No. 785,518. PATENTED MAR. 21, 1905.

J. L. PARSONS.

DERRICK.

APPLICATION FILED OCT. 24, 1904.

4 SHEETS—SHEET 1.

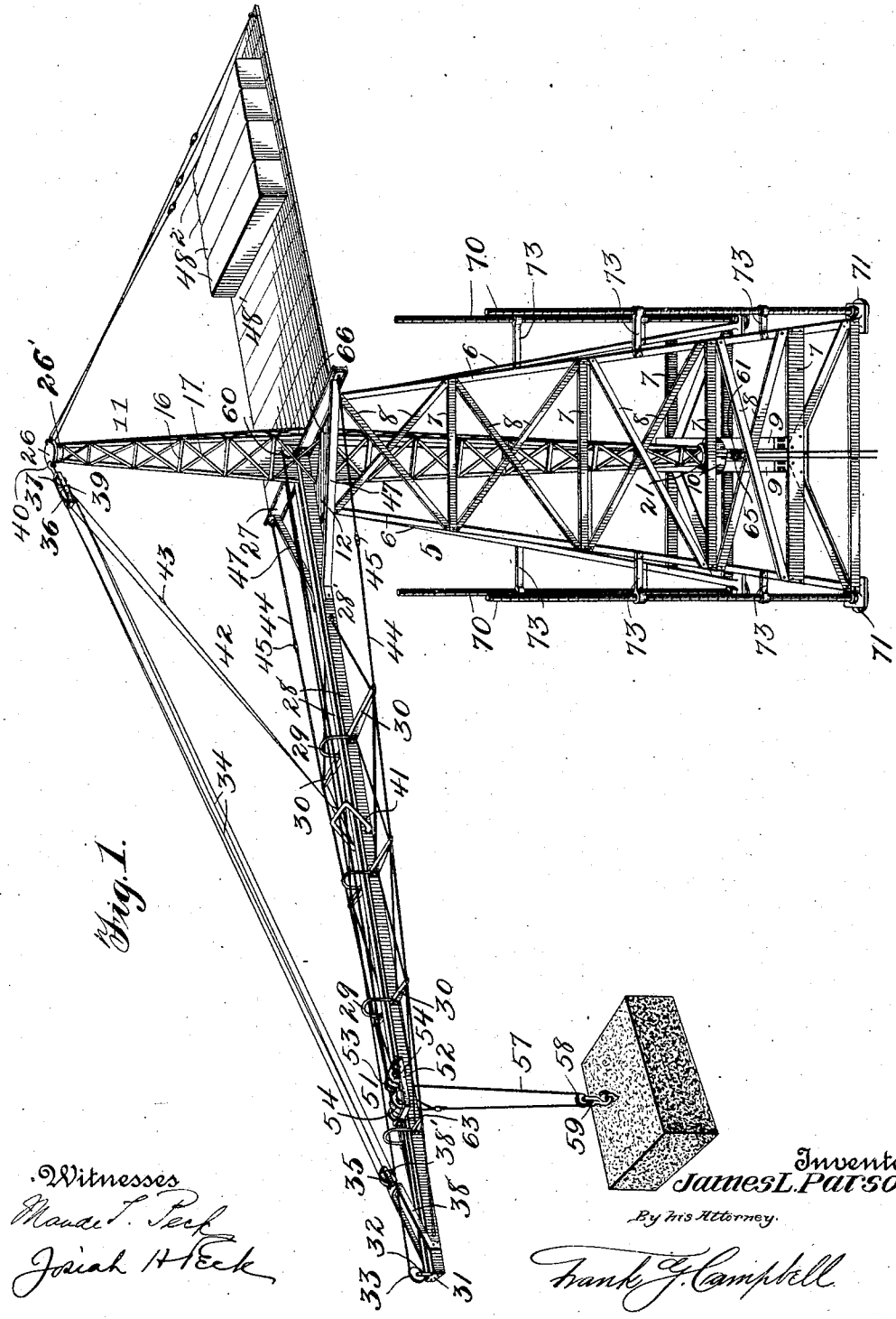


Fig. 1.

Witnesses
Maude T. Peck
Josiah H. Peck

Inventor
James L. Parsons:
By his Attorney.
Frank J. Campbell

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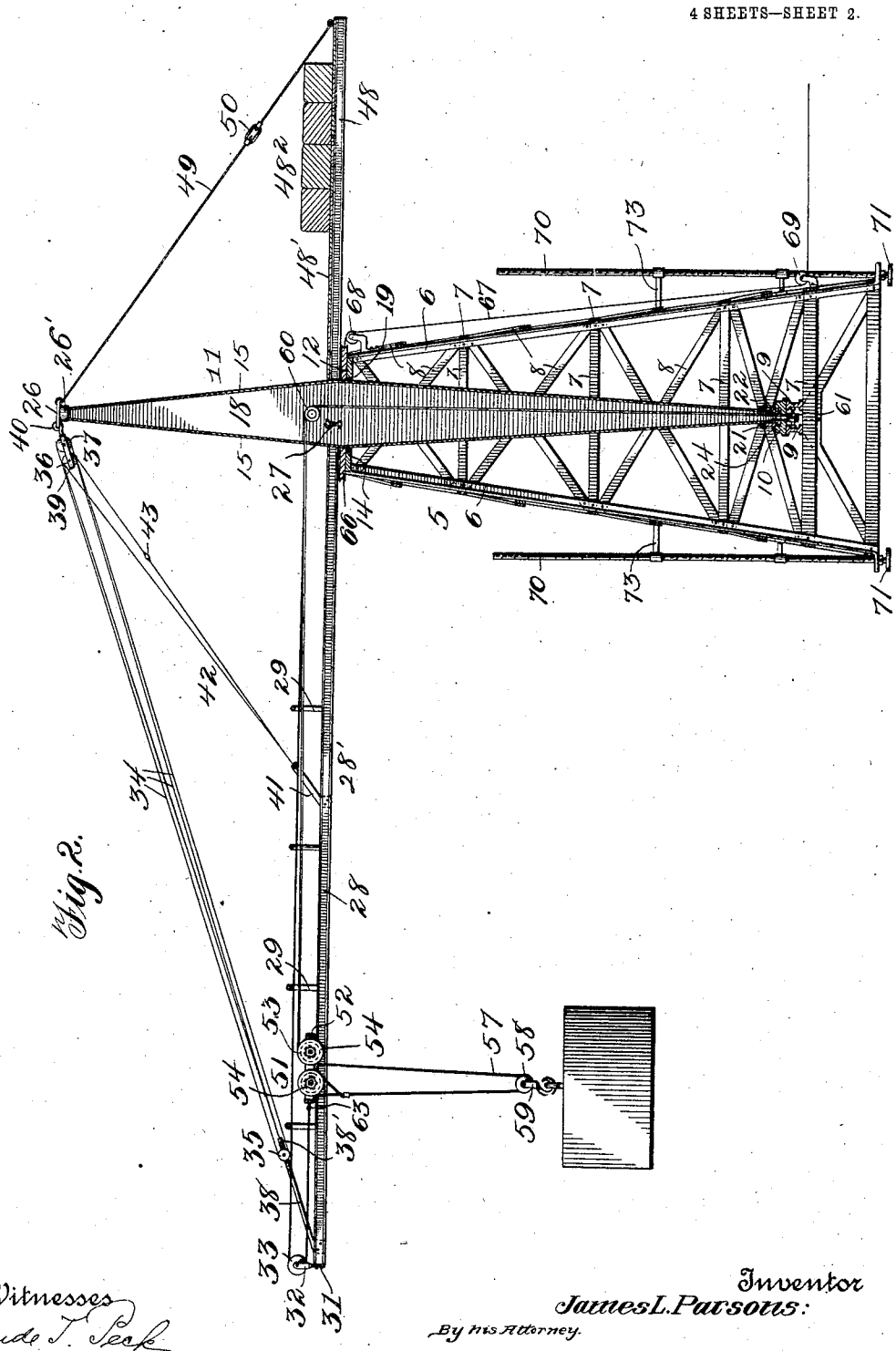


Fig. 2.

Witnesses
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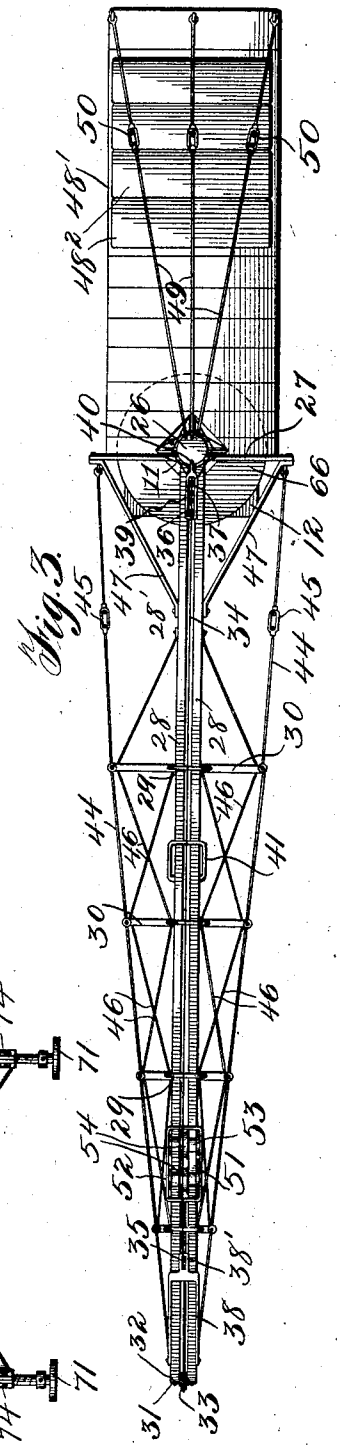


Fig. 3.

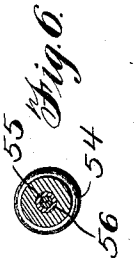


Fig. 6.

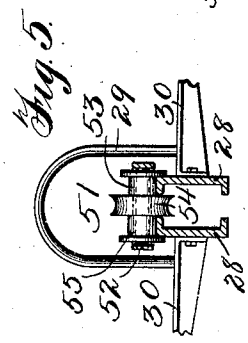


Fig. 5.

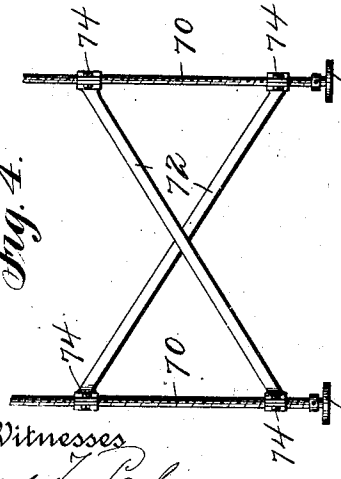


Fig. 4.

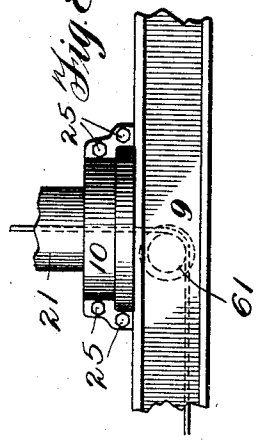


Fig. 8.

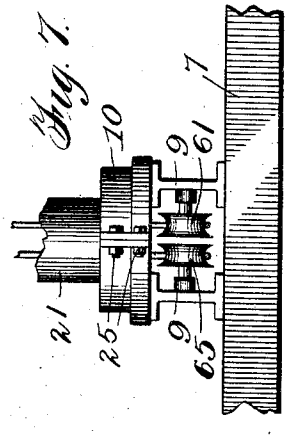


Fig. 7.

Witnesses

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DERRICK.

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4 SHEETS—SHEET 4.

Fig. 9.

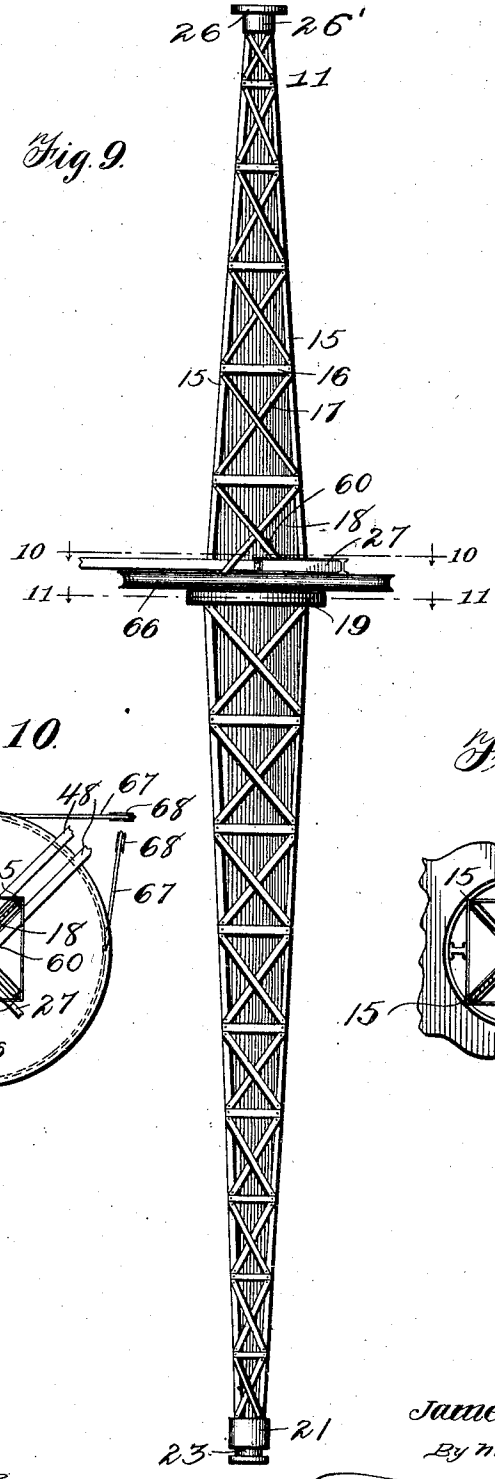
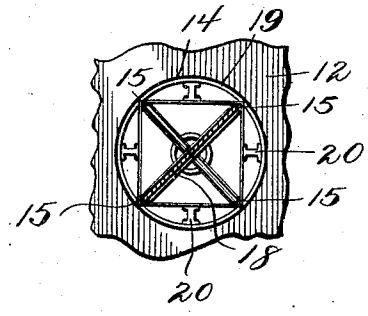


Fig. 10.

Fig. 11.



Witnesses

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No. 785,518. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

JAMES L. PARSONS, OF WASHINGTON, DISTRICT OF COLUMBIA.

DERRICK.

SPECIFICATION forming part of Letters Patent No. 785,518, dated March 21, 1905.

Application filed October 24, 1904. Serial No. 229,696.

To all whom it may concern:

Be it known that I, JAMES L. PARSONS, a citizen of the United States of America, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Derricks, of which the following is a specification.

My invention relates to derricks, and more particularly to that class of derricks used in the construction of buildings of considerable height, though it may be used for other purposes, if desired.

In the construction of buildings the space in which the workers are operating is often a confined one, and as the building is erected floor by floor the point at which the bulk of the work is being done, and consequently at which a derrick is most needed, constantly shifts. To meet these conditions by providing a light, strong, and easily-portable derrick is the object of the present invention.

A further object of the invention is the provision of a derrick having a wide range of action and one that may be effectually manipulated in a confined space.

A further object of the invention is the provision of a derrick capable of great rapidity of action and provided with means for raising or lowering the entire derrick when desired to meet the varying conditions that exist as the work progresses.

Further objects and advantages of the invention will be set forth in the detailed description which now follows.

In the accompanying drawings, Figure 1 is a perspective view of a derrick constructed in accordance with the invention with some of the braces upon the sides of the tower omitted to preserve the clearness of the drawing. Fig. 2 is a longitudinal vertical section of the derrick. Fig. 3 is a plan view of a mast and boom hereinafter described. Fig. 4 is an elevation of certain braces hereinafter described. Fig. 5 is a transverse section of the boom of the derrick, showing a load-carrying traveler, hereinafter described, in section. Fig. 6 is a sectional view of one of the sheaves of the traveler over which the load-line passes. Fig. 7 is an elevation of the lower bearing of the mast, showing a pair of **I**-beams for supporting said bearing and also showing a pair of sheaves over which the load and traveler lines pass. Fig. 8 is a side elevation of the parts illustrated in Fig. 7. Fig. 9 is a side elevation of the mast of the derrick. Fig. 10 is a horizontal section upon line 10 10 of Fig. 9, showing in addition the cable for actuating the bull-wheel; and Fig. 11 is a horizontal section upon line 11 11 of Fig. 9.

Like numerals designate similar parts in all of the figures of the drawings.

Referring to the drawings, the numeral 5 designates a tower of any desired construction. In the present instance this tower is shown as comprising the standards 6, the horizontal braces 7, and the diagonal braces 8. Extending transversely of the tower and supported upon two of the oppositely-disposed horizontal braces 7 are the **I**-beams 9, which serve as a support for the bearing-block 10, which receives the lower end of the mast 11. The top of the tower is formed of a single metallic plate 12 and has a circular opening 14 therein to form the upper bearing of the mast. As is best illustrated in Figs. 9, 10, and 11, this mast is angular in cross-section and comprises the corner-standards 15, the horizontal braces 16, and the diagonal braces 17. Additional rigidity is imparted to the structure by a plate 18, which extends diagonally across the mast between two of the corner-standards 15, thereby forming a continuous web throughout the length of the mast. A bearing-ring 19 is secured to the mast by means of the braces 20, said ring bearing against the walls of the opening 14, as is best illustrated in Fig. 11. At its lower end the standards 15 of the mast are firmly bound together by a cap 21, having the bore 22 formed therein. An annular groove 23 is formed in said cap, said groove being engaged when the various parts are assembled by a circumferential rib 24, carried by the bearing-block 10.

By referring to Figs. 7 and 8 it will be seen that the bearing-block 10 is made in two parts adapted to be clamped together by the bolts

and nuts 25. The engagement of rib 24 with groove 23 prevents any lifting of the mast when the strain of the load comes upon it. At its upper end the standards of the mast are bound together by a cap 26′, which carries a plate 26.

An I-beam 27, which passes through the rib or plate 18 of the mast, has secured to it the inner ends of channel-irons 28, which comprise the boom 28′ of the derrick. The channel-irons 28 are maintained in proper relation to each other by yokes 29, carried by braces 30, which are in turn secured to the outer sides of the channels. At their outer ends the channel-irons are tied together by a plate 31, provided with bearings 32 for the reception of a sheave 33, hereinafter described. By virtue of the construction set forth it will be seen that a clear passage-way is maintained between the channel-irons for the load-line to pass through. The outer end of the boom is supported from the top of the mast by the guy-wires 34, said wires being so arranged upon sheaves 35, 36, and 37 that an equal strain will be borne by each of them. This is accomplished in the following manner: Sheave 35 is mounted in bearings borne by a yoke 38, one of the arms of said yoke being secured to each of the channel-irons. Sheaves 36 and 37 are mounted in a block 39, which is attached at 40 to plate 26 of cap 25. The cable forming the guys 34 is first attached to an extension 38′ of yoke 38. It then passes over sheave 36, from thence over sheave 35, then over sheave 37, and then returns to extension 38′ of yoke 38, to which it is secured. At a point intermediate yoke 38 and the inner end of the boom a second yoke 41 straddles the channel-irons and is secured thereto, said yoke serving as a point of attachment for a guy wire or cable 42, the free ends of which are attached to said yoke and the bight of which passes over sheave 36. A turnbuckle 43 provides means for tightening said guy when desired.

To increase the rigidity of the structure, braces 30 are provided. These braces extend at substantially right angles to the boom. Tie-rods 44 extend from the ends of beam 27 to the outer end of the boom, where they are secured. Turnbuckles 45 provide means for tightening said rods when desired. Diagonal tie-rods 46, between the braces 30, and struts 47, extending from beam 27 to a suitable part of the boom, further strengthen and stiffen said boom.

Extending rearwardly from the mast and secured to beam 27 in like manner as channels 28 are channel-irons 48, bearing a platform 48′, the outer end of which is supported from the top of the mast by guy rods or wires 49. Turnbuckles 50 provide means for varying the tension of said rods or wires when desired. Platform 48′ is provided for the reception of weights 48^2, which serve to balance the weight of the boom and traveler.

Mounted for reciprocatory movement upon boom 38′ is a load-carrying traveler 51, comprising a frame 52, flanged wheels 53, and idle sheaves or pulleys 54. As will be seen by referring to Figs. 5 and 6, the flanges of wheels 53, which bear the load carried by the traveler, overlap the outer edges of the channel-irons. By virtue of this construction any tendency of said channel-irons to spread is resisted. The wheels 53 are mounted for rotation upon studs or arbors 55, borne by the frame 52. Said arbors also form bearings for the sheaves 54, which rotate independently of the wheels 53 and are provided with a bushing 56, adapted to resist wear.

In the form of my invention illustrated the load-line 57 is secured to one of the sheaves 54. It then passes around a sheave 58, mounted in a block 59, carrying a hook or other device for engaging the load to be lifted. Said line then passes over the second sheave 54, passing thence rearwardly to the mast, where it passes over an idler-pulley 60, mounted upon web or plate 18, and then passes through the bore 22 of cap 21, around sheave 61, and thence to any suitable source of power. The traveler-line is secured to the outer end of the frame of the traveler, as at 63. It then passes around sheave 33, extending thence rearwardly to an idle pulley 64, borne by web 18, as is clearly illustrated in Fig. 10. It then passes through cap 21, around a sheave 65, and thence to any suitable source of power, said sheaves 61 and 65 being borne by the I-beams 9.

For turning the mast and boom the bull-wheel 66 is provided, said bull-wheel being secured to the mast immediately above the top of the tower. Cables 67, which pass around said bull-wheel and extend thence over suitable sheaves 68 and 69 to a source of power, serve to actuate said bull-wheel.

The means for elevating the structure comprise the jack-screws 70, plates 71, and braces 72. One of the jack-screws is threaded into each corner of the tower, as is illustrated in Fig. 1. The plates 71 are loosely secured to the bottoms of the jack-screws and do not turn therewith. Braces 73, borne by the tower, encircle the rods; but said rods are not threaded therein. After the structure has been elevated by screwing down the jack-screws braces 72 (see Fig. 4) are applied to said screws below the base of the tower, and that this may be readily accomplished the gripping portions of these braces are made in two parts adapted to be clamped together and around said screws by the nuts and bolts 74. The plates 71 form a

firm base for the support of the structure when this is done.

The operation of the device is as follows: When it is desired to turn the mast to swing the boom into the position necessary to deposit the load at the point selected, motion is imparted to the bull-wheel through cables 67 and through said bull-wheel to the mast. By means of a derrick constructed as herein shown and described the load may be deposited at any point within the radius of a circle described by the end of the boom, excepting where the tower rests. When it is desired to have the traveler move toward the outer end of the boom, the traveler-line is wound in, thereby drawing said traveler toward sheave 33, as will be readily understood. When it is desired to have the traveler move toward the mast, the traveler-line is slackened and the load-line is tightened, which causes said traveler to move toward the inner end of the boom.

From the foregoing description it will be seen that the construction described and illustrated provides a simple, light, and portable derrick, one that will be rapid in operation and may be operated in a confined space. The construction of the upper bearing of the mast is such as to permit vertical movement of the mast. This construction results in the entire weight of the mast being borne by the lower bearing, which is a desirable feature, for it resists any tendency of the tower to upset.

Having described my invention, what I claim is—

1. The combination with a derrick, of screws for raising and lowering said derrick and braces between said screws, one end of said braces being secured to one of said screws and the other end of said braces being secured to another of said screws.

2. In a derrick, the combination with a tower of a mast mounted for rotation in said tower, a boom carried by said mast, a reciprocatory traveler mounted on said boom, a weighted platform, supports extending from the top of the mast to said boom and weighted platform, and means for raising and lowering the entire structure.

3. In a derrick, the combination with a supporting frame or tower of a mast comprising a plurality of standards, a web or plate extending diagonally between two of said standards, and means for binding all of said standards together.

4. In a derrick, the combination with a supporting frame or tower of a skeleton mast having a longitudinal web extending therethrough, a beam carried by said web, members comprising a boom attached to said beam, and a load-carrying traveler mounted upon said boom.

5. In a derrick, the combination with a hollow mast having a web passing longitudinally therethrough of sheaves mounted upon said web, a load-line passing over one of said sheaves, and a traveler-line passing over the other of said sheaves.

6. In a derrick, the combination with a frame or tower of a mast mounted in said tower, a bearing-block having an annular rib, and a cap carried by the mast and having an annular groove with which the said annular rib of the bearing-block engages.

7. In a derrick the combination with a tower of screws threaded into said tower and plates loosely carried by said screws.

8. In a derrick the combination with a tower of jack-screws threaded into said tower and braces adapted to be secured to said jack-screws.

9. In a derrick the combination with a tower of jack-screws threaded into said tower braces adapted to be secured to said jack-screws and plates loosely carried by said screws.

10. In a derrick, the combination, with a skeleton supporting-tower, of a skeleton mast mounted for rotation in said tower, a boom carried by said mast, a weighted platform also carried by said mast and counterbalancing said boom, diagonal and transverse braces for bracing said boom laterally, a load-carrying traveler mounted upon said boom, traveler and load lines passing longitudinally through said skeleton mast to said traveler, braces extending from the top of the mast to the outer ends of the boom and the weighted platform and means for adjusting the tension of said braces.

11. In a derrick, the combination, with a skeleton supporting-tower, comprising corner-standards, diagonal braces and horizontal braces; of a pair of **I**-beams extending transversely of said tower and borne by the horizontal braces of the tower, a bearing-block carried by said **I**-beams, a skeleton mast having its bearing in said bearing-block and in the upper portion of said tower, a boom carried by said mast and a weighted platform also carried by said mast and counterbalancing said boom.

12. In a derrick, the combination with a skeleton supporting-tower, of a skeleton mast rotatively mounted in said tower, a substantially horizontal boom carried by said mast, a weighted platform shorter than said boom also carried by the mast and counterbalancing said boom and jack-screws threaded into the corners of the tower.

13. In a derrick, the combination with a skeleton supporting-tower, of an angular skeleton mast having its bearings entirely within said tower, means for preventing lifting of said mast, a boom carried by said mast,

a weighted platform for counterbalancing said boom, means for supporting the outer ends of said boom and said weighted platform from the top of said mast, sheaves carried by said mast, a load-carrying traveler mounted upon said boom, load and traveler lines passing from said traveler over the sheaves carried by the mast and thence longitudinally through said mast to a source of power.

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

JAMES L. PARSONS.

Witnesses:

W. ELMER ESPEY,

CLARENCE H. POOLE.