(12) **United States Patent**
Ingham

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(54) **CANAL NAVIGATION, BY BOATS**

(76) Inventor: **Samuel D. Ingham**

(Samuel D. Ingham - Letters Patent dated April 19, 1831)

The Solicitor General to whom these Letters Patent and making part of the same, containing a description in the words of the said Samuel D. Ingham himself of his improvement in the navigation of canals by boats.

To all to whom these presents shall come;

Be it known that I, Samuel D. Ingham of the County of Bucks and State of Pennsylvania, now residing in the City of Washington, have invented a new and useful improvement in the navigation of Canals by boats of which the following is a full and exact description as invented and improved by me.

This invention consists in the construction of a boat with a paddle wheel or wheels, located in its forward part or bow, which wheels may be applied to any form of boat now in use, but most advantageously to that form usually denominated a Dutch boat.

In the application of the bow wheel to the Dutch boat there may be one or more wheels applied in the same line of direction on the centre of a transverse section of the bow in such position as to propel the boat along the interstice between the twin parts of the boat, or if the canal be wide in proportion to the burden of the boat a wheel may be placed on each side of the bow.

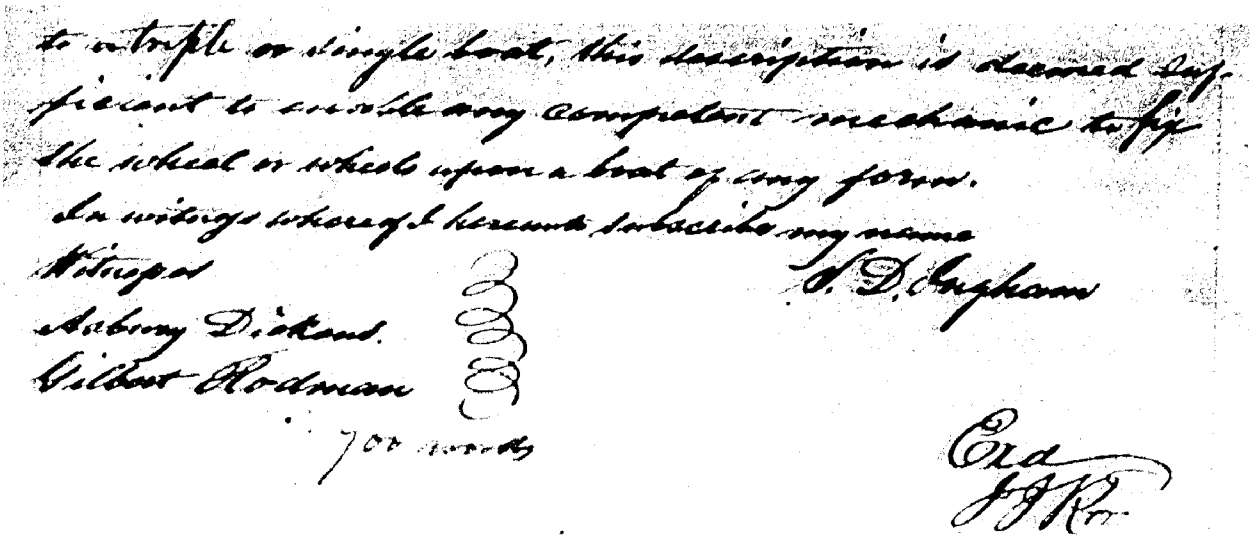
These wheels may be propelled by steam or any other power, of the former, the most efficient and simple adaptation to the Dutch boat will be one boiler and a double engine, one on each side with horizontal pistons connected with cranks of the wheel at right angles to each other, when a single boat is used with a bow wheel on each side, they may be connected with the engine, according to any of the various modes by which the wheels located in other parts of the boat can or may be connected.

The object and operation of this machine of boats and

position of the wheels is to prevent the swell of water in front of the boat and depression of it in the rear which occurs when boats are towed by a power on the shore or propelled by paddle wheels on the sides or in the quarter or stern. When the above described swell & depression exist, the boat in its progress must ascend a plane whose inclination is directly as the difference between the heights of the water at the bow and the stern and inversely as the length of the boat, consequently an increased power is required to propel it and unless the canal be deeper than necessary to float the vessel on a level its stern will ground.

Another object of this structure is to prevent the currents along the margin of the canal which must occur whenever the action of the boat or wheels shall have materially disturbed the level of the water. This is effected by propelling the water from the front to the rear as the boat advances, thus maintaining the boat on a level plane, and in as much as the action of the wheels upon the water must be equal to that of the boat in the same fluid in the opposite direction, there must be as much water displaced and removed from bow to stern by the wheels as will maintain the level, and this current being made to pass rapidly through the middle of a twin boat the level is preserved & is immediately restored that no injury can be done to the banks of the Canal by the effort of the water to find its level along the margin; and the action of the current on the bottom, by keeping the mud disturbed and carrying off the abrasion must effectually prevent the accumulation of bars and shoals by the deposit commonly found.

The drawing and specification of a twin boat and one wheel which are herewith deposited are referred to as descriptive of the structure of that species of boat. The same position of wheel being adopted



to a triple or single boat, this description is deemed sufficient to enable any competent mechanic to fix the wheel or wheels upon a boat of any form.

In witness whereof I have hereunto subscribed my name

Witnesses
Aubrey Dikeman
Gilbert Rodman

A. D. Bingham

Ord
J J R