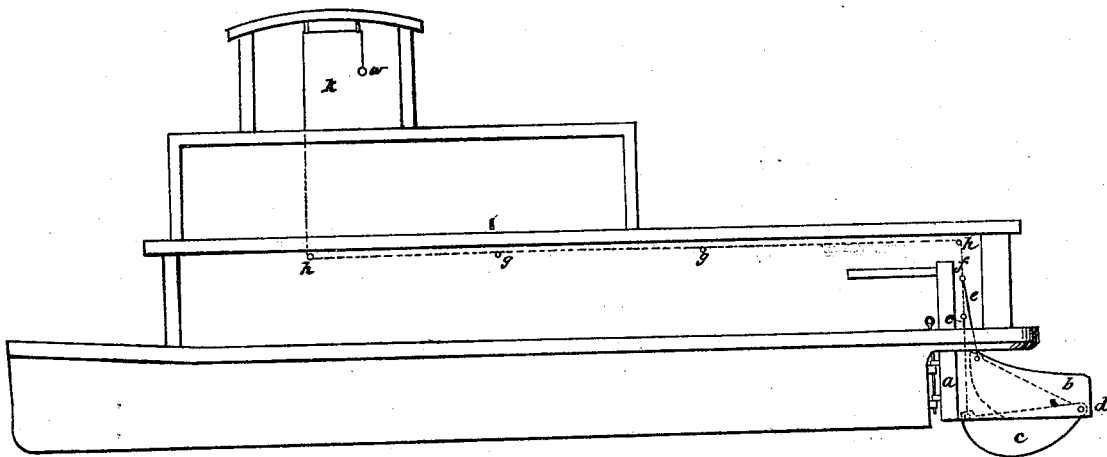W. J. Millar.

Steering.

N°. 54,002.

Patented Apr. 17, 1866.

Witnesses.
M. G. Cushing
W. D. Lewis.

Inventor
Wm J Millar
by his attorney
W. Bakewell.

UNITED STATES PATENT OFFICE.

WILLIAM J. MILLAR, OF McKEESPORT BOROUGH, PENNSYLVANIA.

IMPROVEMENT IN RUDDERS FOR STEERING VESSELS.

To all whom it may concern:

Be it known that I, WILLIAM J. MILLAR, of the borough of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rudders for Steering Vessels, and I do hereby declare the following to be a full, clear and exact description thereof, reference being had to the accompanying drawing, forming part or this specification, which represents the framework and hull of a steamboat such as is used on the Western rivers of the United States, showing the rudder constructed in the manner hereinafter described, as invented by me.

The steamboats which ply on the Western rivers are usually of very light draft, owing to the frequent extreme shallowness of the water in the channel at the shoal places during the dry season, and for this reason it is difficult to get a sufficient surface of rudder submerged to control the vessel and steer it to advantage. The rudder cannot be made permanently deeper than the keel of the vessel, because then it would touch the bottom of the river when the water is low and would be liable to be broken in passing over shoals or obstructions in the river, and even in high stages of water a rudder which projected downward below the keel of the vessel would be apt to be unshipped or injured by floating trees or snags, over which the boat might pass.

My improvement consists in making the rudder with a movable slide or flap pivoted to the toe of the rudder so as to be lowered when the water is deep enough to admit of it, or raised when rendered necessary by the shallowness of the channel, and which will yield to any log or other obstruction situate in the path of the vessel.

In the drawing, *a* is the heel-post of the rudder. *b* is the rudder, which is made double or of two courses of plank extending from the heel-post *a* to the toe, parallel to each other, so as to leave a space of sufficient width between them for the insertion of the flap *c*,

which may be made of wood or of a metallic plate. This flap *c* is pivoted to the toe of the rudder, near the lower edge at *d*, by a bolt passing through the rudder. The lower edge of the flap *c* is curved as shown in the drawing, so that in passing over or touching a log or other submerged obstruction, the flap will rise and recede with the rudder and thus escape injury. A perpendicular rod, *e*, is attached to the heel end of the flap *c*, and passes up between the two boards forming the rudder. It is attached to a rope or chain, *f*, which extends over rollers *g* and pulleys *h* to the pilot-house *k*, where a weight, *w*, is attached to it sufficient to counterbalance the flap *c* and allow it to remain in any position in which it may be set in or out of the recess in the rudder by simply raising or lowering the weight *w*. When the pilot raises the weight the flap descends by its own weight, and when he pulls the weight down the flap rises and recedes into the rudder, as shown by dotted lines in the drawing.

It is manifest that when the flap *c* is lowered the area of submersion of the rudder is correspondingly enlarged, and consequently its effective power to guide and control the vessel is increased.

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

The improvement in rudders for vessels hereinbefore described, consisting of the adjustable flap, *c*, interposed between the side pieces, *b*, of the rudder, and pivoted to its toe at *d* so as to be raised or lowered to diminish or increase the submerged area of the rudder, substantially as described.

In testimony whereof I, the said WILLIAM J. MILLAR, have hereunto set my hand.

WILLIAM J. MILLAR.

Witnesses:
  W. D. LEWIS,
  A. S. NICHOLSON.