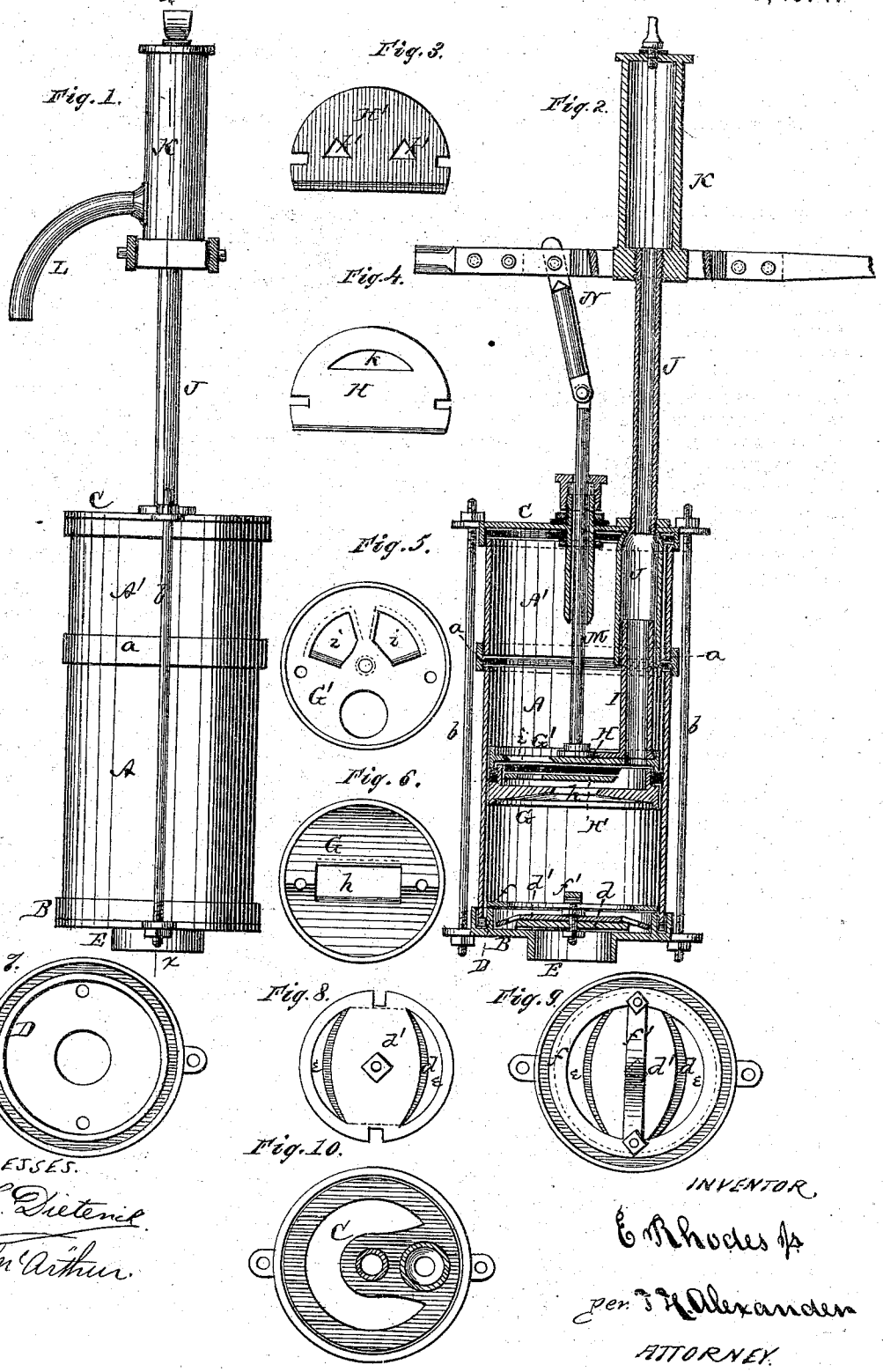
E. RHODES, Jr.

Pumps.

No. 152,684. Patented June 30, 1874.

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ELIAS RHODES, JR., OF CLYDE, OHIO.

## IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **152,684**, dated June 30, 1874; application filed June 4, 1874.

*To all whom it may concern:*

Be it known that I, E. RHODES, Jr., of Clyde, in the county of Sandusky and State of Ohio, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The nature of my invention consists in the construction and arrangement of a reacting suction and force pump, which is applicable to, and useful for, all varieties of steam and fire engines, for wells and cisterns, and for any place where a pump can be used, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a side elevation, and Fig. 2 is a longitudinal section, of my pump. Figs. 3 to 10, both inclusive, represent detached views of certain parts thereof.

The cylinder of my pump is made of two parts, A A′, placed one on top of the other, with packing between them, and a ring or band, *a*, overlapping the joint, which band is secured to one of the parts of the cylinder. B is the lower head, and C the upper head, which are fastened to the ends of the lower cylinder by rods *b b* passing through ears upon the heads, and fastened by nuts, suitable packing being inserted between the heads and the ends of the cylinder. The lower head, B, has a single central entrance, E, and on the upper surface of this head is formed a circular box, D, in which is placed a valve, *d d′*. The under part, *d*, is made of leather or rubber, cut nearly round, and left sufficiently large to cover the aperture E, while the upper part, *d′*, is made of metal, and has two apertures, *e e*, on opposite sides, as shown in Figs. 8 and 9. The two parts *d d′* are bolted together in the center, and the edges of the metal part *d′* bent down to keep it level. Over this valve is placed a circular ring, *f*, with central cross-bar *f′*, at the ends of which bolts pass through the ring *f* to fasten it on the edge of the box D to the head, said bolts passing through notches in the edge of the valve to keep it in place. The plunger of my pump is made of two cup-shaped parts, G G′, fastened together by bolts, and suitable packing at the joint, as shown in Fig. 2. The lower cup, G, has a central opening, *h*, and the lower side of this cup is beveled or inclined upward from the edge to this central opening. The upper cup, G′, has two openings, *i i*, as shown in Fig. 5. Inside of the plunger are two valves, H and H′. The upper valve, H′, is made of leather or rubber, and is provided with two openings, *k′ k′*, as shown in Fig. 3, and about one-third taken off from the opposite edge. The lower valve, H, is made of sheet metal, and has but one opening, *k*, as shown in Fig. 4, and one-third also taken off. These valves lie one above the other in the plunger, and the bolts which fasten the two parts of the plunger together pass through notches in the edges of the valves to hold them in place. In the upper part, G′, of the plunger, on the side opposite the openings *i*, is inserted a tube, I, which enters a tube, J, passing through and fastened in the upper head, C. On the upper end of the tube J is the air-chamber K, from the side of which extends the spout L. M is the piston-rod, secured to the upper part of the plunger, and passing up through suitable stuffing-box in the center of the head C, and connected to suitable levers N for operating the plunger. It will readily be seen that during the downward stroke of the plunger the water in the lower end of the cylinder is divided, and part of it passes into the upper part of the cylinder, while the other part is forced out through the pipes I J; and during the upward stroke of the cylinder, while the water is drawn up into the lower end, the water in the upper part is forced out, thus making a double-acting pump with but one cylinder, having no partition, but one entrance, and one plunger. It can readily be changed to a single-acting suction lift-pump by removing the plunger-valves, and substituting therefor a single valve of suitable construction. A suction-tube or hose-pipe may be attached to the entrance E. The pump can thus be worked at a reasonable distance above the water, as well as in the same.

For a fire-engine, I use two cylinders, and place them, with the ejecting-tubes, side by side, curving the tubes at or near the cylinder toward each other, and connect them with a single tube. The levers are also connected, and provided with two handles. In this way there will be two pistons worked with the same levers, and two jets with one movement of the lever. The tubing I J may be used in the center of the cylinder, and the piston be worked inside of them.

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

1. The combination, in a pump, of a cylinder, with top and bottom heads, a valve in the bottom head, and a plunger, with two interior valves, one above the other, and ejecting-pipe extending from the plunger, all substantially as and for the purposes herein set forth.

2. The combination of the bottom head, B, with entrance E and box D, the valve *d d'*, and ring *f*, with cross-bar *f'*, all constructed substantially as and for the purposes herein set forth.

3. The plunger herein described, consisting of the cup G, with opening *h*, the cup G', with openings *i i*, in combination with the valve H', with openings *k' k'*, valve H, with the opening *k*, and the ejector-pipe I J, all constructed substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ELIAS RHODES, JR.

Witnesses:
BASIL MEEK,
I. H. RHODES.