

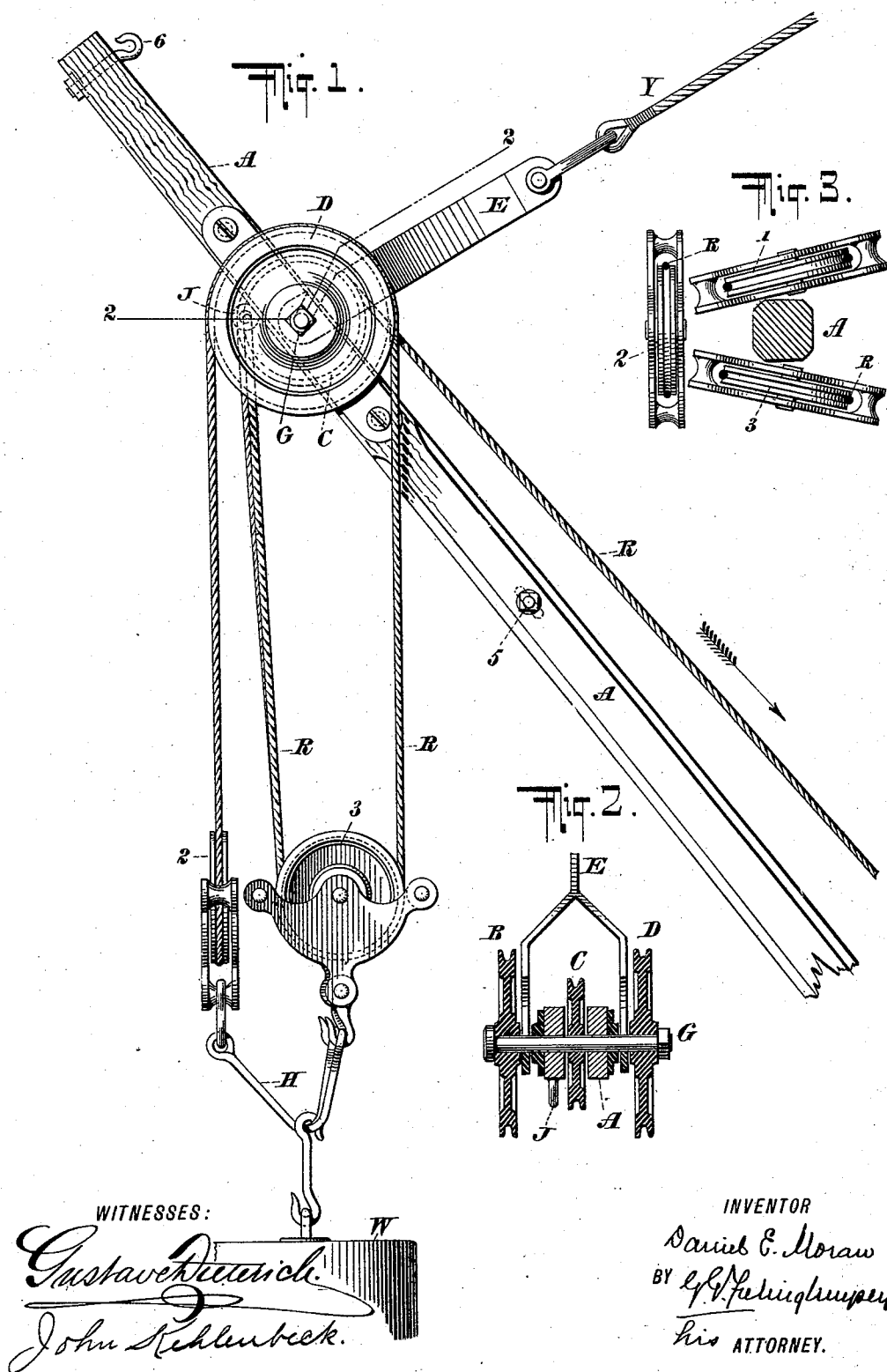
(No Model.)

3 Sheets—Sheet 1.

D. E. MORAN.  
DERRICK.

No. 578,495.

Patented Mar. 9, 1897.



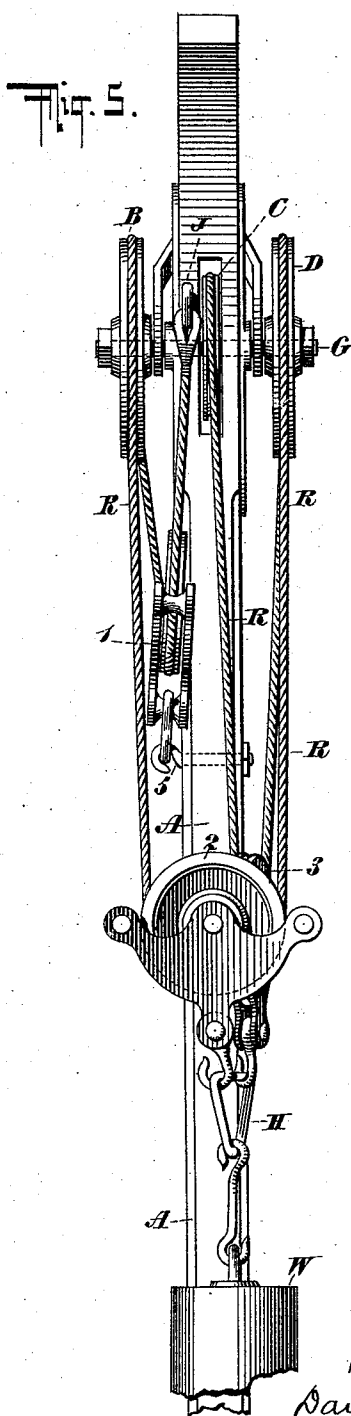
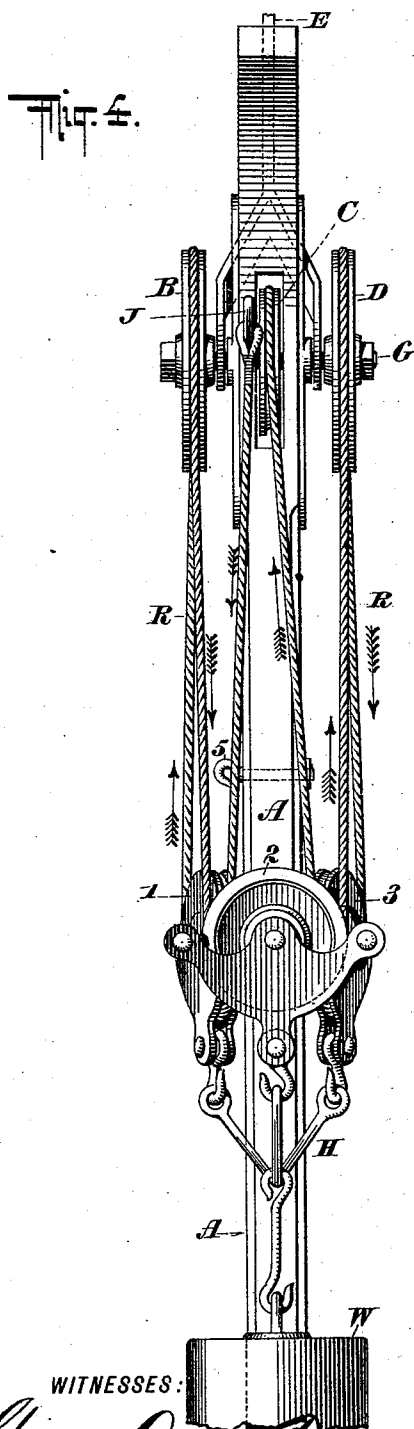
(No Model.)

3 Sheets—Sheet 2.

D. E. MORAN.  
DERRICK.

No. 578,495.

Patented Mar. 9, 1897.



WITNESSES:

*Gustave Dietrich*  
*John Kehlenbeck*

INVENTOR

*Daniel E. Moran*  
BY *Edw. F. Klingenberg*  
his ATTORNEY.

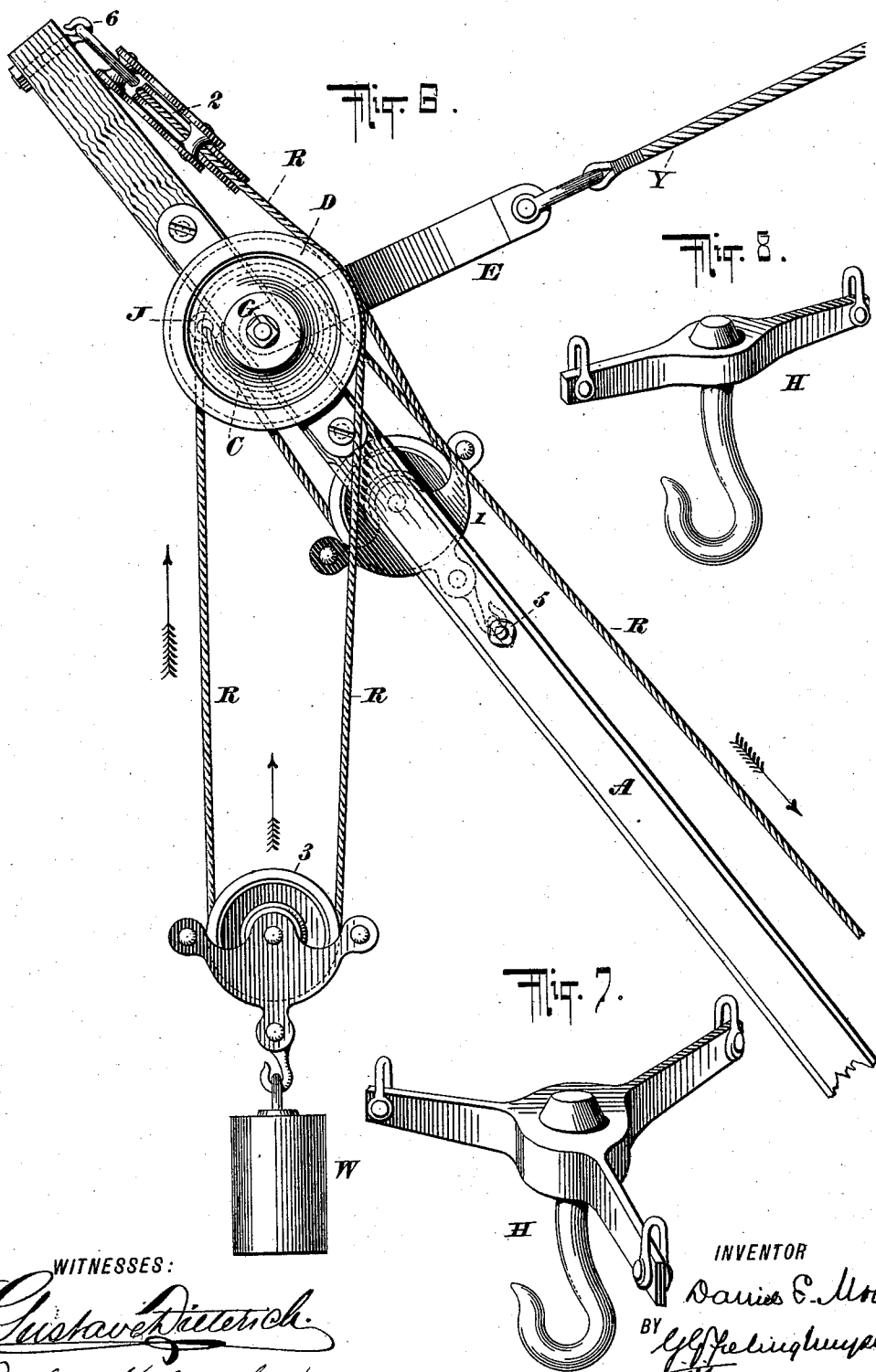
(No Model.)

3 Sheets—Sheet 3.

D. E. MORAN.  
DERRICK.

No. 578,495.

Patented Mar. 9, 1897.



WITNESSES:  
*Gustave Dietrich*  
*John Kehlbeck*

INVENTOR  
*Daniel E. Moran*  
BY *W. F. Kellogg*  
his ATTORNEY.

# UNITED STATES PATENT OFFICE.

DANIEL E. MORAN, OF NEW YORK, N. Y.

## DERRICK.

SPECIFICATION forming part of Letters Patent No. 578,495, dated March 9, 1897.

Application filed September 19, 1896. Serial No. 606,336. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL E. MORAN, of the city, county, and State of New York, have invented a new and useful Improvement in  
5 Derricks, of which the following is such a full, clear, and exact description as will enable others skilled in the art to make and use the same when taken in connection with the accompanying drawings, in which—

10 Figure 1 is a side view of the derrick. Fig. 2 is a cross-section of the boom, showing the sheaves on the line 2 2. Fig. 3 is a cross-section of the boom, showing the position of the pulleys about the same when the boom is in  
15 an approximately vertical position. Fig. 4 is a front view of the derrick, showing the pulleys 1, 2, and 3 in operation. Fig. 5 is a like view of the same with the pulley 1 out of operation. Fig. 6 is a side view of the boom,  
20 showing the pulleys 1 and 2 out of operation. Fig. 7 is a perspective view of a modification of hanger, and Fig. 8 is a perspective view of modified hanger for two pulleys.

This my invention relates to that class of  
25 derricks in which a boom A is used, at or near the upper end of which the operative rope or cable passes over sheaves or pulleys; and it consists in placing a sheave in a mortise in the boom and another sheave at either side  
30 of the boom, so arranged that their centers will be in line with one another and they will turn on the same axis, and three separate pulleys arranged to operate together on one hanger and operated upon by the rope or cable  
35 passing over the sheaves attached to the boom, and the arrangement of the rope or cable about the pulleys and sheaves so that one, two, or more of the pulleys may be used at the option of the operator, and arranging the  
40 pulleys so that the boom may lie between them when it is raised to a nearly vertical position.

I will now proceed to describe the apparatus, in which the boom A is supported in any  
45 appropriate manner by a cable Y, attached to a mast, or in any other appropriate manner. On the upper or projecting end of the boom A is placed the sheaves B C D on a shaft G common to each of them, so that their centers will be in the same line. The shaft G  
50 also passes through the hanger E, which is shown as made with two legs or arms, through

the ends of each of which the shaft G passes, while the upper end of the hanger E is attached to the rope or cable Y. This arrangement makes a direct connection between the  
55 shaft G and the supporting rope or cable Y. Used in connection with the sheaves B, C, and D are the hoisting-pulleys 1, 2, and 3, each separate one from another and each,  
60 however, supported and operated by the rope or cable R and each connected to the hanger H. The pulley 2 is of a diameter equal to the distance between the sheaves B and D, and the other two pulleys 1 and 3 are of such  
65 size as to give the rope passing through them a straight lead on the sheaves B, C, and D. An eye J is provided on the boom at or near the shaft G, to which the rope R is attached at one end. The course of the rope R, starting  
70 from that end, is as follows: down and around the pulley 1, up to the sheave B, around and down to the pulley 2, from that up to the sheave D, around and down to the pulley 3, up and over the sheave C, and down  
75 to the windlass or other operative mechanism for pulling in and paying out the rope.

To the three pulleys 1, 2, and 3 is attached a hanger H, triangular in form, so that when  
80 the pulleys 1, 2, and 3 are attached to it they will be equidistant from one another, and the rope passing around them will have straight leads to the sheaves B, C, and D. The weight W is attached to the hanger H  
85 and is borne equally by the three pulleys 1, 2, and 3.

At Fig. 7 is shown a modification of the hanger H, which may be used for that shown  
in the other figures, in which the three-armed piece is provided at the end of each arm  
90 with an eye for the pulley-hook and at the center with a hook for the weight, so as to equally distribute the load to the three pulleys.

It will be observed that when power is applied by the windlass to the free end of the  
95 rope R the rope is drawn in, as indicated by the arrows in Fig. 4, and the weight raised by the operation of the three sheaves B, C, and D and the three pulleys 1, 2, and 3, thus  
100 increasing the power applied six times and enabling the operator to raise a heavy weight by the use of comparatively small power. If in this operation it becomes necessary to

raise the boom A to a vertical or nearly vertical position, it will be found that the pulleys 1 and 3 adjust themselves to the side of the boom and allow the center of the hanger H, to which the load is attached, to come very close to the foot of the boom, thus making it possible to land a load much closer to the foot of the boom than can be done with any other form of derrick.

If in the use of the derrick it is desired to raise a smaller or lighter load, the same may be done with economy of time by removing the pulley 1 from operation, which is accomplished by detaching its hook from the hanger H and attaching it to the stop 5 on the boom arranged for that purpose, as is shown more clearly in Fig. 5.

It will be observed that the rope R, starting from the eye J, passes over the stationary pulley 1 and over the sheave B, which merely act as supports for the rope and are not turned by the raising and lowering of the pulleys 2 and 3 in the operation of the rope R. The sheaves C and D and pulleys 2 and 3 continue to operate in conjunction with the rope and increase the power four times instead of six times, as in the other manner of using the derrick, thereby greatly quickening the operation of raising and lowering any load which can be handled by the amount of power used in the operation thereof. If now it is desired to raise loads of still lighter weight, in order to quicken the operation I hook the pulley 2 on the stop 6, arranged for that purpose, which removes the pulley 2 and the sheave D from operation, making them stationary and mere supports for the rope, as they are not turned by the operation of the rope. The pulley 3 and sheave C being alone left in operation, the power is simply doubled and a corresponding increase of speed is obtained over the form last described.

While the stop 5 for the pulley 1 is shown on the top side of the boom, it is manifest that the same could be provided for at or near the lower end or at any point on the side of the boom that might be thought desirable, and the stop 6 for the pulley 2 (shown on the upper end of the boom) on a projection of the boom beyond the point of attachment of the sheave provided therefor. This stop could be arranged on the boom between the lower point and the sheaves, if desired, without in any way departing from this my invention, and instead of placing the pulley 1 on the stop 5 when I desire to use only two pulleys and two sheaves I may place the pulley 2 on its stop 6 and obtain the same result as to power applied

and weight raised as if the pulley 1 were placed on the stop 5. With this arrangement, however, the sheaves and pulleys revolve in the operation of the rope, and as the pulley 2 is stationary it does not operate to increase the power, but merely acts as a dummy.

In Fig. 8 is shown a form of hanger I may use with two blocks instead of using the form shown in Fig. 7, each one of the two pulley-blocks taking in one of the two eyes at the extreme end of the arms of the hanger and the weight being attached with a hook at the center thereof.

Among the other advantages of this my invention is the facility with which it may be changed from a high-power derrick to a derrick of less power and the consequent saving of time and expense of operation.

It is manifest that this invention is not confined to boom-derricks, as the sheaves might be supported on a traveling derrick or crane or in various other hoisting-rigs and used and operated as here described.

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

1. The combination in a derrick of three sheaves; three pulleys, each pulley independently detachably attached to a common hanger, and a rope or cable operating upon the pulleys and sheaves, substantially as specified and set forth.

2. The combination in a derrick of three sheaves, and three pulleys, on which a rope operates, and stops for the pulleys 1, and 2, to which they may be attached, or to the hanger H, at the option of the operator, substantially as specified and set forth.

3. The combination in a derrick of three sheaves, and three pulleys, one of which pulleys is attached to the boom of the derrick, the other two pulleys being independently attached to the load, substantially as specified and set forth.

4. The combination in a derrick of three sheaves, and three pulleys, two of which pulleys are attached to the boom of the derrick, the other pulley being alone attached to the load substantially as specified and set forth.

5. The combination in a derrick of three sheaves three pulleys and a rope common to all, the pulleys being so arranged that they encircle the boom when in a nearly vertical position, substantially as specified and set forth.

DANIEL E. MORAN.

Witnesses:

C. J. IVIMEY,  
JAMES MCCUFF.