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MECHANISM FOR BRAKING STEERING APPARATUS.

(Application filed Sept. 13, 1897.)

(No Model.)



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Fig 3

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MECHANISM FOR BRAKING STEERING APPARATUS.

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To all whom it may concern:

Be it known that I, WILLIAM T. JOHNSTON, a citizen of the United States, and a resident of the city of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Mechanism for Braking the Steering Apparatus of Boats when such Apparatus is Operated by Steam, of which the following is a specification.

The several features of my invention and the various advantages resulting from their use, conjointly or otherwise, will be apparent from the following description and claims.

In the accompanying drawings, making a part of this application, and in which similar letters of reference indicate corresponding parts, Figure 1 is a plan view of mechanism illustrating my invention. Fig. 2 is a side elevation of the same mechanism. Fig. 3 is an elevation of the mechanism in immediate connection with the steering apparatus. Such mechanism will be found centrally located in the left-hand portion of Fig. 1, and the elevation shown in Fig. 3 is that which faces toward the right in said Fig. 1.

My invention is applicable to various descriptions of steering apparatus operated by steam-power. For purposes of illustration I have taken a steering-gear of my own invention and will explain the application of my present invention thereto. A short preliminary description of the steering apparatus will be in place and is as follows:

The steam-cylinder A is located transversely to the length of the boat and is secured in position, for example, by the clamps A² A² or other suitable connections. Within the cylinder is a suitable piston connected to a piston-rod A³. This rod is provided with a fixed guide, as A⁴, to prevent it from being laterally deflected. Through this guide the outer end portion of the rod reciprocates. The tiller B is duly connected to a cross-head. Preferred means of making this connection consist as follows: A cross-head A⁵, sliding on the guides A⁶ A⁶, is fixed to the piston A³. A connecting-rod A⁷, pivoted at one end to this cross-head A⁵, is at the other end connected to the tiller B, in turn working the rudder or rudders in any of the well-known modes. In the present illustrative

instance B R indicate the rudder, and B R P the rudder-post. To the free end B² of the tiller B are connected the cords, ropes, or chains B³ B³, extending from the tiller in divergent and substantially opposite directions. Each chain B³ then passes around its own wheel B⁴ and running forward toward the pilot-house passes around its wheel B⁵, and then these ropes from opposite directions are wound upon the hub B⁷ of the pilot-wheel B⁸ in the usual manner, and when desired are connected together. Sheave-wheels B⁶ B⁶ may be present, respectively, for aiding the efficient action of the chains B³. A steam-valve C receives a supply of steam from a boiler through inlet-pipe C², and this valve can communicate steam to one end of the cylinder A by means of the conduit C⁴ and the other end through conduit C³ or can altogether cut off the supply of steam to the cylinder A, according as it (the valve) is moved. The valve is so arranged as to expand one end of cylinder A when the other is taking steam. The valve C is operated by a lever C⁵ in pivotal connection with rod C⁶. The forward end of this rod connects pivotally with one end D³ of an angulated or bell-crank lever D, pivotally fulcrumed at D². The other end of this lever D is pivotally connected to one end of the connecting-rod E. The other end of this rod E is pivotally connected to arm F² of lever F, the latter fulcrumed at F³ to a fixed point or on a fixed bar, as G. The lower end of lever F at F⁴ is pivotally connected to one end of a connecting-rod H, and the other end of this rod is connected at H² to the lower portion of a lever K. This lever K is fulcrumed at K³ to a suitable fixed part, as bar G, of the boat. The lower end of lever K is pivotally connected to a connecting-rod L, extending down and at its lower end pivoted at L² to one end of the lever M. The lever is fulcrumed at M² and at its other end engages a bell-crank lever N, fulcrumed at N² to a part of the boat. The lower end of this lever N engages a bolt or rod P, which passes across under the pilot-wheel from rear to front and engages a swinging or movable brake-piece R, arranged when operated to bear against the pilot-wheel, preferably near or at its periphery, as shown. The bolt or rod P can be shortened or lengthened as to its working

length by any suitable means. One description of such means consists of the nut P^2 , screwed on the end of the rod P . The brake-piece R when swung to oscillate may be pivotally connected to a fixed part, as R^2 , and the piece R^3 , to which the lever N is pivoted, may be swung from a pivot R^4 , as shown, and bind against the rear side of the pilot-wheel as the piece R binds against the front side of said pilot-wheel.

The operation of my invention is substantially as follows, viz: Steam being up in the boiler and the boat making ready to start or having already started, when the pilot desires to steer the boat to the right he grasps one or both of the levers F and K and moves them to the right or left, as the case may be and according as the valve acts relatively to conduits C^3 and C^4 in supplying them with steam. In the present instance when the pilot desires to steer the prow of his boat toward the right he moves the upper ends of the levers F and K toward the right. Such a movement lifts rod E and draws rod C^6 forward and causes the valve C to admit steam to conduit C^3 , thus moving the free end of the rudder toward the right. Moving the upper ends of the levers F and K toward the left causes the valve C to cut off steam from conduit C^3 and to admit steam to conduit C^4 , thereby moving the piston toward the right and the free end of the rudder toward the left. In this way the prow of the boat would be turned toward the left. When the operator locates the levers F and K at the middle point of their movement, the steam will be cut off from cylinder A .

In operating steam steering apparatus it will be found that disadvantageous operations attend the steering of the boat. For instance, it will be found that when the levers have been moved in a given direction the tendency of the mechanism is to continue its movement although steam has been altogether cut off. Then, again, it will happen that strong currents of the stream itself or caused by the rapid motion of the vessel or by the vessel's motion combined with the natural current of the stream will have a tendency (often successful) to move the rudder when the steam for operating it has been cut off. It will be readily understood by those skilled in navigation that when the boat is being moved backward the tendency of the rudder will be to move in directions the reverse of those in which it would move when the boat was running forward. It is natural that when the boat has been sufficiently turned, or has impetus in a given direction to turn sufficiently, the pilot should move the levers to their middle position, thereby cutting off the steam. It is then that the tendency of the rudder to move (when it should stand still) occurs. Such tendency might be overcome to some extent if the pilot grasps the handles of the spokes of the ordinary pilot-wheel B^8 ; but such grasping is not

only somewhat awkward, but it is difficult to control thus the rudder's movements in the case of a large boat. It is at this juncture in the operation of steering that my invention becomes very advantageous and useful. When in steering the proper time arrives to cut off the steam, the pilot moves the levers F and K to their mid-position. As they reach this position the end M^3 of the lever M is elevated and causes lever N to draw the free ends of the brake-pieces R and R^3 together and pinch the felly of the pilot-wheel between them, and thus securely (brake) hold the wheel from turning. Thus the chains B^3 and B^4 will be held stationary, the tiller held fast, and the rudder held still in the desired position. In thus securely holding the rudder in the desired position the pilot is relieved from all labor and care. When he desires to again move the rudder, he moves the levers F and K to the right or left, as desired. As he thus moves them they draw up the end M^4 of lever M and depress its other end M^3 , thereby disengaging the hold of the brake R R^3 upon the pilot-wheel and leaving it and its chains B^3 B^4 free to move. The braking device may not only be applied to the pilot-wheel, but also to other parts of the mechanism, either to accompany the brake already described or to be operated as a separate device. Thus, for example, the rod C^6 may be continued to one end of a lever C^7 , pivotally connected at its other end to a fixed part of the boat. One end of a rod C^8 is connected at C^9 to the lever C^7 and the other end to a lever C^{10} , working a clamp C^{12} , arranged when worked to clamp the rod A^3 , as shown. When the levers F and K are at their mid-length and the steam shut off, the clamp C^{12} will be inoperative; but when the levers F and K are moved to the right or left of their mid-position the lever C^{10} will be moved to the right or left of its middle (inactive) position and will clamp the rod A^3 and set fast the tiller and rudder.

It will now be evident that the broad feature of my invention covers the application to a steam steering apparatus of a brake actuated by the same means as the steam is regulated. Various devices and subapplications may be made in carrying into effect this broad feature of my invention; but the same are naturally and properly included thereunder. Preferred description of the special devices which may be employed to enable the action of the levers which control and regulate the action of the steam for steering the vessel to also actuate the brakes has been already presented.

Obviously one of the levers F or K can be dispensed with and the mechanism of both be combined in one; but the two are desirable because they each afford a hold for the hands of the pilot—the right lever for his right hand and the left lever for his left hand—and he holds his hands in much the same position as when manipulating the pilot-wheel. Furthermore, he can readily transfer his hands from

the levers to the wheel and return them, as desired.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

5 1. In a steam apparatus for moving the steering apparatus of a boat, the combination of a lever at the pilot-wheel, adapted to control the mechanism for furnishing steam to said apparatus, and the brake adapted to en-
10 gage the pilot-wheel, and connected to the wheel-lever by intermediate mechanism, for enabling the wheel-lever to work the brake, substantially as and for the purposes speci-
fied.

15 2. In a steam steering apparatus, the combination of a lever at the pilot-wheel, adapted to control the mechanism for supplying steam to said apparatus, and a brake adapted to en-
gage the rod for moving the tiller, and inter-
20 mediate mechanism for enabling the wheel-lever to loosen the brake, when it, the lever, is shifted to the right or left, and to apply the brake when this wheel-lever is located in its mid-position, substantially as and for the pur-
25 poses specified.

3. In a steam steering apparatus, the combination of a lever, at the pilot-wheel, adapted to control the mechanism for supplying steam to said apparatus, and two coöperative brakes,
30 one at the pilot-wheel and the other at the rod for moving the tiller, and mechanism for enabling the wheel-lever to loosen the brakes, when it, the lever, is shifted to the right or left, and to apply the brakes when this wheel-
35 lever is located in its mid-position, substantially as and for the purposes specified.

4. In an apparatus in which steam is employed to steer the vessel, the combination of a lever at the pilot-wheel, and the connecting
40 mechanism for regulating the supply of steam, and the rod L, lever M, lever N, and brake R, R³, engaging the pilot-wheel, substantially as and for the purposes specified.

5. In an apparatus in which steam is em-
45 ployed to steer the vessel, the combination of a lever at the pilot-wheel, and the connecting

mechanism for regulating the supply of steam, and the lever C⁷, rod C⁸, lever C¹⁰, and clamp C¹², and rod A³, substantially as and for the purposes specified. 50

6. In an apparatus in which steam is employed to steer the vessel, the combination of a lever at the pilot-wheel, and the connecting mechanism for regulating the supply of steam, and the rod L, lever M, lever N, and brake
55 R, R³, engaging the pilot-wheel, and the lever C⁷, rod C⁸, lever C¹⁰, and clamp C¹², and rod A³, substantially as and for the purposes specified.

7. In a steam steering apparatus, the combination of a lever at the pilot-wheel, adapted to control the supply of steam to operate the rudder, the two wheel-levers F and K, connected by rod H, and in combination, as follows, the combination of the lever K, and rod
65 L, levers M, N, and brake against pilot-wheel, and the combination of lever F with rod E, lever D, rod C⁶, lever C⁵, valve C, cylinder A with piston, conduits C³ and C⁴ thereto, rod A³, and rod A⁷, and tiller, and rudder and
70 rudder-chains and pilot-wheel, the latter proximate to the levers F and K, substantially as and for the purposes specified.

8. In a steam steering apparatus, the combination of a lever, at the pilot-wheel, adapted
75 to control the supply of steam to operate the rudder, the two wheel-levers F and K, connected by rod H, and in combination, as follows, the combination of lever K, and rod L, levers M, N, and brake against pilot-wheel, 80
and the combination of lever F with rod E, lever D, rod C⁶, lever C⁵, valve C, cylinder A with piston, conduits C³ and C⁴ thereto, rod A³, and lever C⁷, rod C⁸, rod C¹⁰, clamp C¹², and
85 rod A⁷ and tiller, rudder, rudder-chains and pilot-wheel, at wheel-levers, substantially as and for the purposes specified.

WILLIAM T. JOHNSTON.

Attest:

A. S. LUDLOW,
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