

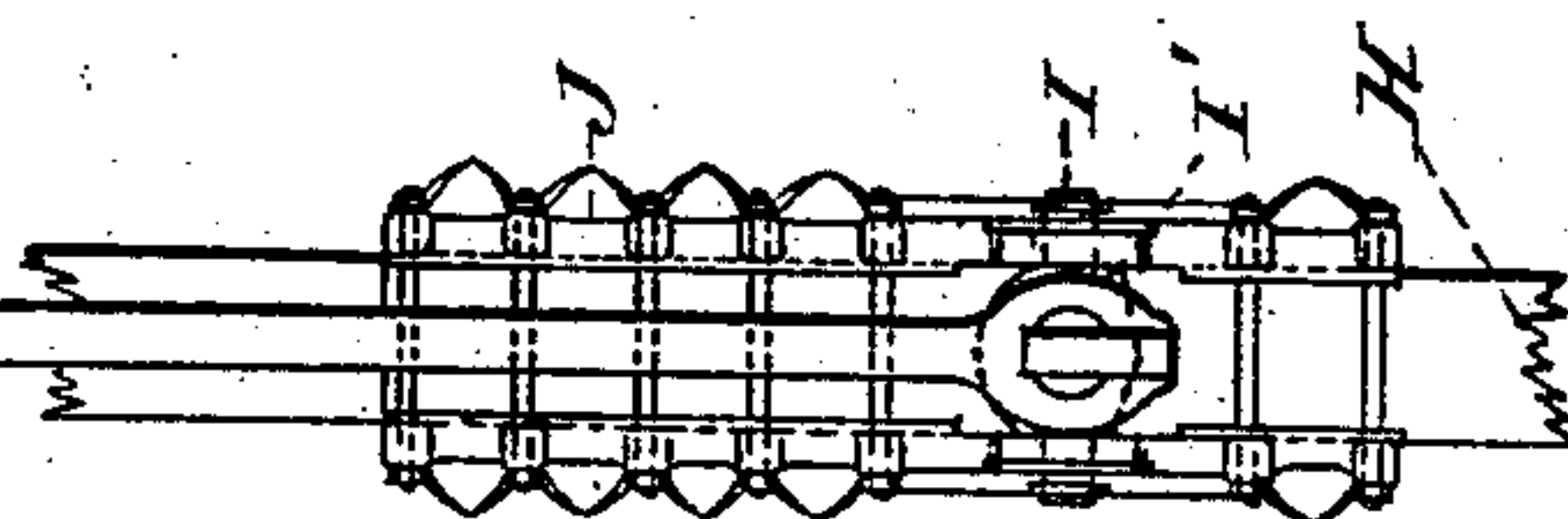
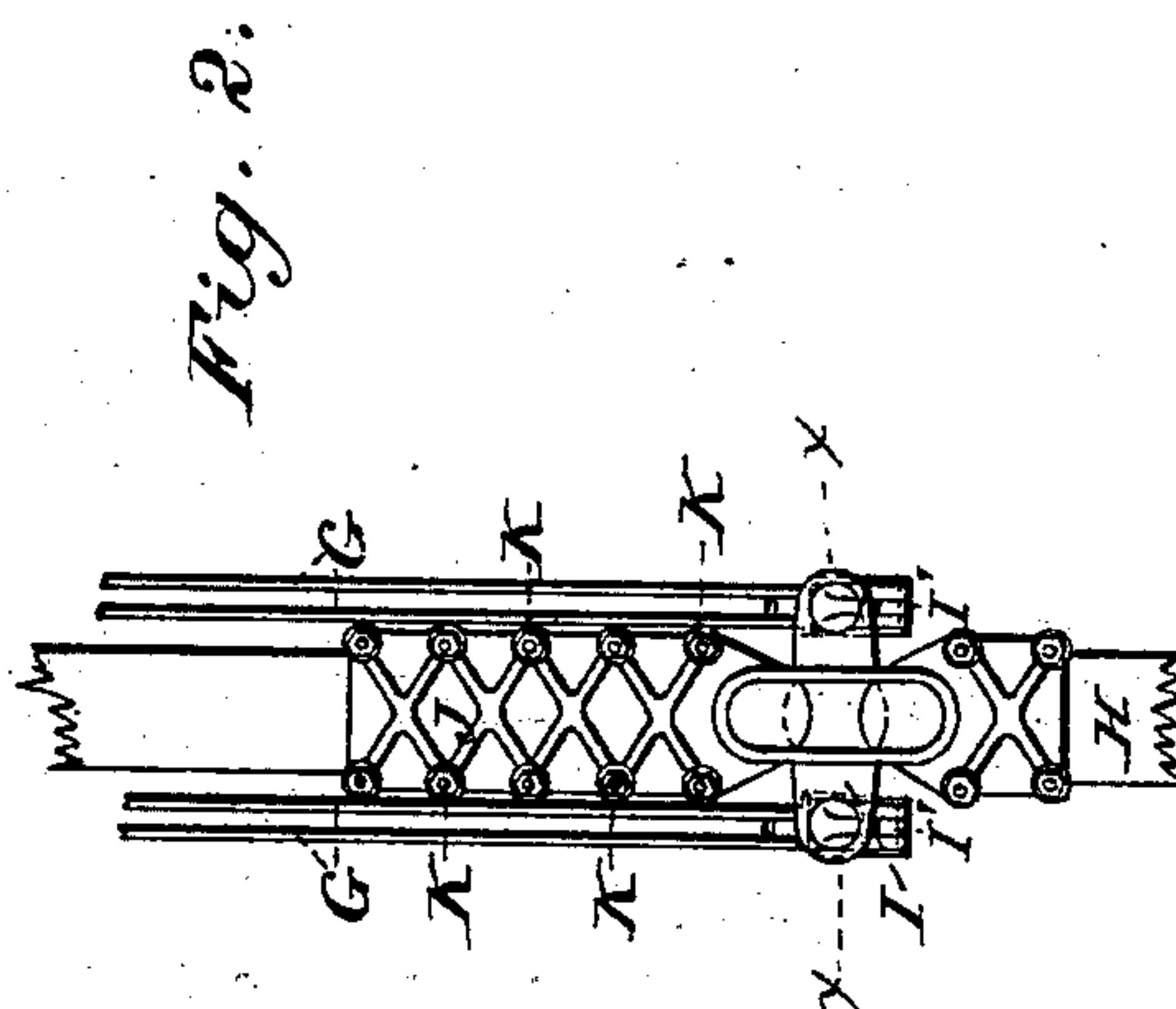
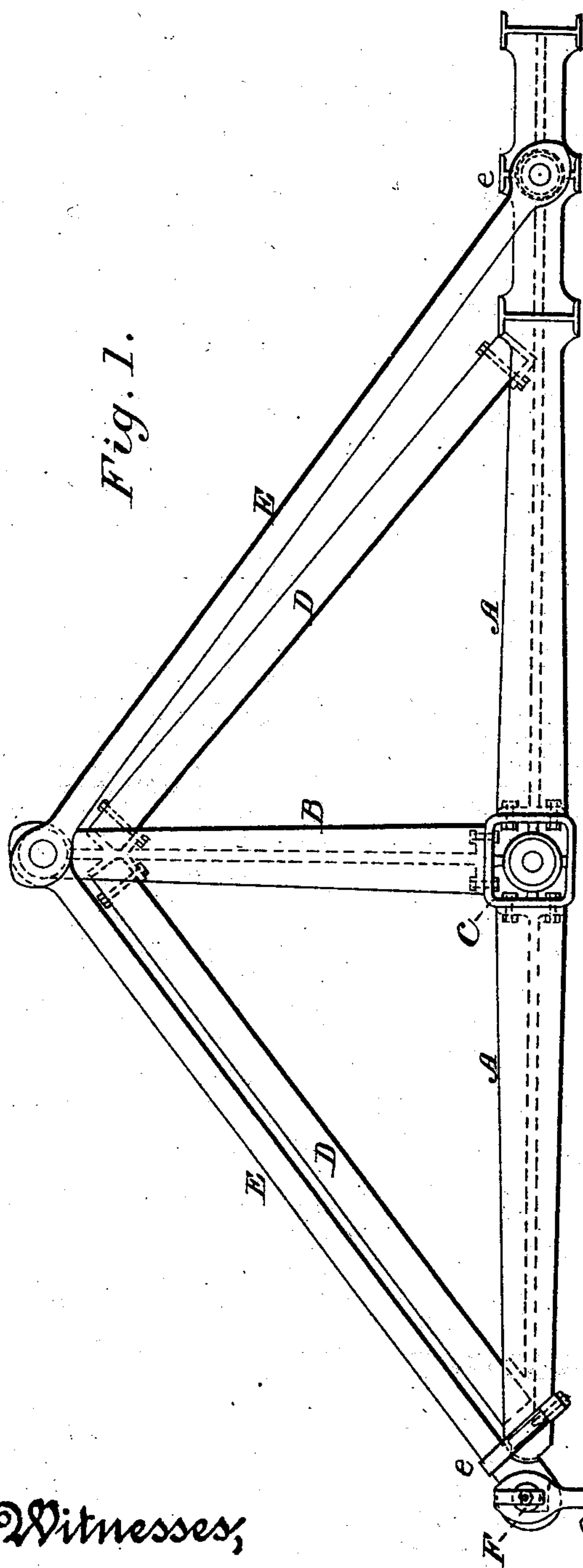
(No Model.)

2 Sheets—Sheet 1.

W. R. ECKART.  
PUMPING APPARATUS.

No. 275,473.

Patented Apr. 10, 1883.



Witnesses,

Geo. H. Strong  
J. & Rouse.

*Inventor,*

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Attorneys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

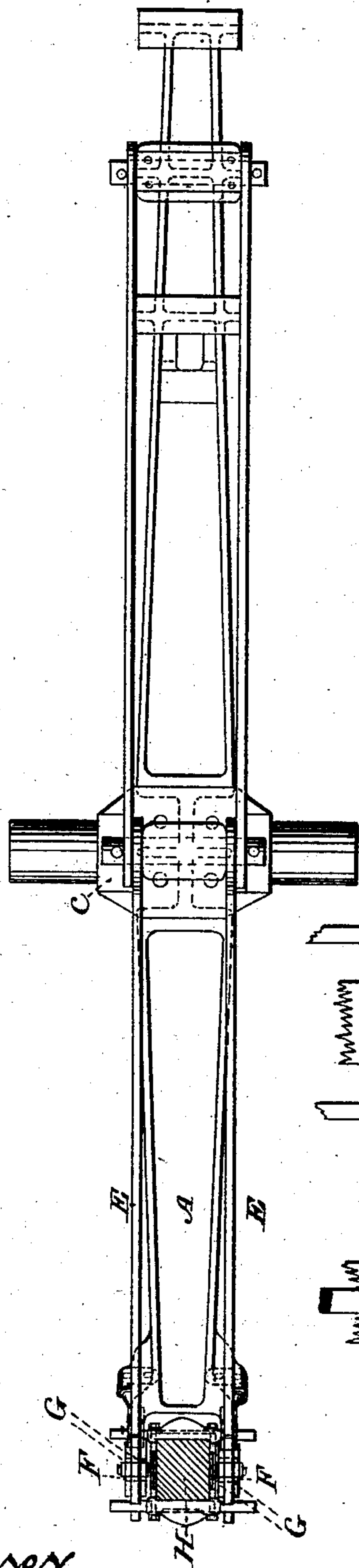


Fig. 6.

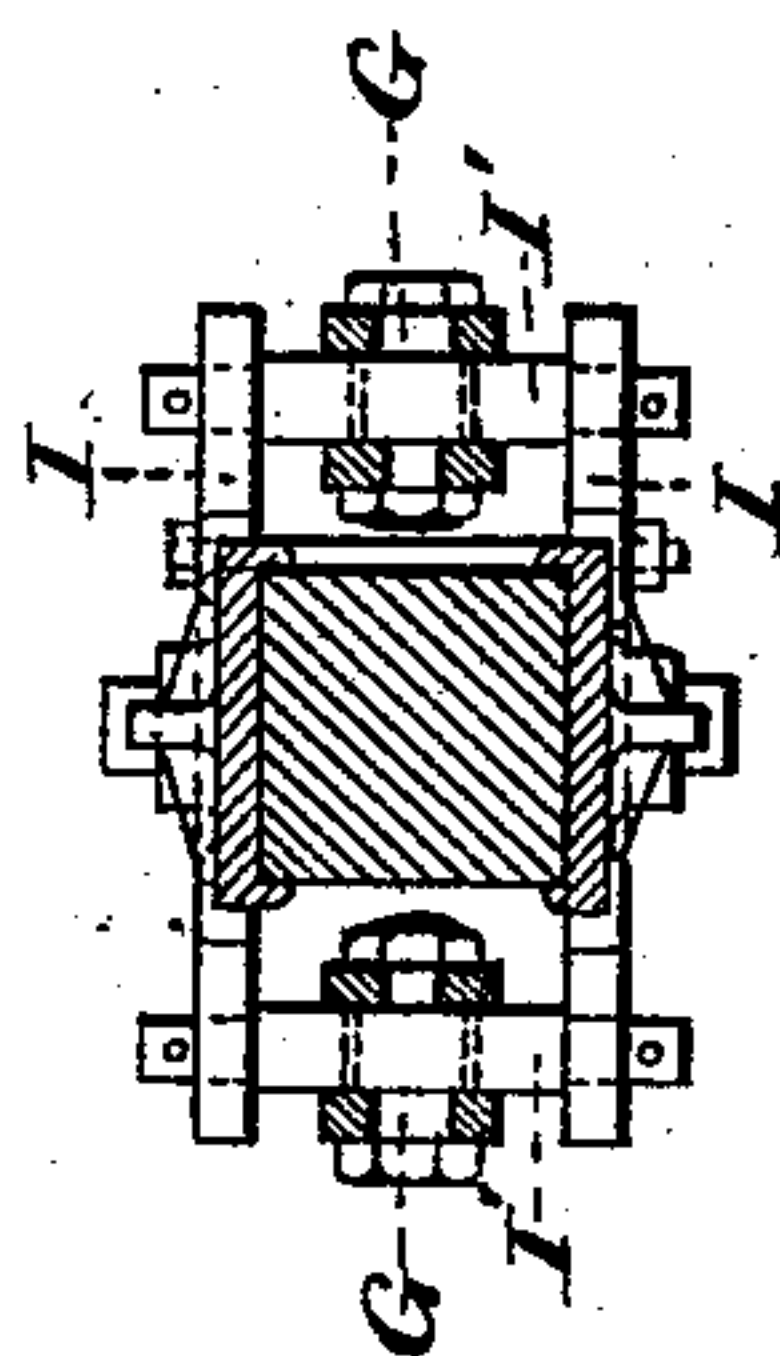


Fig. 5.

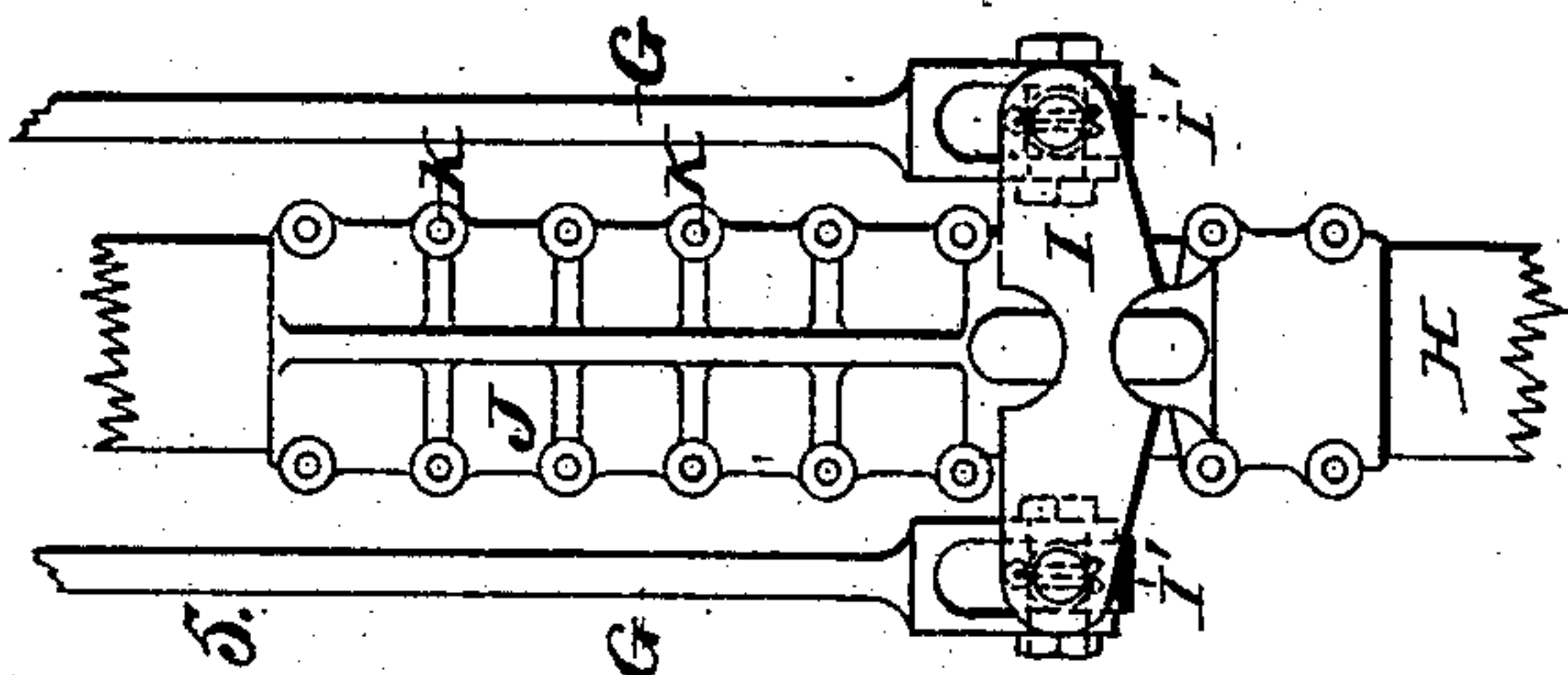
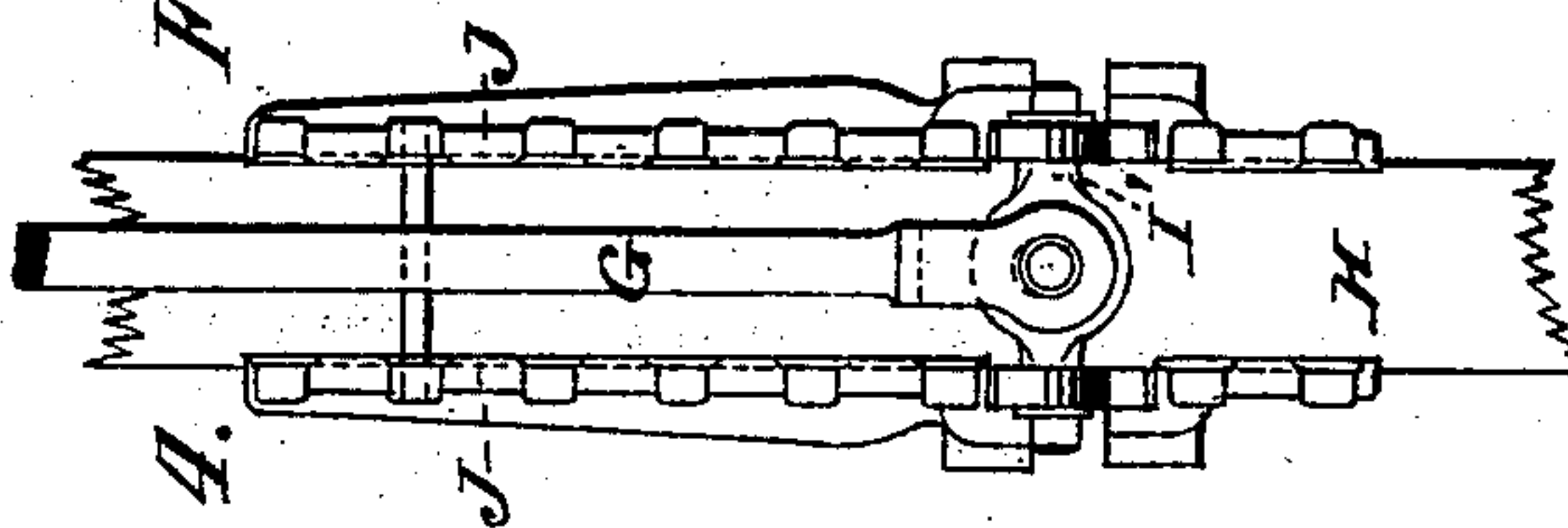


Fig. 4.



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# UNITED STATES PATENT OFFICE.

WILLIAM R. ECKART, OF SAN FRANCISCO, CALIFORNIA.

## PUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 275,473, dated April 10, 1883.

Application filed December 11, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. ECKART, of the city and county of San Francisco, State of California, have invented an Improved Pumping Apparatus; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in that class of pumping apparatus which is operated at great depths; and it consists, first, in an improved construction of the balance-bob, in which the side-rod pins at the bob-nose are connected directly with the ends of the wrought-iron tension-braces of the bob, so that the stress of the side rods is transmitted directly to the weight-box of the bob without submitting any of the cast portions to tensile or transverse strains.

It further consists in a connection of the lower ends of the side rods with the pump-rod saddle-plates by equalizing-levers, so that any variation in the distance between the end pins of either side rod will not produce unequal strain upon the rods or other parts.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a side elevation of the balance-bob, showing its connection with the pump-rod. Fig. 2 is a side elevation of the pump-rod, saddle-plates, and equalizing-lever, taken at right angles with Fig. 1 and showing double side rods. Fig. 3 is a plan or top view. Figs. 4 and 5 show the pump-rod saddle-plates and equalizing-levers with single side rods. Fig. 6 is a section through  $xx$  of Fig. 2.

The term "balance-bob" is generally applied to an assemblage of parts of a trussed frame or lever used in mining operations for the purpose of storing energy by the raising of a certain weight during one part of an engine-stroke so that it may be given out during the other part of the stroke, and thus equalize in part or whole the two strokes of the engine; or, when the pump-rods balance each other, as in the double-rod system, it may be used to support a part of the weight of the pump-rod at intervals, so that their weight will not be increased beyond their tenacity or a safe working limit. These balance-bobs have heretofore

had the nose fitted with a pin projecting from the cast-iron portion, and the side rods have been attached to this pin, so that any severe or unequal strain would be brought directly upon the cast-iron, and would tend to rupture it.

In my invention  $A$  are horizontal beams, and  $B$  the king-post, which may be of wood or cast-iron. These are secured to a central casting,  $C$ , which forms or carries the trunnions. Struts  $D$ , usually of wood, extend from the top of the king-post to the ends of the horizontal beams  $A$ , as shown, and wrought-iron straps or tension-braces  $E$  extend from the bob-nose over the top of the king-post, so as to sustain the strain of the weight. The straps  $E$  are secured to the beam  $A$  by means of bolts or ties  $e$ , or in any well-known way. Pins  $F$  pass through the ends of these braces, and the side rods,  $G$ , are fitted to the projecting ends of the pins. If these rods are in pairs, or if they are single, the ends of the braces are forked and the pin extends across the fork. The side rods extend down alongside the pump-rod  $H$ , and are connected with opposite ends of the equalizing-bars  $I$ , which extend across upon each side of the pump-rod beneath the saddle-plates  $J$ . This connection of the side rods and the equalizing-levers may be made by means of cross-levers  $I'$ , to the centers of which the side rods are connected. The ends of these cross-levers are connected with the ends of the equalizing-levers, as shown. The saddle-plates extend some distance along the wooden pump-rod, and are strongly clamped to it by bolts  $K$ , which pass through holes in the plates just outside of the pump-rod. This gives a firm connection, without the necessity of weakening the pump-rod by any holes or cuts. The enormous weight that must be sustained by the pump-rods sometimes causes the saddle-plates to slip unequally, or the boxes or pins  $F$  at the bob-nose to wear unequally, when the whole strain would be thrown upon one side or the other if the side rods were rigidly secured to the saddle-plates, and breakages would occur. This difficulty is overcome by the use of the equalizing-levers.

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

1. The horizontal bars A, and the bolts or ties c, and king-post B, and the tension-rods E, having the pins F, passing through or fixed to them independent of the bars A, substantially as herein described.

2. The pump-rod H, having the saddle-plates J secured to it, in combination with the equalizing-bars I, upon which the pump-rod is supported, and the side bars, G, connected with the ends of the equalizing-bars and with the nose of the balance-bob, substantially as herein described.

3. The pump-rod H, with its saddle-plates J, and the equalizing-levers I, in combination with the cross-levers I', through which the side bars, G, are connected with the equalizing-levers, substantially as herein described.

In witness whereof I hereunto set my hand.

WILLIAM R. ECKART.

Witnesses:

D. R. DALE,  
J. H. BLOOD.