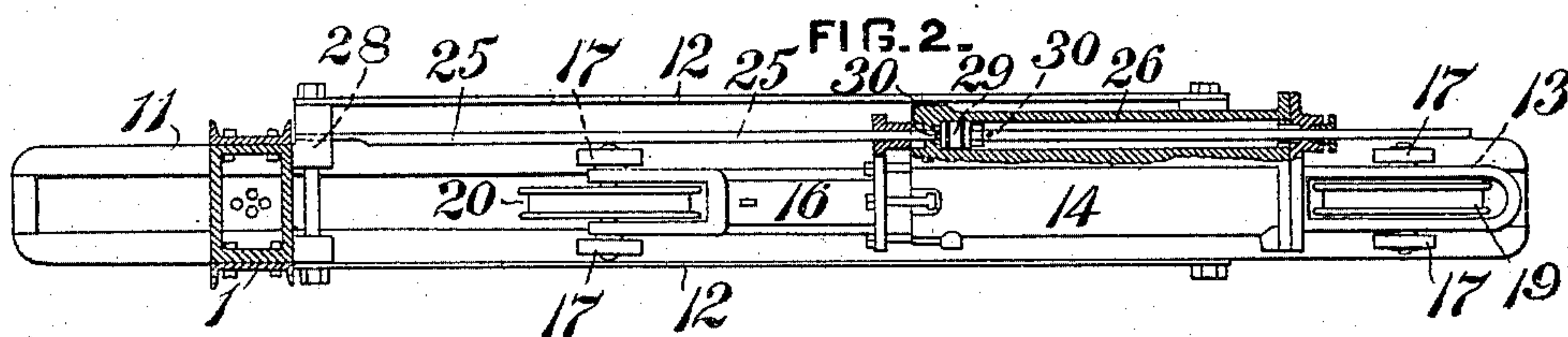
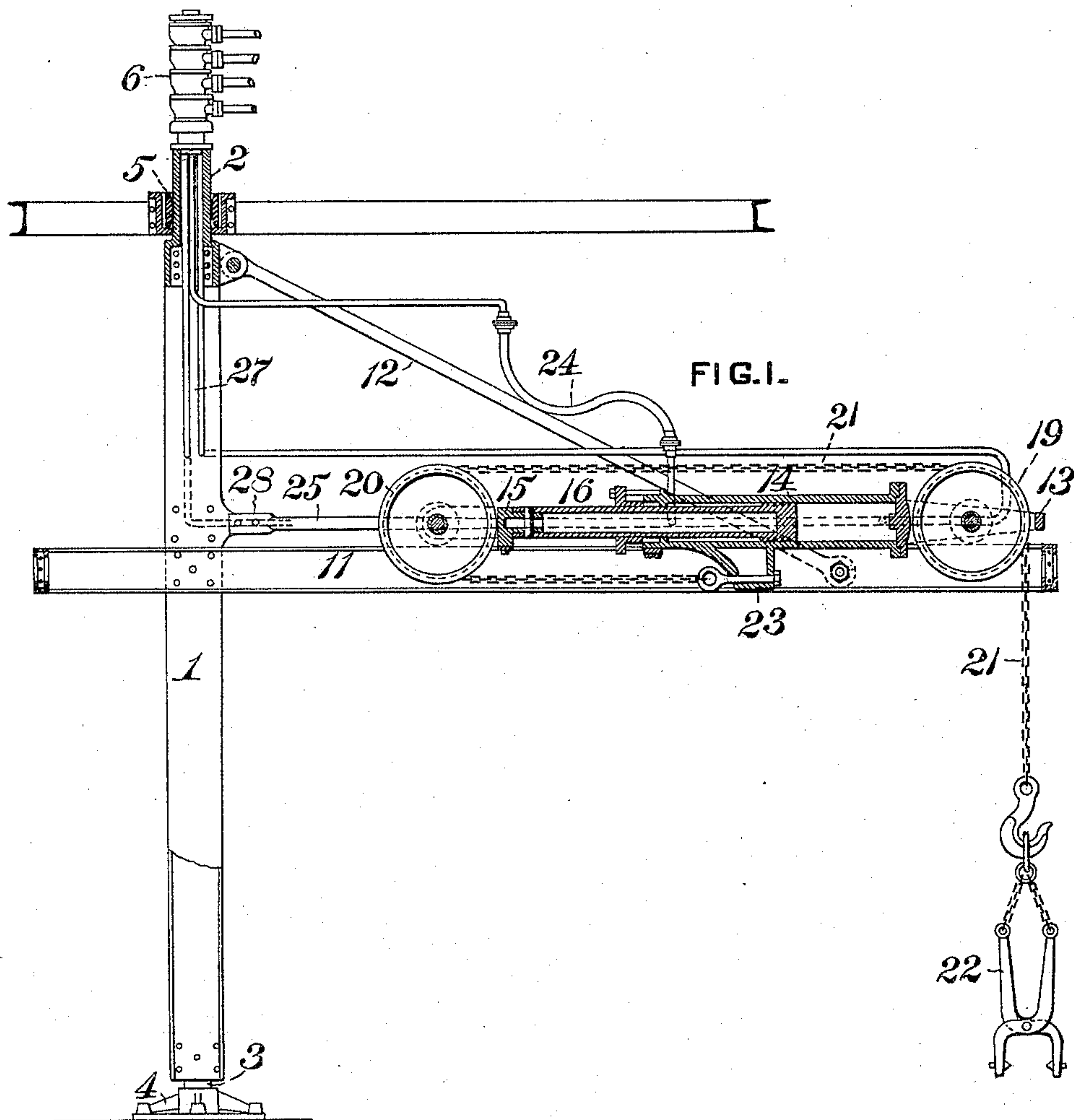


(No Model.)

J. HEMPHILL & J. FAWELL.  
CRANE.

No. 489,635.

Patented Jan. 10, 1893.



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

JAMES HEMPHILL AND JOSEPH FAWELL, OF PITTSBURG, PENNSYLVANIA.

## CRANE.

SPECIFICATION forming part of Letters Patent No. 489,635, dated January 10, 1893.

Application filed July 14, 1892. Serial No. 440,002. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES HEMPHILL and JOSEPH FAWELL, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Cranes, of which improvements the following is a specification.

The invention described herein relates to certain improvements in the construction of cranes described and claimed in an application of even date herewith. The improvements in said application consist generally stated, of a lifting fluid pressure cylinder arranged horizontally on the jib of the crane, and a second fluid pressure cylinder connected to the lifting cylinder so as to effect and control the movements of the lifting cylinder.

The object of the present invention is to provide for the movement of the shifting cylinder with the lifting cylinder and for certain other features of construction, as hereinafter more fully set forth.

In the accompanying drawings forming a part of this specification, Figure 1 is a sectional elevation of a crane embodying the improvements and Fig. 2 is a top plan view of the jib, the shifting cylinder being shown in section.

The crane is constructed substantially as set forth in said application, and consists of a mast 1, provided with journals 2 and 3, mounted respectively in the bearing block 5 and step 4. The jib 11, consisting of suitable I beams is secured in any suitable manner to the mast, its outer end being preferably supported by rods 12 having their upper ends attached to the mast. On one end of a cylinder 14 arranged longitudinal of the jib is attached a frame 13 and a yoke 15 is secured to the outer end of the piston rod 16. On the sides of the frame and yoke are mounted rollers 17 arranged to traverse the beams of the jib. Within the frame and yoke are mounted wheels 19 and 20 over which passes a chain 21 having one end connected to a gripping mechanism 22 and its opposite end attached to a lug 23 on the cylinder 14. Fluid pressure is introduced into the cylinder by pipes 24 extending from the distributing head 6, on the upper end of the mast. By the arrangement of the cylinder and wheels 19 and 20, and the flexible connection from the gripping mechanism pass-

ing over said wheels and attached to the cylinder, the vertical movement of the gripping mechanism will be double the movement of the wheel 20 when shifted by the piston.

On one side of the lifting cylinder 14 is attached a fluid pressure cylinder 26, having its piston rod 25 attached to a projection 28 from the mast 1. The piston rod 25 is made hollow and extends entirely through the cylinder 26, as shown in Fig. 2. The ends of the hollow piston rod are connected with the pipes 27 extending from the distributing head 6, and in the rod on opposite sides of the piston 29 are formed openings 30 for the admission of fluid pressure into the cylinder 26. As in this arrangement of the fluid pressure cylinders, the cylinder 26 moves with the cylinder 14, the employment of a hollow piston, as described entirely obviates the necessity of connecting the fluid pressure supply pipe by flexible connections with the cylinder 26. The cylinder 26 serves not only to shift the lifting cylinder 14 either with or without a load, but also to hold said cylinder stationary during the raising of a load.

We claim herein as our invention:

1. In a crane, the combination of a jib, a lifting cylinder arranged on said jib, and a fluid pressure cylinder for shifting the lifting cylinder and movable therewith, substantially as set forth.

2. In a crane the combination of a jib, a lifting cylinder arranged on said jib, and a fluid pressure cylinder for shifting the lifting cylinder along the jib, and connected to said lifting cylinder and movable therewith, the piston rod of the shifting cylinder being attached to a stationary part of the crane, substantially as set forth.

3. In a crane, the combination of a jib, a lifting cylinder arranged on said jib, a fluid pressure cylinder attached to the lifting cylinder, and a hollow stationary piston rod extending through the shifting cylinder, and having its ends connected to fluid supply pipes and provided with openings within the cylinder and on opposite sides of the piston, substantially as set forth.

In testimony whereof we have hereunto set our hands.

JAMES HEMPHILL.  
JOSEPH FAWELL.

Witnesses:

R. H. WHITTLESEY,  
DARWIN S. WOLCOTT.