P. E. GATCHELL.

SHIP BRAKE.

APPLICATION FILED NOV. 27, 1916.

1,256,786.

Patented Feb. 19, 1918.

2 SHEETS—SHEET 1.

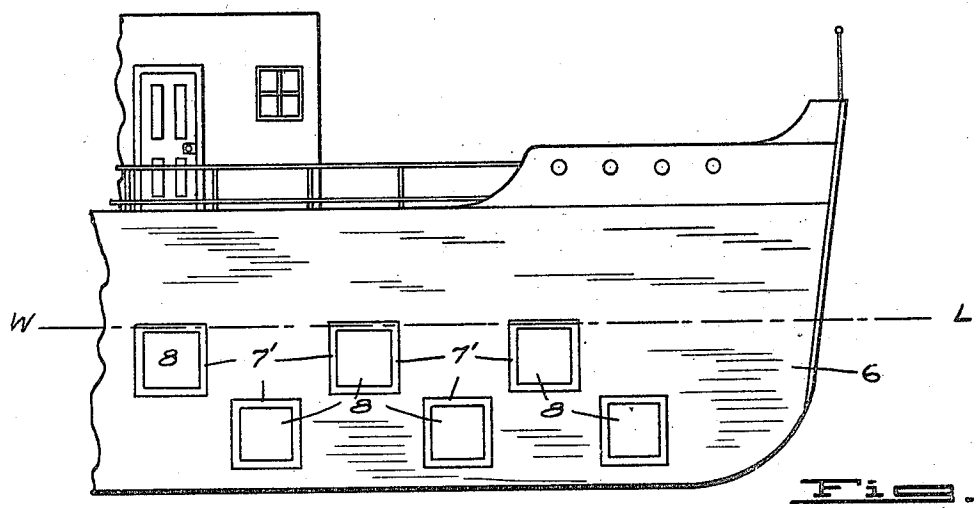


Fig. 1

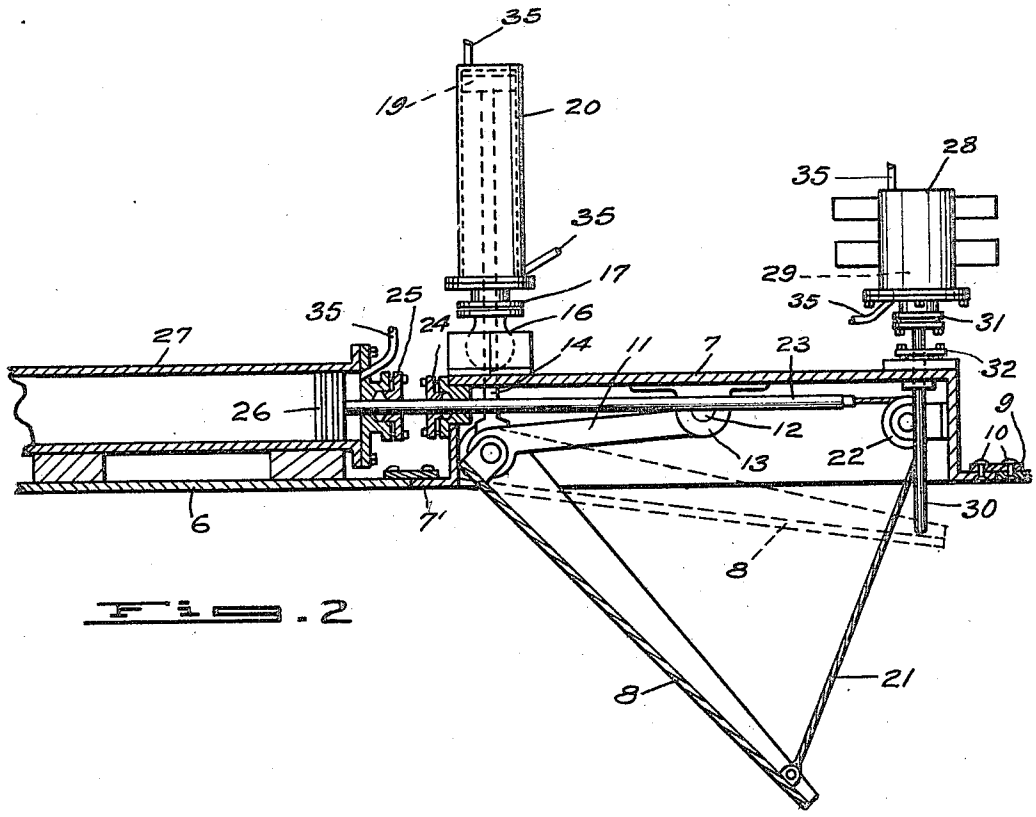


Fig. 2

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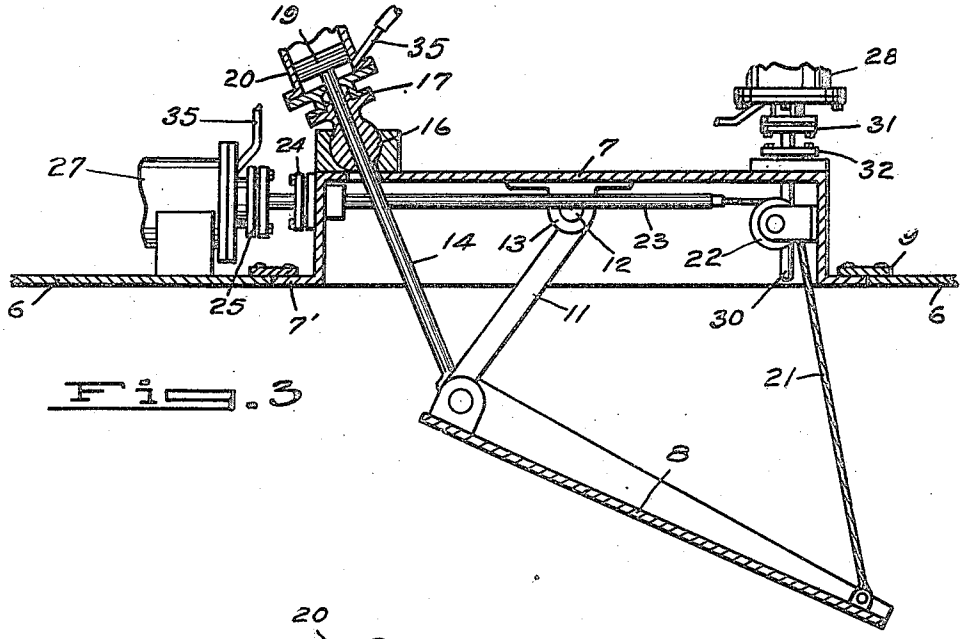


Fig. 3

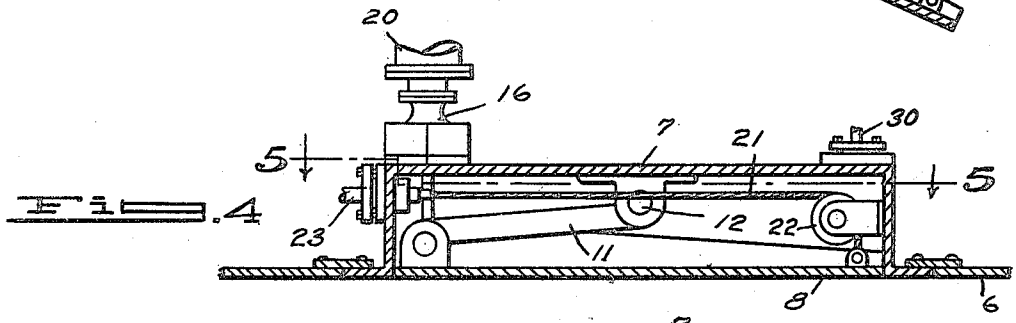


Fig. 4

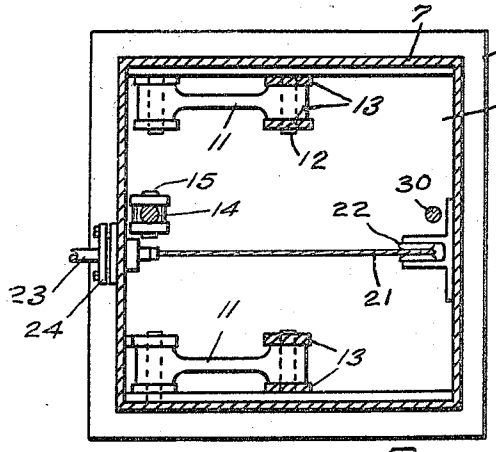


Fig. 5

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SHIP-BRAKE.

1,256,786. Specification of Letters Patent. Patented Feb. 19, 1918.

Application filed November 27, 1916. Serial No. 133,806.

To all whom it may concern:

Be it known that I, PRESTON E. GATCHELL, a citizen of the United States, residing at Buckley, in the county of Pierce and State of Washington, have invented new and useful Improvements in Ship-Brakes, of which the following is a specification.

This invention relates to improvements in ship brakes of a form that may be hinged like a door to the side of a ship below the water line and are adapted to swing outwardly at an angle to the side of the ship to offer resistance to the water when the ship is to be stopped or turned.

The chief object of this improvement is to hinge a brake door of the above described form so that when the brake door is open the rear end thereof may be released and permitted to move outwardly preparatory to closing or releasing the door, thereby permitting the water to pass between the brake door and the side of the ship and making it possible to close the brake door while the ship is in motion and without applying a great amount of power to overcome the braking pressure of the water.

The invention consists in the novel construction, adaptation, and combination of parts of a ship brake, as will be more clearly described in the following specification, illustrated in the accompanying drawings, and finally pointed out in the appended claims.

I am aware that ship brakes of the form that are hinged like a door to the side of a ship and stand at an angle thereto when in the braking position have previously been constructed, but all these brakes with which I am familiar have been hinged directly to the side of the ship and require a great deal of power to close them when the boat is moving ahead. My brake overcomes this difficulty by permitting the rear end of the brake door to swing outwardly, thus making an opening between the brake door and the side of the ship for the passage of water, causing the brake door to be presented more nearly edgewise to the direction of movement of the boat and permitting the brake door to be easily closed.

In the accompanying drawings, Figure 1 is a view in elevation of the front end of a ship upon which my invention is installed; Fig. 2 is a fragmentary view in sectional elevation, illustrating one of the brakes in an operative position; Fig. 3 is a view similar to Fig. 2, showing the brake member in one position it may assume preparatory to being closed; Fig. 4 is a view similar to Fig. 2, showing the brake member in a closed position; and Fig. 5 is a view on a reduced scale substantially on broken line 5, 5 of Fig. 4.

Referring to the drawings throughout which like reference numerals indicate like parts, the numeral 6, Fig. 1, indicates the hull of a ship that is adapted to be immersed in water to the level indicated by the water line WL; and 7 are housings that are built in the sides of the ship flush with the outside surface thereof and form frames that contain swinging brake doors 8 of a type more clearly shown in the detail views.

It is obvious that any desired number of the brake doors and operating mechanism therefor may be installed on a ship, each constituting a separate unit.

The housings 7 are preferably formed with out-turned flanges 7′ and are secured to the sides of the boat 6 by strips of metal 9 and rivets 10, as more clearly shown in Figs. 2, 3, and 4.

The brake doors 8 are each pivotally secured at or adjacent to their rear edge to the rear ends of hinge arms 11 that extend forwardly and have their front ends connected by pivots 12 with fixed lugs 13 on the rear wall of the housing 7 about midway from front to rear end of the housing in such manner that when the doors 8 are opened as shown in Fig. 3 they will be supported in an extended position without sagging or dropping down.

The rear end of each of the doors 8 is normally held in the closed position by a piston rod 14 secured thereto by pivot 15 and projecting inwardly through ball and socket joint 16 and stuffing box 17, and being secured to piston 19 disposed within pneumatic cylinder 20.

The forward end of each door 8 is secured to a cable 21 that passes over a pulley 22 and is connected with the end of a piston rod 23 that extends rearwardly through the rear wall of the housing 7 and through stuffing boxes 24 and 25 and is secured to a piston 26 within a pneumatic cylinder 27 that is secured to the side of the ship.

28 is a pneumatic cylinder fixedly secured within the ship near the forward end of the housing 7 and having a piston 29 that carries a piston rod 30 that projects outwardly through stuffing boxes 31 and 32,

and is adapted to engage the forward end of the brake door and move it outwardly a slight distance so that such door may be caught and opened by the water at the sides of the moving ship.

The pneumatic cylinders 20, 27, and 28 are each provided at both ends with air pipes 35 that lead to suitable control mechanism (not shown) preferably located in the pilot house of the ship whereby air may be admitted to the cylinders to drive the pistons in either direction.

When the brakes are not in use they are closed and occupy a position flush with the outer surface of the ship so that they offer no additional resistance to the water and do not lessen the speed of the ship, it being obvious from Fig. 4 that all of the operating mechanism, hinges, and the like for the brake doors are completely housed when the doors are closed.

When it is desired to stop the ship quickly the air control may be operated to admit pressure behind the piston 29 in the cylinder 28, and at the same time the pressure in front of the piston 26 in the cylinder may be released, thus permitting the cable 21 to slack and the piston rod 30 to press the front end of the brake door outwardly into a position as shown by broken lines in Fig. 2 so that it will be caught by the water rushing past the side of the boat and moved into the braking position shown by full lines in Fig. 2.

During the movement of the brake door 8 from the closed to the open position, the air in the forward end of the cylinder 27 is permitted to escape through the relatively small pipe 35 and thus serves as a pneumatic cushion to prevent the brake door 8 from being arrested abruptly and breaking the cable 21.

When it is desired to close the brake door the air pressure in the cylinder 20 in front of the piston 19 is reduced and the force of the water is allowed to move the rear end of the brake door outwardly into the position shown in Fig. 3, thus giving the water a free passage between the rear end of the brake door and the ship and permitting the front end of such door to be moved inwardly to a closed position by admitting air under relatively low pressure to the forward end of the cylinder 27.

At the same time the forward end of the door 8 is being closed compressed air may be admitted to the forward end of the cylinder 20 to move the rear end of the door 8 inwardly into a closed position.

The ball and socket joint 16 is an essential feature of this device since it serves as a support for the pneumatic cylinder 20 and permits such cylinder to assume any angle between the positions shown in Figs. 2 and 3 respectively.

When brake doors 8 of relatively large size are thrown outwardly at an angle to the sides of a moving ship they form pockets opposed to the water that is rushing past the sides of the ship and offer a great braking resistance.

It is obvious that when the ship is moving and the brake doors are open as shown in Fig. 2, it will require a strong pull on the cable 21 to close the doors if the rear ends of such doors can not be moved outwardly. It has been demonstrated by experiment that it is impractical to close brake doors that are hinged to a fixed support at their rear ends without bringing the ship almost to a stop. My invention obviates this difficulty and permits the doors to be closed when the ship is moving through the water at a high velocity.

Another advantage of my invention resides in the efficiency of its operation in turning a ship; for instance, the brake doors on one side of the ship may be opened to turn the ship quickly and such doors may be closed without stopping the ship after the latter has been turned.

The air control for the cylinders 20, 27, and 28 forms no part of this invention and is not illustrated and described in detail, it being understood that any well-known means of admitting and releasing compressed air to the ends of the cylinders may be employed.

Obviously changes in the form of construction of my invention may be resorted to within the scope of the claims.

What I claim and desire to protect by Letters Patent is:

1. A ship brake, comprising a housing provided in the side of a ship, links pivoted at their forward ends to said housing, a brake door having its rear edge pivotally secured to the rear ends of said links, means for supporting the front end of said door in an open or a closed position, and means for holding the rear end of said door and permitting said rear end to be moved outwardly to facilitate the closing of said door.

2. A ship brake, comprising a housing forming a recess in the side of a ship, a door adapted to close the outside of said recess, said door being flush with the outside surface of said ship when it is closed, links pivoted to the walls of said housing and, to the rear end of said door, means secured to the front of said door for holding said door in an angular open position against the pressure of water and means secured to the rear of said door for hbldíng said door inwardly, said last named means being adapted to be released to permit the pressure of water to move the rear end of said door outwardly to facilitate closing of said door.

3. In a ship brake the combination with

a housing provided in the side of a ship, of links pivoted at their forward ends to said housing, a brake door having its rear end pivoted to the rear end of said links whereby the rear end of said door will be permitted to swing outwardly on a radius formed by said links, a cable secured to the forward end of said door to hold said door in open or closed position, means for moving said door outwardly a slight distance from the closed position, a piston rod pivotally secured to the rear end of said door and extending inwardly through the wall of said housing, a pneumatic cylinder having a piston connected with said piston rod, and a ball and socket joint for securing said pneumatic cylinder to said housing to permit said pneumatic cylinder to assume various angular positions.

4. A ship brake of the class described comprising a brake door, links pivoted at one end to the rear edge of said door and at the opposite end to the side of a ship at a point near the center of said door, a cable secured to the front end of said door, means for exerting a pull on said cable, a piston for exerting an outward pressure on the front end of said door, a power actuated piston arm pivotally connected with the rear end of said door, and a ball and socket joint in the side of said ship to permit said piston arm to swing into various angular positions.

5. The combination with a water tight recess formed in the outer hull of a ship, of a door adapted to fit within and close said recess said door being flush with the outer side of the hull when closed, links pivoted to the rear edge of said door and to the wall of said recess, a pulley in the front end of said recess, a power actuated piston rod extending through the rear wall of said recess, a cable secured to said piston rod thence passing over said pulley and secured to the front edge of said door, a piston to engage with and exert an outward pressure on the front edge of said door, a piston rod pivoted to the rear edge of said door, a ball and socket joint in the wall of said recess for said piston rod to pass through, and pneumatic means for actuating said piston rod.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."