

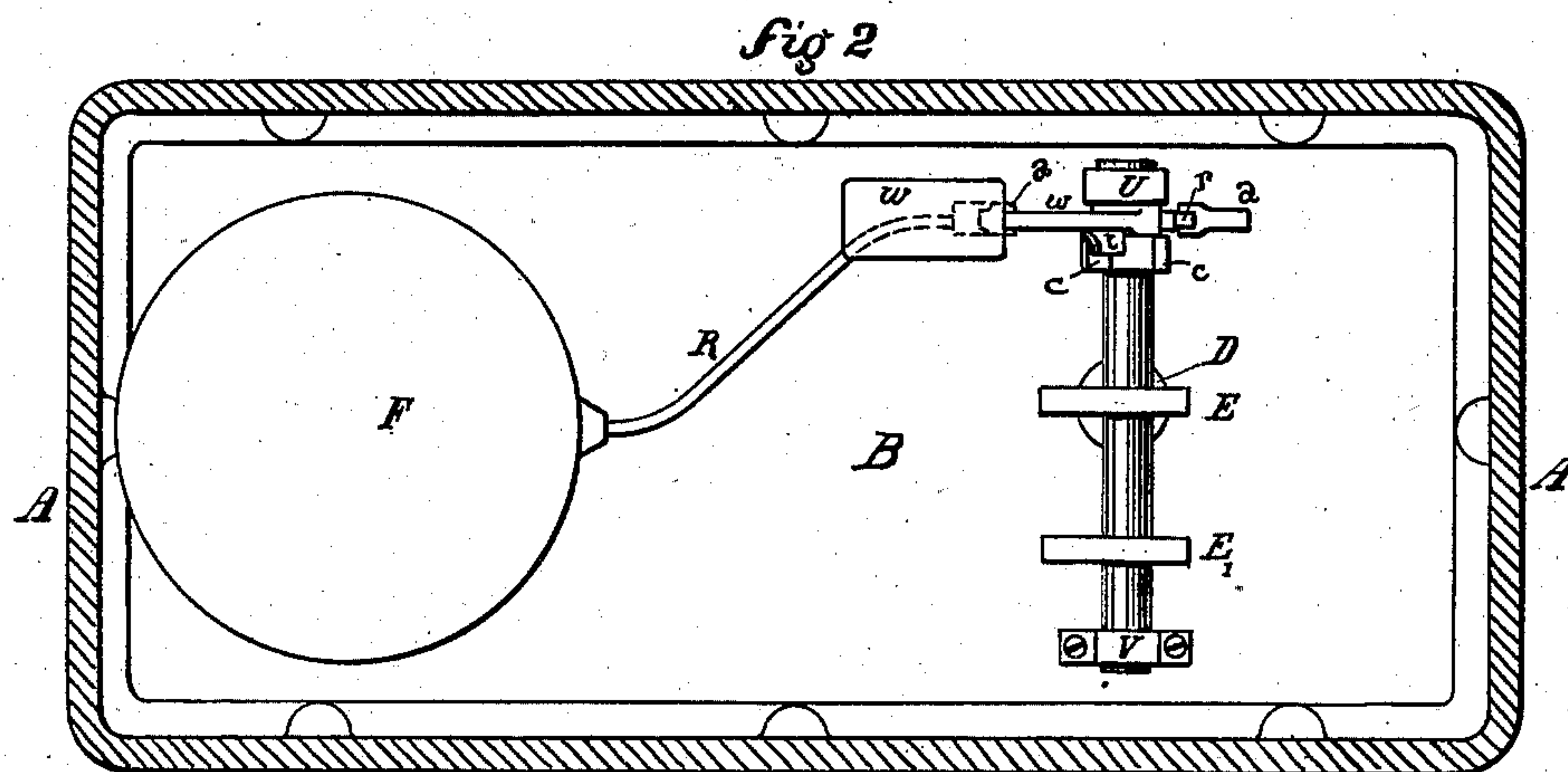
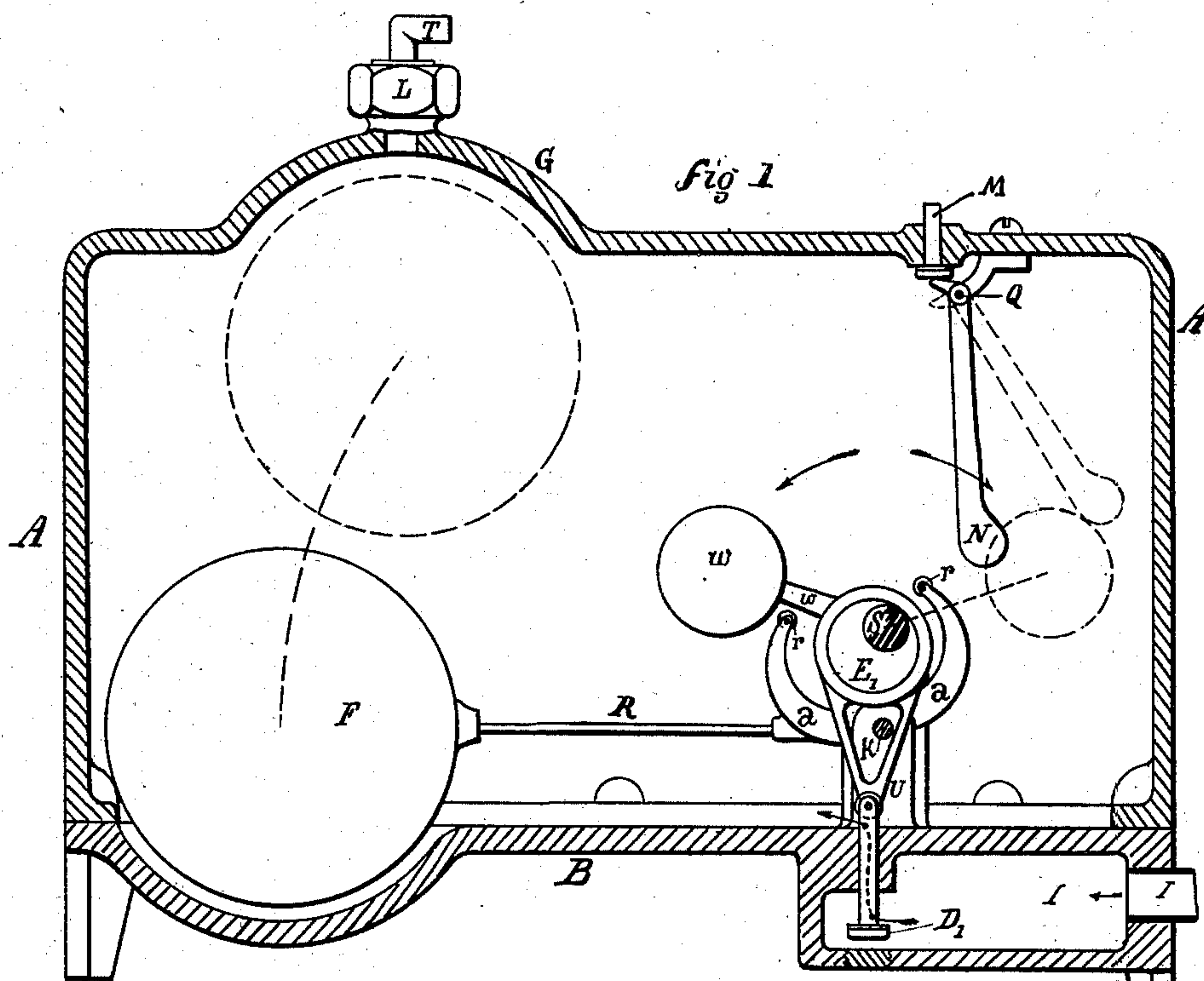
(No Model.)

2 Sheets—Sheet 1.

J. BRADLEY.
HYDRAULIC AIR COMPRESSOR.

No. 254,915

Patented Mar. 14, 1882.



Witnesses:
F. Hickman
W. Halsted

Inventor:
Jerome Bradley

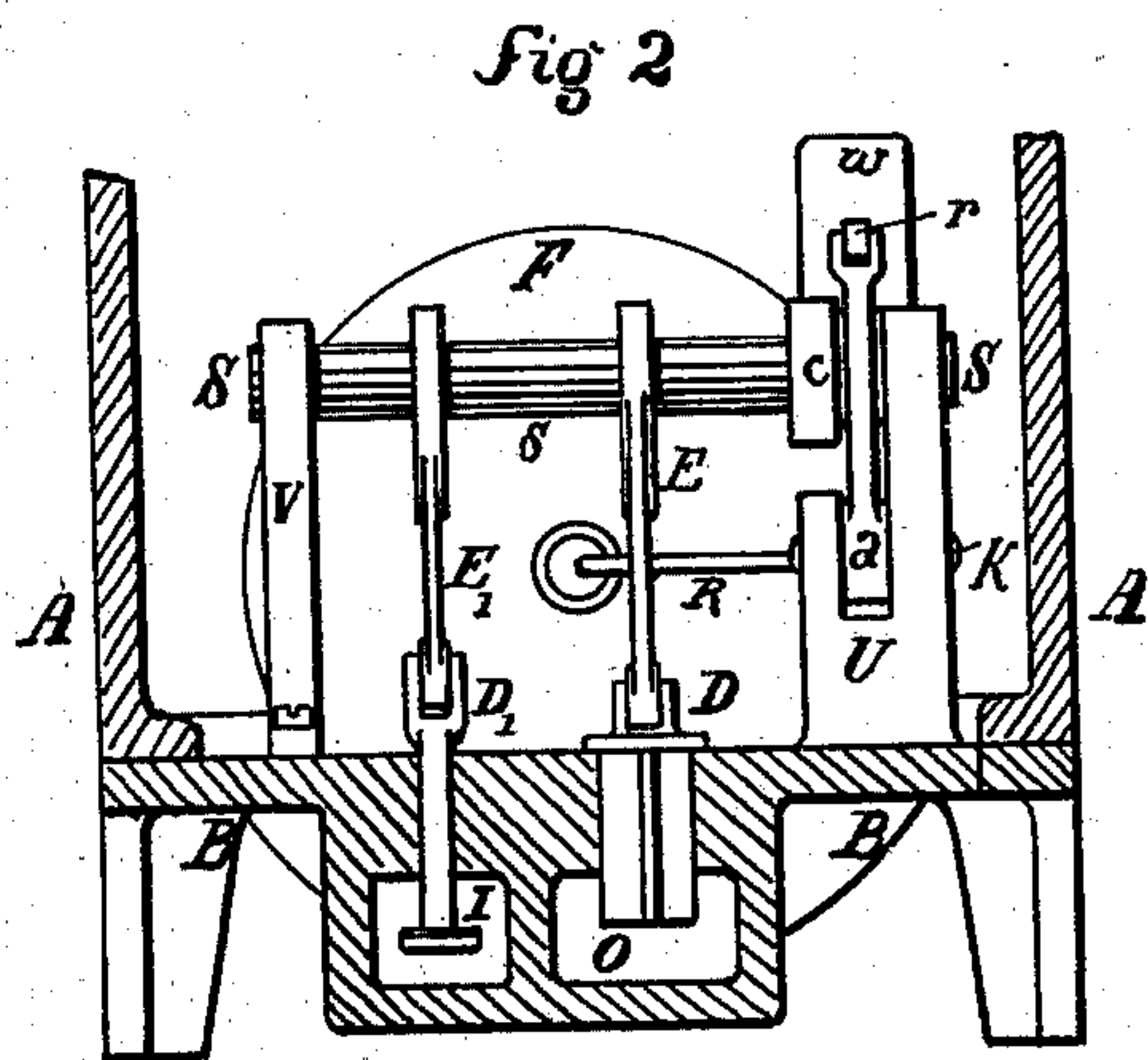
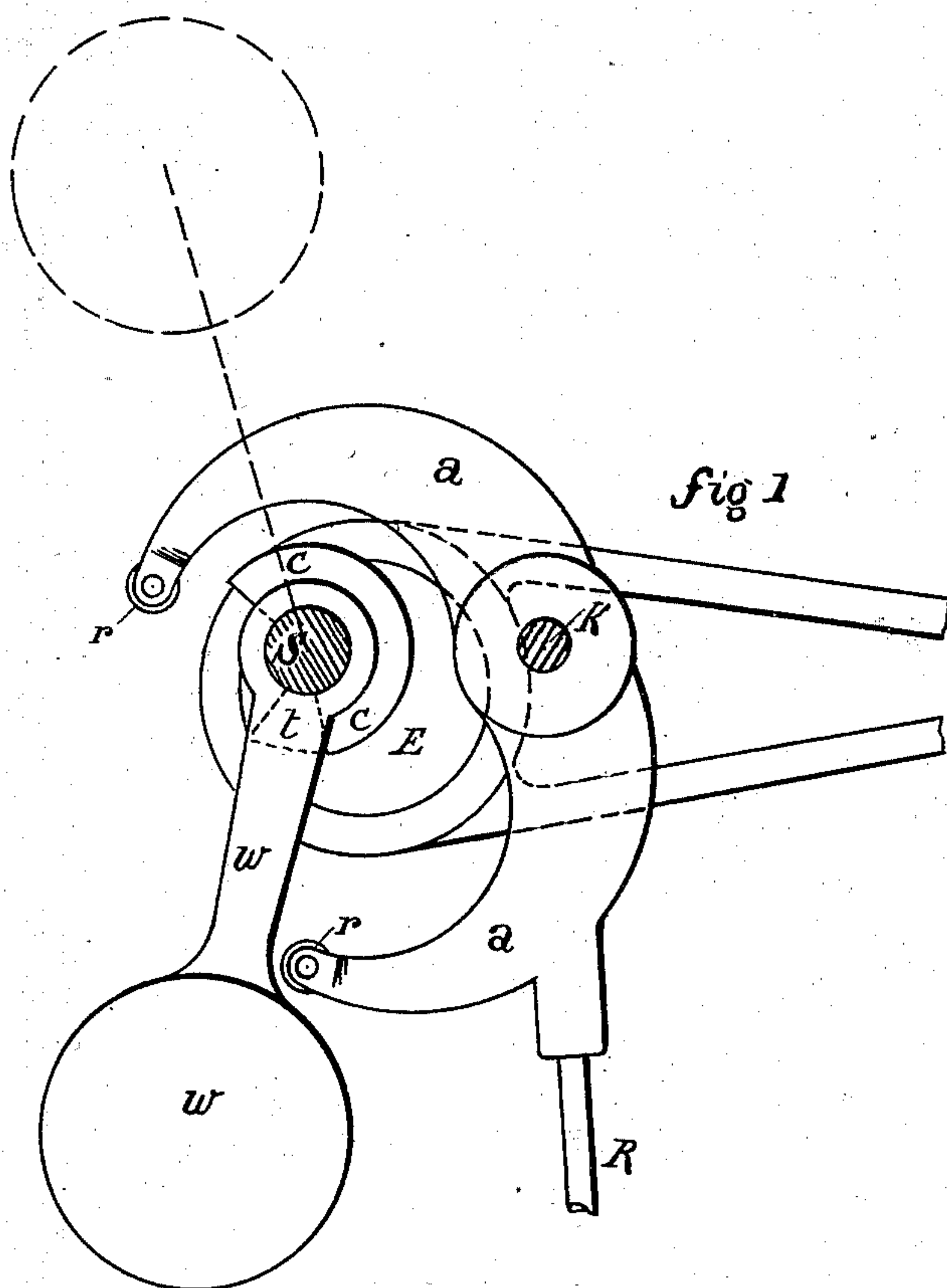
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UNITED STATES PATENT OFFICE.

JEROME BRADLEY, OF NEW YORK, N. Y.

HYDRAULIC AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 254,915, dated March 14, 1882.

Application filed October 26, 1881: (No model.)

To all whom it may concern:

Be it known that I, JEROME BRADLEY, of the city, county, and State of New York, have invented a new and useful Improvement in Hydraulic Air-Compressors, of which the following is a complete description, reference being had to the accompanying drawings, forming part of the specification.

My invention relates to that class of compressors in which the air is compressed by the direct action upon it of water under pressure; and its object is to simplify the mechanism and obviate the wear and tear of parts incidental to such machines when operated with gritty or muddy water.

Figures 1 and 2, Sheet 1, represent respectively a vertical and a horizontal longitudinal section of the compressor, the former through the water-inlet chest I; Fig. 2, Sheet 2, a vertical transverse section; and Fig. 1, Sheet 2, an enlarged view of the mechanism for operating the valves.

The different parts are all designated by the same letters respectively on the different views.

A represents the body of the compressor—an air-tight box with a removable bottom, B. Through this bottom B are two independent passages, (shown at O and I,) which lead from the outside into the box A through openings fitted with the puppet-valves D and D'.

D is the outlet-valve, which seats above, so that any pressure in the box A tends to hold it to its seat, and D' is the inlet-valve, which is seated from below, so that any pressure in the inlet-passage I tends to hold it to its seat. The inlet-valve D' is either put in place through the passage I or through a suitable opening in the bottom, which is plugged up afterward. The valves D and D' are operated through suitable straps and connections by two eccentrics, E and E', secured on a shaft, S, which rocks in suitable bearings in uprights U and V. A float, F, and a tilting weight, w, are connected to the shaft S in such a manner that when the water rises to a certain level in the box A the shaft is suddenly rocked to the full extent of its travel in one direction, and when the water falls to a certain level the shaft is suddenly rocked back to its full extent in the opposite direction. The shaft S in being rocked carries with it the eccentrics, and thus oper-

ates the valves D and D', and the range of motion of the shaft S and the relative position of the eccentrics E and E' thereon are so provided that at all times either one of the two valves is seated and the other one closed.

In the above cursory description are embodied the salient features of my invention—viz., rubber-faced puppet-valves and the operation of the same by eccentrics which can move the valves and hold them in position against pressure.

I will now describe the mechanism for operating the eccentrics and valves.

Attached securely on the shaft S or cast thereon is a cam, c, with two projections, and a weighted arm, w, is pivoted on the shaft S, perfectly free to revolve thereon, but placed so that a projection or toe, t, on it will always be between the two toes on the cam c and strike either one of them as the weighted arm w swings either to one side or the other.

A pin or shaft, K, is fastened in a suitable manner on the upright U, and on this pin is pivoted a forked piece, a. (Shown more distinctly in Fig. 2.) This fork a carries on each arm a small roller, r, and is secured rigidly to the rod R of the float F, which therefore, when worked up and down in the box A by the level of the water, swings around the pin K as a pivot and rocks the forked piece a. The range of travel of the float F is increased by the spherical pocket or dome G, cast on the box A, and also by a similar depression in the bottom B.

I will now explain the working of the machine, the terms "right" and "left" hand applying to the position of the apparatus in the drawings.

The different parts are set so that when the box A is emptied of water, and therefore the float F is at its lowest position, the toe t on the weighted arm w rests on the left-hand projection or toe of the cam c, and the shaft S is in such a position that the outlet-valve D is closed and the inlet-valve D' is wide open.

We will suppose that a suitable connection is made from the water-supply to the inlet-passage I and the water is turned on. Its tendency would be to close the inlet-valve D'; but the eccentric E' holds it locked firmly, and the water therefore rushes into the box A, raising

the float F and driving the air under pressure out of the box A through a suitable check-valve in the fitting L and through the pipe T; but as the float F rises the left roller on the forked piece *a* meets the weighted arm *w* and swings it over to the right. The toe *t* leaves the left-hand toe on the cam *c*, but the shaft S remains stationary. This goes on until the weighted arm *U* passes its center, when it drops by its own weight to the right, and after going a short distance (provided in order to let it acquire some momentum) it strikes the right-hand toe on the cam *c*, and by so doing revolves the shaft S and the eccentrics on it, so that the valve D is opened and the valve D' is simultaneously closed. In other words, the admission of water is shut off and the water in the box runs out of it to waste through the outlet-valve D and passage O.

While the box A is thus emptying the reverse action takes place of what occurred during its filling. The valves are held in their respective positions by the eccentrics—viz., the inlet-valve D' closed and the outlet-valve open—the float F falls, and the forked arm *a* pushes up toward the left the loaded arm *w* until the latter passes its center and falls, when its toe *t* strikes the left-hand toe on the cam *c*, which causes the valves to be tripped, the outlet-valve D becoming closed and the inlet-valve D' open. The water rushes again in the box A, as previously, and the box will keep filling and discharging, as described, as long as it is connected with the water-supply.

The air-discharge valve is an ordinary check-valve, of any suitable pattern, placed at the highest point in the box A—viz., the fitting L

on the dome G. The air-inlet valve presents the special feature that it is moved positively at the proper times. This valve M is a check-valve of any suitable pattern, and is held up to its seat in the top of the box A by the counterbalance-weight N, suspended from a suitable center, Q. The weighted arm *w* strikes the counterbalance-weight N, and shoves it aside as soon as the arm *w* tilts to the right—that is, to open the outlet and shut off the supply of water. The valve M then drops off its seat by its own weight, and a supply of air is admitted to the box A. When, on the contrary, the arm *w* tilts over to the left—that is, to close the outlet and open the inlet of water to compress the air in the box A—it frees the weight N, and the valve M is thereby forced to its seat and held there while the compression takes place.

In conclusion I wish to specify that I do not claim the mechanism hereinbefore described, either in its specific parts or specifically as described; but

What I do claim, and desire to secure by Letters Patent, is—

In a hydraulic air-compressor, the combination of the rubber-faced inlet and outlet puppet-valves D' and D, connected with suitably-set eccentrics E and E' on a shaft, S, with the cam *c* and weighted arm *w*, operated by the float F, through the forked piece *a*, substantially as and for the purpose set forth.

JEROME BRADLEY.

Witnesses:

F. HICKMAN,
W. HALSTED.