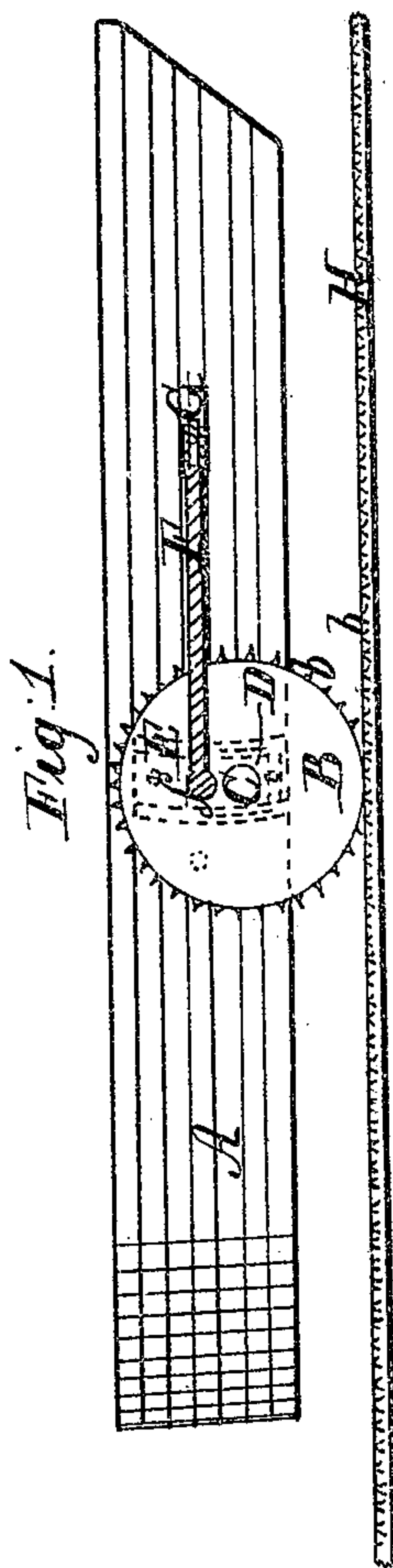
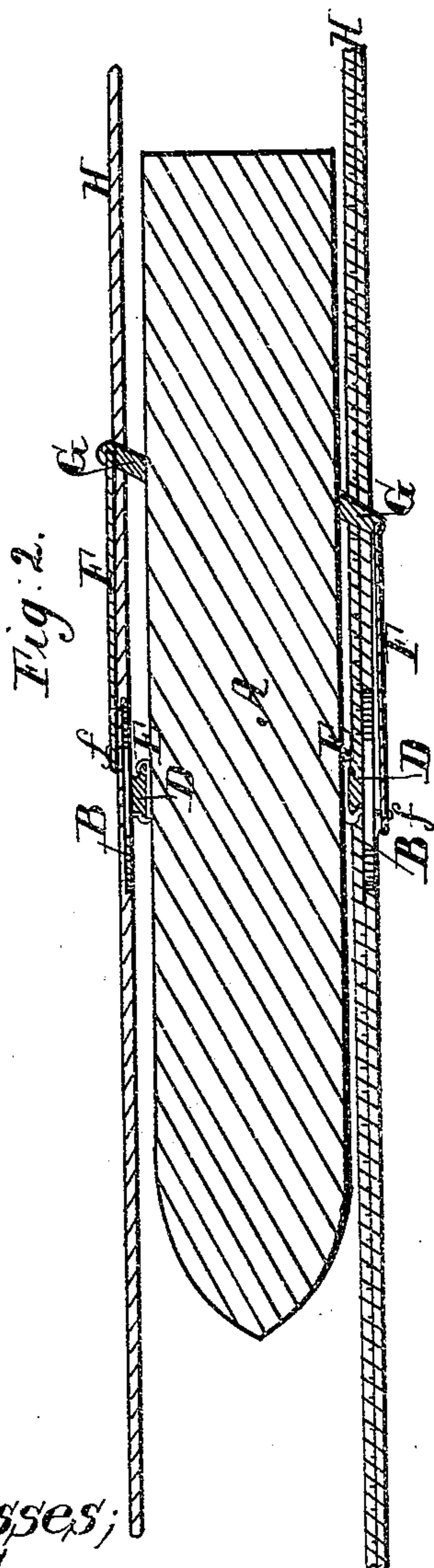


E. C. Harrington,
Towing.

N^o 42,850.

Patented May 24, 1864.



Witnesses;
A. Ames.
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Inventor;
E. C. Harrington

UNITED STATES PATENT OFFICE.

E. C. HARRINGTON, OF BOSTON, MASSACHUSETTS.

IMPROVED SUBMERGED TRACK FOR CANAL PROPULSION.

Specification forming part of Letters Patent No. 42,850, dated May 24, 1864; antedated May 18, 1864.

To all whom it may concern:

Be it known that I, E. C. HARRINGTON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Submerged Track and Tractor for Canal-Boats; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation, and Fig. 2 a top view, of a submerged track and a common canal-boat, tow-boat, or tug provided with tractor-wheels.

Like parts are indicated by the same letters in both of the drawings.

The nature of my invention consists in propelling canal-boats, tugs, or tow-boats by means of self-adjusting tractor-wheels, smooth-rimmed or provided with cogs, running either upon the bed of a canal or a submerged track, smooth-faced or furnished with teeth, as hereinafter described, in place of the common methods of propulsion—*i. e.*, by animals traveling on a tow-path, which is slow and expensive, or by paddle-wheels and screw-propellers acting on the water, which method is impracticable, owing to the agitation of the water and consequent washing of the banks of the canal.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

A represents a canal-boat, tug, or tow-boat of the usual construction.

B B are the drive-wheels, the sides of which are smooth, so as to offer the least resistance in passing through the water. The periphery of these wheels has a flange similar to the flange of railroad-car wheels, so as to run upon the submerged track or rails H H, which may be either of wood or galvanized iron, confined to sleepers or posts on the bed of the canal in any obvious manner. In some cases, however, to increase the traction, I furnish the periphery of the wheels, as represented in Fig. 1, with cogs to mesh into a corresponding rack, *h*, on or in one or both of the submerged rails. The wheels B B turn on the axels C C, which

are fast in the blocks D D, the latter being so constructed as to slide up and down with freedom in the grooved guide-pieces E E, confined to the sides of the boat, as shown in the drawings. The guide-pieces E E are formed on the arc of a circle, the center of which is the farther end of the pitman E, so that the wheels, pivoted to the pitman at *f*, may rise or fall and still be at an equal distance from the engine-levers G G, which project from the sides of the boat, as shown in the drawings.

Instead of placing a wheel each side of the center of the boat, as shown in the drawings, one or two wheels may be placed at the bow or stern, or one in a well in the center of the boat. Where one wheel is used at the bow, center, or stern of the boat, only a single track on the bed of the canal will be required; or the wheel or wheels, whether smooth or cogged, may run on the bottom of the canal without a track. A track, however, is preferable, and as the water in canals is of a uniform depth no grading will be required, and the expense of laying a track will be trifling in comparison with the advantages derived therefrom, a great increase of speed and decrease of expense resulting from the substitution of steam for horse power. The wheels being forced downward by their own weight on the submerged track or bed of the canal, and their axles being free to move vertically in the guides E E, it is obvious that whether the boat be loaded or empty, and whatever be the variation of depth of water within certain limits, the tractor-wheels will operate equally well.

It is obvious that each boat may be furnished with an engine and a tractor-wheel; or a single tug or tow-boat thus provided may be made to draw a long train of boats. It is also obvious that my invention may be applied to advantage in any kind of boats, and wherever the water is not too deep, as well as in artificial canals.

Having thus described the construction and operation of my improvement, what I claim as new, and desire to secure by Letters Patent, is—

1. The employment of tractor-wheels to

act in combination with submerged rails or tracks, substantially as and for the purpose described.

2. Constructing submerged rails or tracks with teeth or racks to operate in combination with cogs on the peripheries of submerged tractor-wheels, for the purpose of propelling boats, substantially as described.

3. Rendering the tractor-wheels vertically

self-adjusting by fixing their axles in blocks D D, or their equivalent, sliding in the grooves or guides E E, attached to the outside of the boat, substantially as described.

E. C. HARRINGTON.

Witnesses:

N. AMES,

ISRAEL PERKINS.