F. HUNT.

DERRICK.

APPLICATION FILED FEB. 9, 1909.

926,191.

Patented June 29, 1909.

2 SHEETS—SHEET 1.

Fig. 4.

Fig. 1.

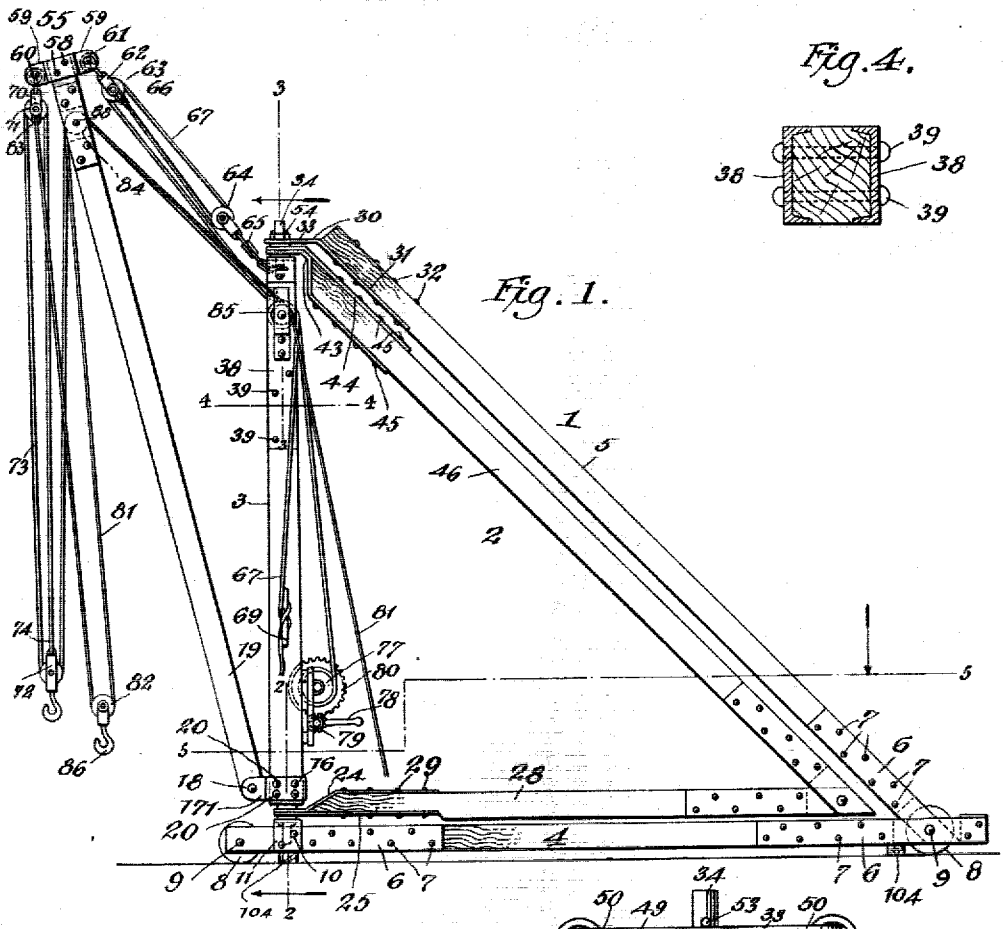


Fig. 2

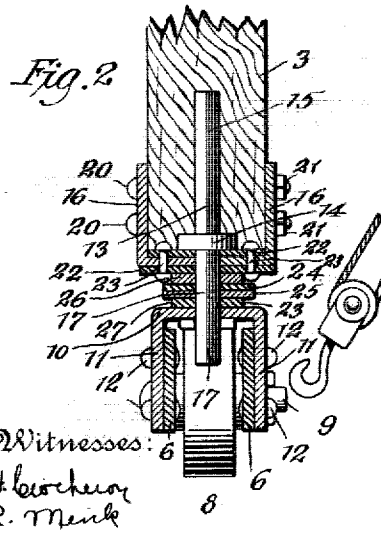
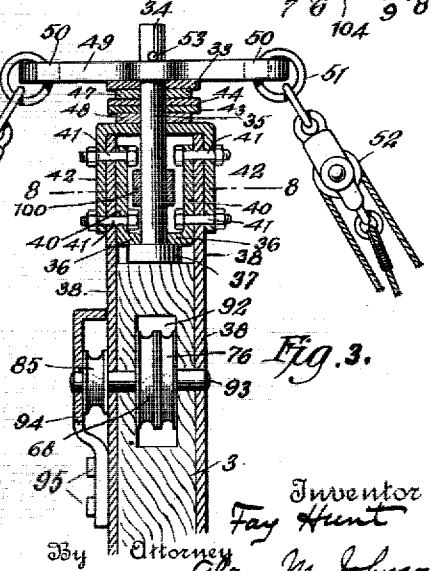


Fig. 3.



Witnesses:
H. Gretcher
R. Meink

Inventor
Fay Hunt
By Attorney
Alan M. Johnson

THE NORRIS PETERS CO., WASHINGTON, D. C.

F. HUNT.

DERRICK.

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2 SHEETS—SHEET 2.

Fig. 5.

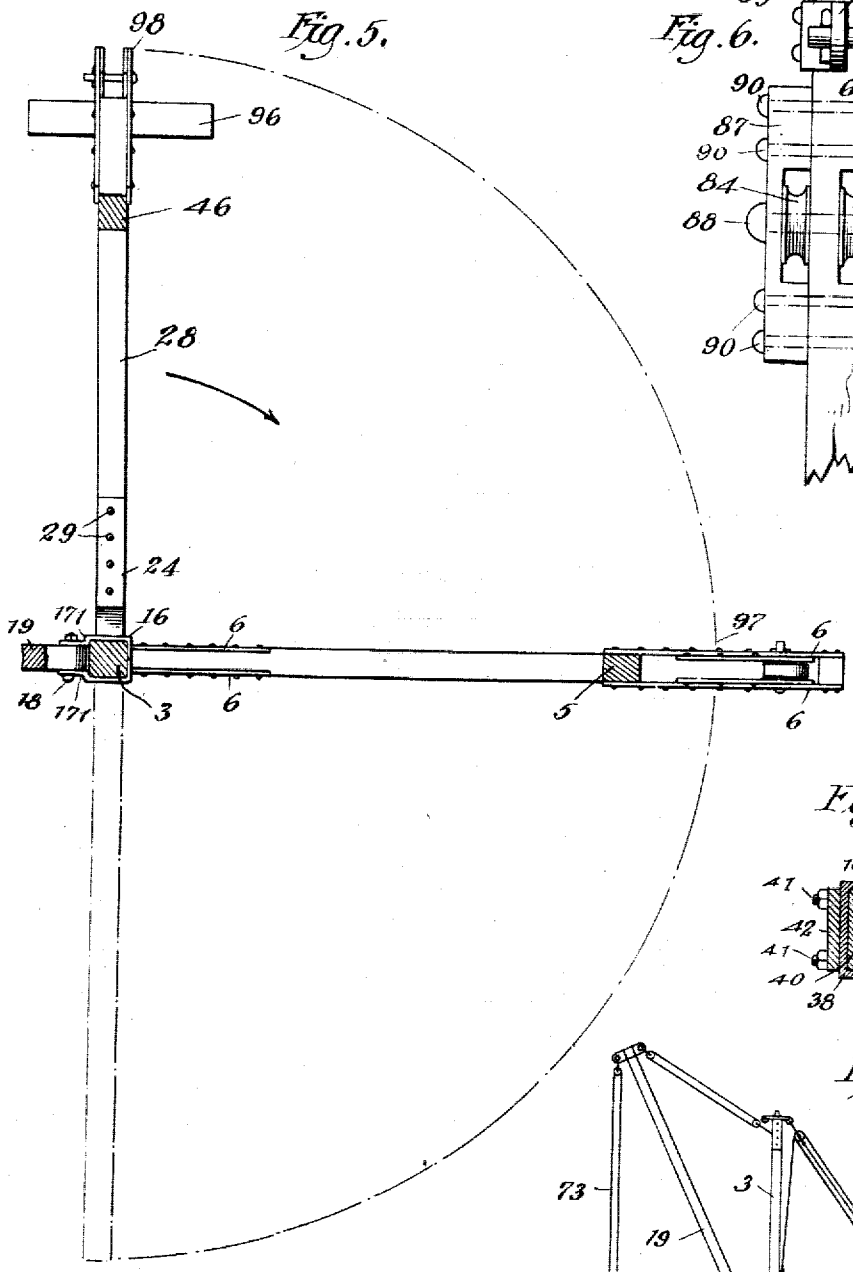


Fig. 6.

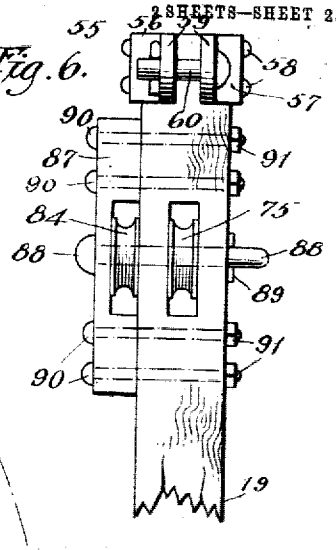


Fig. 6

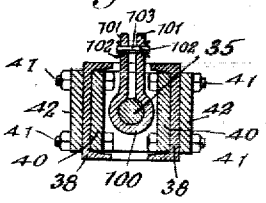
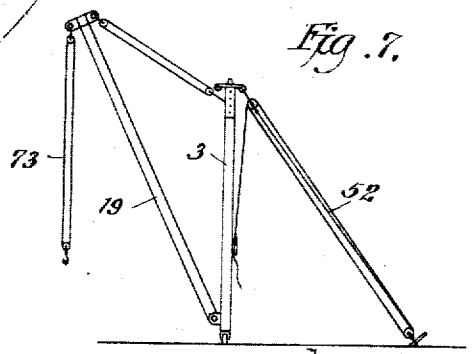


Fig. 7.



Witnesses:
H. Cerchenau
R. Menk

Inventor
Fay Hunt
By Attorney
Alan M. Johnson

UNITED STATES PATENT OFFICE.

FAY HUNT, OF NEW YORK, N. Y., ASSIGNOR TO NEW JERSEY FOUNDRY AND MACHINE COMPANY, A CORPORATION OF NEW JERSEY.

DERRICK.

No. 926,191. Specification of Letters Patent. Patented June 29, 1909.

Application filed February 9, 1909. Serial No. 476,961.

To all whom it may concern:

Be it known that I, FAY HUNT, a citizen of the United States, and a resident of the borough of the Bronx, in the city of New York and State of New York, have invented certain new and useful Improvements in Derricks, of which the following is a specification, taken in connection with the accompanying drawing, which forms a part of the same.

This invention relates to derricks and means for making a derrick right or left handed, and to a derrick which will permit the boom to work in an arc of substantially 360°, the boom being always adapted to operate in an arc of 270°.

My invention further relates to certain details of construction which will be hereinafter pointed out and set forth in the claims.

In the accompanying drawing showing an illustrative embodiment of this invention and in which the same reference numerals refer to similar parts in the several figures, Figure 1 is a side elevation of my derrick showing my auxiliary frame in its inoperative position within the main frame. Fig. 2 is a vertical section on line 2 -2 of Fig. 1 looking in the direction of the arrow. Fig. 3 is a vertical section taken through the mast head on the line 3--3 looking in the direction of the arrow. Fig. 4 is a transverse horizontal section on the line 4 -4 of Fig. 1, the ropes being omitted. Fig. 5 is a horizontal section on the line 5—5 of Fig. 1 looking in the direction of the arrow, the auxiliary frame being swung around into substantially right angles to the position shown in Fig. 1. Fig. 6 is a side elevation of a detail. Fig. 7 is a side elevation of my derrick on a smaller scale and shown supported by guy tackle. Fig. 8 is a horizontal section of a detail taken on the line 8—8, Fig. 3.

In structural iron and other work it is extremely desirable to have a derrick which can be adjusted with a minimum amount of labor and trouble to be either right or left handed, and one which can be readily shifted as required. In the form of my invention illustrated I accomplish this highly desirable object by making my derrick of a plurality of frames preferably, though not necessarily, triangular ones. As shown in the drawing I use in this form of my invention two such frames. The mast 3 in the particular example here illustrated, preferably though not necessarily forms the third side of each triangular frame. Both frames may be formed of any suitable material but preferably they are formed of wood properly strengthened, or the frames may be formed entirely of metal or any other material as desired. In the form shown the main frame 1 consists of a main sill 4 and a main stiff leg 5 fastened to the sill 4 by the aid of metal plates 6, 6 and bolts 7, 7, or any other suitable connection between these two members may be used if desired, those shown being merely illustrative. To more readily move the derrick I may mount rollers 8, 8 between the plates 6, 6 at each end of the sill 4, the rollers being mounted upon axles 9 which pass through the plates 6, 6 as shown in Fig. 1, though these rollers may be omitted if desired.

Near the forward end of the main sill 4, I preferably secure a substantially U-shaped yoke 10 and secure its legs 11, 11 to the plates 6, 6 by means of rivets 12, 12, or any other suitable means can be used, as may be found convenient or expedient. On this yoke 10, I mount the mast 3 by any suitable connection which will permit the mast to have a free rotary movement with relation to the yoke and the main sill 4. In the form shown this connection consists of a bottom gudgeon pin 13 having an enlargement 14 between its ends.

The upper portion 15 of the gudgeon pin, together with the enlargement 14, is seated in the end of the mast 3, Fig. 2, and is secured to it by means of angle irons 16, 16 fitting on the end of the mast 3 and secured to it by means of bolts 20, 20 and nuts 21, 21. The lower end 17 of the gudgeon pin is located between the inturned ends of the angle irons 16, 16. These angle irons have ears 171 through which pass a bolt 18 forming the pivot for the boom 19 (Figs. 1 and 5). Strengthening plates 22, 22 may be used as shown in Fig. 2 and these may be secured to the bracket by means of rivets 23, 23.

The lower end 17 of the gudgeon pin 13 is then passed through an aperture in the sill connection formed by the plates 24, 25 and then into its seat in the yoke 10, washers 26 and 27 being mounted above and below the sill connection 24, 25 if desired. The plates 24 and 25 are secured on either

side of the auxiliary sill 28 by means of bolts 29, 29. The pivoted connection between these plates 24 and 25 and the gudgeon pin 13 is such as to permit the auxiliary frame 2 to have a relative movement with relation to the mast 3 and the main sill 4.

The main stiff leg 5 of the frame 1 is pivotally connected to the mast 3 in any suitable manner such as by a goose neck 33 consisting of a bent plate having an end 31 secured to the upper end of the stiff leg by means of bolts 32, 32, the other end of the goose neck 33, being bent and apertured for the reception of the top gudgeon pin 34. (Figs. 1 and 3.) This upper gudgeon pin 34 consists of a stem 35 and a head 37. The head 37 and a part of the stem 35 are mounted on the top of the mast 3 and between strengthening plates 38, 38, which are secured to the end of the mast 3 by means of bolts 39, 39. To permit the mast and gudgeon pin to have a relative rotation with relation to each other I secure angle irons 40, 40 mounted on the interior of the plates 38, 38, the flanges 36, 36 of the angle irons being spaced apart a sufficient distance to permit the free passage of the stem 35 of the gudgeon pin 34. These flanges 36, 36 are brought in proximity to the head 37 of the gudgeon pin and are secured in that position by means of bolts 41, 41 which also secure inversely arranged angle irons 42, 42, adapted to fit over the ends of the plates 38, 38, as clearly shown in Figs. 3 and 8. Mounted on the stem 35 of the goose neck 34 and above the flanges 36, 36, I mount a bent strap 100, preferably formed of metal and in its ends 101, 101 form apertures 102 for the reception of the pin 103 adapted to pass through and secure the first link of the chain 65, see Figs. 1 and 8. By this arrangement the strap 100 has a limited rotary movement upon the stem 35 of the gudgeon pin 34. This stem of the gudgeon pin is also made to pass through the apertures in the ends of the plates 43, 44 which form the auxiliary goose neck. These plates are secured on opposite sides of the auxiliary stiff leg 46 by means of bolts 45. The two goose necks 33 and 43, 44, and the angle irons 42, 42 are preferably separated from each other by means of washers 47, 48. On the gudgeon pin 34 above the goose neck 33, I preferably loosely mount a head 49 having an aperture for the reception of the stem 35 of the gudgeon pin 34 and apertures 50, 50 at each end for the reception of rings 51, 51 to which are secured supporting guys 52, 52. The end of the stem of the gudgeon pin is provided with an aperture 53 for the reception of a cotter or other locking pin 54, Figs. 1 and 3. These supporting guys 52 are of any well known construction and serve to support the derrick when the auxiliary frame 2 is in its inoperative position as in Fig. 1, though they may also be used, if desired, to further support the derrick when the auxiliary frame is thrown around into the position shown in Fig. 5. The use of these guys is more clearly shown in Fig. 7.

The boom 19 is of any ordinary construction. At its upper end I secure a collar 55 (Fig. 6), which may be of any suitable form but preferably made of two plates 56, 57, which are secured to each other and to the end of the boom by means of bolts 58, 58, which pass through the boom and through the respective collars 56 and 57 as shown in Fig. 6. Each of these plates 56 and 57 is provided at both ends with outwardly extending ears 59, 59 through which pass pins 60 and 61. The latter serves to support the becket or hanger 62 (Fig. 1) of the adjusting sheave 63. The coöperating sheave 64 is supported in any suitable manner such as by a chain 65 from the upper portion of the mast 3, Figs. 1 and 8. One end 66 of the adjusting tackle 67 is secured to the hanger or becket 62 and is thence passed around the sheave 64, over sheave 63, thence over the pulley 68 located in the mast, the other end of the rope 67 being removably secured to a cleat 69 on the side of the mast 3. The angle of the boom 19 with relation to the mast 3 is governed and controlled by drawing in or playing out the adjusting table 67 in an obvious manner.

From the pin 60 on the collar 55 I support the hanger or becket 70 (Fig. 1) within which the sheave 71 is mounted. This sheave together with the falls 72 and rope 73 is the main hoisting tackle. One end 74 of the tackle 73 is secured to the falls 72 and is then passed over the pulley 71 and back under the pulley in the falls 72 and thence over the pulley 75 mounted in the boom 19, thence over the pulley 76 in the mast and thence around a drum 77 operated in any suitable manner. For purposes of illustration I have shown this drum 77 operated manually by a pair of handles 78 (only one being shown in Fig. 1), through the pinion 79 meshing with the gear 80 upon the drum 77. It is to be understood, however, that any other form of operating mechanism may be used and that electric, pneumatic or steam power or any combination of them may be employed to operate this drum without departing from my invention.

In some cases where it is desired to move or shift light loads without the aid of the drum 77 or similar mechanism I use an auxiliary lifting tackle 81 provided with a movable pulley 82. One end 83 of the auxiliary lifting tackle 81 I secure to the becket or hanger 70 (Fig. 1), and pass the other end beneath the movable pulley 82 and then up over a sheave 84 (Fig. 6) mounted near the end of the boom 19, thence over a sheave 85 mounted near the top of the mast 3 and

thence to any suitable cleat or holding device (not shown). It is obvious that by pulling upon the auxiliary tackle 81, any object secured to the hook 86 of the movable pulley 82 will be raised and can be re-adjusted or shifted as desired. In practice this auxiliary lifting tackle is found extremely useful and convenient when the load is not sufficient to require the operation of the main hoisting tackle.

The sheaves 84 and 85 may be secured to the boom and mast respectively in any suitable manner. For purposes of illustration I have shown the sheave 84 mounted on the pin 88 passing through the plate 87, the pin being held from movement in one direction by its head and in the other by means of a cotter pin 89 as shown in Fig. 6. On the same pin 88 I also preferably mount the sheave 75. This plate 87 is secured to the boom in any suitable manner such as by means of bolts 90, 90 and nuts 91, 91 (Fig. 6.)

It is immaterial how the sheaves 85, 68 and 76 are mounted on the mast. For purposes of illustration I have shown the sheaves 68 and 76 mounted in an aperture 92 formed near the end of the mast 3 and both mounted upon the axle 93 on which the sheave 85 is also mounted, the latter being held to the side of the mast 3 by means of an angular plate 94 which is secured to the mast by means of bolts 95.

My derrick may be used for innumerable purposes and it is to be distinctly understood that it is not to be limited to any particular work. I have found in practice that it is particularly advantageous in structural iron work. When so used the auxiliary frame 2 may be swung around into substantially right angles to the main frame 1, as shown in Fig. 5 and if desired, though this is not always necessary, the auxiliary sill 28 may be permitted to rest upon a block or similar device 96. (Fig. 5). Other removable supporting blocks 104, 104 may also be used beneath the main sill 4, Fig. 1, to take the strain off of the axles 9, 9 of the wheels 8, 8, if desired, though these may be dispensed with. When the two frames are in an extended position and properly lashed or secured to the working floor, or any other support upon which the derrick may be mounted, the boom and hoisting tackle may be used in an arc of 270°. The auxiliary frame 2 can then be moved back through the main frame 1 into a position substantially at right angles to the main sill 4 as shown in dotted lines in Fig. 5. The boom and hoisting tackle can then be operated in the arc of the circle appearing between the points 97 and 98, Fig. 5.

In some instances it may be desirable to operate the boom and hoisting tackle in substantially a circle of 360°. This can be done by placing the auxiliary frame 2 within the main frame 1, as shown in Fig. 1, when the boom and hoisting tackle can be swung in a circle of substantially 360°, minus only that portion of the circumference of the circle which is occupied by the main sill 4. In this position of the derrick it can be supported by the supporting guys 52 which may also be used, if desired, to further support the derrick even when the auxiliary frame is thrown out and lashed or secured in any other manner to the working floor, or other support upon which the derrick may rest. It is to be further understood that the auxiliary frame 2 may be swung to and secured in any acute angle to the main frame 1 it, of course, not being necessary that it be swung out to be approximately at right angles.

Having thus described this invention in connection with the several illustrative embodiments thereof to the details of which I do not desire to be limited, what is claimed as new and what it is desired to secure by Letters Patent is set forth in the appended claims.

1. In a derrick the combination of a plurality of frames and means to pivot the frames with relation to each other.

2. In a derrick a plurality of substantially triangular frames and means to permit movement of the frames with relation to each other.

3. A derrick formed of two frames and pivoted means between the frames permitting them to move with relation to each other to form a right or left handed derrick.

4. A derrick formed of a plurality of substantially triangular frames one side of each triangular frame being the mast of the derrick and means to permit the frames to be swung with relation to each other to form a right or left handed derrick.

5. In a derrick, the combination of a main frame and means carried by the frame adapted to make the derrick either right or left handed without moving the main frame.

6. A derrick formed of two substantially triangular frames, one side of each triangular frame being the mast of the derrick and pivoted means between the triangular frames to permit them to move with relation to each other to form a right or left handed derrick.

7. A derrick formed of a plurality of nested frames one side of each frame being the mast of the derrick and connection means between the frames which will permit the smaller frame to swing in the arc of a circle into its operative position or to permit them to remain nested in an inoperative position.

8. A derrick formed of a plurality of nested frames of different sizes, one of the frames being the main frame and the smaller frame being the auxiliary frame and con-

nection means between the main frame and the auxiliary frame permitting the latter to be swung in an arc of a circle or to remain in its nested or inoperative position.

9. In a derrick the combination of two triangular nested frames one side of each triangle being the mast of the derrick, gudgeon pins at each end of the mast, a support in the main frame for the lower gudgeon pin, a sill connection pivotally mounted upon the lower gudgeon pin and secured to the auxiliary frame, a main goose neck upon the outer frame pivotally mounted upon the upper gudgeon pin and an auxiliary goose neck mounted upon the upper gudgeon pin and secured to the auxiliary frame.

10. The combination of a derrick formed of a main frame comprising a main sill and a main stiff leg and means to secure these two members together, an auxiliary frame formed of an auxiliary sill and an auxiliary stiff leg and means to connect these two members together, a mast, pivoted means between the mast and the main sill and the auxiliary sill, and pivoted means between the main stiff leg and auxiliary stiff leg, said auxiliary sill and auxiliary stiff leg being shorter than the corresponding parts in the main frame and adapted to be located in substantially the same vertical plane as the main sill and main frame or at substantially right angles thereto, to form a right or left handed derrick.

FAY HUNT.

Witnesses:
HENRY B. NEWHALL, JR.,
ALAN M. JOHNSON.