

(No Model.)

E. DAVIES.
DOUBLE ACTING STEAM PUMP.

No. 287,252.

Patented Oct. 23, 1883.

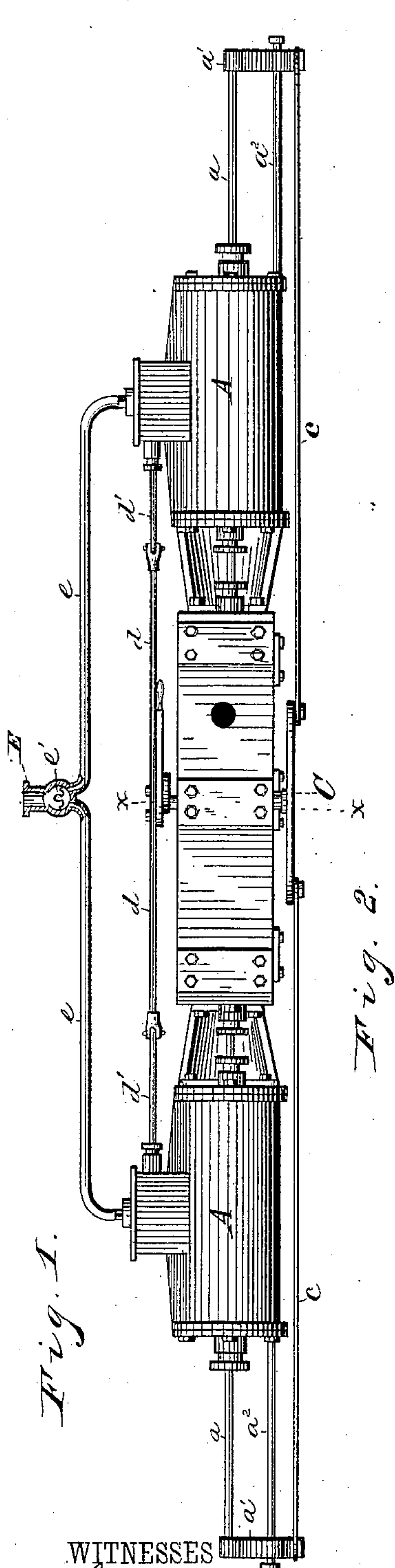


Fig. 1.

Fig. 2.

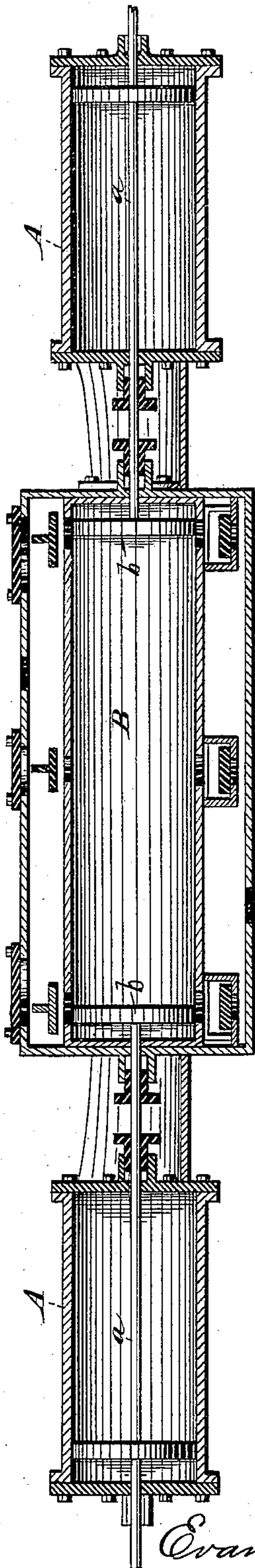


Fig. 3.

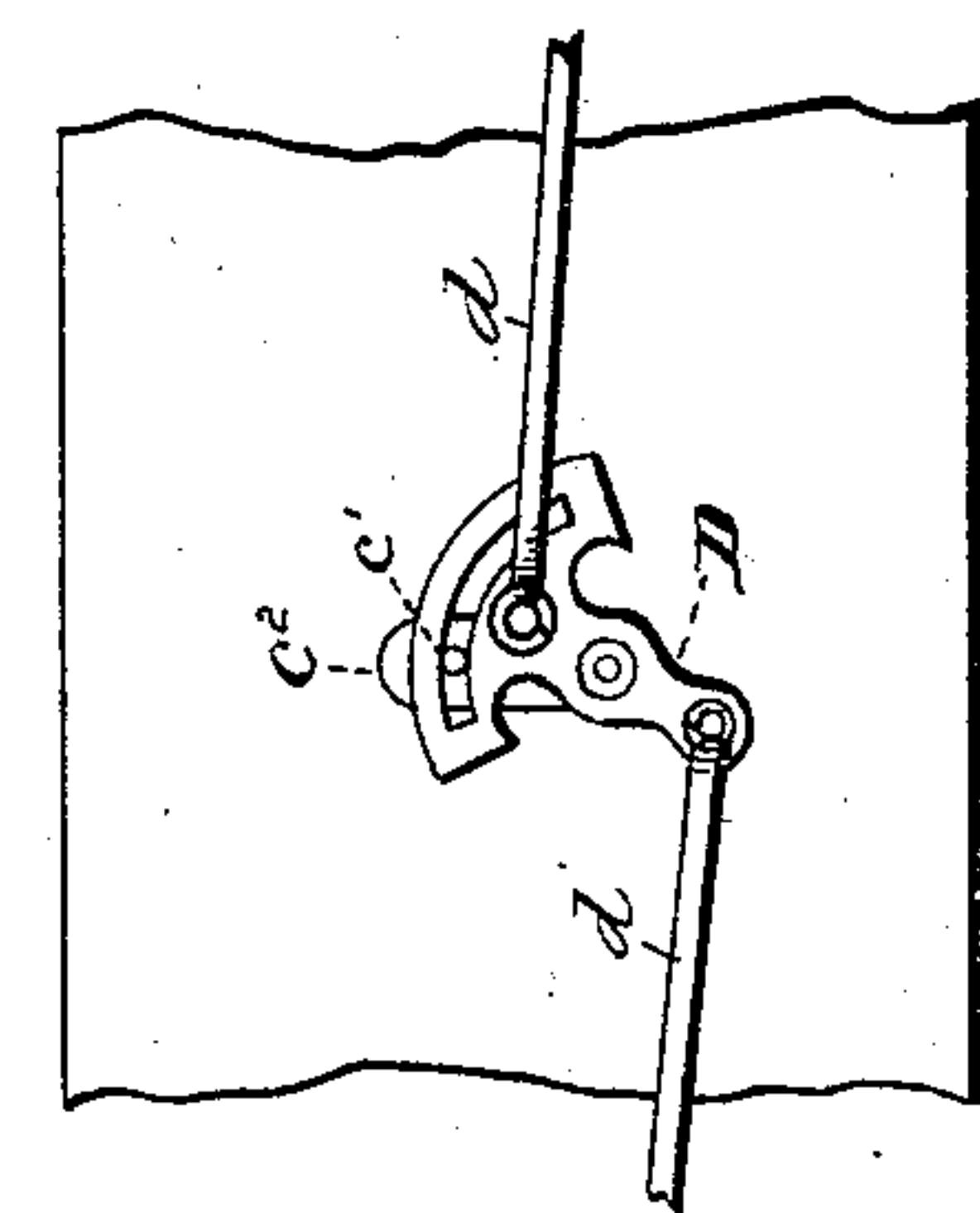


Fig. 4.

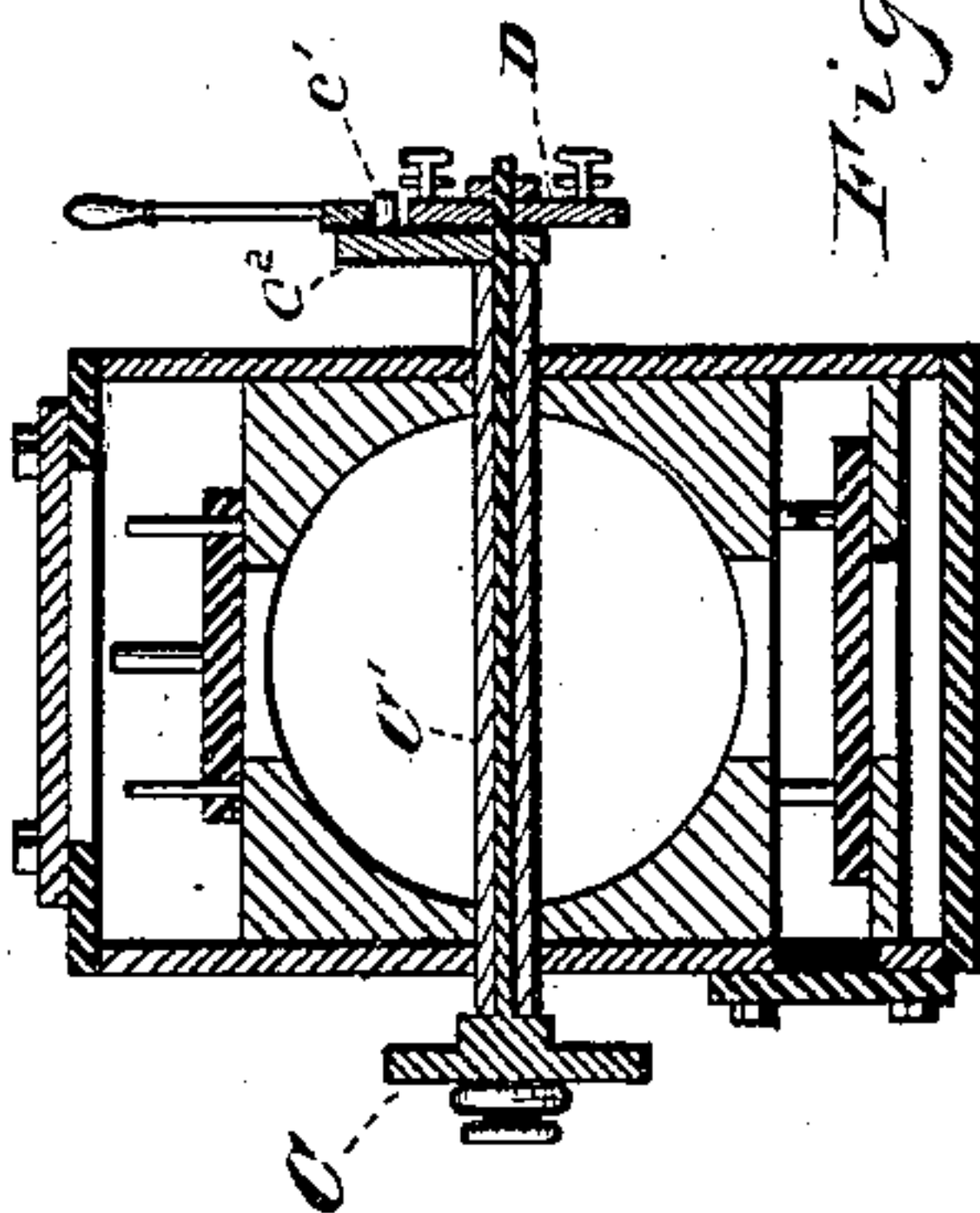


Fig. 5.

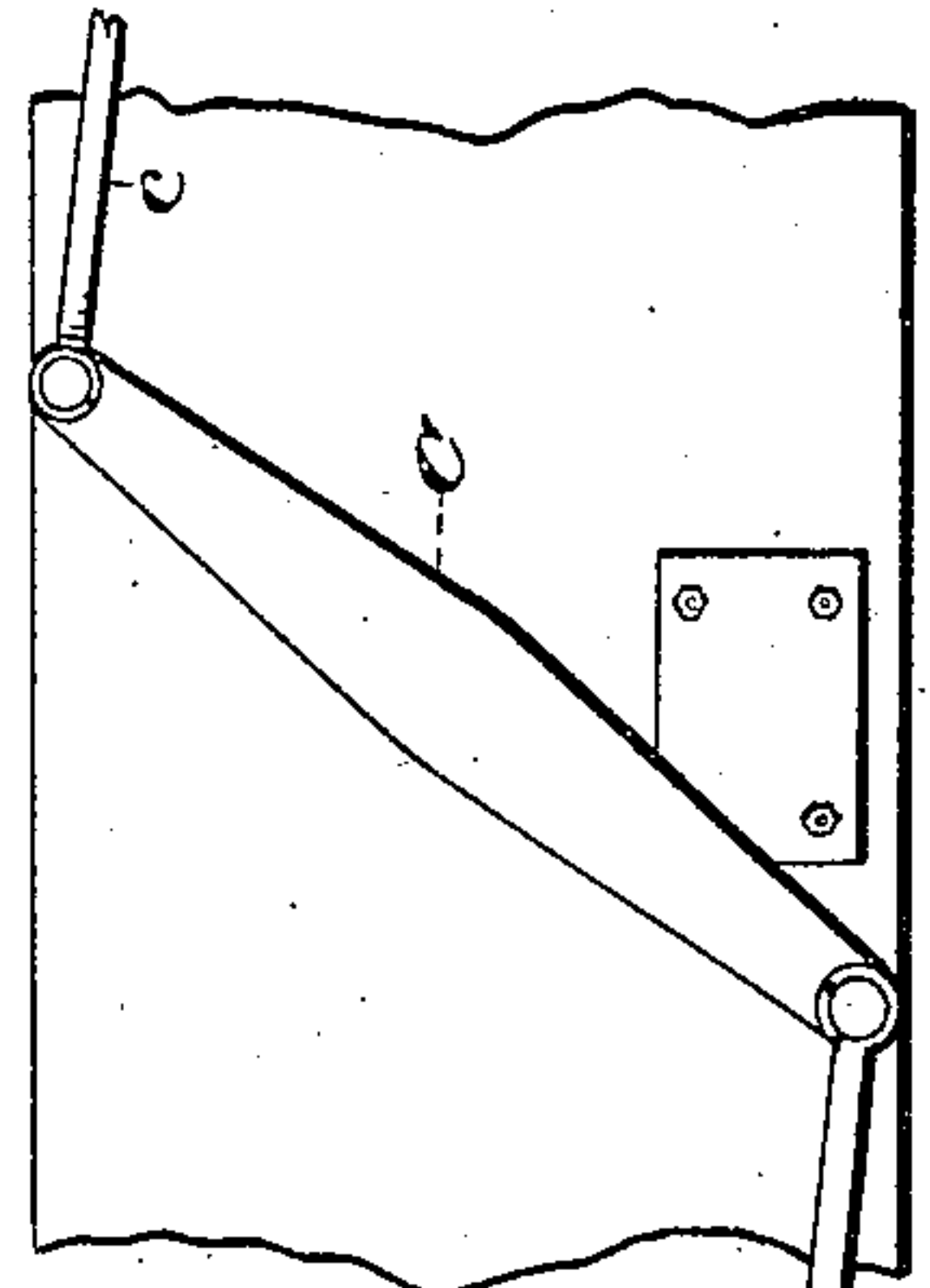
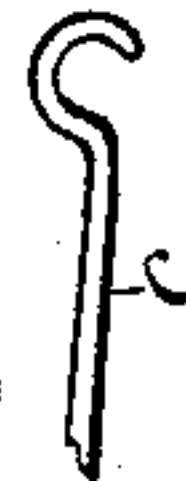


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

EVAN DAVIES, OF CLEVELAND, OHIO.

DOUBLE-ACTING STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 287,252, dated October 23, 1883.

Application filed July 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, EVAN DAVIES, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Double-Acting Steam-Pumps; 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 pertains to make and use the same.

My invention relates to improvements in double-acting steam-pumps; and it consists in certain features of construction and in combination of parts, hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a plan view, and Fig. 2 a vertical longitudinal section, of my improved pump. Fig. 3 is a cross vertical section on the line of $x x$, Fig. 1. Figs. 4, 5, and 6 are views in detail.

A represents steam-cylinders, each provided with a steam-chest, common slide D, valve, valve-stem, and exhaust-pipe in the usual manner of the smaller class of steam-engines. Between the two steam-cylinders, and attached to each, is the water-cylinder B. This cylinder has a chamber above and below, both extending the entire length of cylinder B, and each provided with a valve in the center and one at each end, and all opening upward. The lower chamber has attached the suction-pipe, and the top chamber has attached the discharge-pipe. The piston-rods a extend through both ends of their respective steam-cylinders, and are attached at their inner ends to the piston b of the pump, and at their outer ends to the cross-heads a' , that embrace, respectively, the guides a'' , and actuate the connecting-rods c , that are connected to the rock-arm C, with hook attachments that may be readily disengaged. The said rock-arm is attached to the rock-shaft C', that has attached at the other end the arm c'' , that is provided with the pin c' , operating in the segmental recess in the arm D. This arm D is pivoted on the end of the shaft C', and has above and below the pivoted point wrists that engage, respectively, the rods d , that actuate the valve-stem d' . The rods d have hook ends that engage their respective wrists.

E is the steam-pipe, with the branches e leading to each of the steam-chests, and provided at the center with a three-way valve, by means

of which steam may be admitted in either, both, or neither of the branch pipes.

The operation of the device is as follows: Suppose the valve e' is turned to one side far enough to admit steam to both cylinders, and that the parts are in the position shown in Fig. 2. The steam entering behind the steam-pistons forces them toward the center, together with the said pistons in the pump. These pump-pistons are brought nearly together when the steam-pistons have reached the end of their respective strokes. The water in the pump-cylinder in the meantime is forced out through the upper middle valve, the ends of the pump-cylinder at the same time filling with water by atmospheric pressure. This movement of the pistons just described, by means of the cross-heads a' and the rods c , actuates the arm C, the rock-arm C', and the attached arm c'' . When the pistons are near the end of their stroke, the pin c' engages the part D at the end of the segmental slot and turns it a short distance, so that by means of the attached rods d and the valve-stems d' the valves are moved in the proper distance and direction to reverse the motion of the said pistons. Near the end of the outer stroke a similar but opposite movement of the parts causes the valves again to change and to again reverse the motion of the pistons. When the motion of the pistons is outward, the water in the ends of the pump-cylinder is forced through the upper and end valves, while the central portion of the cylinder is filled from the lower central valve. The connections of the rods c and d with their respective wrists are by hooks, as shown in Fig. 6, so that any of the rods may be easily disengaged from their wrists. The rods c and d on one end may be disconnected, and the valve e' turned so as to shut the steam from the disconnected end, and thus one end of the pump worked alone when so desired. Thus one steam-cylinder and its attachments might be repaired while the other cylinder was working to its full capacity.

As shown in Fig. 3, the rock-shaft C' is inclosed in a tube or thimble that protects the rock-arm from the action of the water and prevents any leakage of the parts.

What I claim is—

1. In a steam-pump, two cylinders, with suitable mechanism attached to the respective ends

of a single pump-cylinder and actuating pistons therein, the two sets of pistons adapted to work in consort but in opposite directions, substantially as and for the purpose set forth.

5 2. In a double-acting steam-pump, the combination, substantially as before set forth, with the steam-cylinders and mechanism to cause their pistons to move simultaneously in opposite directions, of the pump-cylinder open from
10 end to end, and provided with two independent pistons controlled by the movement of the steam-pistons.

3. A steam-pump provided with two steam-

cylinders operating on a pump-cylinder, and provided with hook-connections and a three- 15 way stop-valve, and adapted to operate with one steam-cylinder and one end of the pump, substantially as and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 20 30th day of June, 1883.

EVAN DAVIES.

Witnesses:

ALBERT E. LYNCH,
CHAS. H. DORER.