

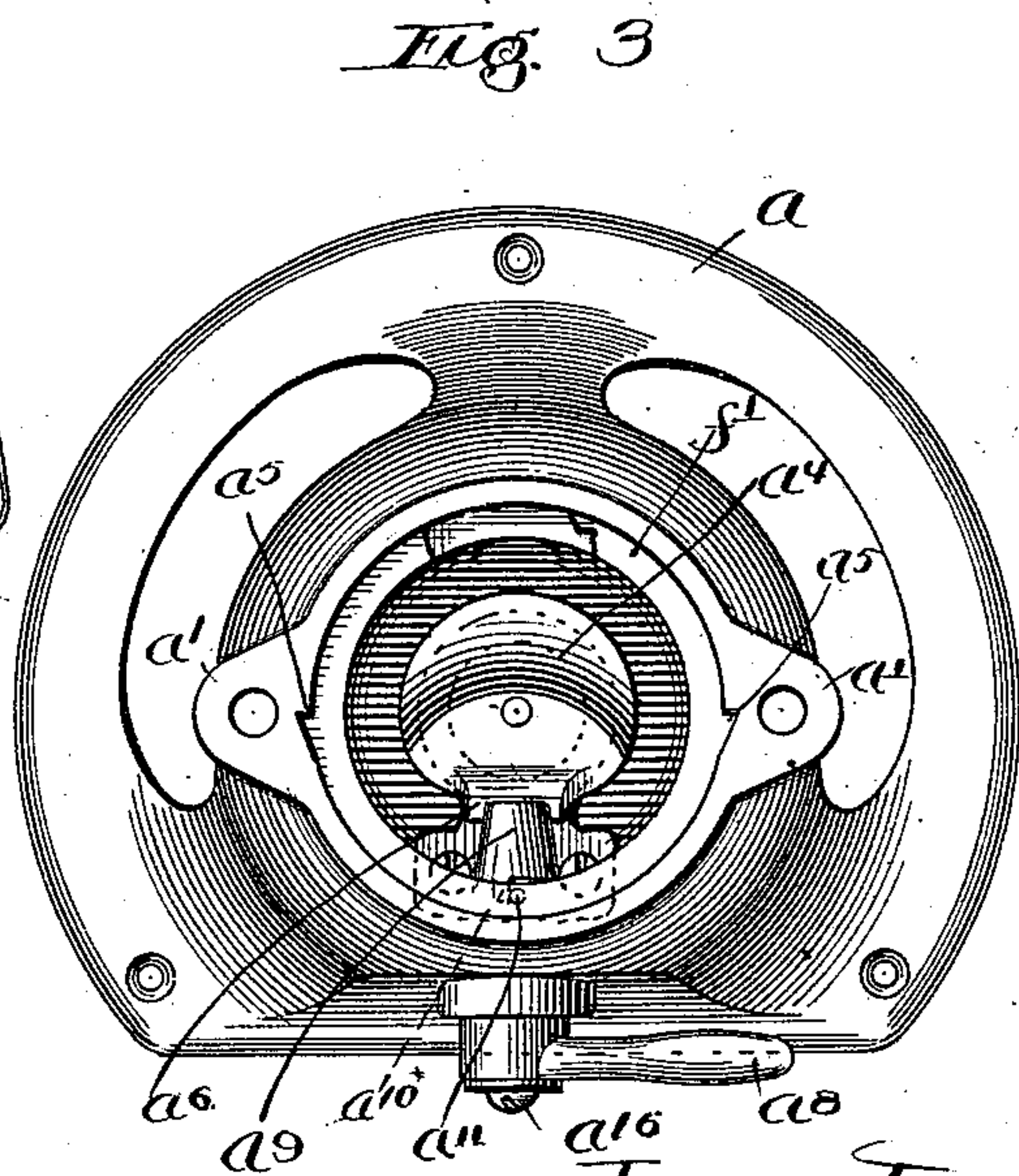
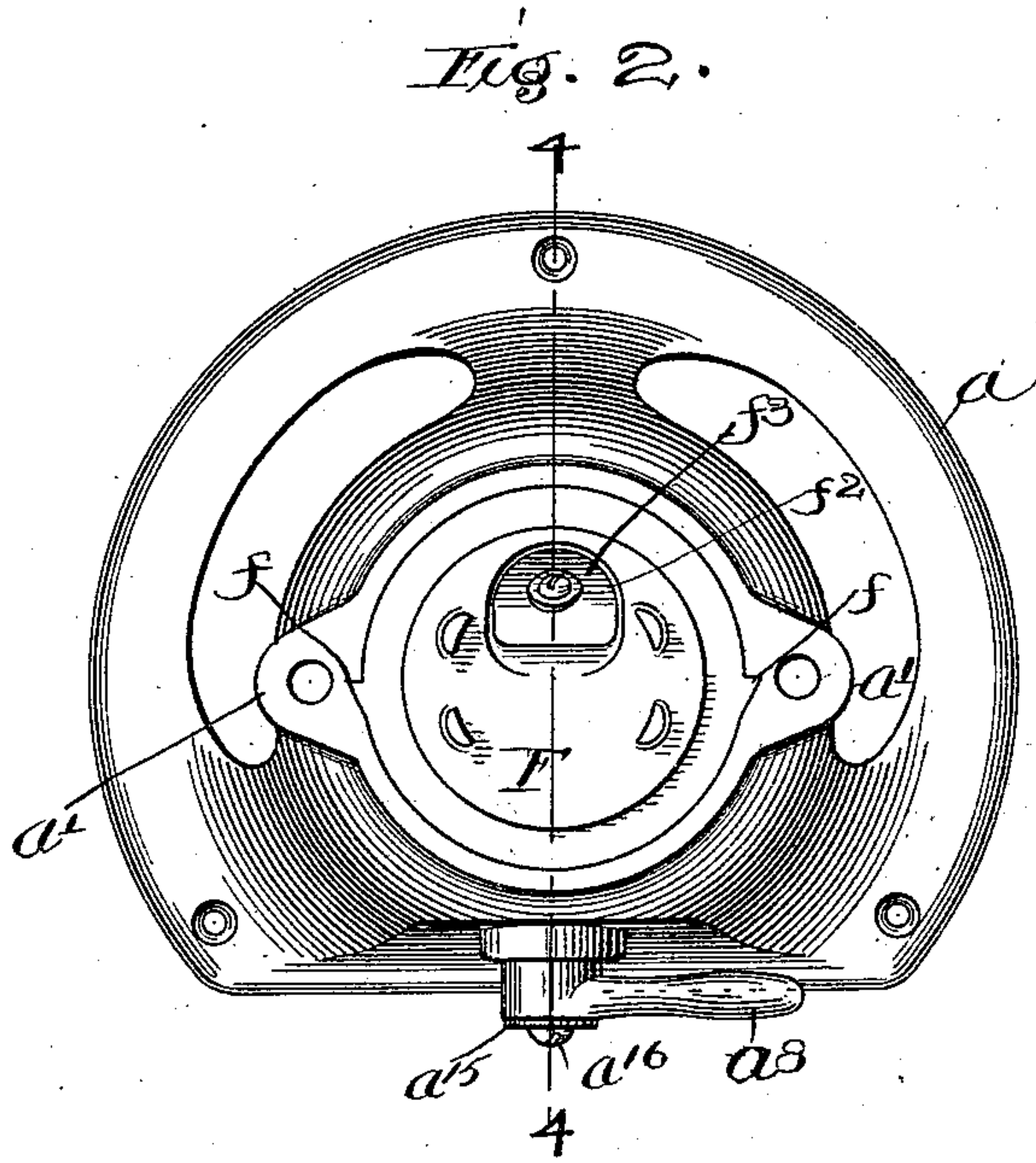
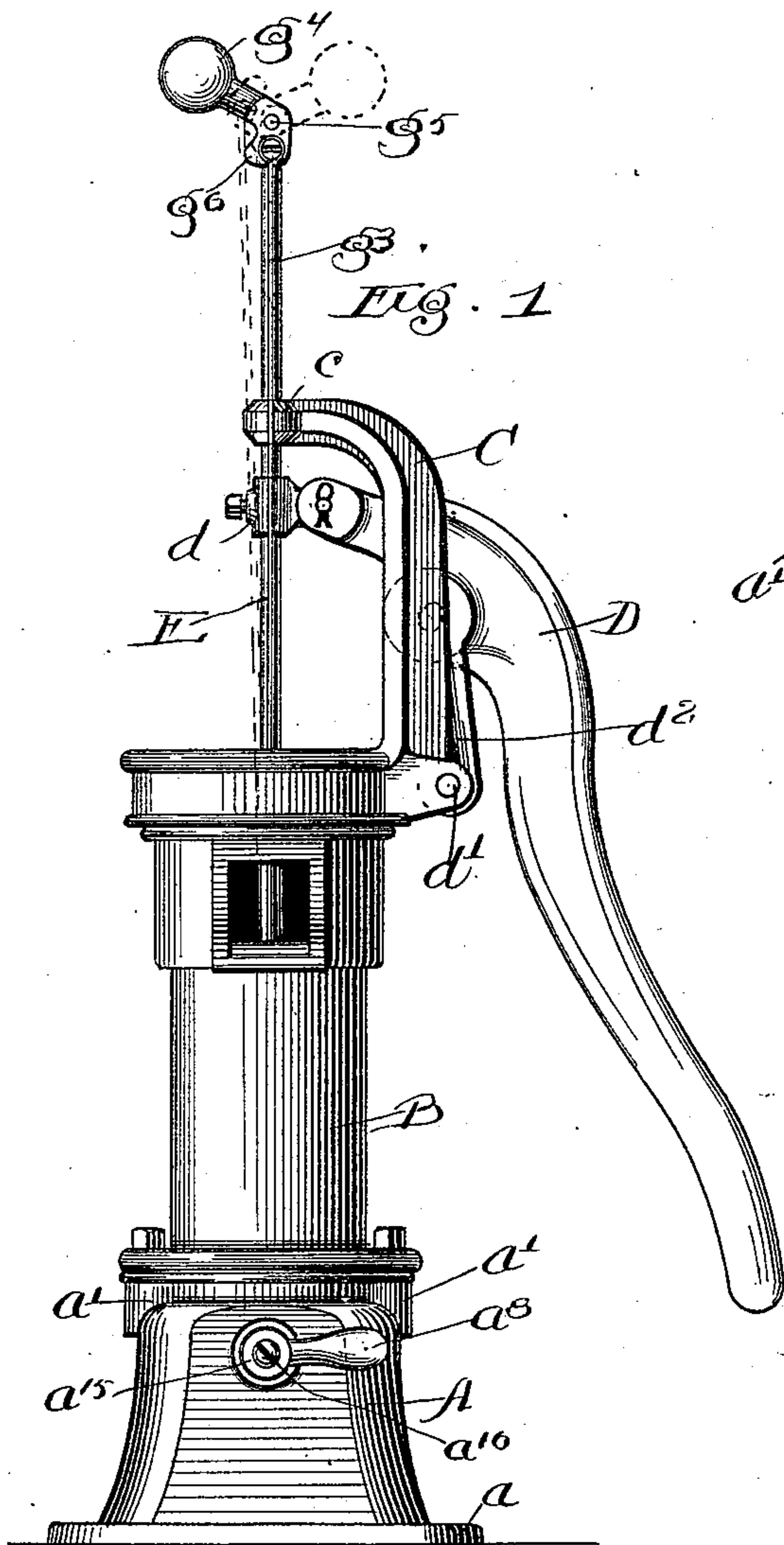
(No Model.)

3 Sheets—Sheet 1.

W. RADLEY.  
PUMP.

No. 541,682.

Patented June 25, 1895.



Witnesses:  
Charles Shewey  
A. H. Ebbesen

Inventor:  
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Wiles Munnings Britton  
attor.



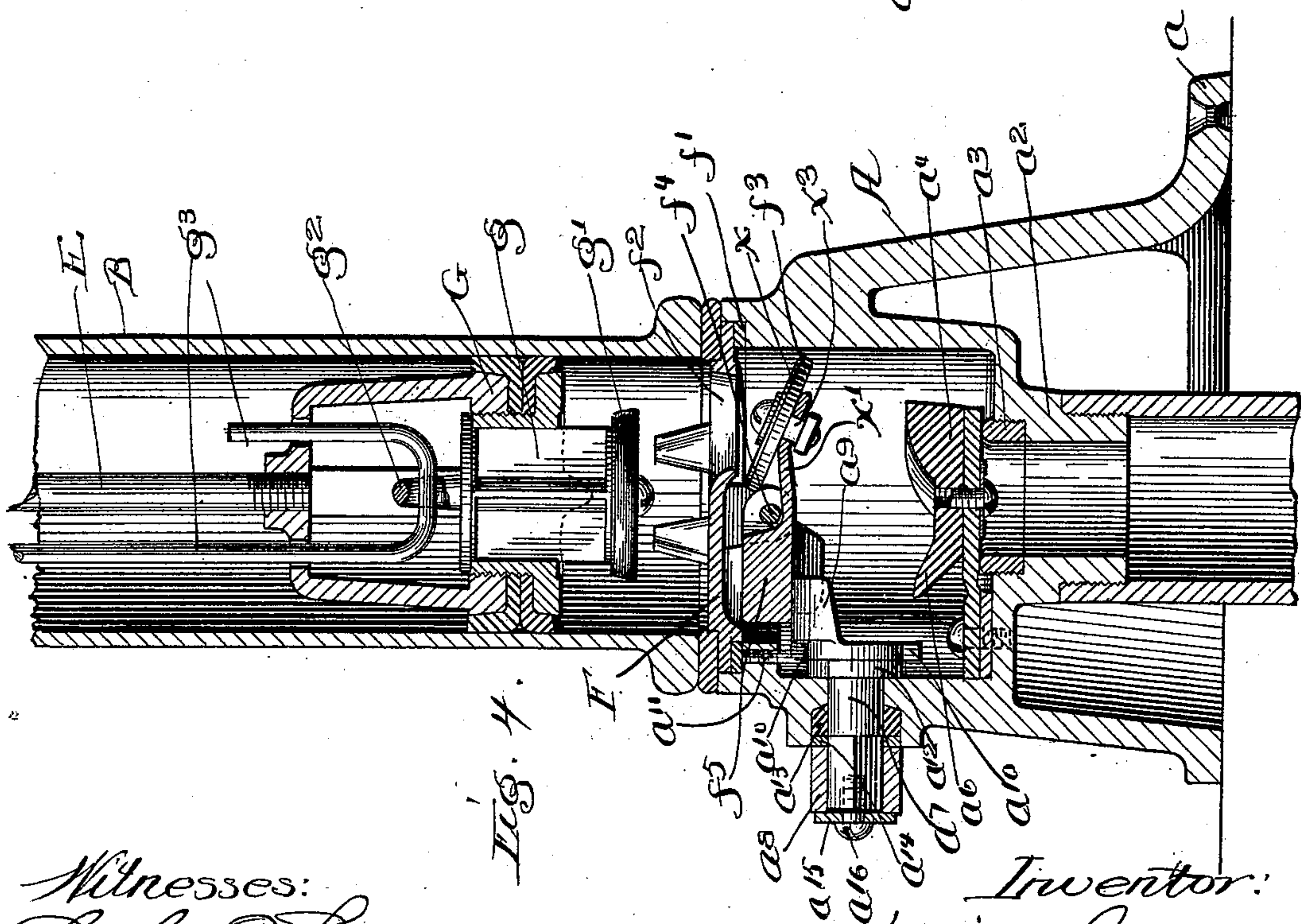
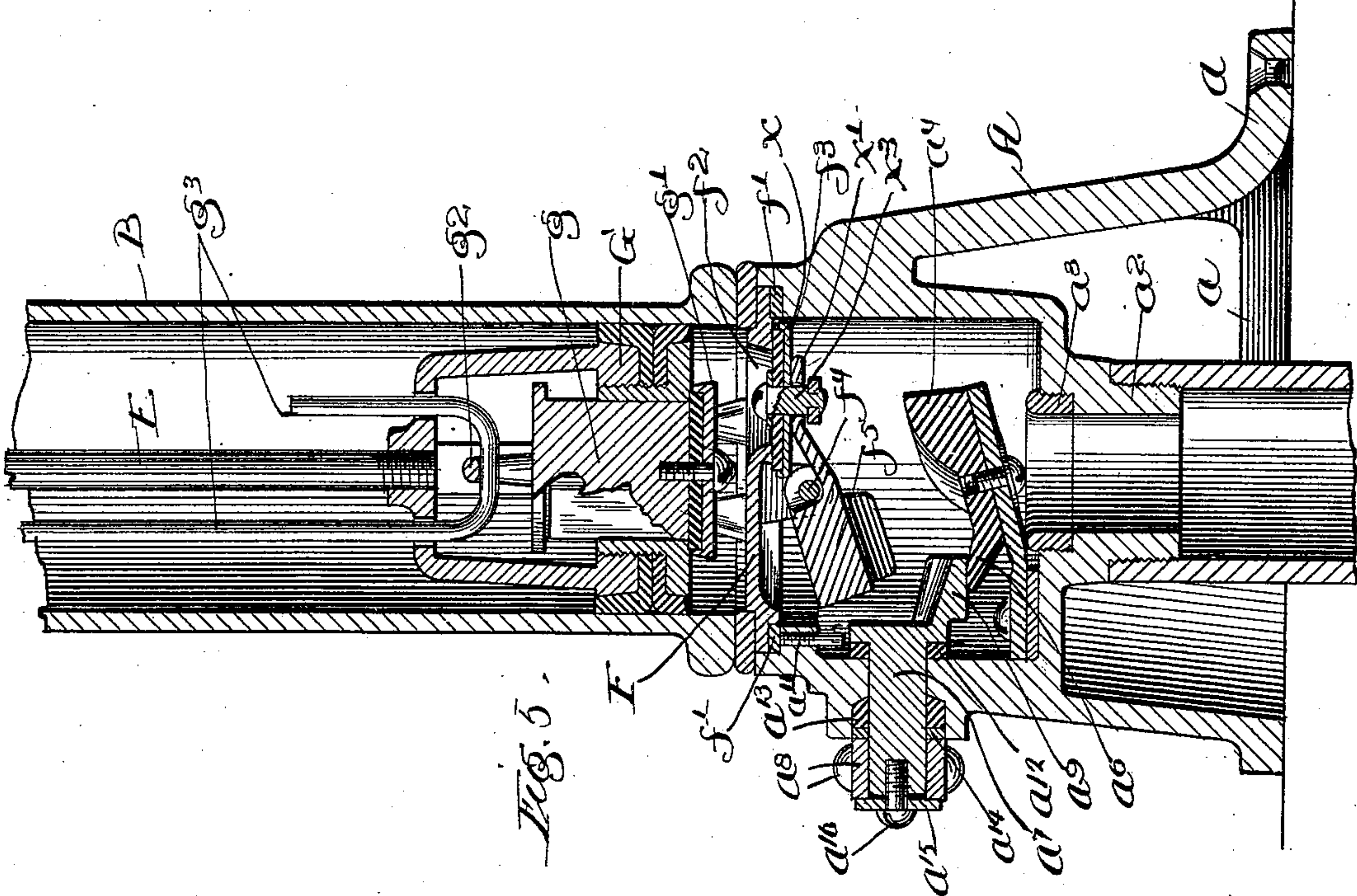
(No Model.)

3 Sheets—Sheet 2.

W. RADLEY.  
PUMP.

No. 541,682.

Patented June 25, 1895.



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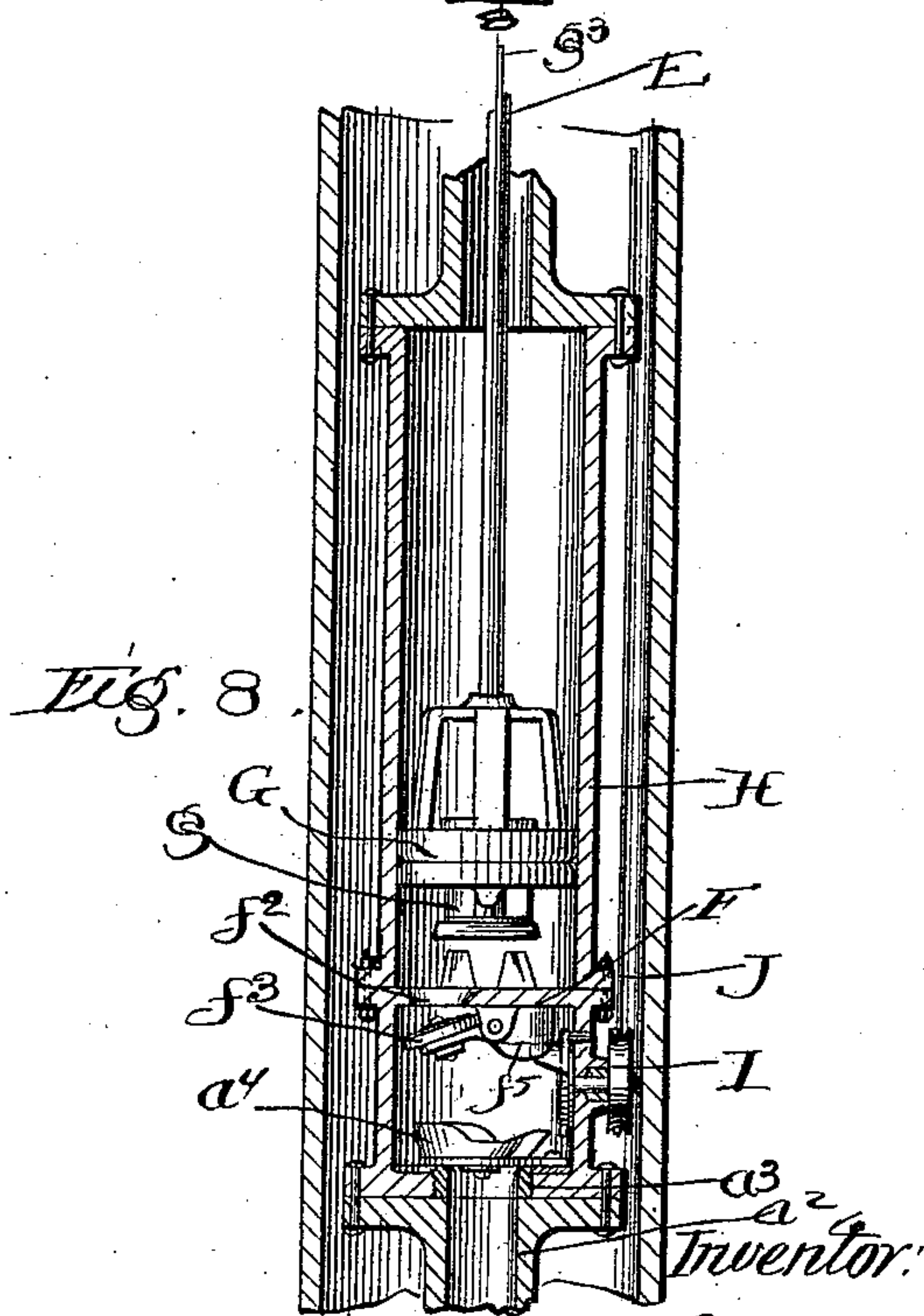
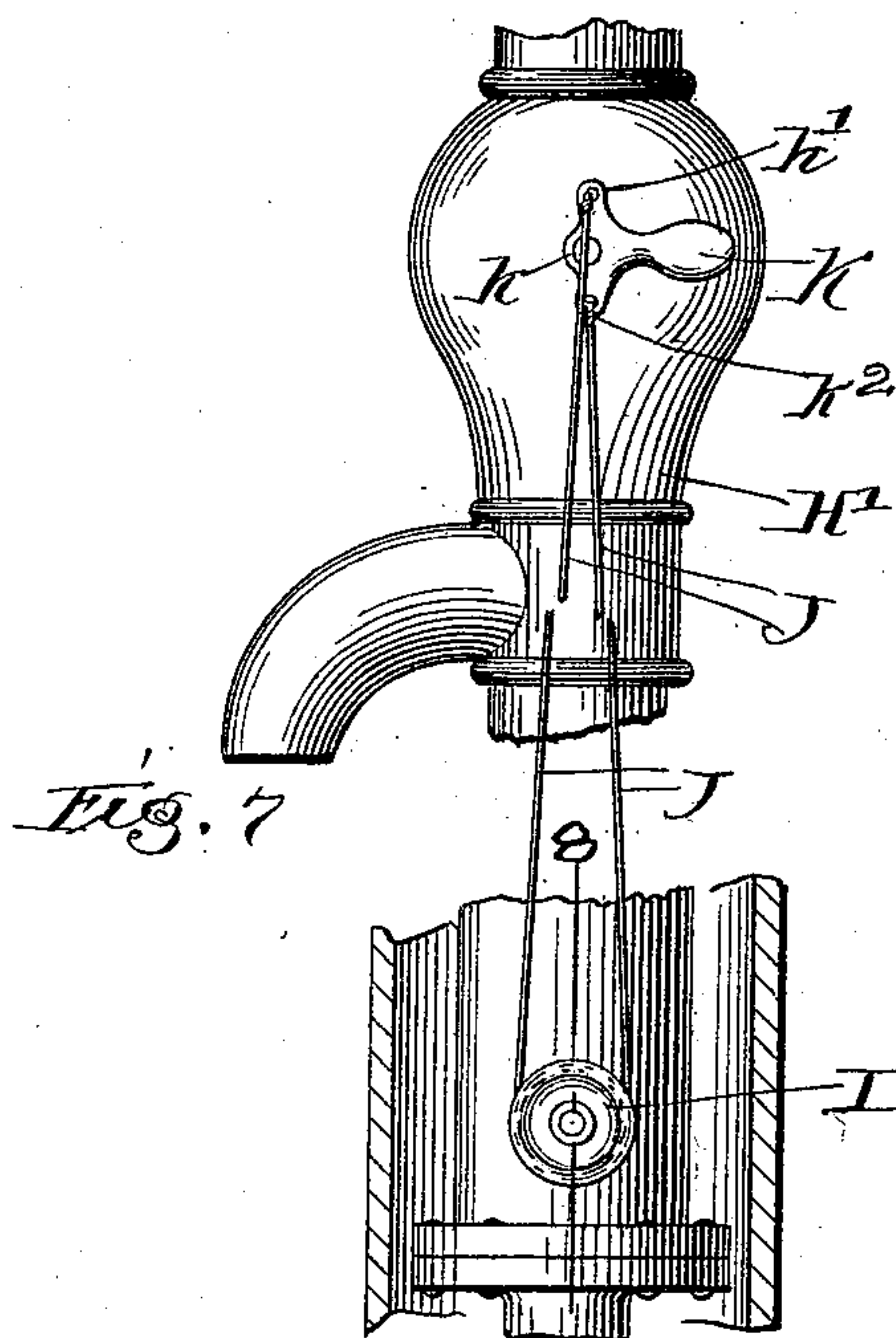
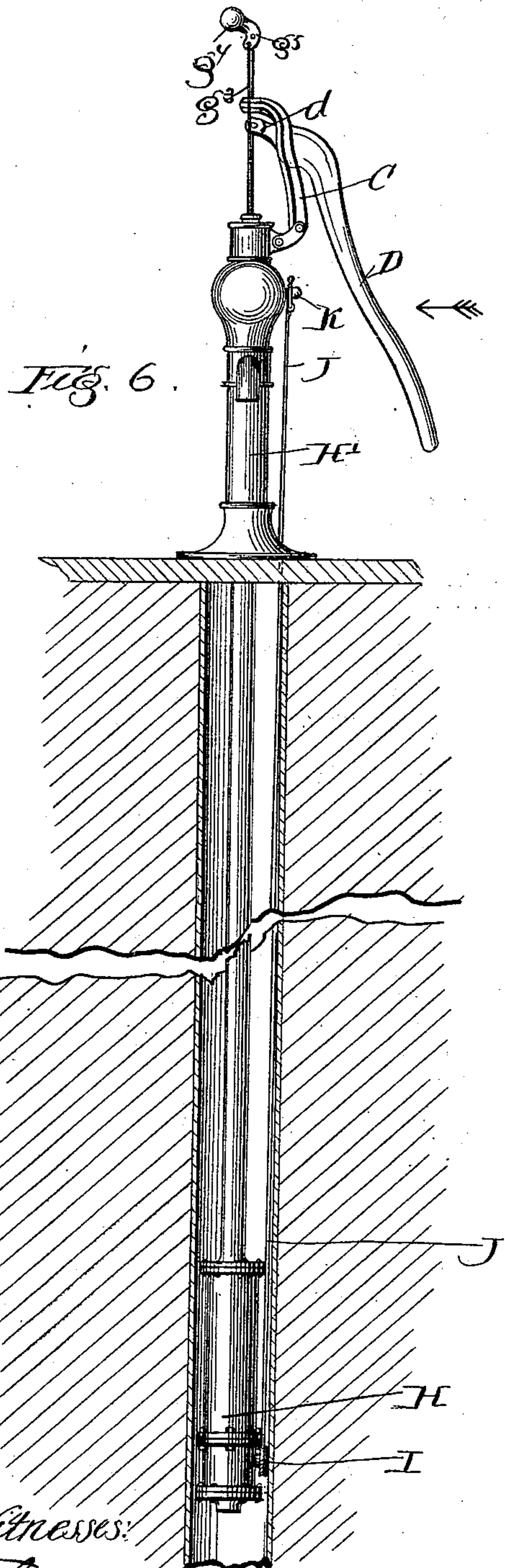
(No Model.)

3 Sheets—Sheet 3.

W. RADLEY.  
PUMP.

No. 541,682.

Patented June 25, 1895.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

WILLIAM RADLEY, OF SANDWICH, ILLINOIS.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 541,682, dated June 25, 1895.

Application filed October 4, 1894. Serial No. 524,863. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM RADLEY, a citizen of the United States of America, residing at Sandwich, in the county of De Kalb and State of Illinois, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention relates to certain improvements in pumps of the class which are designed to pump water in one direction and air in the other. Such pumps are used upon cisterns and tanks in which the water is liable to become foul and unfit for use, the purpose being to agitate and purify the water by pumping air into it through the same pipe by means of which the water is drawn from the cistern. This air escaping at the bottom of the cistern or tank rises in bubbles, violently agitating the entire body of water about the pump.

The invention is illustrated by means of eight figures, of which—

Figures 1 to 5, inclusive, illustrate the application to pumps designed for shallow cisterns or tanks; and Figs. 6 to 8 illustrate the application to pumps used upon deeper cisterns or wells. Fig. 1 is a side elevation of my pump in its preferred form. Fig. 2 is a plan view of the base A, the upper portion of the pump being removed. Fig. 3 is a view similar to Fig. 2 with the plate F removed. Fig. 4 is a vertical section in line 4 4, Fig. 2. Fig. 5 is a similar section, but showing the pump in position for pumping air into the cistern or well. Fig. 6 is a view, partly in elevation and partly in vertical section, showing the pump adapted to deep wells. Fig. 7 is a broken side view looking in the direction of the arrow 7, Fig. 6; and Fig. 8 is a broken section in line 8 8, Fig. 7.

Referring to Figs. 1 to 5, the ordinary kitchen pump is shown as consisting of a hollow base, A, and a cylinder, B, which also forms the pump-head or spout. From this cylinder or head extends a bracket, C, in which is pivoted the handle, D, by means of a link,  $d^2$ , and which also serves as a guide for the pump rod, E, to which the handle is connected at  $d$ . The hollow base, A, is provided with a supporting flange,  $a$ , at the bottom and at the top with oppositely arranged ears,  $a'$ , by means of which it is secured to corresponding ears

upon the cylinder to fasten the two parts of the pump together.

Within the base and at the top thereof is a cup-shaped portion, at the bottom of which is a tubular extension,  $a^2$ , adapted for connection with the ordinary tubing which extends into the cistern. At the bottom of the cup-shaped portion and at the opening of this extension is a valve-seat,  $a^3$ , upon which is arranged an ordinary hinged valve,  $a^4$ , opening upward as is common in this class of pumps. The top of the base is covered by a plate, F, which is held in proper relation to the base by means of lugs,  $f$ , fitting in notches,  $a^5$ , in said base, and which is made to form a tight joint therewith by means of a gasket,  $f'$ . The plate, F, has an opening,  $f^2$ , beneath which is hung a valve,  $f^3$ , by means of a pivot,  $f^4$ , which valve is provided upon the opposite side of the pivot with a weight,  $f^5$ , the gravity of which tends to close the valve. This valve,  $f^3$ , consists of a disk,  $x$ , provided with a proper facing and loosely secured to the valve lever,  $x'$ , by means of a pin,  $x^3$ , so that the disk will be able to seat itself perfectly regardless of a slight variation in the thickness of the facing or the valve pivot.

Extending through the side of the base is a key,  $a^7$ , having a squared outer portion upon which is mounted a handle,  $a^8$ , and upon its inner end a projection,  $a^9$ , which may be brought to bear either against the weighted portion,  $f^5$ , of the valve,  $f^3$ , or against a projection,  $a^6$ , upon the valve,  $a^4$ , by throwing the handle,  $a^8$ , from one side to the other. When it bears upon the weight,  $f^5$ , it raises said weight sufficiently to lower the valve,  $f^3$ , away from its seat throwing said valve entirely out of operation, and, on the other hand, when it bears upon the projection,  $a^6$ , of the valve,  $a^4$ , it raises the latter valve from its seat, so that when the handle,  $a^8$ , is thrown in one direction, it throws one of the valves out of operation, and when it is thrown in the other direction, it throws the other valve out of operation. Two stops,  $a^{10}$ , upon opposite sides of the key and adapted to strike a screw,  $a^{11}$ , prevent the key from being thrown too far in either direction.

To prevent the leakage of water alongside of the key,  $a^7$ , an elastic washer,  $a^{12}$ , is used



within the base and a packing,  $a^{13}$ , and a washer,  $a^{14}$ , without the base. These are all tightened together by means of a washer,  $a^{15}$ , and a screw,  $a^{16}$ , threaded in the key and adapted to crowd the washer,  $a^{15}$ , down upon the handle.

Within the cylinder, B, is a piston, G, containing an upwardly opening winged valve,  $g$ , upon the downwardly extending wings of which is secured a downwardly opening valve,  $g'$ , and an upward extension,  $g^2$ , above the valve,  $g$ , contains a vertically elongated eye, through which passes a hooked rod,  $g^3$ , extending upward to the top of the pump rod and there pivoted to one end of a weighted oscillating lever,  $g^4$ , which is itself pivoted to the end of the pump rod, and which is provided with a stop,  $g^6$ , to prevent the weight from carrying it beyond the position seen in full lines in Fig. 1.

Figs. 1 and 4 show the pump adjusted for pumping water upward. In these figures it will be noticed that the upwardly opening valve,  $a^4$ , in the base is in operative position and the downwardly opening valve,  $f^3$ , is held from its seat so that the water can pass freely by it in either direction; also that the upwardly opening valve,  $g$ , in the piston is in operative position, said valve being allowed sufficient vertical movement by means of the elongated eye in the projection,  $g^2$ , but that said eye is not sufficiently long to allow the valve,  $g'$ , to rise to its seat without moving the rod,  $g^3$ , which rod is prevented from being raised because of the position of the lever,  $g^4$ , the lever-pivot and the rod pivot being substantially in a vertical line, so that when any upward push upon the rod is sustained upon the pivot it does not tend to move the weight.

To adjust the pump for pumping air downward the handle,  $a^8$ , is thrown into the position seen in Fig. 5, and the lever,  $g^4$ , is thrown into the position shown in dotted lines in Fig. 1. As the result of the movement of the handle,  $a^8$ , the valve,  $a^4$ , is raised and the weight,  $f^5$ , is released so that it may operate to close the valve,  $f^3$ . The throwing of the lever,  $g^4$ , raises the rod,  $g^3$ , pulling the valve,  $g$ , away from its seat and raising the valve,  $g'$ , to its seat where it is held by the weight upon the lever,  $g^4$ . If the pump handle, D, be now operated, the result will be the forcing of air downward through the two valves,  $g'$ ,  $f^3$ , each of which opens downward and is held to its seat by a yielding weight.

Figs. 6 and 7 show the application of my pump to a deep cistern or well. The change of construction consists in substituting a pulley, I, for the handle,  $a^8$ , and operating said pulley by means of two wires secured to the same and extending up through the well to the pump-head and there secured to a T-lever, K, so that the operation of said lever is trans-

mitted to the pulley and operates the valves as before.

I claim as new and desire to secure by Letters Patent—

1. The combination in a pump and with a piston and piston rod, of a pair of valves opening in opposite directions through the piston, a controlling rod adapted to throw either of said valves into or out of operation by a movement substantially parallel to the piston rod and a weighted lever pivoted to the controlling rod and also the piston rod and adapted to be tilted upon opposite sides of the latter pivot to hold the controlling rod in either of its two positions; substantially as described.

2. The combination in a pump and with its piston and piston rod, of a downwardly seating valve, having a downward extension extending through the piston and an upwardly seating valve attached to the lower end of said downward extension, a controlling rod loosely connected with said valves so as to allow of sufficient vertical movement for the operation of the downwardly seating valve, a lever pivoted to the piston rod and also to the controlling rod and adapted to be thrown upon the opposite sides of the piston rod pivot to raise or lower the controlling rod; substantially as described.

3. The combination in a pump and with the piston and piston rod, of the double valve,  $g$ ,  $g'$ , the controlling rod,  $g^3$ , the weighted tilting lever,  $g^4$ , pivoted to the pump rod and to the controlling rod and having the stop,  $g^6$ , adapted to sustain the weight when the two pivots are substantially in line; substantially as described.

4. The combination with a piston and piston rod, of a pair of valves opening in opposite directions through the piston, a valve rod adapted to throw either of said valves into or out of operation, and a weighted lever pivoted to the valve rod and also to the piston rod; substantially as described.

5. The combination in a pump and with its piston and piston rod, of a downwardly seating valve having a downward extension extending through the piston and an upwardly seating valve attached to the lower end of said downward extension, a valve rod loosely connected with said valves so as to allow of sufficient vertical movement for the operation of the downwardly seating valve and a weighted lever pivoted to the piston rod and also to the valve rod; substantially as described.

In witness whereof I have hereunto set my hand, at Chicago, Illinois, this 26th day of September, A. D. 1894.

WILLIAM RADLEY.

Witnesses:

CHARLES O. SHERVEY,  
A. I. H. EBBESEN.