

No. 741,525.

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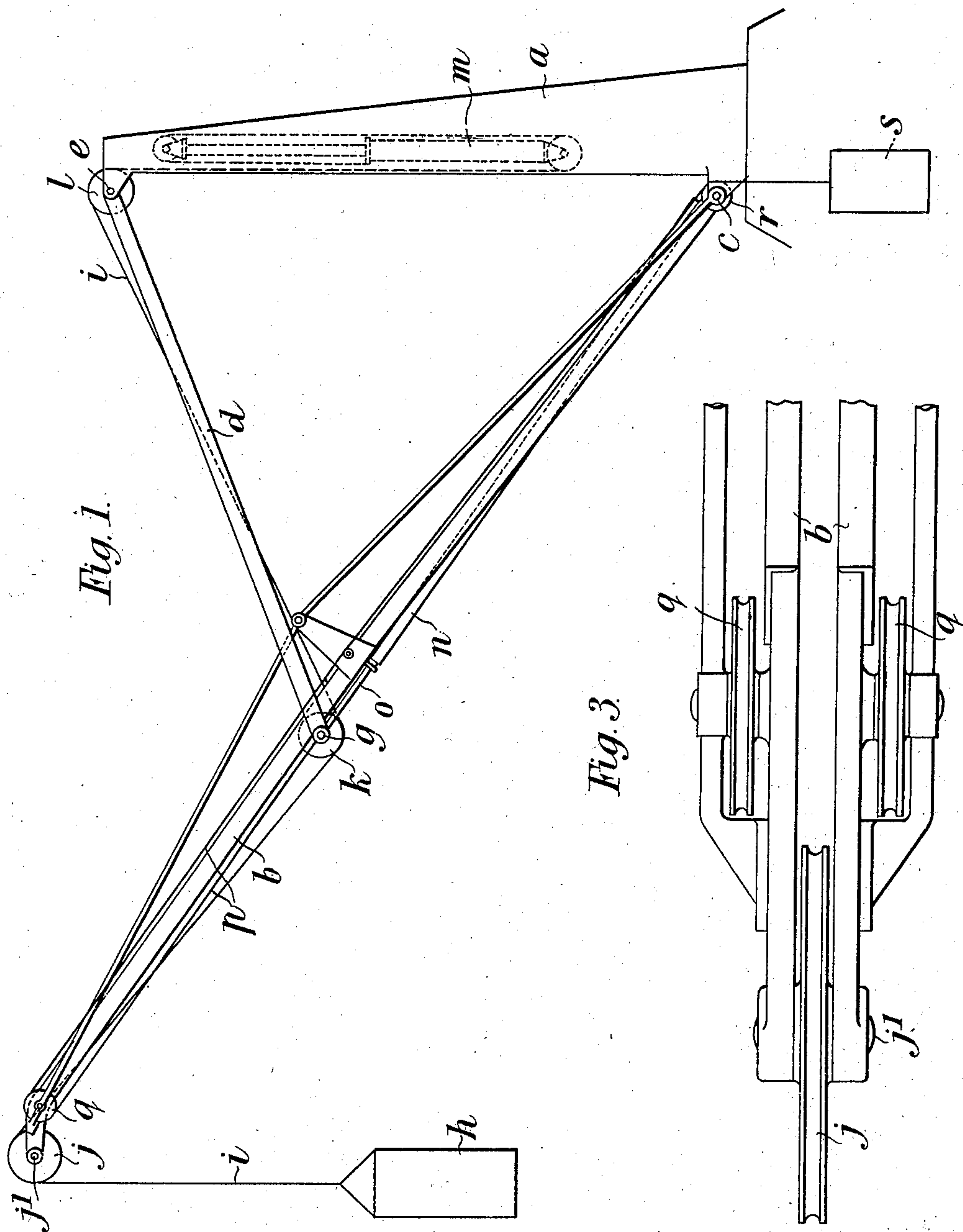
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CRANE OR LIKE HOISTING OR LOWERING APPARATUS.

APPLICATION FILED OCT. 7, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
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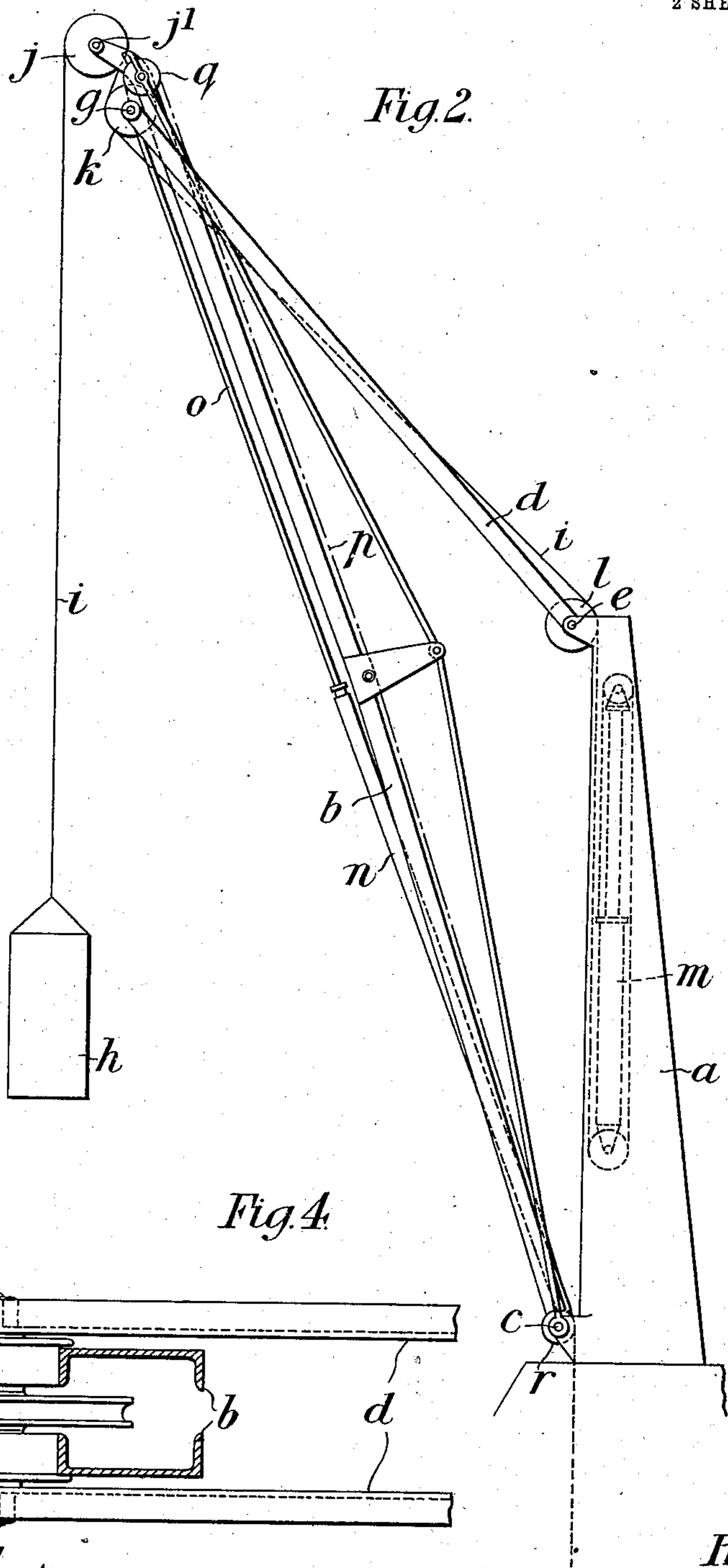


Fig. 2.

Fig. 4.

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UNITED STATES PATENT OFFICE.

ALFRED HILLYARD MITCHELL, OF OLD CHARLTON, ENGLAND, ASSIGNOR
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CRANE OR LIKE HOISTING OR LOWERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 741,525, dated October 13, 1903.

Application filed October 7, 1902. Serial No. 126,276. (No model.)

To all whom it may concern:

Be it known that I, ALFRED HILLYARD MITCHELL, a subject of the King of Great Britain, residing at 25 Wellington road, Old Charlton, county of Kent, England, have invented new and useful Improvements in Cranes or Like Hoisting or Lowering Apparatus, of which the following is a specification.

This invention relates to improvements in cranes and like hoisting and lowering apparatus.

In luffing or derricking cranes as heretofore made the jib is adapted to move in a vertical rotary direction about its bottom or pivoted end in such a manner that any load suspended from its free end is brought nearer to or moved farther away from its pivoted end when the jib is raised or lowered. Furthermore, on lowering the jib the load is also lowered and in lifting the jib the load is also lifted, this secondary operation of lifting the load causing a waste of power and being unnecessary. Again, the jib itself is generally lifted by means of a chain or rods fixed to its upper end and attached to a lifting-gear fixed on some part of the crane post or structure, and the power required continually varies according to the weight of the load suspended and the angle of inclination of the jib.

Now this invention has for its object to provide for lifting and lowering the jib without lifting or lowering the load, which thereby travels nearer to or farther away from the bottom or pivoted end in a horizontal plane, and also for lifting and lowering the jib without the use of the aforesaid chains or rods fixed to its upper end and so that the power required to lift or lower the jib is practically constant throughout the operation no matter what load be attached to the lifting rope or chain and no matter what be the angle of inclination of the jib, the arrangement also enabling the jib to be balanced at any angle of inclination. To this end I construct my crane as hereinafter described and as illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic view of my improved crane. Fig. 2 is a view similar to Fig. 1, showing the jib raised. Fig. 3 is a

plan view, drawn to a larger scale, of the front end of the jib; and Fig. 4 is a plan view, also drawn to a larger scale, of a detail hereinafter described.

a is the crane-post, and b is the jib, which is pivoted to the post at its lower end at c .

d is what I term a "compensating lever," pivoted at e to the upper end of the post a . This lever is made compound, so that it can embrace the jib b , as shown, and is provided at its outer end with traveler-rollers ff , (see Fig. 4,) which bear against the under side of the said jib, and thus support the latter. These rollers ff are mounted upon a pivot g .

h represents the load, the said load being suspended to the lifting rope or chain i , which passes up over a pulley j , mounted at j' in the free end of the jib, and thence back over the guide-pulley k , mounted on the pivot g , to the pulley l , mounted on the pivot e , whence the rope passes down to the hydraulic lifting-cylinder m , supported on the crane-post a . By passing the rope i over the two pulleys j and k , as shown, the weight tending to lower the jib is removed, since the upward reaction at g is always equal to the downward action at j , whereby the jib is able to take the weight without requiring further tie-rods.

To perform the operation of lifting or lowering the jib b , I mount upon the said jib the hydraulic cylinder n , (or other suitable motor,) the ram o of which bears against the end of the lever d , so as to force the said lever end up or allow it to descend, and thus raise or lower the jib. The pressure on the rollers ff along the longitudinal axis of the jib is a constant, and as the tendency of the load to drop is entirely compensated for by the compensating lever the pressure required to raise the jib is the same for all loads, subject only to the increased or reduced friction occasioned thereby. The jib is constructed to carry the load without additional supports or slings. By attaching a double chain p to the end of the lever d and passing it over pulleys q at the front end of the jib b (see Fig. 3) and a pulley r on the pivot c the entire weight of the jib itself may be balanced by a weight s , attached to the end of the said chain.

To maintain the height of the load h constant, the distance between the centers c and

e must be equal to the distance between the centers e and g and the distance between the centers j' and c must be twice as great.

When these dimensions are adopted, it will be clear from theoretical considerations that the height of the load will not be disturbed by the up and down movements of the jib b . Fig. 2 shows the jib in a raised position, the load, notwithstanding, being at the same height as that indicated in Fig. 1.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a crane or like hoisting and lowering device, the combination with a post, of a jib pivoted to said post said jib being provided at its free end with a pulley, a lever pivoted to said post and adapted to support and allow the pivotal movement of said jib, said lever being provided at its ends with pulleys, a rope passing over said pulleys and adapted to be secured to the load to be lifted and means for tightening and loosening said rope whereby said load is respectively raised and lowered and means for raising and lowering said lever whereby the jib is simultaneously raised and lowered, substantially as described.

2. In a crane or like hoisting and lowering device, the combination with a post, a jib

pivoted to said post, a lever pivoted to said post and adapted to support and raise and lower said jib, hydraulic means for operating said lever and hydraulic means for operating the mechanism for raising and lowering objects at the free end of said jib, substantially as described.

3. In a crane or like hoisting and lowering device, the combination with a post, of a jib pivoted to said post, a lever pivoted at one end to said post and adapted to support and allow pivotal movement of said jib, means for raising and lowering objects at the free end of said jib, pulleys at each end of said jib, ropes or chains secured at one end, to the end of said lever and adapted to pass over said pulleys, and a weight secured to the free ends of said ropes or chains, substantially as and for the purpose described.

4. A crane consisting of a post a , jib b , lever d supporting the jib, the weight s for balancing the jib and the rope or chain i passing over the pulleys j' , k and l for supporting the load, substantially as described and illustrated.

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Witnesses:

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