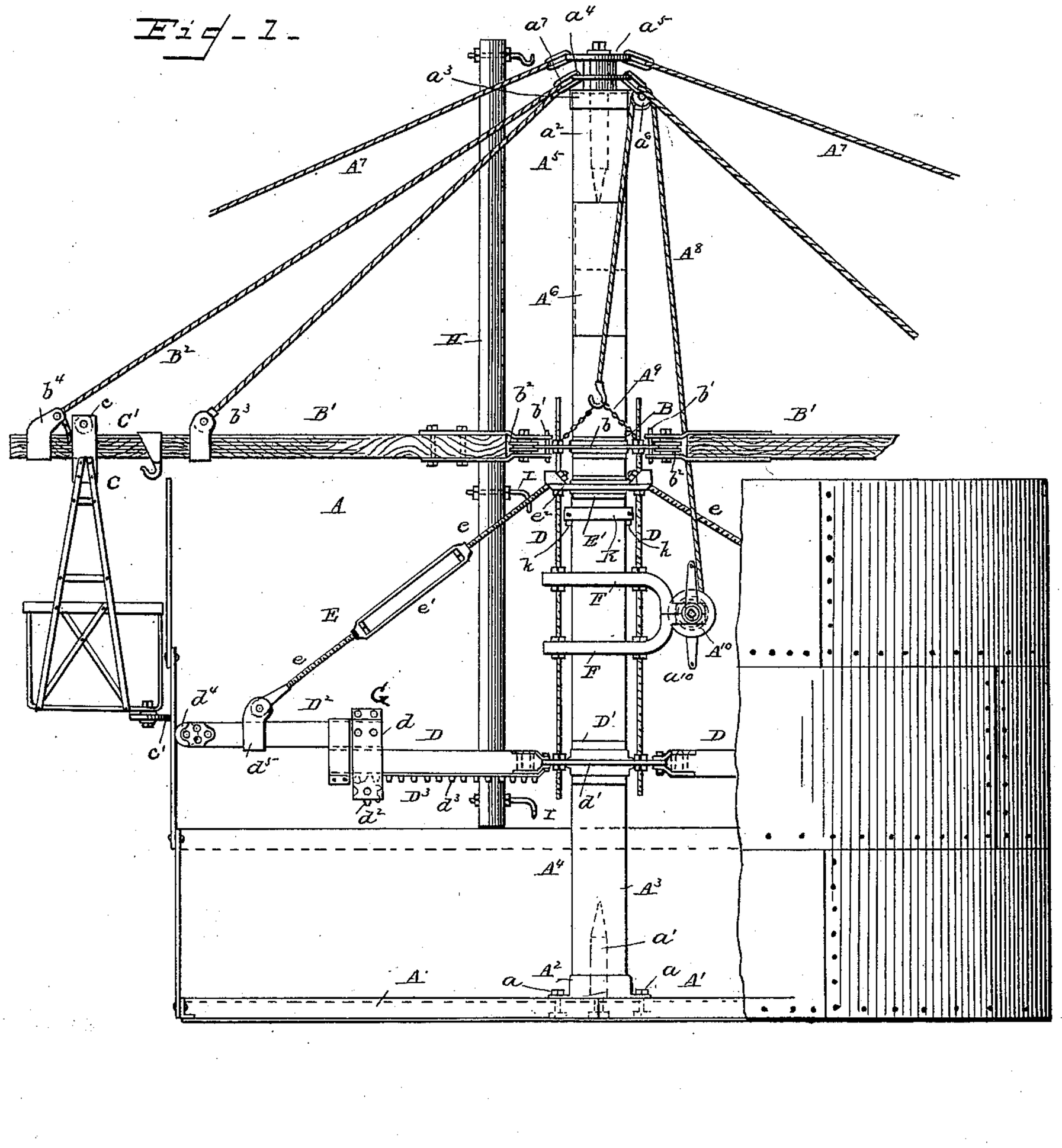
(No Model.) 2 Sheets—Sheet 1.

J. LIGHTHAM.

DERRICK.

No. 376,037. Patented Jan. 3, 1888.

Fig - 1 -



WITNESSES
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

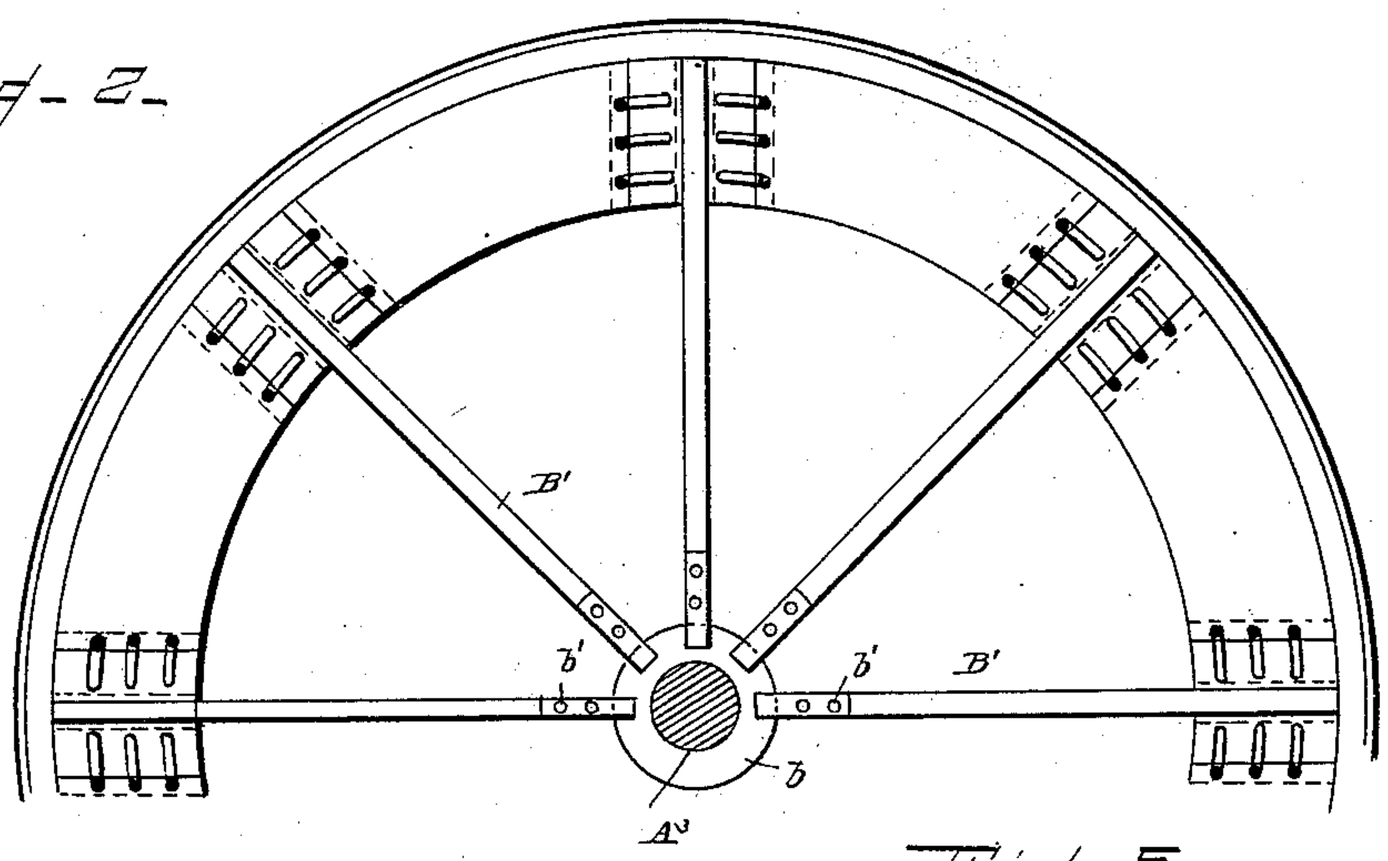
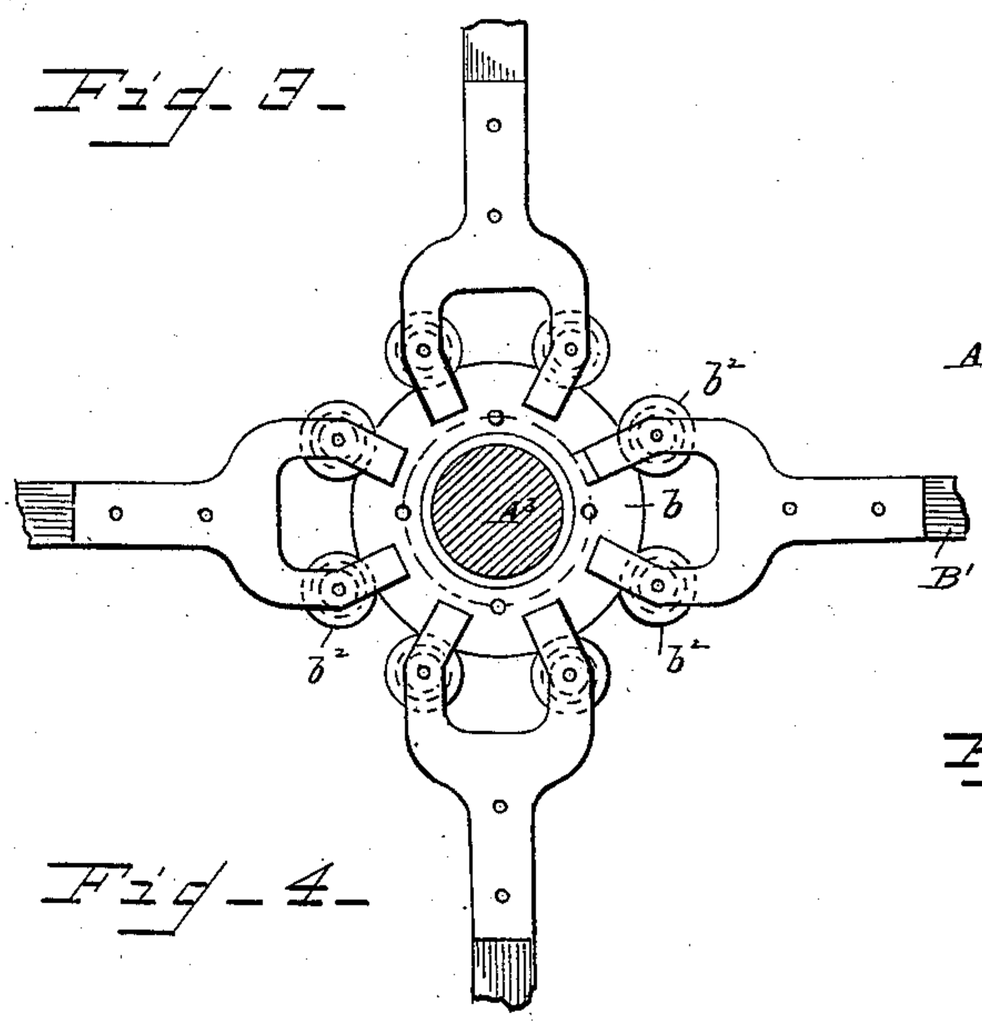


Fig. 5.

Fig. 3.



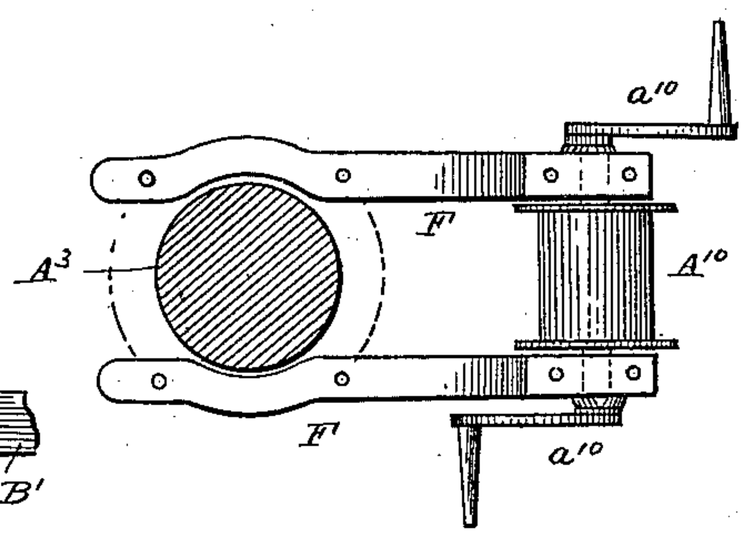
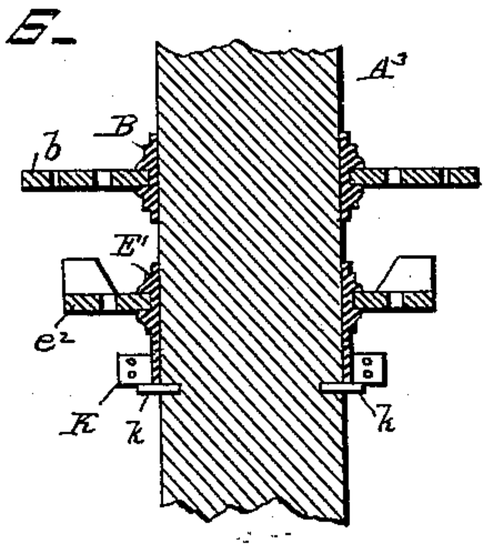
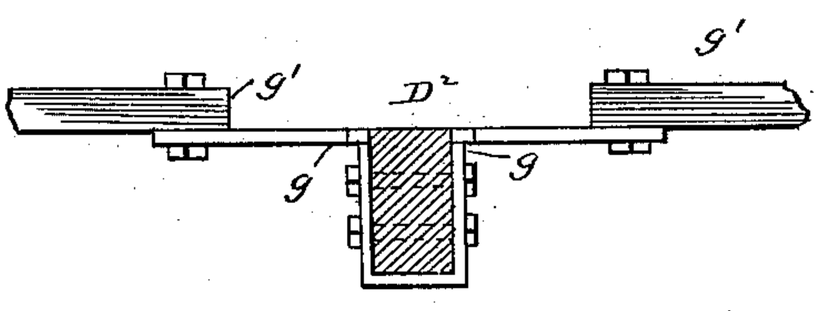


Fig. 4.

Fig. 6.





WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH LIGHTHAM, OF LEBANON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WILLIAM P. BOGER, OF SAME PLACE.

DERRICK.

SPECIFICATION forming part of Letters Patent No. 376,037, dated January 3, 1888.

Application filed August 6, 1887. Serial No. 246,255. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH LIGHTHAM, a citizen of the United States, residing at Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Derricks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved derrick for erecting the sheet-iron work of blast-furnaces, hot ovens, or hot-blast stoves, oil and water tanks, and brick-work of furnaces.

The object of my invention is to construct a derrick in such manner that men stationed on the inside and outside of the structure can work together; and so arrange the parts of the derrick that as the work increases in height the parts where the men are stationed can be raised to meet the different heights; and, furthermore, the derrick is so constructed that the parts can be elevated to any desired height, and the diameter of the parts supporting the inner platform can be increased or diminished to fit different constructions, all as will hereinafter be described.

To these ends the nature of my invention consists in constructions and combinations of parts, all as will hereinafter be described in the specification, and pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 represents an elevation of a tank, with parts broken away to show the construction of the derrick contained therein, part of the derrick, however, being removed to show the supporting mechanism upon the mast; Fig. 2, a detail showing a top plan of the buggy-beams, the mast being in section; Fig. 3, a detail showing in plan the upper side of part of the radial arms and platform supported thereon; Fig. 4, a detail showing the manner of attaching together the segments forming the platform; Fig. 5, a detail, in top plan, showing the drum secured to the rods; and Fig. 6, a detail showing part of the mast and the rings and supporting parts in section.

A represents the structure in the process of building. At the bottom of the structure is placed a series of timbers, A′, radiating from the center of the structure. A socket, A^2, is secured to these timbers by means of bolts *a*, and is provided with a vertical projecting pin, *a′*, which is inserted in a recess in the end of a mast, A^3, which is inserted in said socket and projects upwardly to any desired height.

Ordinarily a mast is made of two sections, A^4 A^5, secured together by a thimble, A^6. It is obvious that the upper section can be removed, and any number of intermediate sections be placed between it and the section A^4 by using thimbles or other socketing device to hold them in position. The upper section, A^5, must always be used at the top, as it carries the upper end of the guy-ropes A^7, and the means for raising and lowering the parts for supporting the workmen building the structure. The upper end of this section A^5 is provided with a stud or pin, a^2, which is inserted in the top section and carries a collar or socket, a^3, and flanges a^4 a^5, the guy-ropes A^7 being secured to the latter, a^5.

To the collar or socket a^3 is secured a pulley, a^6, from which is suspended the supporting device for the workmen, by means of a cable, A^8, which is secured by one end to a chain, A^9, attached to the top of the supporting device, and by the other end to a drum, A^{10}, also secured to the frame, as will hereinafter be described. The chain A^9 is secured by its ends to a flange, *b*, on a sleeve, B, which encircles the mast. Pivoted to this collar, by means of bolts *b′*, are radial buggy-beams B′, having upon their inner ends wheels b^2, having a bearing-face upon the periphery of the flange *b*. The outer ends of these buggy-beams are provided with clips b^3 b^4, arranged at different points. A cable, B^2, is secured at one end to the clip b^3, and is passed through a ring, a^7, on flange a^4, and secured by its other end to the clip b^4 on the outer end of the buggy-beam. This cable supports the outer end of the beam, to which it is secured by means of a carriage, C, having wheel *c*, which runs upon the upper side of the beam or staging C′, having on its lower side a wheel, *c′*, which rests against the outside of the structure that is being built. The flange *b* is provided with screw-threaded vertical openings, in which are screwed the

screw-rods D, that support the platform upon the inner side of the structure. To the lower end of these rods is secured a flange, d', upon a collar, D′, encircling the mast in the same manner as flange b. Pivoted to and radiating from this flange are the platform-beams D, which may be of any desired length, or may be formed of sections coupled together in any desired manner.

In the present instance the coupling device consists of plates d, secured by their upper ends on each side of section D^2, and embrace and project below the section D^3, having on its under side a rack-bar, d^3, which meshes with a pinion, d^2, pivoted in the lower end of the plates d, and when operated serves to increase or decrease, as the case may be, the length of the beam. The outer end of section D^2 is provided with a wheel, d^4, which rests against the inner side of the structure and permits the radial beams to be raised or lowered without injuring the walls of the structure. The section D^2 is also provided with a clip, d^5, which can be adjusted longitudinally on said section. To it is secured by one end an adjustable brace, E, which consists of screw-bolts e e and a buckle, e'. The upper screw-bolt, e, is secured to a flange, e^2, on a sleeve, E′, encircling the mast and secured to the rods D in the same manner as the flanges b and d'. Upon these rods are secured arms F, which are joined together at their extended ends to form bearings for the winding drum A^{10}, which is provided with crank-handles a^{10}.

Upon the sections D^2 the platform G is formed by means of angle-irons g and planking g', secured to the angle-irons, and extends around the inner circumference of the structure, and is designed for the workmen, who rivet the ends of the bolts inserted through the plates by the workmen on the staging suspended from the buggy-beams.

The operation of the device is as follows: In building a structure the base or foundation is first formed and the timbers 'A' fixed in place therein, and the socket secured to the timbers for the insertion of the mast and its appendant parts. The sections forming the structure are then put in place and workmen, located upon the interior platform and the exterior staging, insert and rivet the bolts to secure the sections in place. As required, the staging and platform are raised by winding the cable upon the drum and causing the other end of said cable to lift the chain and parts supported therefrom. The collar K is then pushed up until in contact with the collar E′, and secured in place by pins k. If it be desired to build the structure higher than the mast herein shown, the upper section of the mast may be removed by loosening the ropes attached thereto and lifting it by means of the pole H, having the hook I, which is inserted in one of the rings on said section and another one placed between it and the lower part of the mast, the ropes being drawn to suit. The number of platform-beams is determined by the diameter of the structure.

What I claim is—

1. In a derrick, the combination of a mast and a frame encircling said mast, a platform supported from said frame, and a carriage upon a beam supported from said frame and projecting said carriage beyond the platform, substantially as described.

2. In a derrick, the combination of a mast, a platform supported from said mast by a beam having adjustable sections, and an adjustable carriage upon a beam supported from said mast and projecting said carriage beyond the platform, substantially as described.

3. The combination of a mast and a frame encircling said mast and vertically adjustable thereon, a platform supported from said frame, and a carriage upon a beam supported from said frame and projecting said carriage beyond the platform, substantially as described.

4. The combination of a mast and a frame encircling said mast and vertically adjustable thereon, a platform supported from said frame, and a carriage upon a beam supported from said frame, and a cable passing over a pulley on said mast and secured by one end to said frame and by the other to a drum secured to said frame, substantially as described.

5. In a derrick, the combination of a mast and frame on said mast, longitudinally-adjustable platform-arms secured by one end to said frame, and an adjustable brace-rod secured by one end to the frame and by the other end to the outer section of the adjustable arm, substantially as described.

6. In a derrick, the combination of a mast, a frame encircling said mast and having a collar, the buggy-arms secured by their inner ends to said collar and having on their inner ends wheels which bear on the periphery of said collar, and a carriage on their outer ends, and a cable connecting their outer ends with the top of the mast, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH LIGHTHAM.

Witnesses:
W. P. BOGER,
DAVID J. HARTLIEB.