

No. 615,924.

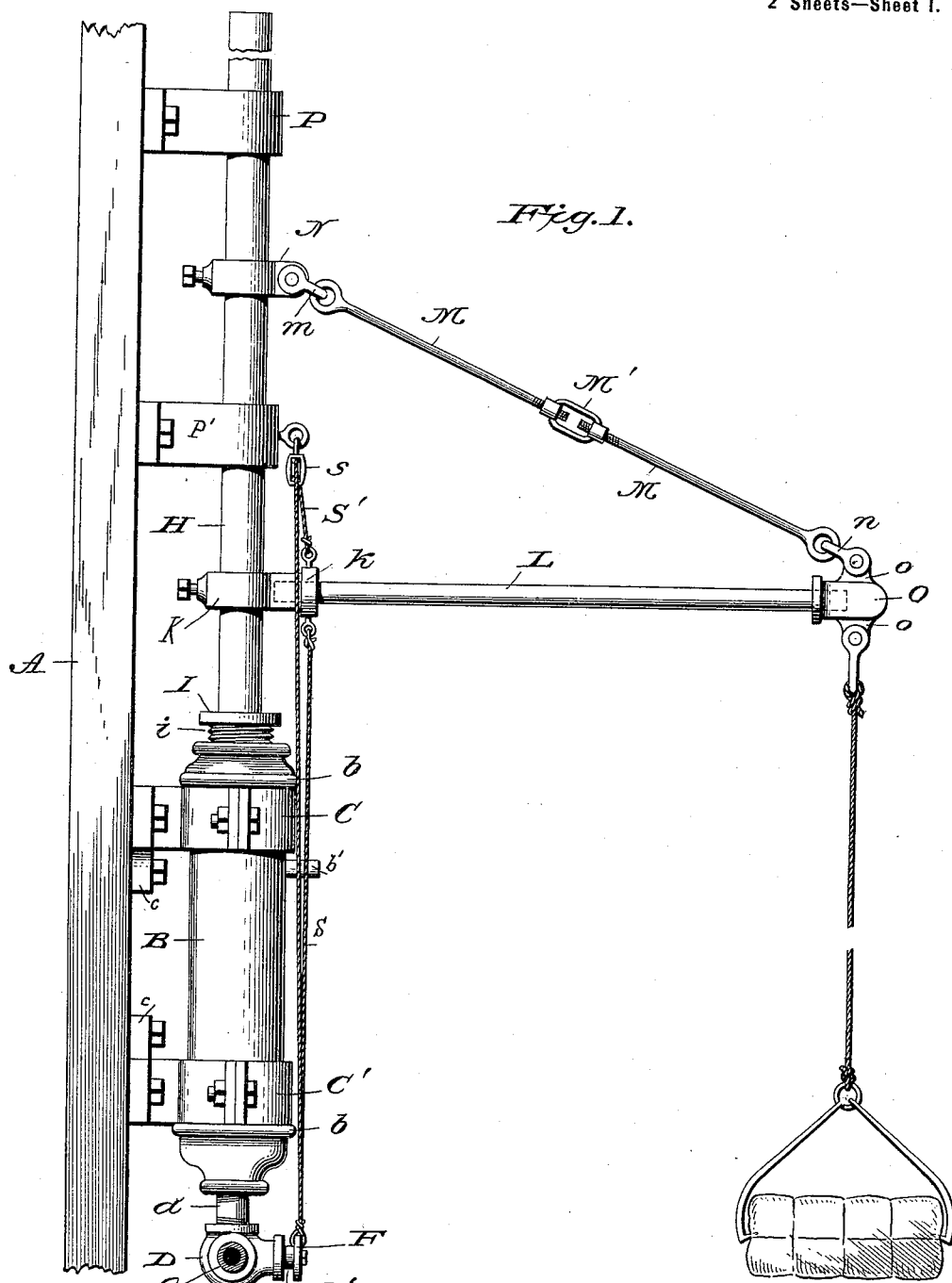
Patented Dec. 13, 1898.

A. THOMLINSON.
CRANE.

(Application filed Mar. 9, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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L. S. Elliott.
R. M. Elliott.

Inventor:

Inventor:
Arthur Thomlinson,
By *John D. Thomas & Co.,*
his attorneys.

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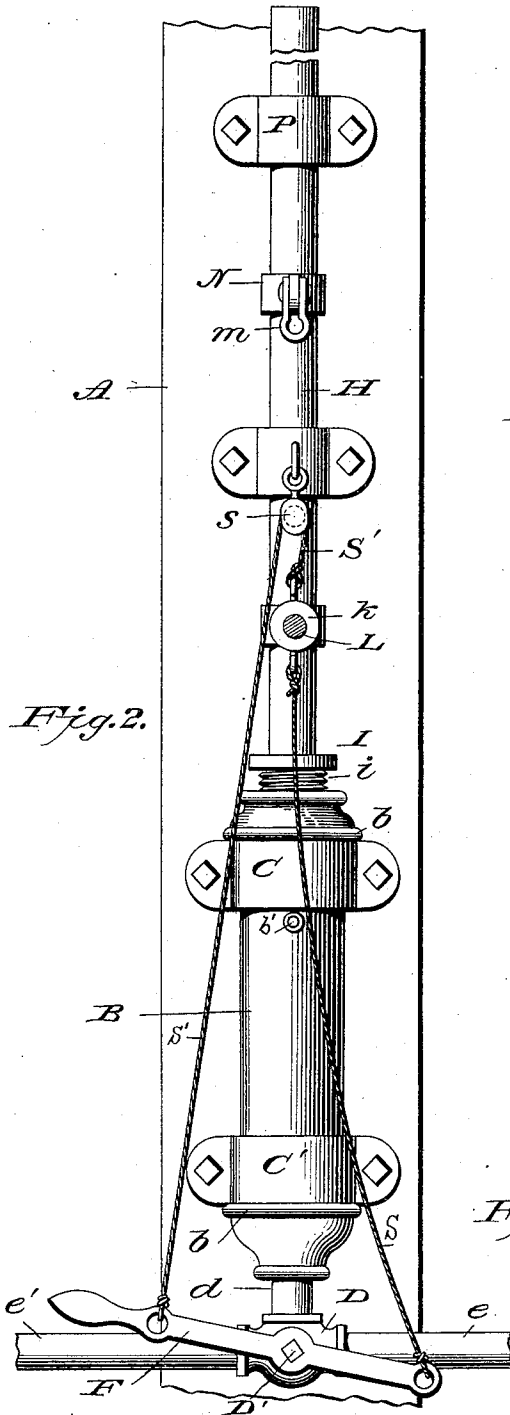


Fig. 2.

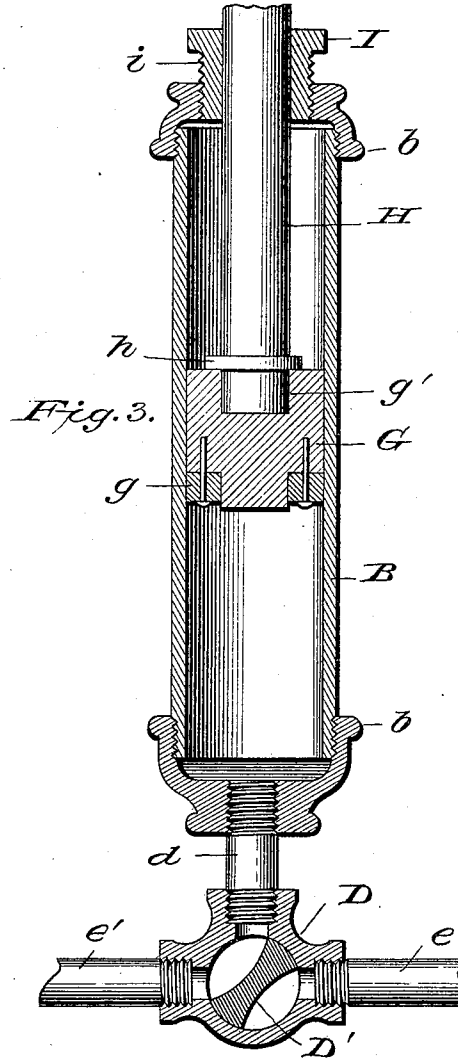


Fig. 3.

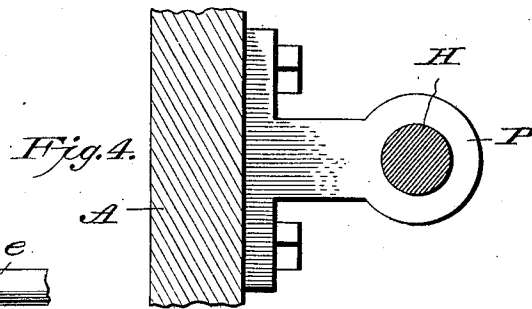


Fig. 4.

Witnesses:
L. S. Elliott.
R. H. Elliott.

Inventor:
Arthur Thomson,
by John D. Thomas & Co.,
his attorneys.

UNITED STATES PATENT OFFICE.

ARTHUR THOMLINSON, OF LITTLE ROCK, ARKANSAS.

CRANE.

SPECIFICATION forming part of Letters Patent No. 615,924, dated December 13, 1898.

Application filed March 9, 1898. Serial No. 673,182. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR THOMLINSON, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, 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 ap-
10 pertains to make and use the same.

This invention is an improvement in cranes or derricks, the object of the same being to provide an apparatus of this character which is particularly adapted for handling cotton-
15 bales and other material requiring but a short lift, the construction and operation providing for a direct lift of the crane-arm and its supporting-mast, thereby dispensing altogether with cables and sheaves employed in connection with the ordinary styles of cranes and
20 derricks.

The invention also contemplates an arrangement which provides for shifting the crane-arm in loading and unloading material and
25 incidentally includes devices for automatically operating the valve which supplies the motive force to the cylinder.

The apparatus is designed with the view of producing a crane that is not only very strong,
30 but is as light as possible consistently with the required strength, and in which the power applied effects a rapid lifting and transporting of the burden or object supported from the crane-arm, the said crane-arm being rigidly
35 connected to the mast, while the latter is reinforced or braced to withstand the bending movement to which it would otherwise be subjected in operation.

With the above objects in view the invention consists in the particular construction and combination of parts.

The following specification gives a detail description of the parts constituting the apparatus, including their construction, relative
45 arrangement, and operation, in such manner that any one skilled in the art may make and use the same, reference being had to the accompanying drawings; and what I particularly claim as my invention, and desire full
50 protection upon, is set forth in the appended claims.

Referring to the drawings, Figure 1 is a

front elevation of a crane or lifting apparatus constructed in accordance with my invention. Fig. 2 is a front elevation of the same. Fig. 55 3 is a vertical sectional view through the cylinder, the upper part of the mast being broken off. Fig. 4 is a transverse sectional view adjoining one of the guide-fixtures.

A designates an upright or post which forms 60 the support for the apparatus and is held stationary by braces or in any other suitable manner. To the lower part of this post is rigidly secured a cylinder B, which is vertically disposed and, as shown, is supported 65 from the post by boxes or clamps C and C', each consisting of two sections, which embrace the body of the cylinder and are bolted together, having projecting flanges for the purpose, the inner section being provided 70 with flanges c, through which the securing-bolts pass into the post or upright. The cylinder is provided at or near its ends with annular flanges b b, which bear, respectively, against the upper and lower ends of the boxes 75 or clamps C C' and prevent a movement of the cylinder in its supports. Passing into the lower head of the cylinder is a pipe d, extending from a three-way valve D, the said valve connecting with pipes e and e', one 80 leading from the source of power and the other serving as an exhaust, and in this connection the plug D' of the valve is cut away at opposite sides to provide passages which establish communication between the pipe d 85 and either pipe e or e', according to the position of the valve, said valve being adapted to also cut off communication with pipe d when at an intermediate position. An operating-
90 lever F is connected to the plug of the valve and is adapted to be operated either manually or automatically through the intervention of certain devices hereinafter described.

Within the cylinder B is a piston G, having a packing g of any preferred form, said 95 packing being at the lower end of the piston, as the latter is moved in but one direction or upward by the steam, hydraulic, or other pressure which may be admitted into the lower end of the cylinder through the pipe d, 100 the opposite movement being effected by gravity of the parts carried by said piston. In the center of the upper side of the piston is a circular recess g', in which is stepped the

lower end of a post H, forming the mast of the crane, said mast passing loosely through the upper head of the cylinder, a threaded thimble or bushing I being screwed into the head to receive the wear. The lower end of the mast has an annular flange *h*, which bears upon the piston, and as the mast is designed to have a rotatable movement in the piston any approved antifriction devices may be employed in the step. Upon the mast, at a suitable distance from the cylinder, is mounted a collar K, fastened rigidly to the said mast by a set-screw or equivalent device, said collar having an enlarged portion *k*, with a recess forming a socket to receive the inner end of a bar or beam L, which constitutes the crane-arm and is firmly braced to the mast by a guy-rod M, consisting of two eyebolts connected to each other by a turnbuckle M'. The guy-rod or brace is connected at one end to a collar N on the mast H and at its other end to a socketed casting O on the outer end of the crane-arm through the intervention of eye-loops *m* and *n*, respectively, the said casting having opposite projections or ears *o o*, to one of which the eye-loop *n* is connected while the other forms a connection for the grappling device or means which engage the burden.

The mast is braced and guided by blocks or castings P and P', which are rigidly bolted to the post or upright A and are provided with vertical openings through which the said mast passes. These guides or blocks reinforce the mast and prevent the bending movement to which the mast would otherwise be subjected when a heavy burden is suspended from the crane-arm. The wear which would necessarily come upon the guide-blocks and mast during the operation of both lifting and transporting a burden could be reduced by employing some style of antifriction-bearing. It is also obvious that when the bushing or thimble at the upper end of the cylinder has become worn on one side the thimble can be given a half-turn to bring a new surface in position to receive the wear.

The operation of so much of my invention as hereinbefore described will be readily understood, for when the valve D is turned to admit steam or other pressure into the cylinder the piston G will be raised, and the mast of the crane being stepped in said piston and having a free movement in its guides will be raised, carrying both the crane-arm and burden suspended therefrom, the valve being closed when the proper height has been reached. After being raised the burden can be shifted or transported by turning the crane upon its axis, and by operating the valve to connect the cylinder with the exhaust-pipe the crane will be gradually lowered by the gravity of its own weight, forcing the steam or other fluid-pressure out of the said exhaust-pipe. It will therefore be noted that the operation of raising and lowering the crane in handling its burden can be rapidly accom-

plished, as the power is applied directly to the crane.

The construction also provides an apparatus that is very compact and has the advantage of being light and strong by permitting a thorough bracing of both the mast and crane-arm. Also by dispensing with the usual cables and sheaves over which they pass a considerable reduction is made in running expenses as compared with the ordinary crane and the accidents occurring with the use of cables is entirely avoided.

It is preferred to use hydraulic pressure in the cylinder, and by the proper manipulation of the valve the crane can be raised and lowered to any extent and keep its height. In order to prevent accident by the piston being forced against the upper head of the cylinder through neglect of the valve, the upper part of the body of the cylinder is tapped and a short pipe *b'* inserted therein, said pipe being so arranged as to be uncovered by the piston in its upward movement, and thereby limit said movement.

In connection with the apparatus hereinbefore described I employ an automatic attachment for closing the valve both when the crane has reached a certain height and when lowered. To this end a rope or cable S is attached to one end of lever F and extends therefrom direct to the arm-socket or collar K, to which it is also connected, and the length of this rope is such that when the crane is raised to a certain height it will draw upon the lever and operate to close the valve. A second rope or cable S' is connected to the other end of the lever and, extending therefrom, passes over a pulley *s* above the crane-arm and is brought down and attached to the upper part of the arm-socket or collar K. When the crane lowers to its normal position, the cable S' will be drawn taut and rock the lever F to close the valve. It will be understood, however, that in case an operator is stationed at the lever the automatic devices described could be dispensed with; but they are useful where a single operator is to manipulate the entire apparatus, permitting him to leave the valve after starting the crane either up or down and give his attention to swinging the crane-arm and handling the burden.

The apparatus is simple, strong, and durable and by applying the motive force directly to the crane will require less power than most of the cranes in use and permit the burden to be handled in practically the same manner.

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

1. In a crane or lifting device, the combination, of a stationary vertical cylinder, a piston mounted therein, a mast rotatably stepped in the piston and carrying a crane-arm, a thimble or bushing screwed into the upper end of the cylinder and through which the mast passes, and guides reinforcing the upper

part of the mast; together with means controlling the admission of the motive force to the cylinder, substantially as shown and described.

5 2. In a crane or lifting device, the combination with a vertical stationary cylinder and piston mounted therein, of a mast rotatably mounted in the piston, a collar secured to the mast and forming a socket, an arm fitting into
o said socket and carrying a socketed casting at its outer end, a brace-rod connected to the casting and to the mast, a thimble or bushing screwed into the upper end of the cylinder and through which the mast passes, and guide-
5 blocks reinforcing the upper part of the mast; together with a three-way valve connected to the lower end of the cylinder and to supply and exhaust pipes, and means for operating the valve, substantially as shown and de-
o scribed.

3. In a crane or lifting device, the combi-

nation, of a stationary vertical cylinder, a piston mounted therein and provided with a packing at its lower end, said piston also hav-
ing a central opening at its upper end, a mast 25
passed through the upper end of the cylinder and stepped in the central opening of the piston, an integral flange at the lower end of the
mast resting upon the piston, a thimble or
bushing screwed into the upper end of the 30
cylinder and through which the mast passes, an arm projecting from the upper part of the
mast, and guides reinforcing said mast; together with means controlling the admission
of the motive force to the cylinder, substan- 35
tially as shown and described.

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

ARTHUR THOMLINSON.

Witnesses:

W. H. SUTTON,
CHAS. F. PENZEL.