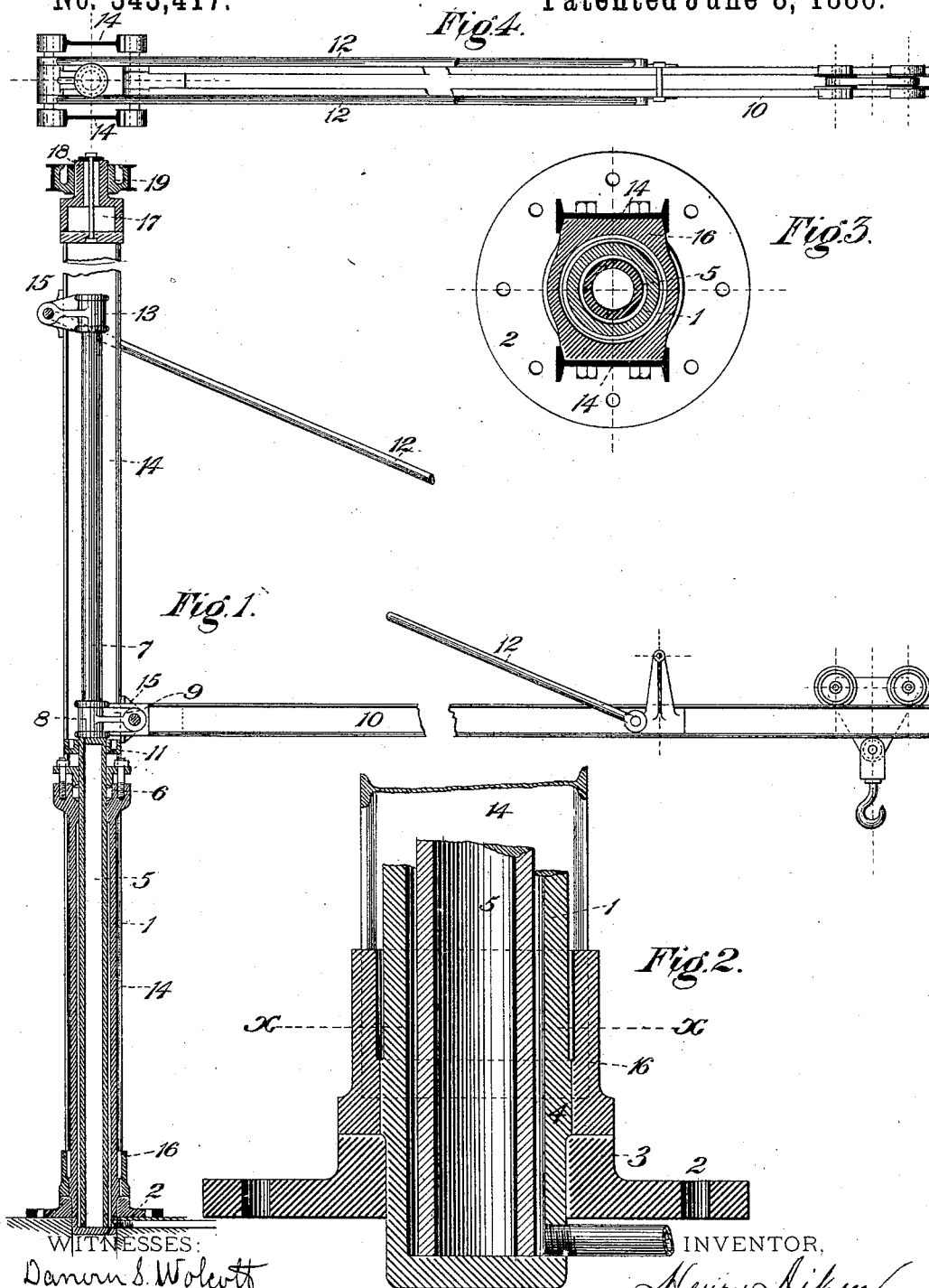


(No Model.)

H. AIKEN.  
HYDRAULIC CRANE.

No. 343,417.

Patented June 8, 1886.



WITNESSES:  
Samuel S. Wolcott  
C. M. Clarke.

INVENTOR,  
Henry Aiken.  
BY George H. Christy  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

HENRY AIKEN, OF PITTSBURG, PENNSYLVANIA.

## HYDRAULIC CRANE.

SPECIFICATION forming part of Letters Patent No. 343,417, dated June 8, 1886

Application filed October 17, 1885. Serial No. 180,139. (No model.)

### *To all whom it may concern:*

Be it known that I, HENRY AIKEN, residing at Pittsburg, in the county of Allegheny, in the State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Hydraulic Cranes, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a view in side elevation of my improved hydraulic crane, the cylinder and piston being shown in section. Fig. 2 is a sectional elevation of the lower portion of the cylinder and piston. Fig. 3 is a transverse section on the line *xx*, Fig. 2. Fig. 4 is a top plan view of the same.

The object of my invention is to so construct a hydraulic crane as to transfer the lateral or transverse strains imparted by the load on the jib from the stem of the piston or plunger to suitable vertical supports or braces secured at the upper and lower ends, and at the same time to provide a fluid cushion on which the piston may rest and rotate when loaded; and to these ends my invention consists in the construction and combination of parts, substantially as hereinafter described and claimed.

The lower end of the hydraulic cylinder 1 is arranged in a central opening in the base-plate 2, and is supported in a vertical direction by the rim 3, formed around the opening in the base-plate, engaging the circumferential shoulder or collar 4 on the cylinder near its lower end, as clearly shown in Fig. 2. Within the cylinder is arranged the piston or plunger 5, the upper portion of said plunger projecting through the stuffing-box 6 on the upper end of the cylinder. At its upper end the plunger is provided with a stem portion, 7, preferably formed integral therewith, as shown, although it may be made separable therefrom, if desired. Around the base of the stem 7 is placed a ring, 8, provided with a projecting ear 9, and on each side this ear is secured the inner ends of the beams forming the jib 10 by a bolt passing through the ear and the ends of the beams. This ring 8 rests upon a circumferential shoulder, 11, formed at the junction of the plunger and stem. The jib is supported near its outer end by the brace-rods 12, extending up to the upper end of the

stem 7, where they are attached to an ear projecting from the cap-piece 13, located on the end of the stem 7. The vertical strain of a load on the jib falls upon the shoulder 11 and the cap-piece 13; but the lateral transverse strain of such a load is transferred to the supporting-beams 14 by the bearing-blocks 15, attached to the bolts connecting the inner end of the jib and the brace-rods to the ears projecting from the ring 8 and the cap-piece 13, respectively. These beams are arranged on opposite sides of the cylinder, and are bolted at their lower ends to a sleeve or collar, 16, surrounding the lower portion of the cylinder 1, and having oppositely-disposed projections constructed to fit the inner surfaces of the I-beams 14, as shown in Fig. 3. This sleeve or collar 16 is supported on the rim 3 of the base-plate, and is adapted to rotate freely around the cylinder.

The upper ends of the supporting I-beams 14 are bolted to a block, 17, provided with a journal, 18, adapted to fit within a block, 19, secured in any suitable manner to beams in the upper portion of the building in which the crane may be located, thus supporting the beams 14 in a vertical position. The blocks 15 bear against the edges of the beams 14, the lower blocks being arranged to receive the inward thrust of the jib, and the upper blocks being arranged to transmit the downward pull of the brace-rods 12 to the supporting-beams, thus relieving the plunger and its stem from all lateral or transverse strains. The vertical strains are, however, taken by the plunger, which always rests upon a fluid cushion, and can therefore turn freely and easily, and as the beams 14 are not connected to the plunger and do not therefore receive any of the vertical strain they will turn freely about the cylinder 1. The only friction between the collar 16 and its supporting-rim 3 is such as is due to the weight of the beams themselves.

As the load is always on one side of the beams 14, a half ring or sleeve connected at its ends to the beams may be substituted for the ring or sleeve 16, and in cases where light loads only are to be raised only one beam or brace need be employed.

The ring 8 and cap-piece 13 fit loosely

around the stem 7, so that ordinarily the jib will rotate around the stem; but when heavy loads are on the jib the plunger and stem may rotate with the jib.

5 I claim herein as my invention—

1. In a hydraulic crane, the combination of a cylinder, a ram movable vertically and rotatory within said cylinder, a jib supported by the ram, said parts being so arranged as  
10 to provide a water cushion for the support of all vertical strains, and vertical braces for supporting the horizontal thrusts of the jib, substantially as set forth.

2. In a hydraulic crane, the combination

of a stationary cylinder, a ram vertically mov- 15  
able and rotatory within said cylinder, a jib supported by the ram, and vertical braces for supporting the horizontal thrusts of the jib, said parts being so arranged as to provide a  
20 water cushion for the support of all vertical strains on the crane, substantially as set forth.

In testimony whereof I have hereunto set my hand.

HENRY AIKEN.

Witnesses:

DARWIN S. WOLCOTT,  
F. X. BARR.