

(No Model.)

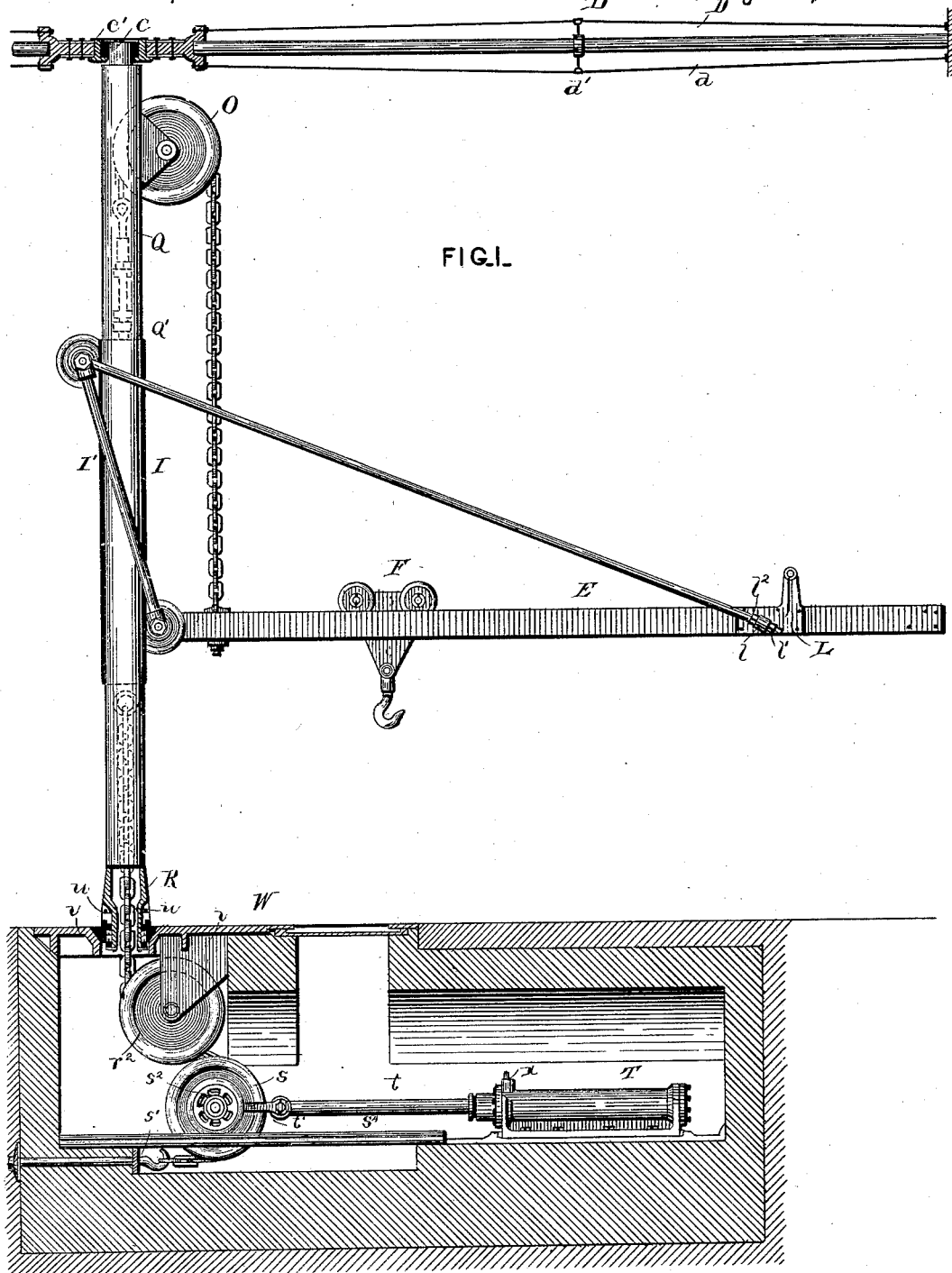
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S. T. WELLMAN.

CRANE.

No. 302,180.

Patented July 15, 1884.



WITNESSES
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Geo. F. Downing.

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(No Model.)

2 Sheets—Sheet 2.

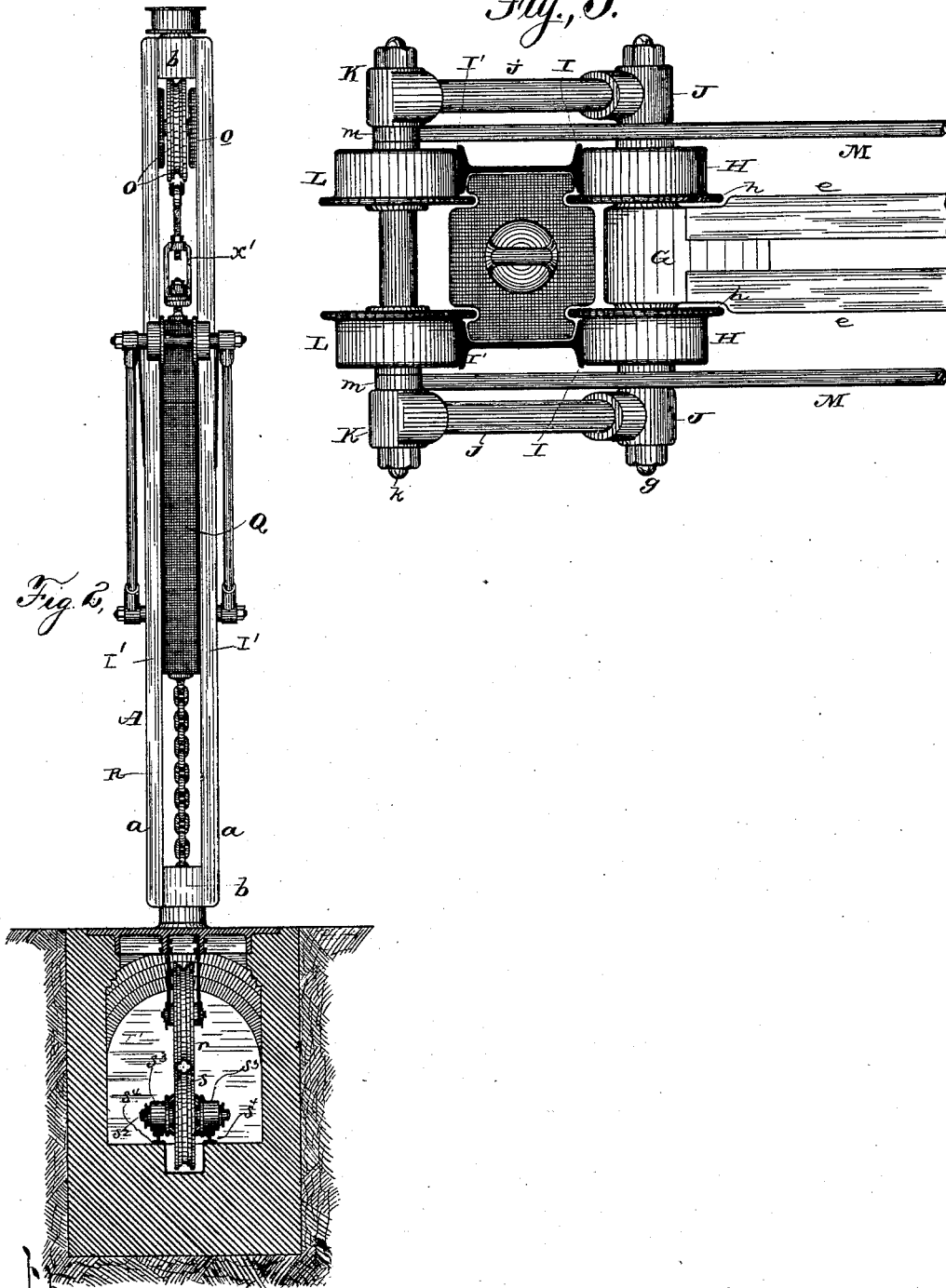
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Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL T. WELLMAN, OF CLEVELAND, OHIO.

CRANE.

SPECIFICATION forming part of Letters Patent No. 302,180, dated July 15, 1884.

Application filed October 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL T. WELLMAN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Cranes; 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 improvement in steam or hydraulic cranes, the object being to provide a crane of such construction that the jib may be vertically moved by means of a chain or rope or wire cable extending through the mast and leading to a steam or hydraulic cylinder located under the ground or floor.

With this end in view my invention consists in certain features of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view partly in side elevation and partly in vertical section of a crane embodying my invention. Fig. 2 is an end view of the same. Fig. 3 is a view partly in transverse section and partly in plan of a portion of the crane.

A represents the mast, which consists of the two uprights *a a*, secured at their opposite ends to the blocks *b b*. The upper end of the mast is provided with a journal, C, which is supported in a bearing, C', secured at the intersection of the roof truss-bars D, the latter consisting of the central bar, D', the truss-rods *d*, and the struts *d'*. The journal C is encircled by anti-friction rollers, to insure minimum friction to the upper end of the mast as it is rotated in its bearing.

E is the jib, consisting of the parallel bars *e e*, forming trackways for the carriage F. The inner end of the jib is provided with a bearing, G, that is journaled upon the axle *g*, upon which rotates the wheels H H, located at opposite sides of the bearing. Wheels H are provided with flanges *h*, and run on trackways I I, located on one side of the mast of the crane.

J J are sleeve-bearings secured to outer end of axle *g*, and are connected by diagonal rods or tubes *j j*, with similar bearings, K K, mounted upon opposite ends of the axle *k*, which support the wheels L L, that run upon

the trackways I' on the opposite side of the mast.

M M are tension-bars, their upper ends being provided with collars *m*, which encircle the axle *k*, while their lower ends are screw-threaded, each passing through a perforated lug, *l*, formed on a bracket, L', attached to the jib, and by means of the nuts *l'* any desired tension may be imparted to the tension-bars. The bracket L' is provided with a vertical arm, N, and the two brackets are connected by a transverse bar, *n*. A chain-pulley or sprocket-wheel, O, is journaled in suitable brackets, *o*, secured to the upper end of the mast. Around this wheel passes a chain, P, one end of which is attached to the jib, while its opposite end is attached to a swivel, Q, the latter being secured to the upper end of a counter-weight, Q'. This counter-weight is located between the two uprights of the mast, and is guided thereby.

To the lower end of the counter-weight Q' is secured a chain, R, which extends down through the hollow step R' of the mast and down around the under side of the chain-pulley *r*, which is supported in bearings *r'*, and thence partly around the chain-pulley *s*, the lower end of the chain being firmly secured to the hook *s'*. Chain-pulley *s* is secured to an axle, *s''*, upon the opposite ends of which are mounted the track-wheels *s'''*, which travel backward and forward on the tracks *s''''*.

T is a steam or hydraulic cylinder, which, together with the chain-wheels *r s*, is located beneath the ground in a suitable chamber, T', of masonry, or beneath the floor of a building. Cylinder T is provided with a piston-rod, *t*, having links *t'* pivoted to its outer end, the latter being attached to the journals of the track-wheels in any suitable manner. The hollow step of the mast rests upon conical anti-friction rollers *u*, which are supported upon the self-adjusting bearing U, the latter having a spherical bearing-surface, *v*, which engages a like supporting-surface, *v'*, formed in the bed-piece W. By means of the bearing the mast is permitted to incline slightly without binding or increasing the friction between the parts. Water under pressure or steam is admitted to T through the pipe X.

Having described the construction and rela-

tive arrangement of parts, I will now briefly describe its operation. The jib of the crane is readily swung around to any desired position, owing to the fact that the mast is supported in bearing at its upper and lower ends, and the further fact that the ball-and-socket joint for the step of the mast prevents the latter from binding, and it insures its free rotary movement under all conditions. The carriage F is then moved on the jib to a point over the load to be raised, which is connected to the carriage. Water or steam is then admitted to the cylinder T through the pipe X, and operates to draw the chain-pulley s toward the cylinder, which operation is facilitated by reason of the anti-friction link-bearings. As the chain-pulley s is drawn toward the cylinder T, the chain R is drawn down, and the chain P and the jib elevated to any desired height, when the jib is rotated to any desired point, the carriage F moved over a point where it is desired to deposit the load or weight, and then, by opening or regulating a valve, the steam or water is allowed to escape gradually, causing the jib to descend gradually the desired distance. The counter-weight serves to partly counterbalance the jib and parts connected therewith.

It is evident that many changes might be made in the construction of the different parts of the crane, and that the parts might be arranged in different ways without departing from the spirit of my invention, and hence I do not restrict myself to the exact construction and arrangement of parts shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a steam or hydraulic crane, the combination, with a rotary mast and a vertically-adjustable jib, of a steam or hydraulic cylinder situated below the mast, and a cable connected to the jib and extending downwardly through the mast, and devices for connecting the cable with the cylinder.

2. In a steam or hydraulic crane, the combination, with a mast and a vertically-movable jib, of a pulley or sprocket-wheel journaled to the mast, chain wheels or pulleys journaled below the mast, a steam or hydraulic cylinder, a cable connected to the jib and passing

downwardly through the mast, and devices, substantially as described, for transmitting motion from the cylinder to the jib, substantially as set forth. 55

3. The combination, with a rotary mast and a vertically-movable jib, of a chain passing upwardly through the mast, one end of said chain being connected to the jib for vertically elevating the same, and a motor connected to the chain. 60

4. The combination, with a mast constructed substantially as described, and a vertically-adjustable jib, of chains connecting the jib to the motor, and the counter-weight secured to the chains and guided by the side frame-pieces of the mast, substantially as set forth. 65

5. The combination, with the hollow step of the mast, of the self-adjusting bearing U, supported on the bed-plate W, and anti-friction rollers u, interposed between the step of the mast and the bearing U, substantially as set forth. 70

6. The combination, with a hollow mast, vertically-adjustable jib, and chain or cable, one end of which is connected to the jib, of the chain-pulleys r s, track-wheel s', rails t', cylinder T, and piston-rod and link, substantially as set forth. 75

7. The combination, with a mast constructed substantially as described, of the jib, wheels H, moving in contact with one face of the mast, wheels L, moving in contact with the opposite face of the mast, diagonal rods connecting the axles of the two sets of wheels, and tension-bars connecting the axle of the upper set of wheels with the jib, substantially as set forth. 80

8. The combination, with the mast and jib, of the lower set of wheels moving against one face of the mast, an upper set of wheels moving against the opposite face of the mast, diagonal rods connecting the two sets of wheels, the tension-bars connecting the axle of the upper wheels with the jib, the chains P and R, and intermediate counter-weight, substantially as set forth. 85

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

SAMUEL T. WELLMAN.

Witnesses:

THOS. H. BROOKS,
W. H. SHEPARD.