J. A. Morrell,

Pump Lift.

No. 34,068. Patented Jan. 7, 1862.

Fig. 2

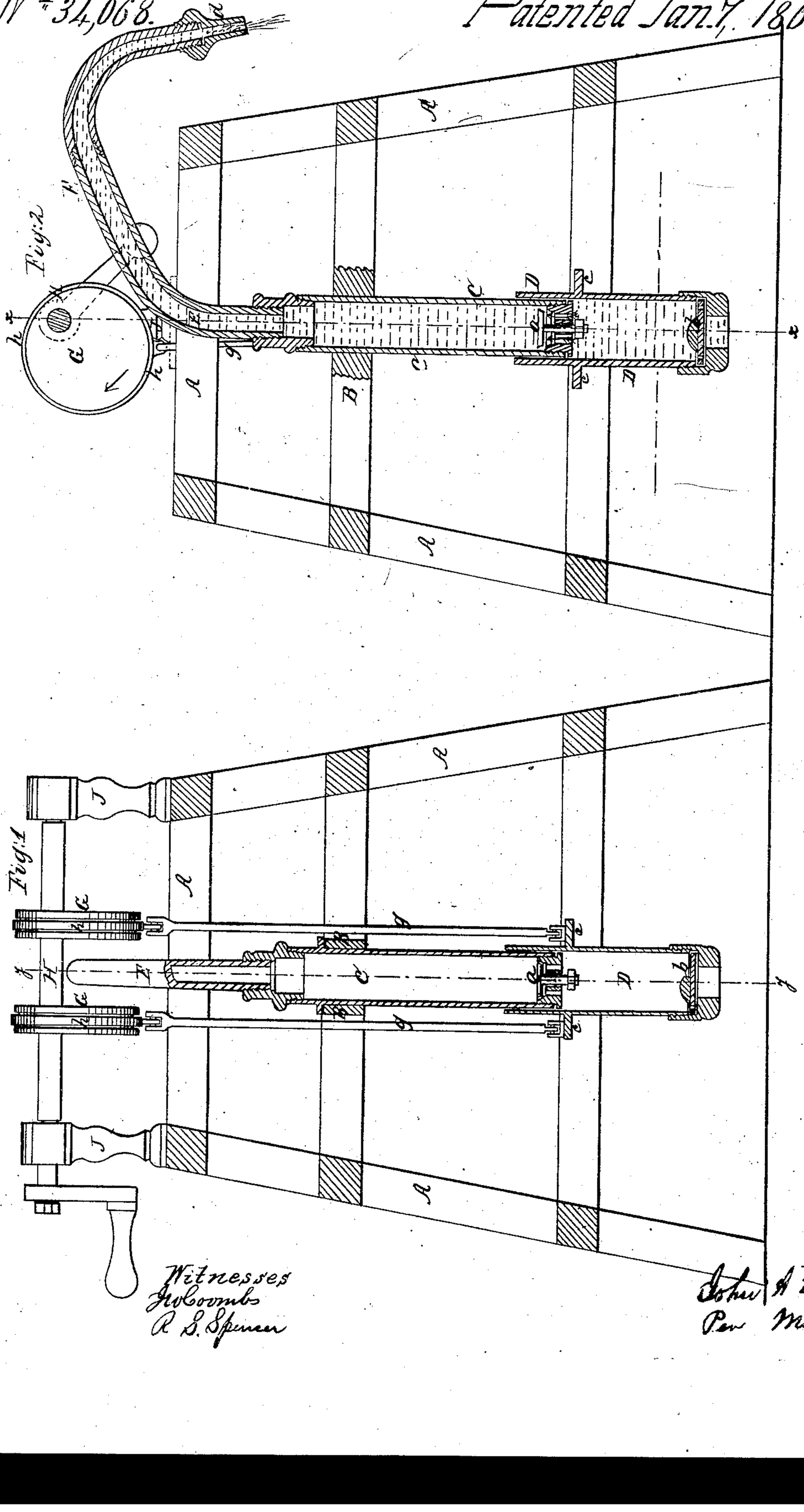

Fig. 1

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JAMES A. MORRELL, OF ST. CHARLES, MISSOURI.

PUMP.

Specification of Letters Patent No. 34,068, dated January 7, 1862.

To all whom it may concern:

Be it known that I, JAMES A. MORRELL, of St. Charles, in the county of St. Charles and State of Missouri, have invented a new and Improved Pump; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1, is a diametrical section through the pump cylinders, and a vertical transverse section through the frame work of the pump. Fig. 2, is a sectional elevation through the improved pump, taken in the vertical plane indicated by red line *y*, *y*, in Fig. 1, showing the interior of the pump when it is in operation.

Similar letters of reference indicate corresponding parts in both figures.

This invention is an improved force pump, intended for raising water from deep wells; and for any and all purposes where it is desired to force water a great distance.

The nature of my invention consists in the employment of one or more sliding cylinders, each provided with a valve opening upward in the lower end, and arranged on the lower end of a stationary main in such a manner that said sliding cylinders may be alternately raised and depressed by eccentrics on a driving shaft, so as to raise and force water up through the main pipe at every upward stroke of the pump as will be hereinafter described.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The frame-work A, is made of sufficient size and strength to contain and support the pump and its fixtures.

B, is a horizontal cross-beam which is secured in frame A; and through the middle of this beam B, passes vertically, the main pump cylinder C, which is secured to the beam B, so that it will be immovable. The stationary cylinder C, is carried down into the well some distance but not as far as the bottom thereof, and in the lower end of this cylinder C, a valve *a*, is seated which opens upward so as to allow water to rush up into this cylinder.

D, is the movable cylinder which works on the outside and on the lower end of the main cylinder C. This cylinder D, should fit tightly around the main cylinder so that a good joint will be formed and at the same time this lower cylinder should be allowed to perform a vertical or endwise sliding movement on the main cylinder C. The length of this cylinder D, should be such that its lower end will not get above the surface of the water in the well when this cylinder is raised to its highest point; it may descend as far as is desirable but the length of stroke which the movable cylinder is allowered to make will depend upon the capacity of the pump and the power to be expended in operating it. The two cylinders C, and D, may be made very large in diameter and very long, or they may be made quite small in diameter and very short, cylinderD, has also a valve *b*, in its lower end which opens upward.

On the upper end of the stationary cylinder C, a pipe E, is screwed which is somewhat smaller in diameter than cylinder C, and which carries the nozzle *d*, on its uppermost end.

A flange *c*, is formed around the upper end of the movable cylinder D, to opposite sides of which are pivoted connecting rods *g*, *g*. These two connecting rods *g*, *g*, are secured at their upper ends to bands *h*, *h*, which pass around the grooved peripheries of eccentrics G, G.

The eccentrics G, G, are turned by the main horizontal shaft H, to which they are keyed. Shaft H, has its end bearings in posts J, J, which are mounted on the top of frame A, and this shaft H, may be rotated by a common hand crank, or a pulley may be applied to the shaft and motion applied to it through belts communicating with any convenient prime mover.

The operation of the above described pump is as follows: Motion is communicated to shaft H, and the eccentrics G, G, communicate a rapid vertical movement to the cylinder D, the valve *b*, of which rises as the cylinder descends and allows the water to rush in, and closes when this cylinder is raised. When the cylinder D, is raised the water which it contains will be forced up through valve *a*, into cylinder C, and when cylinder C, has thus been filled the water will be discharged through nozzle *d*, at every upward stroke of the movable cylinder D. Water will not flow continuously from the nozzle *d*, of this pump as the up-

ward pressure in the column of water in cylinder C, occurs only when cylinder D, is making its upward stroke.

To obtain a continuous flow of water from the pump it is only necessary to introduce a second movable cylinder with a valve in its bottom and to give this cylinder a downward stroke while the one above it is ascending. A second and even a third movable cylinder may be employed in combination with the cylinder D; and these cylinders will work on the outside of their respective movable cylinders in the same manner as the cylinder D, is worked on the outside of the lower end of the stationary main C.

The eccentrics G, G, on shaft H, which give an up-and down movement to the movable cylinder D, may be taken off and others of a smaller or larger diameter substituted, which will give a greater or less throw to the cylinder D, the use of eccentrics therefore is found specially useful for this pump.

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

The employment of one or more sliding cylinders having valves suitably arranged in them opening upward, in combination with a stationary main pipe C, connecting rods g, g, and the eccentrics G, G, on the driving shaft H, all arranged and operating substantially as and for the purposes herein described.

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