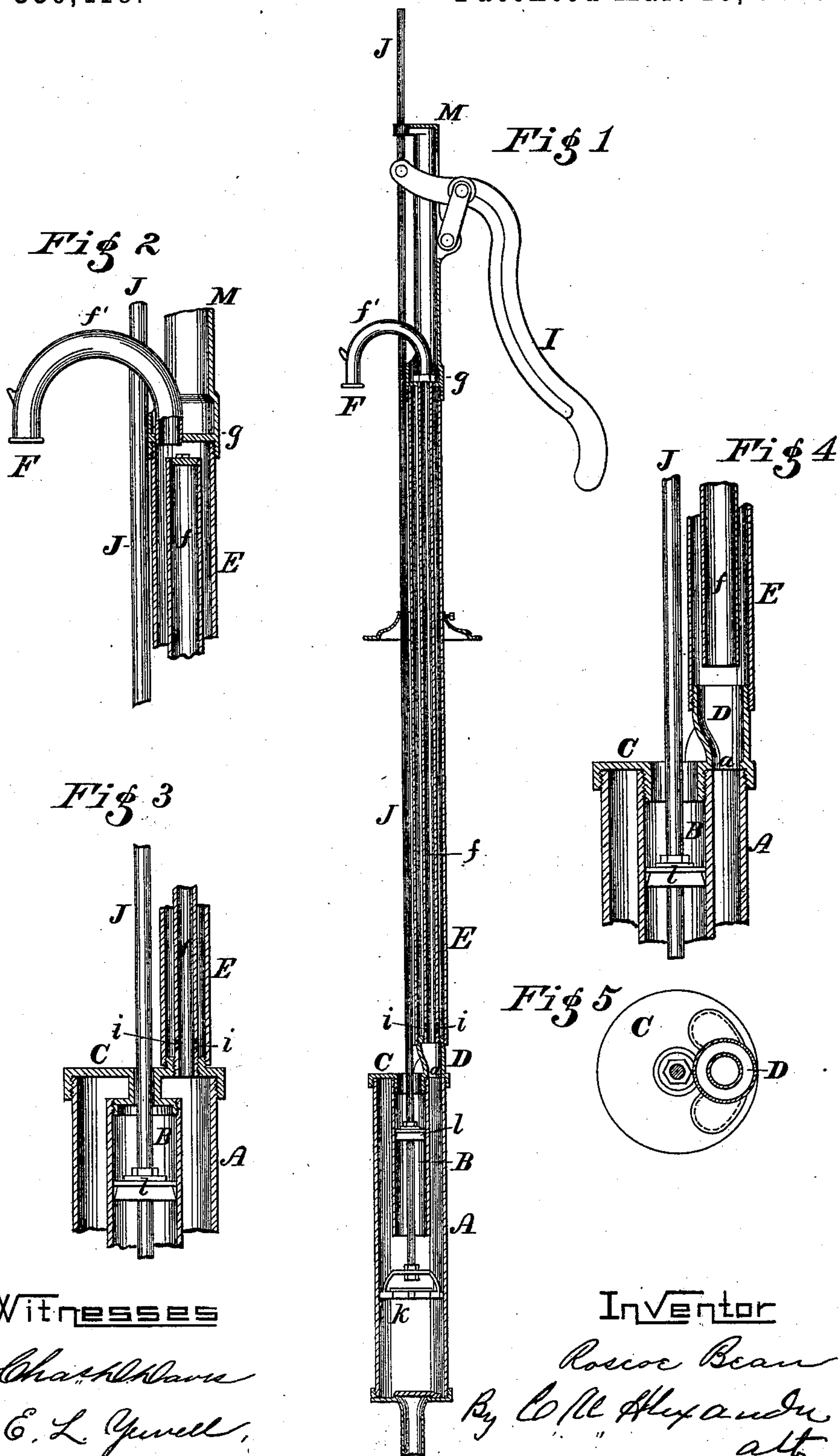


(No Model.)

R. BEAN.  
FORCE PUMP.

No. 359,419.

Patented Mar. 15, 1887.



Witnesses

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# UNITED STATES PATENT OFFICE.

ROSCOE BEAN, OF SPRINGFIELD, OHIO.

## FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 359,419, dated March 15, 1887.

Application filed March 24, 1885. Serial No. 159,976. (No model.)

*To all whom it may concern:*

Be it known that I, ROSCOE BEAN, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have  
5 invented certain new and useful Improvements in Force-Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to the novel construction of force-pumps, whereby the water way or conduit from the lifting-cylinder to the top of the pump is very nearly on a straight line, thus avoiding unnecessary friction; also, the symmetrical and compact arrangement and  
15 construction of parts is such as to adapt it for use in drilled or other narrow wells, while pumps constructed with side or projecting outlets from the cylinder are thereby rendered impracticable in such wells. Furthermore,  
20 pumps so constructed are unequally balanced and have a tendency to tip or sway sidewise when in operation, thus not only greatly increasing the wear, but obstructing the easy and efficient working of the pump.

25 In the drawings, Figure 1 represents a side elevation showing a vertical section of the pump. Fig. 2 is a modified construction of the upper section of the pump, in which the curved section of the discharge-pipe is attached to the top cap or head of the pump.  
30 Fig. 3 is a modified construction and connection of the outer cylinder and case, also of the inner cylinder and head. Fig. 4 is also a modified construction, in which the discharge-pipe or water-conduit is disconnected at its  
35 lower end. Fig. 5 is a plan view of the cylinder-head with a section of the enlarged water-way connected thereto.

Referring by letter to the accompanying  
40 drawings, A designates the outer cylinder, which may be located at any desired point below the platform or well-cover. The interior cylinder, B, is of half the capacity of that of A, and being placed inside of A, and with its  
45 upper end attached to the cylinder-head C and its lower end open, it is adapted to receive half the water lifted at one downward stroke of the pump handle or lever I.

The section D of the water-way is connected  
50 with the cylinder-head C, and is semicircular in form at the connection, extending about half-way around the top of the head, as shown

in Fig. 5, thereby not only affording an enlarged water-way, but also adding greatly to the strength of the connection, the form of it  
55 being such as to afford a suitable brace, thereby overcoming the tendency to sag or the liability to break from the side weight.

Cylinder-head C performs the function of a cylinder-head and of a support to cylinder B, 60 and also connects case E and cylinder A. A vertical opening or water-way, *a*, is provided, as shown in Figs. 1 and 4, through which the water passes. The upper end of section D is adapted for connecting with case E, and from 65 preference is made to fit inside of it. The discharge-pipe F is preferably made in two sections, *ff'*. *f*, being made straight and of suitable size and length, is attached firmly to section D from preference, being screwed into it, 70 which is done before case E is put in position. Cap *g* (which is provided with a suitable opening to receive the upper end of section *f*) is then placed in position by being screwed down firmly onto case E, section *f* extending 75 through cap *g* sufficiently to engage with curved section *f'*, which, being provided with a suitable packing and screwed down onto section *f* and cap *g*, forms an air and water tight joint, and at the same time adds greatly to the 80 strength and stiffness of the pump-stock by this double connection. Section *f* is provided with perforations *ii*, through which the water passes into case E, thus forming a complete air-chamber. 85

The actuating-rod J is connected to the lever I, and, passing down outside of case E and through the cylinder-head C, extends to valve *k*, as shown in Fig. 1. The standard *m* is connected to cap *g*, and may be of any desired or 90 suitable form. The plunger *l* is attached to the actuating-rod J in any suitable manner, and is adapted to operate in the cylinder B. The plunger *l* and valve *k* being both attached to the actuating-rod J are moved simultaneously thereby. Consequently with the downward thrust of the lever I valve *k* and plunger *l* are carried upward. Valve *k*, lifting the water, forces a portion of it up through the discharge-pipe *f*, while the remainder fills the 95 space made in chamber B by the receding plunger *l*. When the motion is reversed, the plunger *l*, descending in cylinder B, displaces the water, which is in turn forced out through 100



the discharge. Thereby a continuous flow of water is obtained.

Fig. 2 represents a modified construction of the upper portion of the pump, in which section *f* of the discharge-pipe is disconnected from the cap *g* and from curved section *f'*, and being closed at the top is thereby made to serve as an air-chamber, the water passing through openings *i i*, as shown in Fig. 3, into case E and out through curved section *f'* of the discharge-pipe, which is connected to cap *g*.

Fig. 3 is a modified construction, in which cylinder B is dropped down slightly in cylinder A, and connected to head C by means of a contracted neck, thus permitting case E and section *f* to be connected directly to head C, thereby dispensing with section D.

Fig. 4 shows still another method of construction, wherein section *f* of the discharge-pipe is disconnected at the lower end, but is connected at the top by being screwed into cap *g*, extending through sufficiently to engage with curved section *f'*. Practically the same results are obtained with these various constructions, either of which may be employed with satisfactory results; but from preference we use the construction shown and described in Fig. 1, for the reason that it is stronger and stiffer, capable of greater wear, and less liable to break or get out of order.

Employing either of the constructions described, it will be readily seen and understood that we have a pump that is strong, well balanced, and, by reason of its compact and symmetrical construction, adapted to drilled and other narrow wells; but employing the construction shown and described by Fig. 1 we not only have the very strongest and best possible combination of parts, but we also have a straight water way or conduit, whereby the water is carried to the outlet with the least possible obstruction or friction, thereby lessening the labor and decreasing the liability of getting out of order.

I hereby disclaim the hollow connecting-section enlarged and of segmental form at its lower end, in that the same is embodied in applications filed by me February 24, 1885, Serial No. 156,912, and May 28, 1885, Serial No. 166,976, both for improvements in pumps, the said section being a subject of the claims in the latter application.

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

1. In a pump, the combination, with the outer cylinder, the cap having openings and secured thereto, and the inner cylinder secured to that cap about one of the openings, of the outer pipe secured to that cap about the other of said openings, closed at its upper end, and forming an air-chamber and a support, and the inner pipe extending upwardly from or from near the said cap and forming the discharge-pipe.

2. In a pump, the combination, with the cylinder proper, the cap secured thereto and having openings, and the inner cylinder secured about one of those openings, of the hollow connecting-section, the outer pipe secured to that cap through that section, extending upwardly and forming the air-chamber and the support, the inner pipe extending upwardly from or from near the cap and forming the discharge-passage for the water, and the actuating-rod having a plunger within the cylinder proper and a plunger within the inner cylinder and extending through the cap and outside of the said pipes.

3. In a pump, the hollow connecting-section enlarged and of segmental form at its lower end.

4. In a pump, the combination, with the cylinder proper and the inner cylinder, of a cap secured to the former and sustaining the latter and provided with two openings, and the pipe secured to the cap about one of said openings, the position of the latter opening being within the circumference of the cylinder proper, whereby the water finds its outlet in a directly upward line without lateral divergence, and the position of the other opening being such as to admit of the passage of the actuating-rod outside of said outer pipe.

5. In a pump, the combination, with the cap having a hollow neck and a hole to one side of the neck, and the inner cylinder secured to said neck, of the pipe secured to the cap about said hole, the position of the pipe being such as to permit the actuating-rod to pass upwardly and to one side of the same.

In testimony whereof I affix my signature in presence of two witnesses.

ROSCOE BEAN.

Witnesses:

J. S. BOGLE,  
CHAS. L. BOGLE.