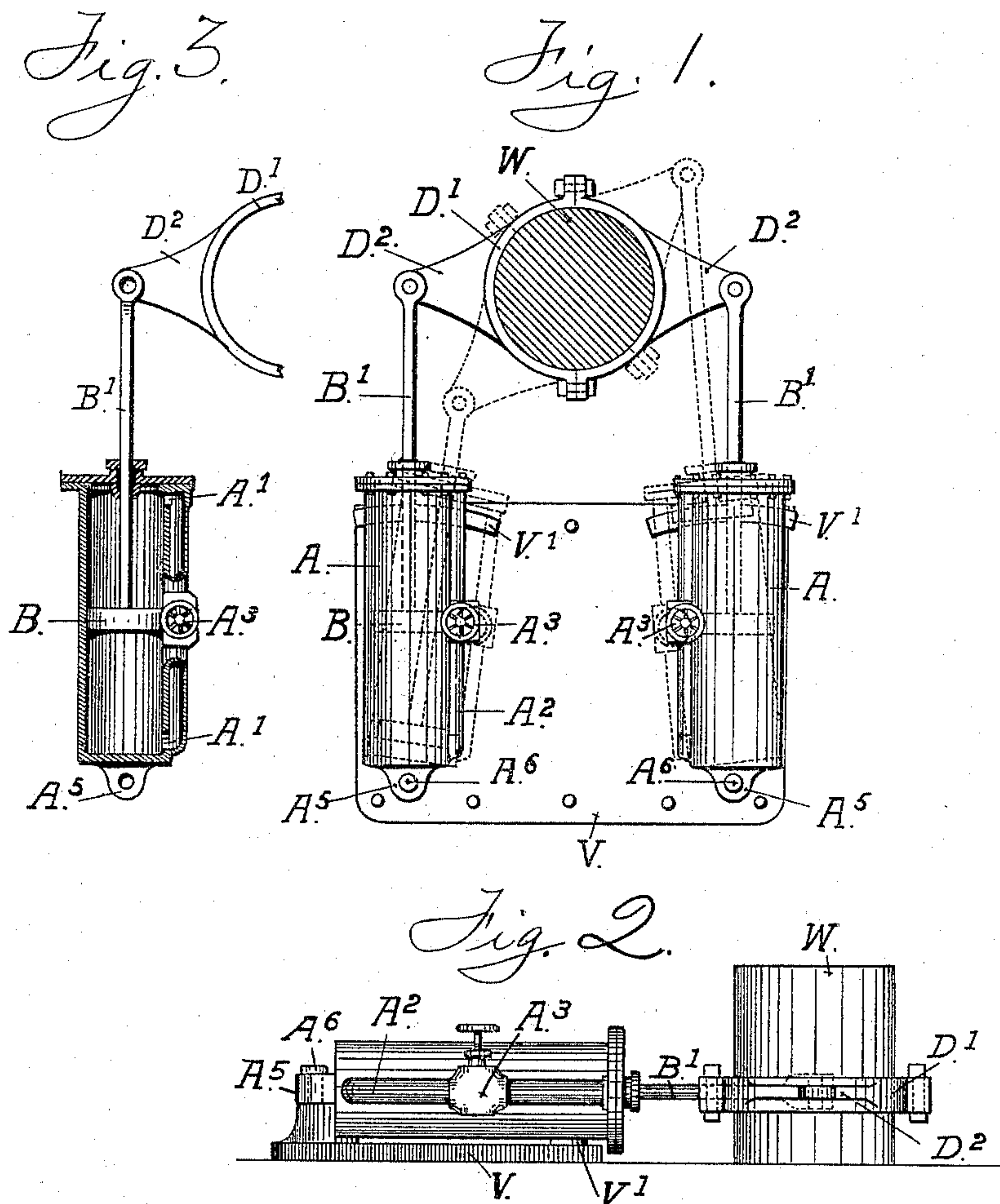
(No Model.)

J. CHRISTENSEN.

MECHANISM FOR CONTROLLING SHIPS' RUDDERS.

No. 495,623.

Patented Apr. 18, 1893.



WITNESSES:

*M. Rogers*

*William Franklin*

INVENTOR:

*Jorgens Christensen*

*by Smith & O'Brien*  
*his Attys*



# UNITED STATES PATENT OFFICE.

JORGEN CHRISTENSEN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO HANS HANSEN HJUL, OF SAME PLACE.

## MECHANISM FOR CONTROLLING SHIPS' RUDDERS.

SPECIFICATION forming part of Letters Patent No. 495,623, dated April 18, 1893.

Application filed June 20, 1892. Serial No. 437,353. (No model.)

*To all whom it may concern:*

Be it known that I, JORGEN CHRISTENSEN, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Mechanism for Controlling Ships' Rudders, of which the following is a specification.

This invention relates to an improved device for holding and controlling a ship's rudder to relieve the rudder and its steering gear from shocks and strains in heavy seas, and the same consists in the described construction and combination of parts producing an attachment for use on rudders of vessels as an auxiliary to and entirely independent of the steering gear as hereinafter fully explained.

My improved device or mechanism consists mainly of a hydraulic cylinder having a piston connected by a piston-rod directly to an arm projecting from the rudder-post and containing within the spaces in front of and behind the piston a body of liquid such as water or oil. The cylinder is set horizontally and in longitudinal position, or "fore-and-aft," in front of the rudder-post; the piston is fitted to work through the head next to the rudder-post, and the cylinder is attached at the opposite end or head to a bed-block or plate on the deck by a pivot. The space within the cylinder is connected at the ends around the piston by a passage in which is interposed a valve to regulate the size of the passage and also to close it, and this passage is not open at any other point to permit either the entrance or exit of any fluid whatever. For large ships I arrange a pair of these cylinders in front of the rudder-post on opposite sides of a longitudinal center line and connect the piston rods to two arms projecting from opposite sides of the rudder-post, as shown in Fig. 1. But for a small vessel or where the shocks and strains to be resisted are not excessive I use a single cylinder and connections.

The following description explains the manner in which I proceed to construct and apply my said invention to a ship's rudder, the accompanying drawings that form part of this specification being referred to by letters.

Figure 1 is a top view of the cylinders and connections by which they are applied to the rudder-post, the full lines representing the position of the parts when the rudder is set in line with the keel and the dotted line indicating their position when the rudder is set hard to port. Fig. 2 is a side elevation showing the left-hand cylinder. Fig. 3 is a top-view in section showing the ports and the passage connecting them together at the ends of the cylinder around the piston.

A is a hydraulic cylinder, B a piston properly fitted with packing to prevent the passage of liquid from one side into the other side of the cylinder, and B' the piston-rod working through a suitable stuffing box in the head of the cylinder.

D' is a heavy ring or collar fixed on the rudder-post W and D<sup>2</sup> is an arm projecting from the side of this collar and forged or made integral with it. The end of the piston-rod is attached to the end of this arm by an eye and a bolt or pin, as shown, to form a loose joint.

A' A' are ports in the side of the cylinder at or near the ends and A<sup>2</sup> is a connecting pipe or passage cored along the side of the cylinder from one port to the other and closed at all points except where it opens at its ends into these ports. A<sup>3</sup> is a valve in this passage to open and close the passage between one port and the other and at about the center of the length of said passage.

A<sup>5</sup> is a lug on the end of the cylinder with a hole to take a short-post or upright pin A<sup>6</sup> secured to the deck, and on this pin as a pivot the cylinder is free to swing in an arc.

V is a bed-plate or block bolted to the deck in front of the rudder-post to carry the pins A<sup>6</sup> and furnish necessary support under the cylinder to keep the piston-rod in line.

V' is a segment track or way standing above the bed-plate under the outer end of the cylinder on which the bottom of the cylinder rests.

In the arrangement shown in Fig. 1 the two cylinders are mounted on one bed-plate and the piston-rods are connected to the rudder-post on opposite sides of the center. As thus constructed the device is put in working condition by filling the cylinders with liquid



through an opening provided for that purpose in the top of each cylinder and then tightly closing and sealing the opening. Liquid can be also introduced from time to time through  
5 the same opening to replace the loss by leakage.

A greater or less degree of resistance to the movements of the rudder is produced by turning the valve A<sup>3</sup> in the proper direction either to reduce or to increase the area of the liquid-  
10 passage: or the rudder can be locked and held at any point by shutting the valve. Even at this time it will be understood that one-half of the length of the passage at least must be filled with the liquid and this will offer a cer-  
15 tain amount or volume of said liquid as a cushion or buffer so that, when the rudder is struck by heavy waves, it will not be broken as would be the case if it were locked rigidly in place. Of course if the piston stands at  
20 about the center of the length of the cylinder, there will be an additional volume of liquid within each half of the cylinder to serve as a further cushion; but if the rudder is locked at a great angle (as shown in dotted lines in  
25 Fig. 1) the greater part of the strain would be on the front side thereof and this would be resisted by the larger cushion afforded by the liquid throughout almost the entire length of

the cylinder together with that in one-half of the passage. 30

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination with a rudder-post having a radially-projecting arm, a piston rod piv- 35 oted to said arm, and a piston head carried by the rod; of a bed secured to the deck, a hydraulic cylinder having a passage cored in its side and communicating only through ports with the opposite ends of the cylinder, one of 40 said ends being closed and having a lug pivoted to the bed so that the piston shall stand at about the center of the length of the cylinder when the rudder is in alignment with the keel and the other end of the cylinder 45 having an opening for the passage of the piston rod, and a valve at the center of said cored passage for regulating its size or closing it entirely, as and for the purpose set forth.

In testimony that I claim the foregoing I 50 have hereunto set my hand and seal.

JORGEN CHRISTENSEN. [L. S.]

Witnesses:

C. W. M. SMITH,  
CHAS. E. KELLY.