N. M. TOBEY.

PROPELLING CANAL-BOATS.

No. 192,606. Patented July 3, 1877.

Fig. 1.

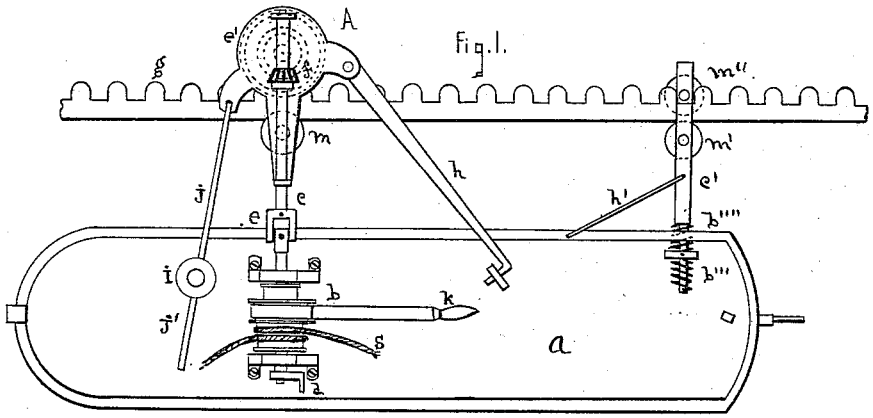


Fig. 4.

Fig. 2.

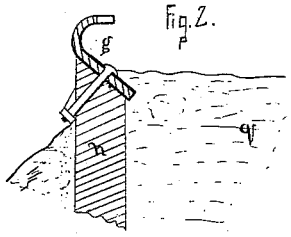


Fig. 3.

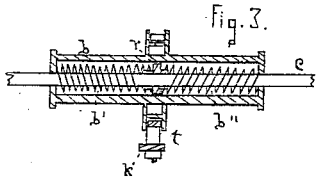
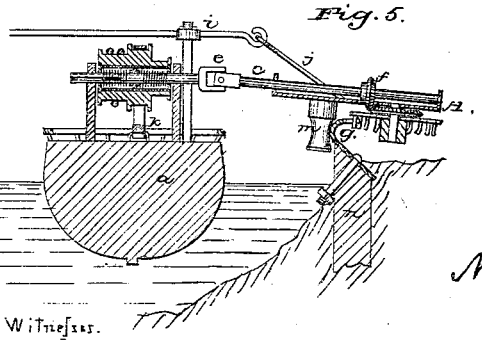


Fig. 5.



Witnesses.

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NATHANIEL M. TOBEY, OF CAROLINE, NEW YORK.

IMPROVEMENT IN PROPELLING CANAL-BOATS.

Specification forming part of Letters Patent No. **192,606**, dated July 3, 1877; application filed February 6, 1877.

To all whom it may concern:

Be it known that I, NATHANIEL M. TOBEY, of Caroline, Tompkins county, New York, have invented an Improved Device for the Propulsion of Canal-Boats, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a hollow toothed rail, made fast to the banks of the canal, and with a flexible shaft or arm, that extends from the boat to the rail, and which is driven by an engine placed in the boat; and the nature of my invention will be apparent as I describe it.

Figure 1 is a view from above of a canal-boat and of my cogged rail, with my propelling device. Fig. 2 is a side elevation of the bank-rail. Fig. 3 is a section of the drum on the driving-shaft, with springs for varying the length of the shaft; and Fig. 4 is a side view of one of the preferably round cogs or teeth of the rag-wheel of the propelling-head. Fig. 5 is a sectional view through the driving-shaft and head, showing the parts connected therewith.

In Fig 1, *a* is the boat, (represented disproportionally in size, as it is not the boat but the devices shown that are now important,) and *b* is a drum on the shaft *c*. In this drum are two springs, *b' b''*, one on each side of a collar, which is fast to the shaft. The object and use of these springs are to provide for the wave and other swayings of the boat, so that the shaft shall give or yield to these motions, and not strain the propelling apparatus I am describing. This drum and shaft are held by davits to the deck of the boat; and driven by an engine attached to the crank *d*.

The shaft has a universal joint at *e*, and is continued onto the driving-head A. This head is composed of a bed-plate, to which is attached the brace *h*, which holds and controls the bed-plate, and a connecting-rod, *j*, that extends to and has free motion on the shipping-in post *i*; and a part of the bed-plate act as a cap or protecting cover to the driving rag cog-wheel beneath it. Other familiar parts are in the head A, and add to its efficiency. The rag cog-wheel of the head A makes connection with the curved bank-rail *g* by means of the curved tooth seen in Fig. 4. These teeth are thus curved to aid in the putting in connection and taking out of gear of the rag cog-wheel and the bank-rack, as well as for the purposes of better suiting the angles caused by the various depths to which the canal-boat is loaded, and the better running of the rag-cog, when there is rough water in the canal. The bank-rail is cogged, and, that the cogs may not interfere with tow-ropes of boats drawn by horses, the teeth or cogs of the rack of the rail are turned, by curving the rail away from the canal, or toward the tow-path, as is shown in Fig. 2, where the position, the pile fastening, and the shape of the bank-rail are seen, as well as the position of the teeth, and that a tow-rope would fall on the smooth curve of the rail. The drawings make clear the action of the driving-head on the rail, as well as the connection through the spring variable shaft *c* from the engine to the rail.

About the drum *b* is arranged a friction-band, with a hand-lever, *k*. This is because the strain on the engine, or its action in stopping the boat, would be liable to injure the propelling parts. Hence a friction retardation is desirable. The shipping-in post *i* is composed of the post proper, which is made as high as necessary, or the canal bridges allow. On the top of this post is a jointed hand-lever, *j'*, though the hand-lever part of it is not ordinarily used. The joint allows side and vertical motion. To the end of the jointed lever is fast the connecting-rod *j*, which, as has been said, connects with the bed-plate of the head A.

Now, by a little reflection it will be seen that if the brace *h* is unhooked, and by it the head A is lifted out of gear with the bank-rail and rack, this shipping-in post *i* aids the bringing on board the boat of the head A, for thus a triangle of three points or lines is made, namely the line of the shaft *c*, the line of the brace *h*, and the line of the post *i*, and these lines have virtually a triangular base. This device can be used by one man, at the brace *h*, but is easier managed by one man lifting on the brace *h* and another on the jointed hand-lever of the post *i*.

A rear guide-rod, not rotating, is made on a part of the principles used on the driving-

shaft *c*—namely, the rod *c'*, the brace *h'*, jointed where it connects with the rod *c'*, the springs *b'''* and *b''''*, collar for the action of the springs fast to the rod, and a wheel, *m''*, in the hollow of the rail, and another wheel, *m'*, on the curve of the bank-rail. The other parts shown or used are well-known, or shown so as to be easily understood.

I claim—

1. The rail *g* curved from the water inward toward the tow-path or bank, with rack or cog teeth on the inside, so as to present on the outside a smooth surface to tow-ropes of boats drawn by horses, in the ordinary manner, as set forth.

2. The curved teeth of the driving rag-wheel of the head A, as and for the purposes set forth.

3. The shipping-in post *i* having a hand-lever, and a rod, *j*, connecting it to the driving-head A, in combination with the driving-shaft *c* provided with joint *e*, and the head-brace *h* for aiding the shipping in of the head A, as set forth.

4. The combination of the head A, driving-shaft *c* having the springs *b' b''* in the drum *b*, the friction-band and lever *k*, and the shipping-in post *i*, as set forth.

5. The rear guide-rod *c'* having wheels in the hollow and on the outer curve of the rail *g*, and a hinged brace, *h'*, and springs *b'''* and *b''''*, as and for the purpose set forth.

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Witnesses:

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