

L. LACOSTE.
SHIP BRAKE.

APPLICATION FILED APR. 23, 1908.

Patented Apr. 6, 1909.

3 SHEETS—SHEET 1.

917,618.

Fig. 1.

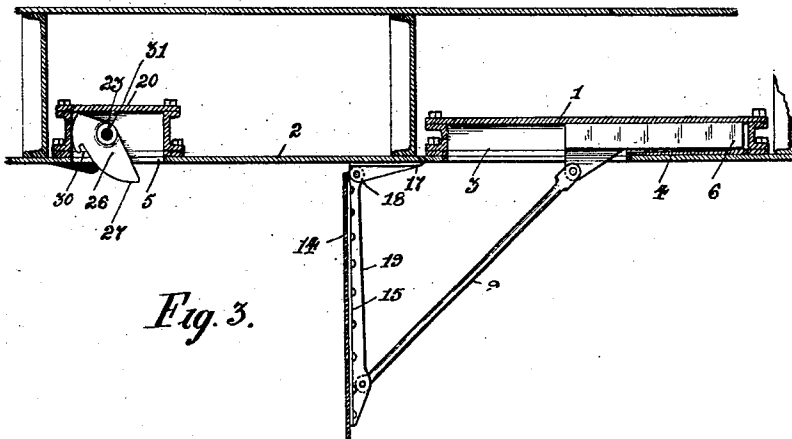
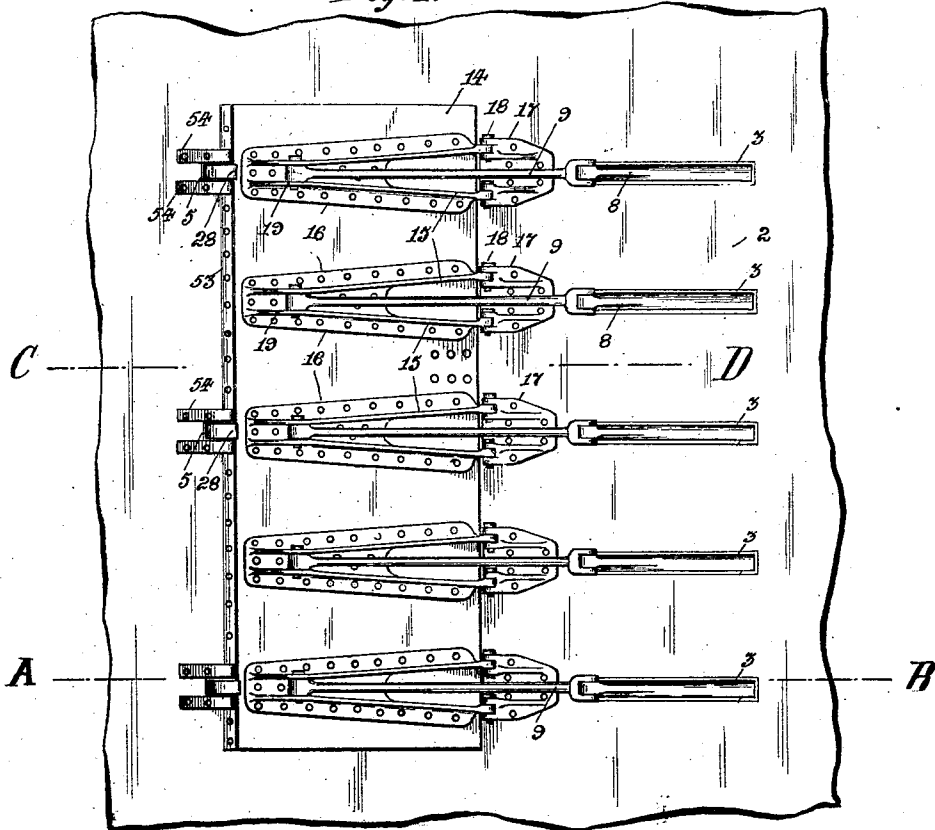


Fig. 3.

Witnesses.

Lloyd A. Blackmore,
Henry Davis.

Inventor.

Louis Lacoste
By E. J. Götterström,
Atty.

L. LACOSTE.
SHIP BRAKE.

APPLICATION FILED APR. 23, 1908.

Patented Apr. 6, 1909.

3 SHEETS—SHEET 2.

917,618.

Fig. 2.

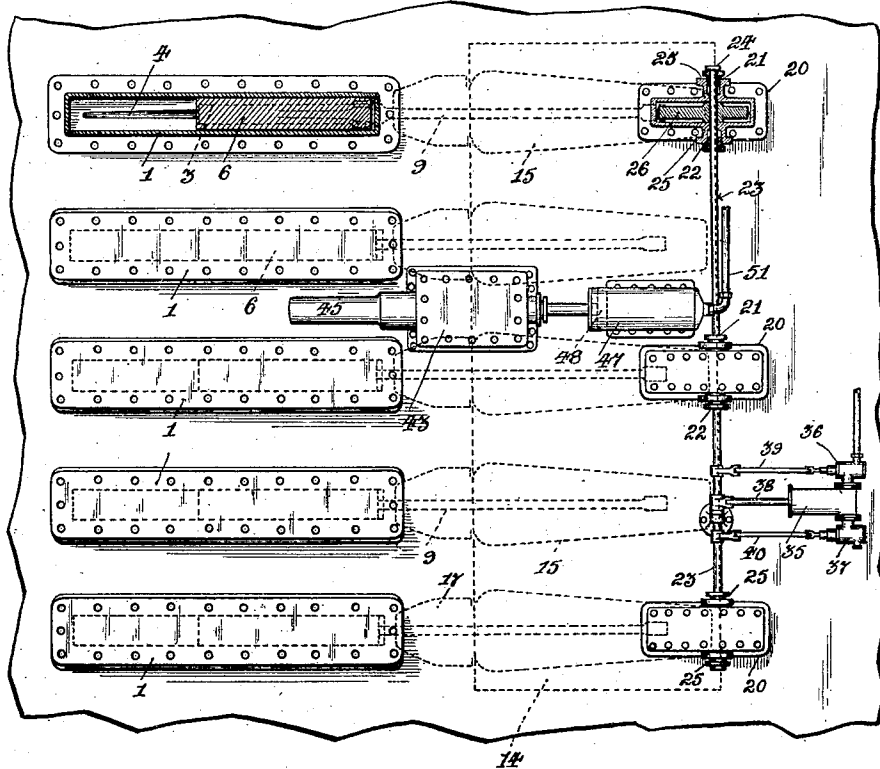
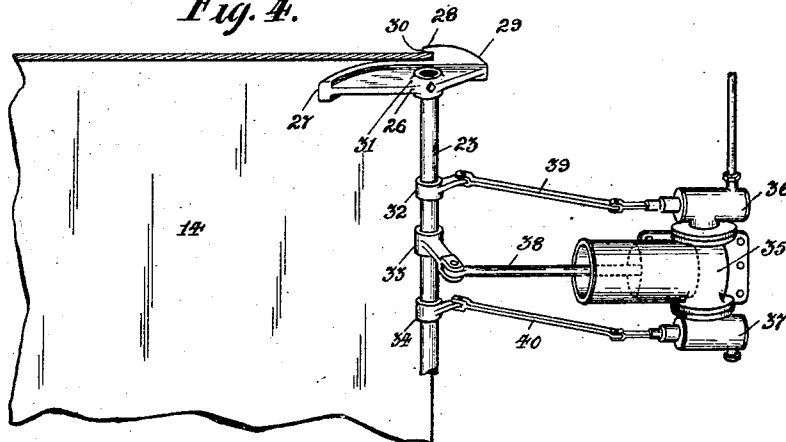


Fig. 4.



Witnesses.

Lloyd Blackmore.
Harry Davis.

Inventor.

Louis Lacoste
By C. F. Atkinson, Jr.
Atty.

917,618.

L. LACOSTE.
SHIP BRAKE.
APPLICATION FILED APR. 23, 1908.

Patented Apr. 6, 1909.

3 SHEETS—SHEET 3.

Fig. 7.

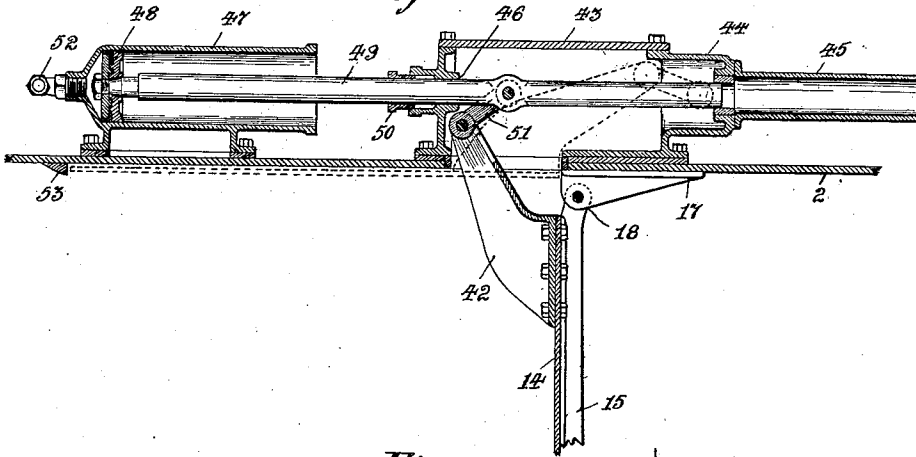


Fig. 5.

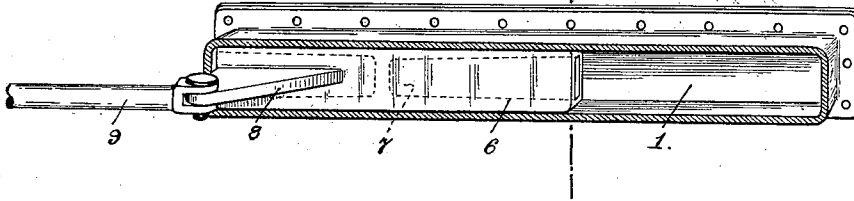


Fig. 8.

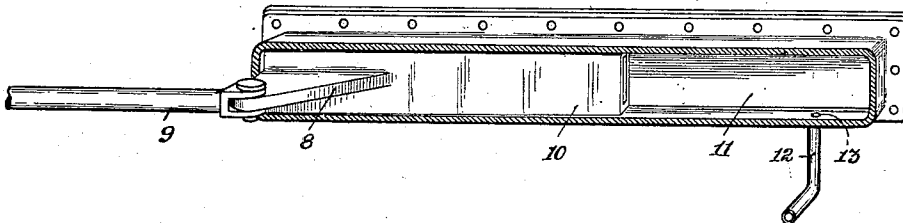


Fig. 6.

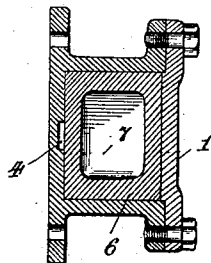
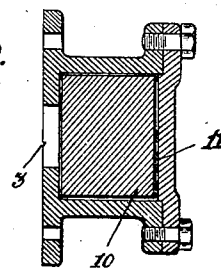


Fig. 9.



Witnesses.
Lloyd Blackmore
Harry Davis.

Inventor.
Louis Lacoste
By *E. J. Vetterstaugh*
Atty.

UNITED STATES PATENT OFFICE.

LOUIS LACOSTE, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO LACOSTE SHIP BRAKE COMPANY LIMITED, OF MONTREAL, CANADA, A CORPORATION OF CANADA.

SHIP-BRAKE.

No. 917,618.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed April 23, 1908. Serial No. 428,817.

To all whom it may concern:

Be it known that I, LOUIS LACOSTE, a subject of the King of Great Britain, residing at 7 Place d'Armes, in the city of Montreal, in the district of Montreal, in the Province of Quebec, in the Dominion of Canada, have invented certain new and useful Improvements in Ship-Brakes, of which the following is a specification.

The invention relates to improvements in ship brakes, as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially in the novel construction and arrangement of parts whereby the water cushion formed to receive the impact of the plunger connected with the wing is gradually diminished and particular means are employed for opening the wing and receiving and retaining it to its closed position.

The objects of the invention are to entirely eliminate any strain on the ship's side from the effect of the opening of gates during the forward and rapid motion of the ship, to retard the ship's forward progress suddenly and without shock and generally to simplify such devices and furnish a construction durable and efficient in operation.

In the drawings Figure 1 is an exterior view showing a side elevation of a portion of a ship's side and one of the wings forming part of the ship's brakes. Fig. 2 is an interior view showing an elevation of a portion of the ship's side and the operating parts for opening and closing the wing. Fig. 3 is a cross sectional view on the line A—B in Fig. 1. Fig. 4 is a perspective detail of the means for operating the parts that open the wing. Fig. 5 is a sectional perspective detail enlarged of a plunger well. Fig. 6 is a cross sectional view of the plunger and plunger well casing as illustrated in Fig. 5. Fig. 7 is a sectional view on the line C—D in Fig. 1. Fig. 8 is a perspective detail enlarged showing a modified form of plunger well. Fig. 9 is a cross sectional view of the plunger and plunger well casing as illustrated in Fig. 8.

Like numerals of reference indicate corresponding parts in each figure.

In the known construction of devices for braking the speed of ships, there are many which include the use of gates, fins or wings opening out from the bow, stern or sides of

the ship and it is entirely with the means of opening and the means of sustaining the shock of opening without injury to the ship that the present invention has been made, and further this invention has to do with improvements on the device for braking the speed of the ship as patented under United States Letters Patent Number 681713, granted on the 3rd. of September, 1901.

Referring to the drawings, 1 are the plunger wells or boxes here shown as secured to the inner face of the outer side wall or skin of the ship 2, below the water line, the said outer wall forming one side of said wells and having the longitudinal slots 3 therethrough leading into the forward portions of said wells. 4 are grooves longitudinally arranged in the inner faces of the said walls 2 in the interior of said plunger wells 1 and extending from the slots 3 into proximity to the extreme rear ends of the said plunger wells and tapering toward their rear extremities. 5 are openings through the side wall 2 in vertical arrangement and preferably in alinement with the plurality of slots 3. 6 are plungers preferably of hollow formation having the central division walls 7 in said hollows adapted to back up against the water cushion and said plunger wells. 8 are lugs extending outwardly from said plungers through the slots 3. 9 are struts pivotally joined at their rear end to the said lugs 8.

The plungers 6 travel in the plunger wells 1 fitting closely in said wells and backing up against the water ordinarily contained in said wells during the progress of the ship, said water during the action of said plunger backing up and forming a compressed water cushion in the rear end of said well but finding egress from said well slowly through the grooves 4, the opening into said groove becoming narrower as the plunger slides rearwardly, thus permitting less water to flow from said well in order that the cushion shall not be diminished too rapidly, as the plunger comes into proximity with the rear extremity of the well.

In Figs. 8 and 9 the means for permitting egress of water is of somewhat different arrangement and in said figures, the plunger 10 is of slightly smaller dimensions in outside measurement than the inside measurement of the plunger well 11, sufficiently so to permit the water to gradually ooze out there-

around. In addition to said egress means an exhaust port 13 is arranged in proximity to the rear end of the said plunger well 10 having the pipe 12 therefrom leading through the ship's side, thus practically the same effect is accomplished, as with the aforesaid longitudinal grooves, for while there is a continual escape of water very slowly around the plunger, the main portion of the water goes through the exhaust port 13 which though near the rear extremity of the said plunger well 11 is still intermediate of the length of said well.

14 is a wing folding to the side of the ship below the water line and intermediate of the length of said ship, one or more of said wings being arranged on each side of said ship, preferably in pairs.

15 are hinges having the leaves 16 securely bolted to the outside face of the wing 14, centrally in alinement with the slots 3, and their leaves 17 securely bolted to the wall 2 of the ship, the knuckles 18 of said hinges being arranged to permit said wing to fold flatly to the ship's side. The leaves 16 have the longitudinal ribs 19 between which, near to the forward ends, the struts 9 are pivotally secured, consequently the wings 14 are connected with the plungers 6 or 10, as the case may be, by the said struts. It will thus be seen that through the said connection of the said wing with the plungers, a means is provided for relieving the impact of the sudden opening of said wing from the side of the ship, as in the forward movement of the ship, when the wing suddenly opens and the weight of water presses thereagainst, the water in the plunger wells will gather in the end of said plunger wells, being forced thereto by the said plungers, and in its compressed state furnish a water cushion, against which the said wing is gradually opening, for the said water cushion is diminishing through the egress of water by way of the grooves 4 or the exhaust port 12, as the case may be.

20 are comparatively small casings securely bolted to the ship's side around the openings 5 and having the journal orifices 21 and 22 through the top and bottom respectively and in vertical alinement. In securing said boxes to the side of the ship, the joints therearound are made water-tight in any suitable manner. 23 is a rod journaled in the orifices 21 and 22 and extending above the topmost of said boxes and below the lowermost, a suitable collar 24 being arranged at the top thereof to retain said rod in position. 25 are stuffing boxes through which the said rod 23 extends into and from said casings 20.

26 are arms fixedly mounted on the rod 23, each formed with the arc-shaped extremity or finger 27 and the short thumb piece 28, said thumb piece being the extremity of the enlarged rear end 29 of said arm and form-

ing between itself and the arc-shaped finger, the recess 30, into which the forward end edge of the door folds, the said arms 26 being mounted at the apexes of their inner angular sides 31.

32, 33 and 34 are cranks fixedly mounted on and extending laterally from the rod 23.

35 is an air cylinder rigidly supported from the ship's side and having inlet and exhaust ports connected respectively to the valve chambers 36 and 37, said valve chambers preferably forming part with the casing of said cylinder 35 and being in the path of the fluid operating the piston in said cylinder.

38 is a piston rod connected to the piston operating in the main air cylinder 35 and to the crank 33, the valves in said valve chambers being pivotally connected to the cranks 32 and 34 by the rods 39 and 40 respectively, thus when the air or other fluid is turned on, emanating from a suitable source of supply, from the bridge or other part of the ship, the said air will flow freely through said valve chamber 36 into the main cylinder and to the rear of the piston, the said piston then traveling outwardly in said cylinder and operating the crank 33 and coincidentally the cranks 32 and 34, in order to turn the cranks 32 and 34 and close both the inlet and exhaust valves, while the pressure of air remains. The effect of operating the crank 33 is that the rod 23 is turned and as the said rod is turned, the arms 26 are also rotated the finger portions 27 in rotation projecting outwardly through the openings 5 in the side wall of the ship, being arranged opposite to said openings, and as the wing 14 closes partly over said openings, the fingers 27 engage the inner face of the door. The thumb pieces 28 as they are part of the same arms 26 move from engagement with the outside face of the door, so that there is no obstruction to the said fingers in pushing the front edge of said door outwardly. The weight of the water in the rapid forward movement of the ship accomplishes the rest.

42 is an arm rigidly secured to the inner face of the wing 14 intermediate of the height of said wing and extending inwardly in a rearward direction from said wing behind the side wall of the ship through a suitable opening in said side wall. 43 is a casing around said opening through which said arm extends and is securely bolted to the side of the ship, the joints being made water-tight in any suitable manner. The casing 43 has the reduced end 44 and the further reduced end 45 extending therefrom, said reduced ends preferably being separate pieces bolted together in longitudinal arrangement and supported from said main portion, said main portion at its other end having the central orifice 46 therethrough.

47 is a cylinder rigidly secured to and sup-

ported from the side of the ship in alinement with the casing 43 and open at one end and having suitable inlet and exhaust openings. 48 is a piston traveling in said cylinder. 49 is a piston rod extending from said piston through the central opening 46 in said casing 43 and into said further reduced end 45. 50 is the stuffing box formed to the outside of the central orifice 46 in the casing 43 and through which said piston rod 49 extends.

51 is a link pivotally joining the extreme end of the arm 42 with the piston rod 49 intermediate of the length of said piston rod and inside of the casing 43.

52 is a pipe by means of which the cylinder 47 is connected to an air supply and to the operating valve which may be in any part of the ship, preferably on the bridge within easy reach of the commander.

Having described the various parts in detail, I shall now more particularly explain the operation of the invention. The operating levers controlling the air valves or any other fluid, or means of operating, such as electric, are preferably located within easy reach of the commanding officer of the ship, so that at a moment's notice, he may, without giving any signal whatsoever, control the position of the wings 14, and consequently the speed or direction of the ship. The wings 14 are normally folded flat against the side of the ship being of comparatively light steel plate and offering little or no resistance at their forward edge, though this may even be eased off by the beveled jamb such as shown in the strip 53. The forward edge of the door is held firmly in the recesses 30 between the finger and thumb pieces of the arms 26 the back of the projecting thumb pieces being protected by suitable shields 54, thus everything is quite snug in the ordinary travel of the ship and the wings being quite below the water line, there is no evidence to the eye of any particular arrangement of brakes whatsoever and, as has been explained, not sufficient resistance in the projecting parts to in any way impede the progress of the ship. In the event of it being necessary to avert a collision or for any other reason suddenly stop the progress of the ship, the commanding officer opens the valve permitting a flow of air through the pipes leading to the inlet valve chambers herein pointed out as valve chamber 36, and as the path is quite clear, for the passage of said air or fluid, the piston is moved forwardly in the main air cylinder 35 turning the rod and projecting the fingers 27 outwardly against the inner face of the wings 14, the thumb pieces being part of the same arms 26 move with the movement of the fingers, thus releasing the wings, with the consequence that the wings are slightly open and the weight of the water resulting from the rapid forward movement of the

ship presses on the inner faces of the wings, but the impact is taken by the water cushions in the plunger wells, which gradually diminish, as fully described. The progress of the ship has now been suddenly checked and the wings will continue such checking, until the said ship floats idly and with only the ordinary weight of water against the wing on both inner and outer faces, that is to say, an even pressure from each side. In this position, the wings may be readily closed as they will simply fold inwardly moving through the water without any great power being necessary to so close them to the sides. This closing is done by means of feeding air to the cylinder 47 and the feed of such air may be controlled by the commanding officer if desirable. The outward movement of the piston 48 in the cylinder 47 forces the rod 49 along within the casing 43 carrying the link therewith and consequently pulling inwardly and rearwardly on the arm 42, until the said link and arm have been drawn to their extreme rearward position as shown in dotted lines in Fig. 7. The wings are then in their closed position folding inwardly against the projecting fingers 27 and rotating the rod 23 the forward edges of said wings automatically locking themselves into the recesses 30. This particular means of opening, closing and retaining the wings in the closed position, is an extremely important feature in ship building and is particularly useful for closing the gates and doors in the sides of ships and consequently may be used in various ways not necessarily being confined to the particular form of wing described. Further, the operating mechanism of the opening and closing means may be changed to suit existing conditions and the particular arrangement of the various rods, as also the attaching of the wings to the ship's sides for many variations have to be made where the wings are attached to the sides of a ship previously constructed in a manner not to include such braking devices and similarly it may be said that where the ship is in its design made to receive said wings, the details may not be precisely as described.

What I claim as my invention is:

1. In a ship brake, the combination with the side wall of the ship having a suitable opening therethrough and a wing hinged to said side wall, of a casing secured to said side wall and having an opening therefrom leading through said side wall, an arm rigidly secured to the inner face of said wing and projecting inwardly through said opening, a cylinder suitably supported from the side wall of the ship having a suitable inlet and exhaust and connected to an expansile fluid supply, a piston operating in said cylinder, a piston rod extending from said piston into said casing and connected to said arm, and a

link connection from said arm to said piston rod within said casing.

2. In a ship brake, the combination with the ship's side wall, and a wing swinging outwardly and rearwardly from said side, of a plurality of casings having suitable openings therefrom and secured to the inner side of the ship's wall, a rod suitably journaled and extending through said casings, an arm fixedly mounted on said rod in each of said casings having arc-shaped fingers extending out through said openings and thumb pieces substantially parallel with the inner portions of said fingers and forming a recess into which the forward edge of said wing fits, and means for turning said rod.

3. In a ship brake, the combination with the ship's side wall, of a wing swinging outwardly and rearwardly from said side wall, a casing secured to the inner side of the ship's wall having a suitable opening therefrom, a rod extending through said casing and journaled in suitable bearings, an arm fixedly mounted in said casing and having an arc-shaped finger adapted to project outwardly through said opening and a thumb piece forming a recess between said finger and itself to which said wing closes, a crank fixedly mounted on said rod and means for operating said crank.

4. In a ship brake, the combination with the side wall of the ship, of a wing hinged at its rearmost edge to the side of the ship, a vertical rod journaled on suitable bearings extending inwardly from said wall, an arm fixedly secured on said rod projecting through said side wall and having an arc-shaped finger extending therefrom, and a thumb piece extending therefrom parallel to the inner end of the convex side of said finger and forming a recess therebetween into which the forward edge of said wing extends, means secured to said rod for rotating the same and causing said finger to contact with the inner face of said wing and said thumb piece to rotate away from contact with the outer face of said wing, a chamber suitably supported and inclosing said arm, and means for supporting said wing in its outward position

against the pressure of water on the inner face.

5. In a ship brake, a pair of wings hinged to the side walls of the ship and swinging rearwardly, a plurality of struts pivotally secured to the outer faces of said wings, a plurality of plunger wells rigidly secured to said side walls and a plurality of plungers contained in said plunger wells and connected to said struts through the said side walls, said plungers and said plunger wells forming a passage therebetween from the sternward ends of said wells to the strut openings at the forward ends for the gradual reduction of the water cushion behind said plungers on the sudden opening of said wings.

6. In a ship brake, a wing opening outwardly from the side wall of the ship and swinging in a sternward direction, a plunger-well secured to the side of the ship and a plunger traveling in said well connected with said wing, said plunger well having a longitudinal passage therefrom for the gradual reduction of the water cushion behind the plunger on the sudden opening of the wing.

7. In a ship brake, a plurality of submerged casings firmly secured to the ship's side and having openings thereinto through which the water may flow freely, a plurality of plungers contained within said casings and sliding longitudinally therein, said parts being arranged with a longitudinal passage from the rear of the plungers leading to said water ingress opening forming a means of gradually reducing the water cushion behind said plunger at a predetermined rate of diminution, a plurality of wings swinging outwardly and folding to the ship's sides, and flexible means connecting said plungers to said wings.

Signed at the city and district of Montreal, in the Province of Quebec, in the Dominion of Canada, this 21st day of April 1908.

LOUIS LACOSTE.

Witnesses:

GRACE TRESIDDER,
H. DAVIS.