

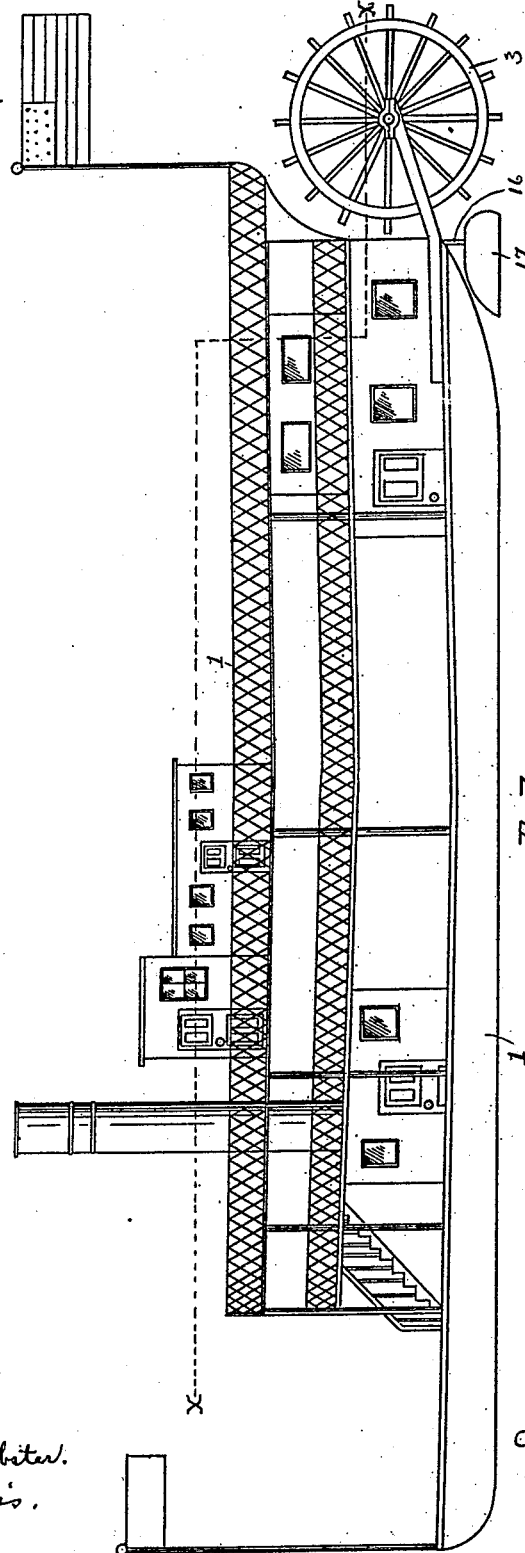
(No Model.)

3 Sheets—Sheet 1.

J. M. MITCHELL.  
STERN PADDLE WHEEL AND RUDDER.

No. 523,817.

Patented July 31, 1894.



WITNESSES

Carroll J. Webster.  
L. W. Morris.

INVENTOR

John M. Mitchell.  
By Wm Webster  
Atty

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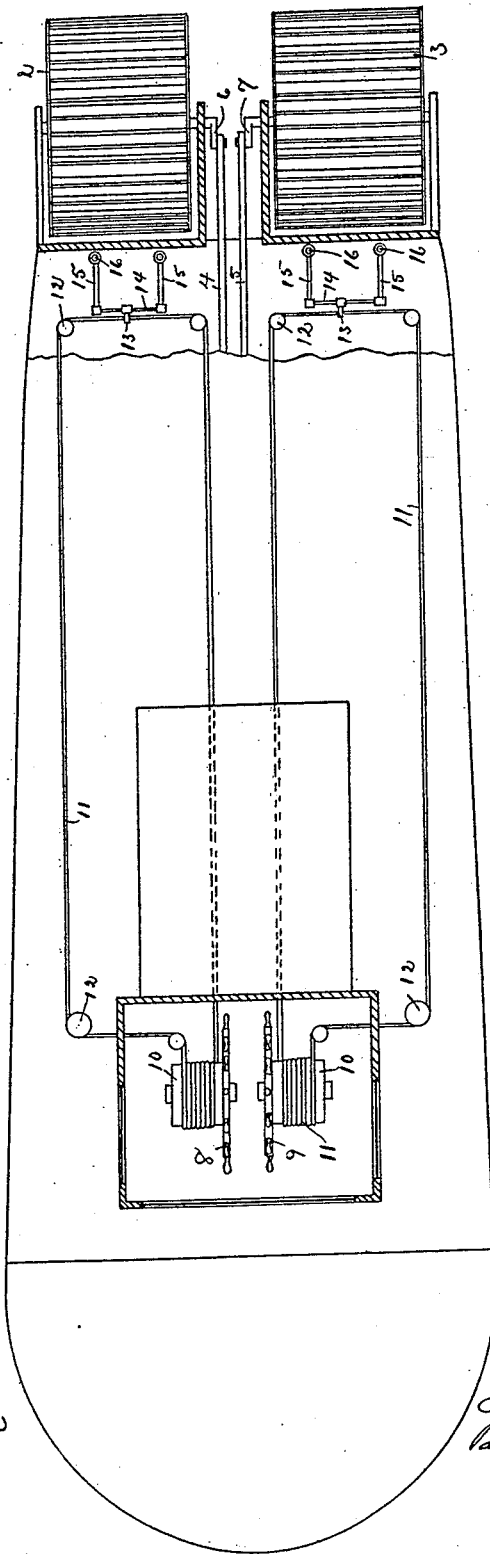


Fig. 2.

WITNESSES

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Steering mechanism,

168 Rudders, Multiple.  
(No Model.)

116. MARINE PROPULSION.

Paddle wheels,

Steering.

3 Sheets—Sheet 3.

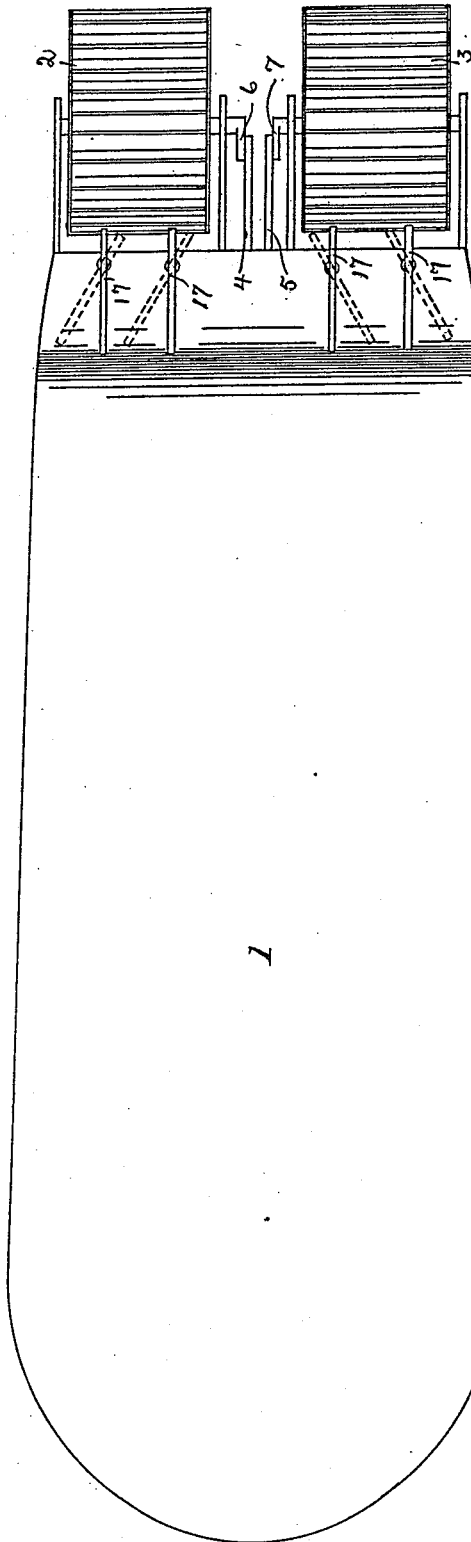
Draftsman

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# UNITED STATES PATENT OFFICE.

JOHN M. MITCHELL, OF TOLEDO, OHIO.

## STERN PADDLE-WHEEL AND RUDDER.

SPECIFICATION forming part of Letters Patent No. 523,817, dated July 31, 1894.

Application filed February 18, 1891. Renewed January 31, 1894. Serial No. 498,663. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN M. MITCHELL, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Independent Stern Paddle-Wheels and Rudders; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to an independent stern paddle wheel and rudder therefor, and has for its object to provide means for more expeditiously turning the boat than heretofore.

A further object is to provide duplex paddle wheels, each having an independent movement.

A further object is to provide independently acting rudders whereby the rudder of one side may co-act with a forwardly revolving paddle wheel, while the rudder of the opposite side may be inclined in an opposite direction to co-act with a rearwardly revolving wheel.

With these objects in view the invention consists in providing a stern paddle wheel boat with independently acting paddle wheels and independently acting rudders.

In the drawings:—Figure 1 is a side elevation of a boat provided with my improvements. Fig. 2 is a plan view of the same, on lines *x-x*— Fig. 1, the top portion being removed to disclose one means that may be employed in carrying out my invention. Fig. 3, is a bottom plan view showing the different positions the rudders may assume relative to the wheels and to each other.

My invention is particularly designed for use in vessels of light draft, such as are employed in navigating rivers and streams having but slight depth of water. As is usually the case, rivers of this character are crooked and tortuous, requiring frequent and abrupt turns of the boat to prevent contacting with the sides. With the ordinary form of propelling and steering mechanism it is very difficult to effect the turn of the boat without

great delay and inconvenience. It is also difficult to turn the ordinary form of stern wheel boats without a large area of water when desired to reverse the direction of travel of the same. By the use of independently acting paddle wheels, and rudders capable of being turned in reverse directions I am enabled to control the boat at will.

In the drawings 1, designates the ordinary form of stern wheel steamer.

2, designates the paddle wheel upon the starboard, and 3, the wheel upon the portside, each being driven independently, preferably by independent engines, actuating pitmen 4, and 5, secured upon cranks 6, and 7, respectively. By this means the wheels may be caused to revolve in unison, or in reverse order. In order to cause a direct pressure and consequently a quick response to the rudders when it is desired to turn the boat, it is not only necessary to reverse the direction of rotation of the wheels (that is cause one wheel to propel and the other to retard) but it is necessary that the rudder upon the side of the propelling wheel shall be inclined to guide the boat in the direction it is desired that it should turn, and that the rudder upon the side of the retardingly rotative wheel should be inclined in a direction opposite to that in which the boat is to turn in order that the suction or draft caused by the backing wheel shall cause the receding current to move in harmony with the propelled current of the forwardly moving wheel as it passes upon the inside of the rudder and also outside of the same. By this method the propelling wheel has immediate and effective action, and the backing wheel not only assists by pulling, but the rudders instead of retarding by pressure against the radial movement of the same were they in the same inclination, assist in pulling the boat in the desired circle.

In order to illustrate one of the means that may be employed to render the two sets of rudders independent in action, I have shown what I will designate a starboard wheel 8, and a port wheel 9, each having the ordinary winch or barrel 10, over which the rope or cable 11, is wound and guided by pulleys 12, to form a circuit, and being connected to a tiller 13, rigidly attached to a bar 14, which is piv-

otally attached to levers 15, each of which is attached to a rudder post 16, to which rudders 17, are secured. This being the description of one side and the arrangement being the same on both sides, the same numerals will be employed upon each side.

In operation, should it be desired to turn to the starboard, the wheel upon the port side is caused to propel, the starboard wheel being backed, the rudders of the port side are inclined to starboard, and the rudder upon the starboard inclined to port, this causes the water urged forward by the port wheel to impact upon the rudder upon the port side in harmony with the radial movement of the boat, and at the same time the starboard wheel turning in a reverse direction draws the water against the starboard rudder in the same arc of a circle, thereby causing the movement of the boat to substantially revolve with

the center of the boat at the rudders as the pivot.

What I claim is—

The combination with the hull of a vessel, of two independently operated paddle wheels 25 arranged on the rear thereof and within the width of the stern, a pair of rudders parallel to each other in front of each independent paddle wheel, and to the rear of the hull each pair acting in unison and independent of the other pair, and the independent steering devices for operating the rudders. 30

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

JOHN M. MITCHELL.

Witnesses:

WILLIAM WEBSTER,  
CARROLL J. WEBSTER.