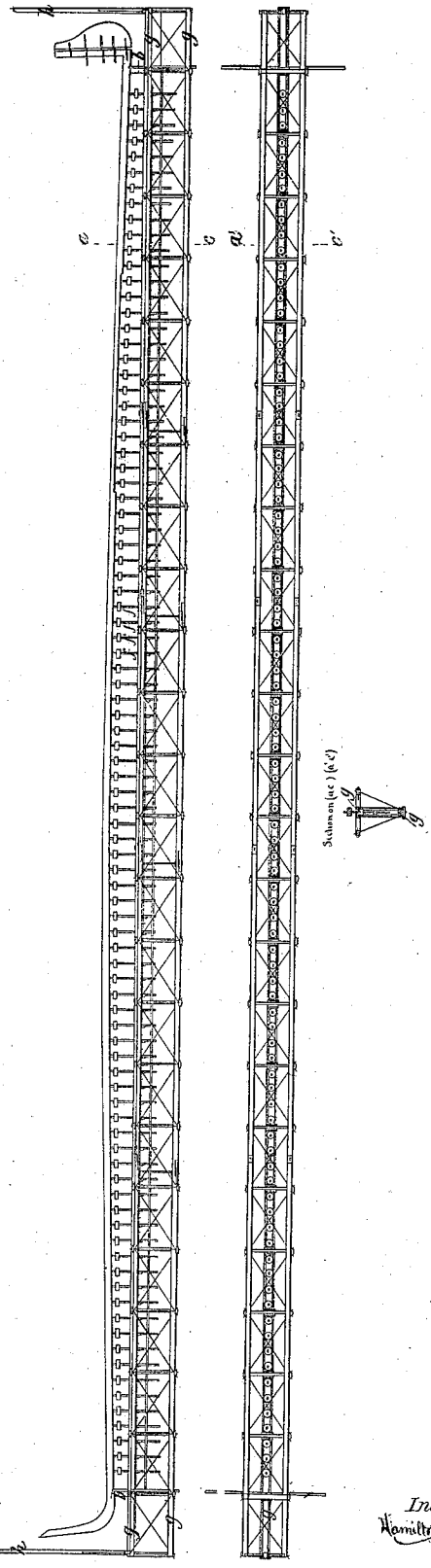
H. E. Towle

Gauging Keels of Ships.

No. 1,153.

32,167.

Patented Apr. 23, 1861.



Witnesses;
Wm. H. Baily
Gardner Towle

Inventor;
Hamilton E. Towle

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HAMILTON E. TOWLE, OF EXETER, NEW HAMPSHIRE.

APPARATUS FOR ASCERTAINING THE CURVATURES OF THE KEELS OR BOTTOMS OF VESSELS.

Specification of Letters Patent No. 32,157, dated April 23, 1861.

To all whom it may concern:

Be it known that I, HAMILTON E. TOWLE, of Exeter, in the county of Rockingham and State of New Hampshire, have invented a new mode of ascertaining the curvature or irregularities of the bottoms or keels of vessels in order that proper supports may be placed in docks or other receptacles for examining and repairing them, so as to avoid any undue strain upon such vessels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, and the letters of reference marked thereon.

My invention consists in an instrument extending the length of that part of the keel or bottom of vessel the curvature or irregularities of which are to be ascertained, to which instrument, vertical rods are attached in such manner as to admit of motion at right angles with the direction of the length of the instrument, which rods by pressing against the keel or bottom will indicate its curvature or irregularities.

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

I take a compound girder, of sufficient length to reach over that portion of the vessel's keel or bottom the curvature or irregularities of which it is desired to ascertain, at two points on this girder are fixed two blocks or distance pieces, for the purpose of keeping the girder at any convenient distance from the line of curvature, these distance pieces are indicated on the annexed drawing by the letters (*b b*)—near each extremity of the girder *g g g g*. To such girder vertical rods are attached in such manner as to admit motion in the direction of their length, their distances apart and their height being determined by the requirements of the case. These rods marked on the drawing (*f f f f*) may be properly called measuring rods are confined down by catches working into notches made in the sides of the rods, or by cams or other appliances, which may be controlled by means of a narrow plate or wire running the whole length of that part of the girder required to be used.

The mode of using this apparatus is by two handles marked (*h h*) on the drawing connected to the girder by hinges near its extremities.

The apparatus is submerged by weights or otherwise in the plane of the curvature or irregularity which it is desired to ascertain. The distance pieces (*b b*) are made to touch the vessel the catches or confining power of the measuring rods is then released and the rods are made to rise, either by buoyancy or by the action of springs or weights, till their upper ends touch the vessel, when the catches or confining power is made to restrain any motion of the rods in the direction of their length by means of the narrow plate or wire before mentioned. The apparatus is then removed from the vessel and brought to the surface of the water, when the position of the rods will show the precise curvature or irregularities to be provided for in placing supports for the vessel when she ceases to be sustained by her buoyancy in the water.

What I claim and desire to secure by Letters Patent is—

The girder in combination with the vertical measuring rods constructed and arranged substantially as above described.

HAMILTON E. TOWLE. [L. S.]

Witnesses:

I. MOODY SMITH,

CHS. P. WANNDEL.