

Sheet 2-2 Sheets.

A. D. Bishop.
Hoisting Derrick.

N^o 4,709.

Patented Aug. 22, 1846.

Fig. 2.

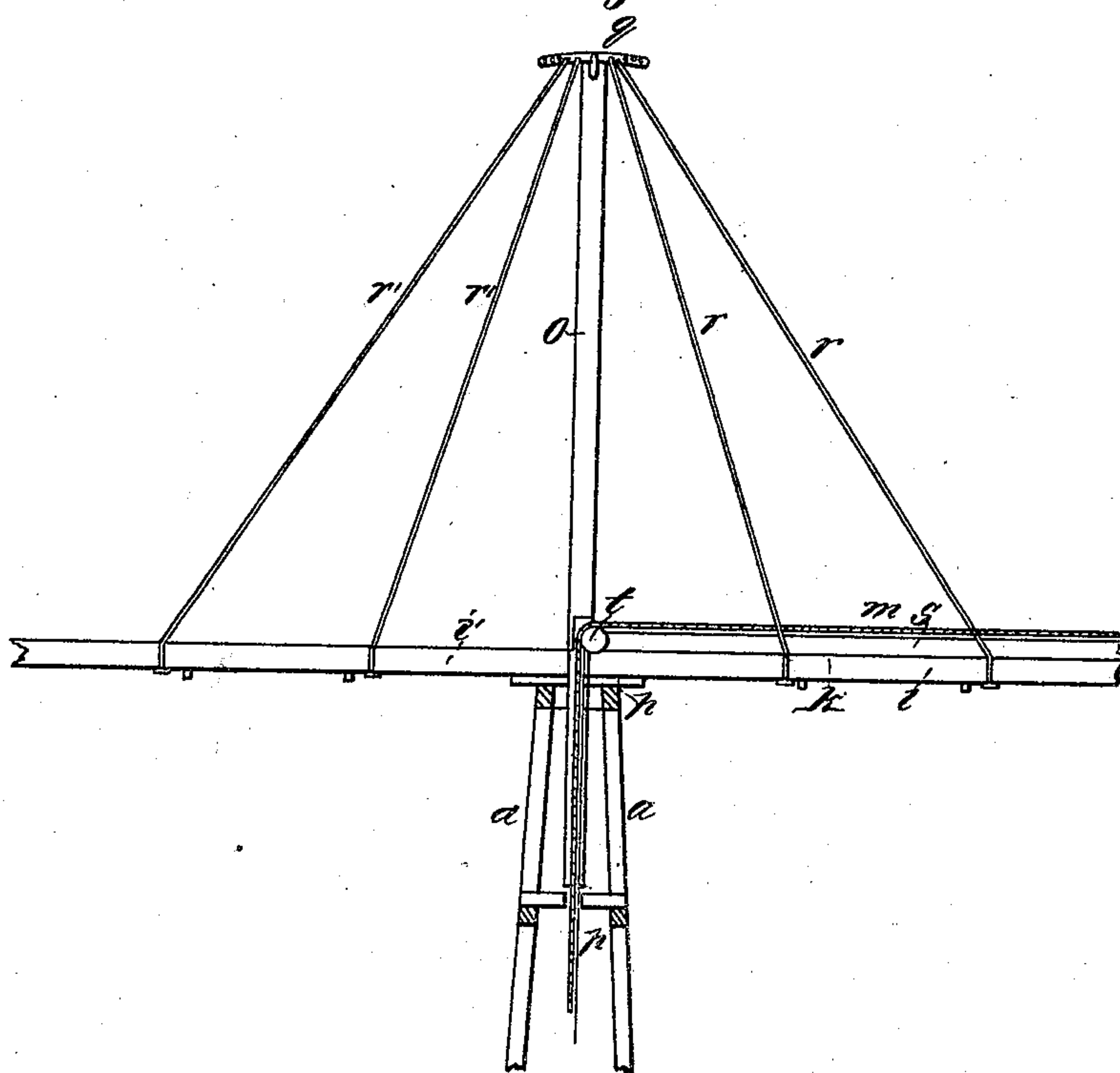
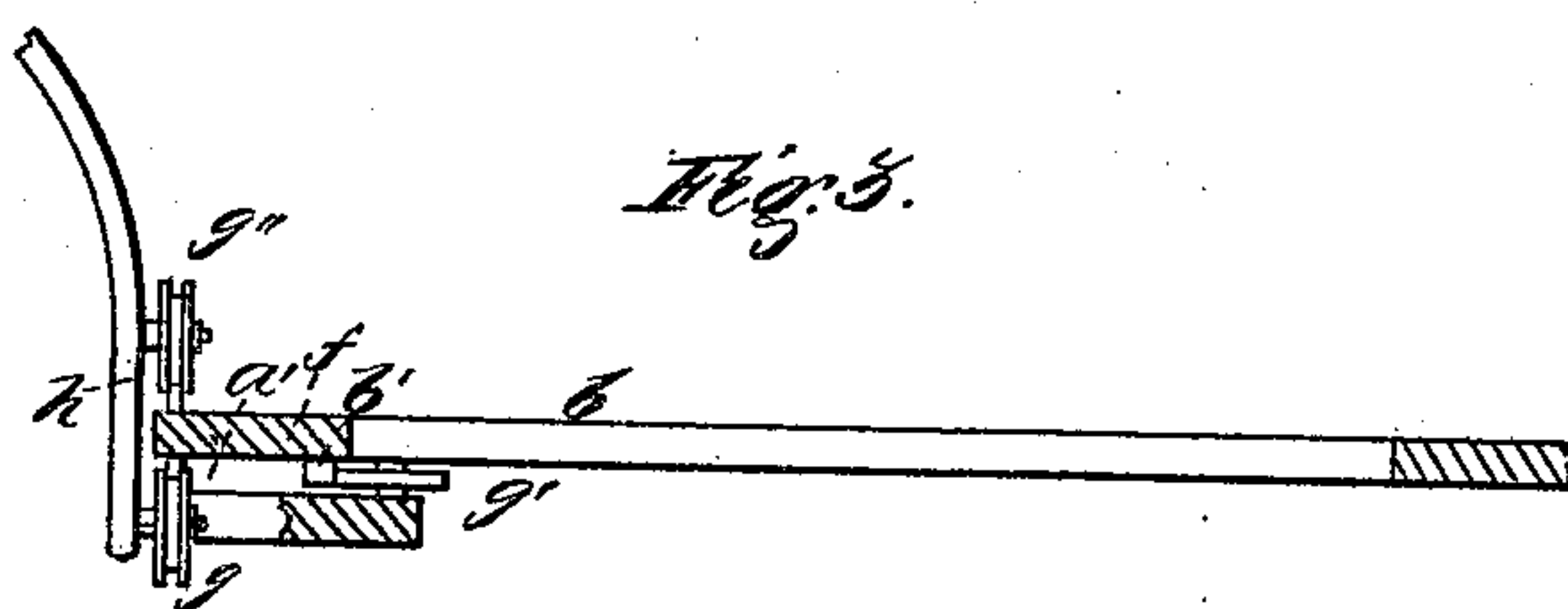


Fig. 3.



UNITED STATES PATENT OFFICE.

ALBERT D. BISHOP, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN BOOM-DERRICKS.

Specification forming part of Letters Patent No. 4,709, dated August 22, 1846.

To all whom it may concern:

Be it known that I, ALBERT D. BISHOP, of Brooklyn, in the county of Kings and State of New York, have invented new and useful improvements in derricks for raising and moving heavy weights and in the mode of framing together the standard which sustains the boom; and I do hereby declare that the following is a full, clear, and exact description of the principle or character thereof which distinguishes them from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view, and Fig. 2 a vertical section, of the apparatus.

The same letters indicate like parts in all the figures.

Instead of making the boom which sustains the weight that is being lifted, as heretofore, to project all on one side of the mast, which tends to carry over the whole apparatus, and which therefore has to be sustained by guy-ropes, I make the boom to extend horizontally to an equal distance beyond a short mast that turns in appropriate bearings in the upper part of a frame-standard, this rear projection of the boom being provided with a brace-rod which is connected with the base of the standard by a roller or rollers and rail to admit of the free turning of the boom. The rope by which the weight is sustained and raised passes over a pulley that has its bearings in a block that slides on two rails on one end of the boom and moved from or toward the mast by two cords attached to the sliding block, one of them passing directly to and over a pulley let into the mast and through a hole therein, and the other passing first over a pulley at the end of the boom and then over another pulley in the mast, so that by means of these two ropes, after the weight has been raised, it can be moved toward or from the mast, the lifting-rope being also passed over a pulley attached to the mast and down through the hole therein. This arrangement will admit of turning the boom in any direction to deposit the weight at any point within a circle of which the boom is the radius. The standard is a

base provided with an inverted circular rail under which the roller of the brace-rod runs and with two sills to rest on or by means of wheels to run on a permanent railway to admit of moving the whole apparatus to any distance required by the extent of the work intended to be done, and the upper end of this standard is adapted to the reception and turning of the mast of the boom. The mode of framing this standard is novel and highly important, as affording more stiffness and solidity for various kinds of structures than any other mode of framing with which I am acquainted. It consists of three posts placed at equal distances apart and so inclined as to form a triangular pyramid connected together by horizontal ties and braced together by diagonal braces running in opposite directions and crossing each other. Each set commences at the base of one post, runs up diagonally to the next, (on one face of the pyramid.) From the upper end of this brace another commences on the other face of the pyramid and runs up at the same inclination to the next post, at the end of which and on the third face of the pyramid another commences, runs up at the same angle to the first post to complete the circuit, and so on to the top. The other set runs up in the reverse direction and crosses the first. In this way the system of diagonal braces commences at the base on each face of the pyramid, extending up to the top. The ends of the braces where they come together and on opposite sides of each post overlap, so that one bolt passes through the ends of four braces and one post.

In the accompanying drawings, A represents the framed standard, consisting of three inclined posts *a a a*, properly secured to a base *b* and connected together to form a triangular pyramid by horizontal cross-ties *c c c*, mortised or otherwise secured and braced together by diagonal braces *d d'*, those indicated by *d* inclining to the right and the others *d'* inclining in the reversed direction. These braces are arranged in the same manner on each face of the triangular pyramid, there being two braces on each face extending from one cross-tie to another, and it will be observed that commencing at the base of either of the posts the two sets form continuous systems of braces running diagonally all around the

pyramids from top to bottom, which renders the whole structure more stiff and unyielding than by any mode of framing with which I am acquainted, and which therefore peculiarly adapts it to sustain heavy masses and to resist the thrusts and twists to which the standard of a boom-derrick is subjected and to which a single mass sustained by guy-ropes is ill adapted and subject to serious accidents. The braces d and d' overlap each other in the middle and at the ends, so that by one single bolt e the ends of four braces are connected together and with the post. When desired, intermediate cross-ties c' may be introduced. The base b is formed of timbers connected together in a triangle to correspond with the horizontal section of the pyramid, and then by other timbers a circular form may be given to it to receive the inverted circular rail f of the roller g at the lower end of the brace-rod h , that braces and holds down the back end i' of the boom B . The sustaining or forward end of the boom is composed of two straight timbers $k k$, placed at a sufficient distance apart to admit of the passage of the rope m , by which the weight is lifted, and the pulley n over which it passes, and to form rails on which the block of the pulley n can slide or run if mounted on wheels. These timbers are firmly connected together at their outer extremity, and their inner ends embrace and are firmly secured to the mast o and to a single timber which forms the rear or balance end i' of the boom to which the brace-rod h is attached. The mast o passes down into the upper end of the standard-frame A and turns freely in boxes $p p$, and the lower end is made hollow for the passage of the ropes to admit of turning the boom without obstruction, there being pulleys to guide the ropes into the hole in the mast. The upper end of the mast is provided with a metal plate q , to which are attached a system of brace-rods $r r'$, that are also attached to the boom on either side, the rods r , that sustain the end i of the boom being branched and attached to the two rails or timbers $k k$ to admit of the free passage of the roller and sliding block, which is governed and moved toward or from the mast by two ropes, one s , attached to the block and passing through the mast over a pulley t to draw it toward the mast, and another u , passing from the sliding block over a pulley or pulleys v at the end of the boom, and thence through the mast over another pulley by the side of pulley t . The hoisting-rope m after passing over the pulley n passes through the hollow mast over a pulley on the same pin as pulley t , and thence to a windlass or other apparatus. The boom

is braced laterally in any manner desired, this making no part of my invention.

If it be desired to move the whole apparatus to facilitate the work, the base b may be adapted to run on permanent rails $y y$ in any desired or well-known manner by being careful to have the base principally sustained by means of timbers z' , one of them under one of the posts of the standard and the other under the other two posts, as the weight will then rest to the best advantage, and care should be taken to have the base sufficiently elevated to give a free passage to the roller on the end of the brace-rod.

With the view to make the connection more permanent I provide the under surface of the circular platform with two iron rails $a' b'$, (see section, Fig. 3,) one for the roller g of the brace-rod h to run under, and the other within for two horizontal rollers g' to run against, the journals on these latter being connected with the brace-rod in the manner represented in section, Fig. 3, in which only one of the rollers is seen, and for greater safety against a sudden jar I contemplate the use of another rail on the upper surface of the base b , on which a roller g'' , also connected with the brace-rod h , is to run, and to facilitate the turning of the boom the arbor of this roller may be provided with a crank-handle, by the turning of which the brace-rod will be carried around and of course the boom with it.

It will be obvious from the foregoing that the mode of framing the standard is adapted to various structures where great strength and stiffness are required to resist thrusts in various directions.

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

1. Making the boom to extend back of the mast which turns in an elevated standard, in combination with the mode of bracing it by means of a brace-rod connected with the base of the standard by a roller and rail to admit at the same time of turning the boom, as described.

2. The mode of constructing the standard by making it of three posts tied together to form an equilateral triangular pyramid, in combination with the system of diagonal braces, as herein described, whereby the structure is rendered stiff and unyielding to resist vertical and oblique thrusts and all tendency to twist, as described.

ALBERT D. BISHOP.

Witnesses:

CHS. M. KELLER,
J. J. GREENOUGH.