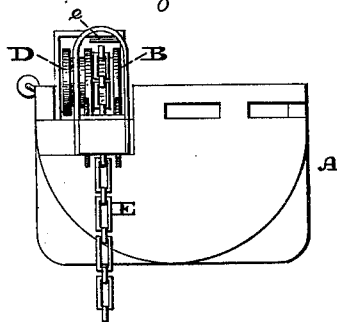


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by John A. Diersheim.
ATTORNEY.

UNITED STATES PATENT OFFICE.

MERRITT H. HALL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CHAIN-PROPELLERS FOR BOATS.

Specification forming part of Letters Patent No. **213,652**, dated March 25, 1879; application filed August 28, 1878.

To all whom it may concern:

Be it known that I, MERRITT H. HALL, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Canal-Boat Propulsion, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of a canal-boat having my invention applied to it. Fig. 2 is a top or plan view thereof. Fig. 3 is an end view thereof.

Similar letters of reference indicate corresponding parts in the several figures.

My invention relates to improvements in canal and other boat propulsion, wherein an endless chain is suspended from the boat so as to rest on the bottom of the canal or stream, and by hauling in said chain at one end of the boat the traction of the chain due to its friction on the bottom of the canal imparts motion to the boat.

The invention consists in supporting the chain on movable belts, whereby friction is reduced and wear of wood-work prevented.

It also consists in passing the chain around pulleys at the ends of the boat, said pulleys being mounted on swinging brackets or supports, whereby the latter may be folded, so as to shorten the entire length of the boat for purposes of entrance into locks, &c.

It further consists of means for rendering the chain inoperative, withdrawing it from the water, and subsequently holding it.

Referring to the drawings, A represents a canal or other boat, which may be of usual form and construction. From opposite ends of the deck there rise longitudinally-extending pieces, forming guides B B', on which are mounted rollers *a a*, around which pass horizontally-arranged belts C C'.

D represents a pulley or drum, which is mounted on the deck of the boat, at the side between bow and stern, and receives power from steam, compressed air, or other motor or mechanical means. The face of said pulley D is toothed or spurred, so as to engage with the links of an endless chain, E, and impart motion thereto. This chain passes from the pulley D over one of the belts C and between the respective guides B, then around a pulley,

b, at one end of the boat, and into the water, finally to the other end of the boat around a pulley, *b'*, thereat, and over the belt C', between the guides B', to the pulley D. The chain will be of sufficient length to reach the bottom of the canal, and a portion of the same will rest thereon, the weight to be such that great friction is created between the chain and bottom of the canal. As the pulley or wheel D is rotated the chain is hauled in at one end and played out at the other end, and, owing to the traction or resistance of the chain, a power is obtained which is communicated to the boat, and this power is continuous as long as the traction or resistance of the chain is overcome, which is accomplished by the movement of the endless chain in the manner stated.

Owing to the belts C C', which are moved by the chain, the latter runs with ease and less friction, and avoids cutting or chafing the rollers *a a*, &c., and the guides B B' serve to retain the chain in proper position, and prevent lateral or transverse play of said chain.

The bow and stern pulleys *b b'* are mounted on brackets or supports F F, which are hinged or pivoted to the adjacent portions of the boat, and adapted to be folded on the deck or against the bow and stern of the boat. When the brackets are lowered they prolong the boat, which, however, may require to be shortened when it enters locks and other places, and this is accomplished by folding the brackets, as has been stated.

In order to conveniently manipulate the brackets, I secure thereto handles *d d*, the advantage of which is evident.

Projecting above the pulley D from the bearings of the same is a horizontally-extending pin, *e*, and adjacent thereto there projects from the deck a vertically-arranged pulley, *f*, and from the gunwale a horizontally-arranged pulley, *g*.

When the chain is to be rendered inoperative, a rope is attached to the chain below either of the pulleys *b b'*, and near thereto, and drawn to the side of the boat near the line of the pulley D. The pulley D is stopped and one of the links of the chain hung on the pin *e*. The upper end of the rope is then connected to the pulley D, the rope passing

around the pulley *f* and over the pulley *g*. The pulley *D* is again set in motion, and as the chain is not in contact therewith, and the rope, as stated, is attached thereto, said rope is wound on the pulley, and thus hauls in the chain from the water and holds it elevated.

When the boat is again to be propelled, the holding-rope is let go and disengaged from the chain, the link, hanging on the pin *e*, is cleared therefrom, and the pulley *D* caused to be rotated, whereby motion is imparted to the chain, the effect whereof is to propel the boat, as has been stated.

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

1. The boat having a traction-chain, *E*, supported on belts *C C'*, substantially as and for the purpose set forth.

2. The upright guiding-pieces *B B'*, supporting the rollers *a a*, in combination with the belts *C C'*, resting on said rollers, and the traction-chain *E*, resting on said belts, substantially as and for the purpose set forth.

3. The traction-chain *E*, in combination with the elevating-pin *e* and the pulleys *f g*, substantially as and for the purpose set forth.

4. The boat provided with folding brackets *F F'* at the top of the bar and stem, and traction-chain *E*, passing around pulleys mounted on said brackets, substantially as and for the purpose set forth.

MERRITT H. HALL.

Witnesses:

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