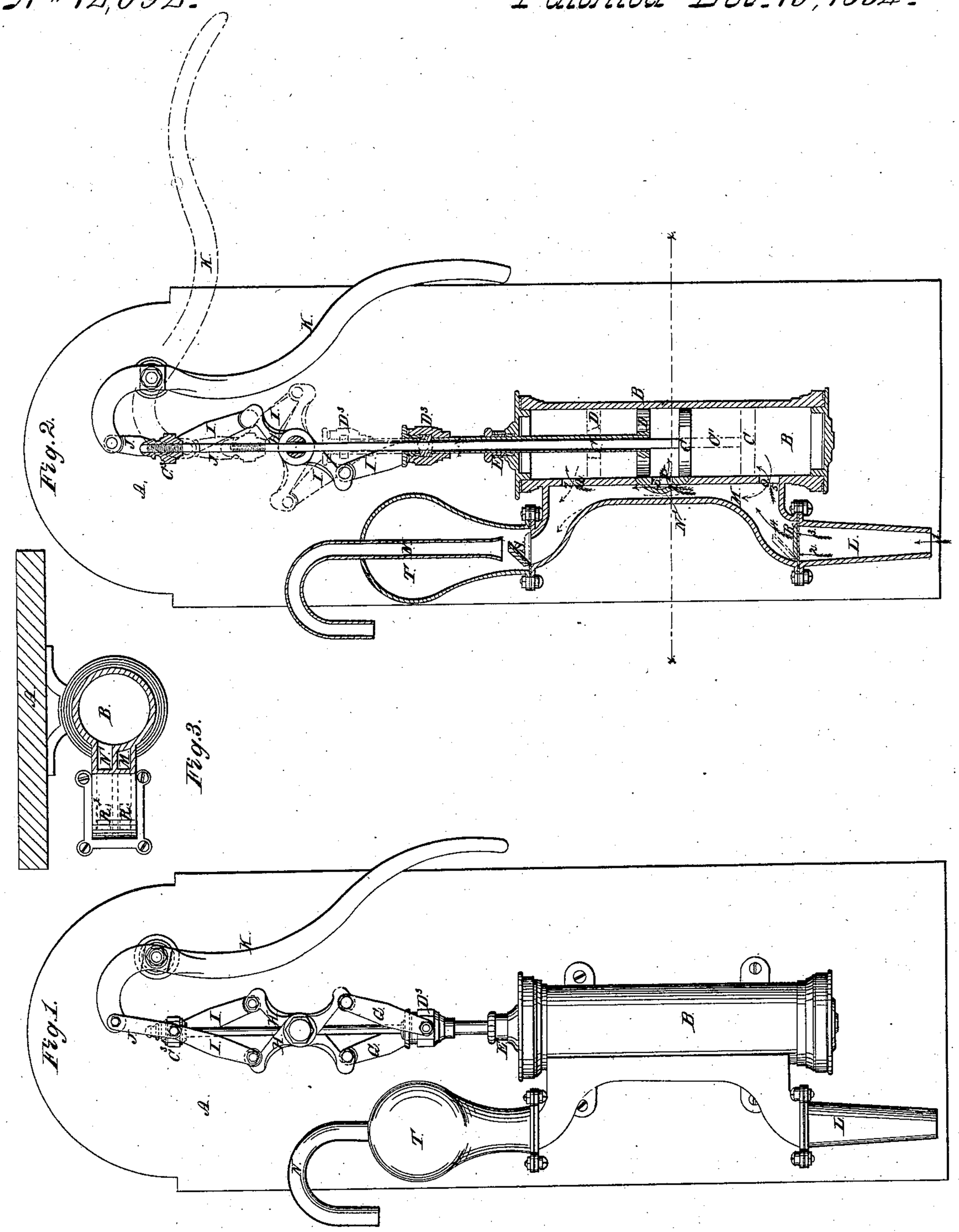
Clark & Gray,

Force Pump,

No. 12,092. Patented Dec. 19, 1854.



UNITED STATES PATENT OFFICE.

D. W. CLARK AND S. H. GRAY, OF BRIDGEPORT, CONNECTICUT.

DOUBLE-ACTING FORCE-PUMP.

Specification of Letters Patent No. 12,092, dated December 19, 1854.

To all whom it may concern:

Be it known that we, D. W. CLARK and S. H. GRAY, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Force-Pumps; and we do hereby declare that the following is a full and exact description of the same.

The nature of our improvement consists in furnishing the barrel of the pump with two pistons, the rod of one piston passing through the interior of the other rod, which is made hollow for that purpose, the two piston rods being connected by means of link levers with one brake, in such a manner that both pistons are simultaneously operated.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation, reference being had to the annexed drawings, forming a part of this specification, in which—

Figure 1, is a side elevation of our improvement. Fig. 2, is a side vertical section of the same. Fig. 3, is a horizontal plan section through lines, *x*, *x*.

Similar letters of reference indicate the same parts.

A, is the board or support to which the pump is secured; B, the barrel of the pump; C, lower piston; C′, piston rod of same; D, upper piston; D′, rod of same; E, stuffing box through which the piston rod D′, passes; F, stuffing box through which piston rod C′, passes; G, G′, connecting links which unite the head D^3, of piston rod D′, with the cross levers H, H′; I, I′, connecting links which unite the head C^3, of piston rod C′, with levers H, H′; J, connecting links which unite the head of rod C^3, with the brake K; L, supply pipe; M, N, supply and discharge chambers; O, P, Q, orifices in the pump barrel; R, valve of the supply pipe; S, valve of the air chamber; T, air chamber; U, discharge pipe; V, center pin of cross levers H, H′.

The barrel of our improved pump is constructed in the ordinary manner, and is furnished with two pistons C, D. The piston rod C′, of the upper piston C, is made hollow, and through its interior the piston rod D′, of piston D, works, as shown in Fig. 2. The upper part of the barrel of the pump is furnished with a stuffing box E, which renders the working of piston rod D′, tight. The upper part of the piston rod D′, is also furnished with a stuffing box F, which renders the working of piston rod C′, tight.

The piston rod C′, is connected with the brake K, by means of connecting links J, which pass from the extremity of the brake to head (C^3,) of the piston rod.

The piston rod D′, is connected with the brake, by means of connecting links G, G′, which pass from the head (D^3) of the piston rod D′, to the cross levers H, H′. These levers turn upon a center pin V, which fastens in the board A. The upper ends of the cross levers are connected with the links J, by means of the intermediate links I, I′.

By the act of pushing down the brake K, piston C, is raised toward the center of the barrel, and piston D, correspondingly depressed. Piston D, traverses the upper half of the barrel, and piston C, the lower half.

There are orifices in the barrel at O, P, Q, for the inlet and exit of the fluid. The two chambers M, N, are placed side by side, both receiving water from the supply pipe L, at their junction with which each chamber is provided with a valve, the valve R, of chamber M, only, being shown in Fig. 2. Both chambers also empty into the air chamber T, at their junction with which both are furnished with a valve, the valve S, of chamber M, being the only one shown, (Fig. 2).

The chamber M, supplies and conveys away the fluid which enters and leaves the barrel through orifices O, Q. The chamber N, supplies and conveys away the fluid which passes orifice P.

By the act of pressing down the brake K, the pistons C, D, approach the center of the barrel, piston C, producing a vacuum in the lower part of the barrel, while piston D, produces a vacuum in the upper part of the same. Accordingly, the water, rushing up the supply pipe L, lifts valve R, of chamber M, and fills both vacuums; the inward passage of the fluid is indicated by arows 1, 2, 3, 4, 5, 6, 7.

The intermediate space in the barrel between the two pistons, is supplied and discharged through the orifice P. When the brake is pushed down and the two pistons approach each other, the water between them is expelled through P, into the chamber N, and rises through the same in the direction of the dotted arrows, into the air

chamber T, the ingress valve at the bottom of chamber N, being, of course, closed.

When the brake K, is pushed up, the water in the previously formed vacuums is expelled through the orifices O, Q, and passes up through chamber M, into the air chamber T, in the direction of the red arrows.

By the upward movement of piston D, and the downward movement of piston C, a vacuum is formed between the pistons, which is filled by the entrance of water through chamber N, and orifice P. Thus, while the water is being discharged above piston D, and below piston C, a vacuum is formed between the two pistons, which is being filled by means of a distinct chamber (N), which is connected with the supply pipe (L), and air chamber T. It should be observed that the piston rod C′, passes for convenience through the middle of the center pin V.

The positions of the moving parts, when the brake K, is pushed down, are shown by the dark lines, Fig. 2, and the position of the same when the brake is thrown up, by the red lines.

The water is conducted from the air chamber T, by means of the discharge pipe U, the lower end of which reaches nearly to the bottom of the air chamber.

Having thus described our invention, we claim—

The combination of two pistons and piston rods with one pump barrel and one brake, when one of the rods is made to pass through the hollow interior of the other; and when both rods are connected with the brake, by means of the connecting links and cross levers, in the manner described.

DAVID W. CLARK.
SYLVESTER H. GRAY.

Witnesses:
SAMUEL WINE,
JOHN SMITH.