J. Hornig

Towing.

No. 110,466. Patented Dec. 27, 1870.

Fig 1

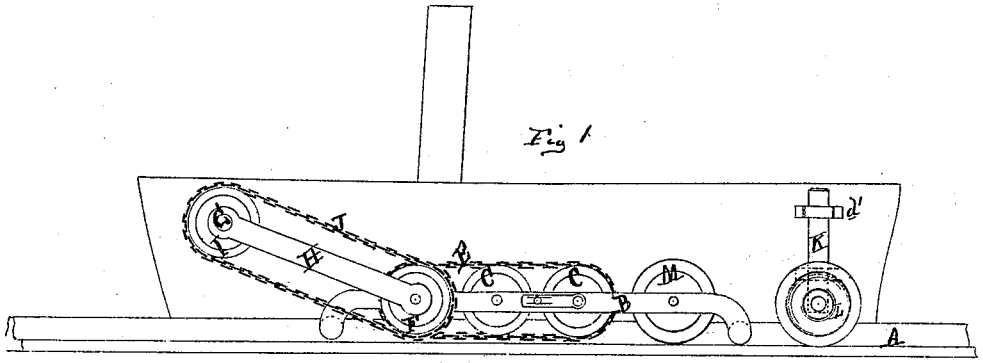
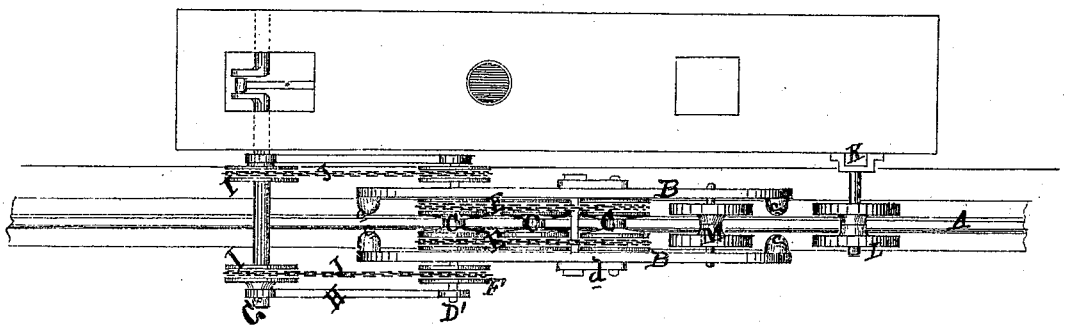


Fig 2



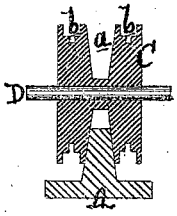


Fig. 3.

Witnesses:
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Inventor:
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Thos. P. Sprague

UNITED STATES PATENT OFFICE.

JULIUS L. HORNIG, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN PROPULSION OF CANAL-BOATS.

Specification forming part of Letters Patent No. **110,466**, dated December 27, 1870.

To all whom it may concern:

Be it known that I, JULIUS L. HORNIG, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in the Propulsion of Vessels in Canals; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and being a part of this specification, in which—

Figure 1 is an elevation of my propelling mechanism, as attached to a canal-boat provided with steam-power for its operation. Fig. 2 is a plan of the same. Fig. 3 is a cross-section on the line *x x* in Fig. 2.

Like letters indicate like parts in each figure.

The nature of this invention relates to an improved method of propelling vessels in canals, so that no commotion or disturbance is created in the water, to wash and destroy the banks.

The invention consists in the novel construction of the drums or sheaved wheels carrying the propelling-carriage, in combination with the rail and endless chain; in the novel construction of the frame of said carriage, having inwardly-projecting bosses, in combination with the drums, guide-wheels, and grooved pulleys connected therewith; in the construction and arrangement of the guide-wheels attached to said carriage and their connecting-axle, and in the combination of the various devices employed to communicate power from the canal-boat to the motive mechanism on shore.

In the drawings, A represents a rail, preferably of the section shown in Fig. 3 of the drawings, secured to the surface of a permanent way at each side of the canal. This permanent way may be either the bank of the canal itself or a stringer surmounting a series of piles driven in the canal near the bank.

B is a carriage or truck constructed of two parallel bars or webs of iron properly stayed by lateral or cross braces.

C are metallic drums or sheaves, whose axles D are journaled in the carriage-frame. In the middle of each drum is a deep groove, *a*, which straddles the rail, as shown in Fig. 3. Another groove, *b*, is formed in the periphery of the drum, near each end, to receive the endless chains E, passing around the front and rear drums and resting in the grooves *b* of the intermediate drums. The shaft D′ of the rearmost drum projects outwardly on each side of the frame, and has mounted on each end a grooved pulley, F.

G is the driving or main shaft, projecting laterally from the vessel, overhanging the permanent way, and is rotated by a motive power contained in the vessel.

H are braces in the form of radius-bars sleeved at their rear ends on the shaft G, and in their forward ends is journaled the shaft D′ of the carriage.

On the shaft G are keyed two grooved pulleys, I, in line with the pulleys F on the shaft D′. Around these pulleys the endless chains J pass.

c are inward-projecting bosses at the ends of the carriage-frame, which serve to keep the rail free from obstructions, and to prevent damage to the moving parts of the carriage from strains resulting from any cause, which would cause the former to sway laterally.

M are guide-wheels loosely sleeved on a transverse axle at the front of the carriage. They bear neither against the sides of the web nor on the foot of the rail, except when passing over an uneven joint, and then only to guide the carriage so that the grooves in the drums will take the following rail without jar or impact on its end. The sides of the rail being more or less inclined, if the inner faces of the rail-grooves in the drum were perpendicular to their axis, the tractive adhesion would be at their peripheries at the point directly under the axis. Motion being given the shaft G, it is evident that the drums C, being rotated through their endless chains, from their adhesion to the rail, will propel the vessel in the same direction, the weight of the carriage and the pitch of the contact-faces of the grooves being adjusted to prevent their slipping. I do not wish, however, to confine myself to the section of rail shown, nor to the use of straddling drums or pulleys whose tractive adhesion is alone available for the propulsion of the vessel, as other forms may be employed, such as a T-rail with a carriage supported by carrying-wheels and the necessary adhesion obtained by the compression of propelling wheels against the sides of the head or web thereof, the compression of said wheels being effected by suitable springs.

To keep a proper tension upon the endless

chains H, the axle of the forward drum is journaled in a block, *d*, at each side of the frame, passing through a slot therein, and the plates being provided with proper means for their adjustment lengthwise of the frame, so that by moving them forward the slack of the chains may be taken up. The shaft D′ is in like manner journaled in the ends of the radius-bars, so that the chains J may be kept taut.

At or near the bow of the boat, to the side thereof, is affixed a pair of guides or keepers, *d*′—one above the other—and in which freely plays the vertical arm of the L-shaped guide K, whose horizontal arm projects over the rail and carries a pair of guide-wheels, L, rolling in the foot of the rail at either side of the web, whereby the boat is kept parallel from end to end with the rail, thus dispensing with the usual steering apparatus. The vessels going in opposite directions take opposite sides of the canal, each being provided with the permanent way and rail, as described.

Although I have described the device or carriage as being operated from the after part of the boat, it works equally as well in the other direction.

I do not contemplate the application of this means of propulsion to single freight-boats, as I deem it more advantageous to thus fit a tow-boat for towing such vessels.

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

1. The drums or sheaved wheels C, provided with the central groove, *a*, and side grooves, *b*, in combination with the rail A and the endless chain E, all constructed substantially as described and shown, for the purposes set forth.

2. The carriage B, provided with inwardly-projecting bosses *c* at the ends of the side frames thereof, and with the drums C, guide-wheels M, and grooved pulley F, all constructed and arranged substantially as described and shown, for the purposes set forth.

3. The guide-wheels M, traversing loosely upon a connecting-axle, constructed and arranged substantially as described and shown, for the purposes set forth.

4. The combination of the shaft G, rotated by suitable power upon a canal-boat, the pulley I, the brace H, the carriage B, provided with pulley F, drums C, and guide-wheels M, the endless chains J and E, and the rail A, all constructed and arranged substantially as described and shown, for the purposes set forth.

JULIUS L. HORNIG.

Witnesses:
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