

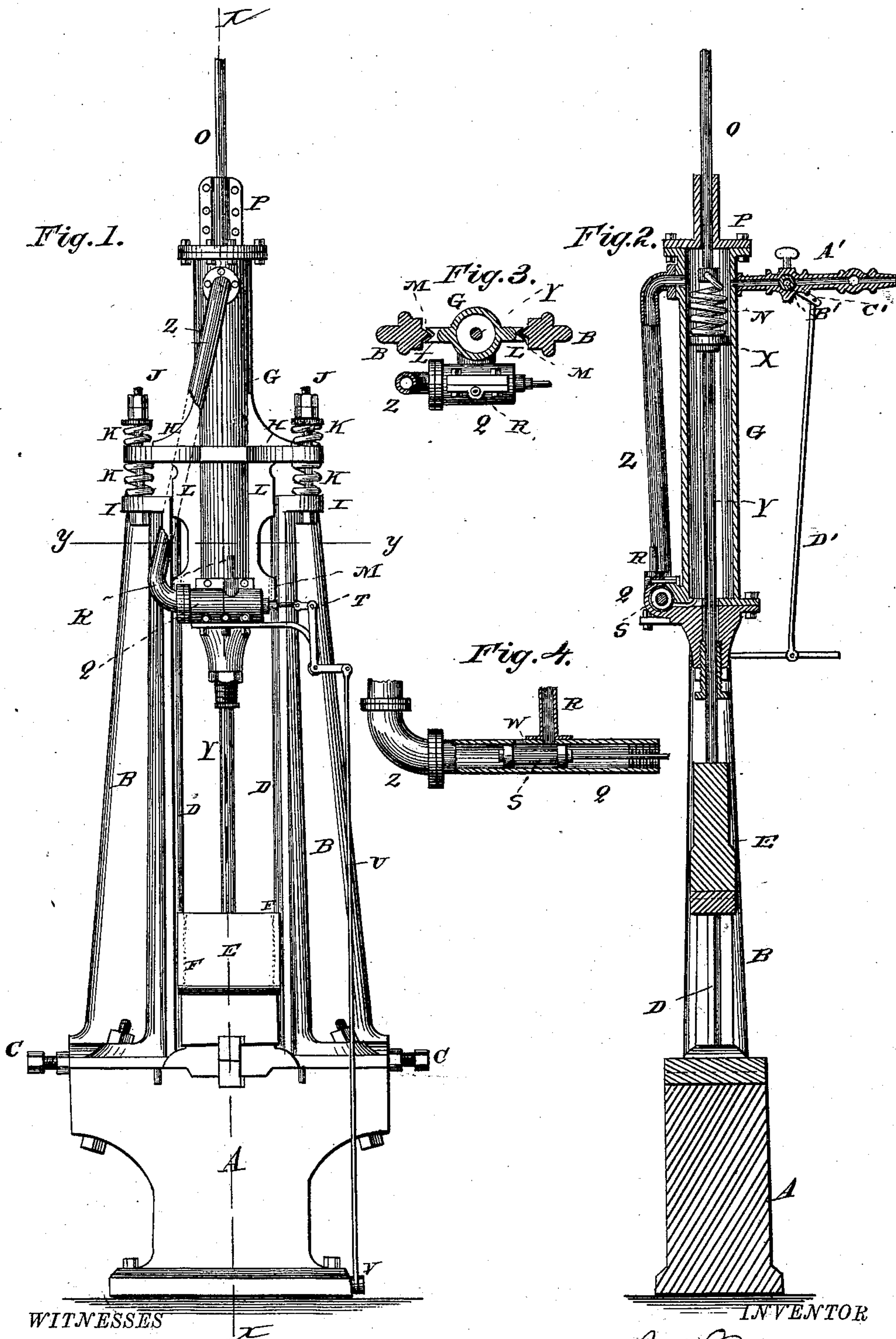
(No Model.)

J. C. RICHARDSON.

STEAM DROP HAMMER.

No. 255,393.

Patented Mar. 21, 1882



WITNESSES
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UNITED STATES PATENT OFFICE.

JULIUS C. RICHARDSON, OF COLUMBUS, OHIO, ASSIGNOR TO THE GREEN-
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STEAM DROP-HAMMER.

SPECIFICATION forming part of Letters Patent No. 255,393, dated March 21, 1882.

Application filed November 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, J. C. RICHARDSON, of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful
5 Improvements in Steam Drop-Hammers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the
10 same, reference being had to the accompanying drawings, which form a part of this specification.

Figure 1 is a front view. Fig. 2 is a vertical sectional view on the line *xx*, Fig. 1. Fig.
15 3 is a horizontal sectional view on the line *yy*; and Fig. 4 is a sectional view, on an enlarged scale, of the steam-chest.

Corresponding parts in the several figures are denoted by like letters of reference.

20 This invention relates to steam drop-hammers; and it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claims.

25 In the drawings hereto annexed, A represents the base or anvil, and B B the vertical guides or uprights, which are laterally adjustable upon the base by means of set-screws C. The uprights B have A-shaped flanges D to
30 guide the hammer E, which is provided with correspondingly-V-shaped grooves F.

G is the cylinder, which is provided about midway of its length with laterally-projecting flanges H H, by which it is supported upon
35 similar flanges, I I, at the upper ends of the uprights B, to which it is connected by bolts J, located at the four corners. Cushion-springs K are coiled upon the bolts J; between the flanges I H, and above the latter, thus per-
40 mitting the cylinder to yield or slide vertically, either in an upward or downward direction.

The cylinder is provided below the flanges H with laterally-projecting wings L, having vertical V-shaped grooves M, by which it is
45 fitted between the vertical guides B B, as represented in the sectional view, Fig. 3.

In the upper end of the cylinder is located a cushion-spring, N, vertically adjustable by a rod, O, to which it is attached, said rod be-

ing held adjustably by clamping-plates P above 50 the cylinder.

Attached to the lower end of the cylinder is a steam-chest, Q, into which the live steam enters through a pipe, R.

S is the valve, which is operated by means 55 of a bell-crank lever, T, connected by a rod, U, with a hand-lever or treadle, V, at the base of the machine. When the valve is in the position shown in Fig. 4 it permits the steam to enter through port W the lower end of the 60 cylinder, thus raising the piston X, to the stem of which, Y, the hammer E is attached. When the valve (which is bored longitudinally, in order to balance it in the steam-chest) is withdrawn to the position shown in dotted lines in 65 the drawings the steam entrance R is closed and the port W thrown into communication with a large exhaust-pipe, Z, leading from the end of the steam-chest to the top of the cylinder above the piston. At its upper end the cylin- 70 der is provided with a smaller pipe, A', for the final escape of exhaust-steam. Said pipe has a cock or valve, B', operated by a lever, C', connected by a rod, D', with the rod U, by which valve S is operated, the arrangement 75 being such as to open the escape-valve B' while live steam is being admitted into the cylinder and close it while the exhaust is taking place from the lower into the upper end of the latter. 80

The operation of my invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. When live steam is admitted into the cylinder through port W it lifts the pis- 85 ton, and with it the hammer, the springs N K preventing any violent shock to the frame of the machine. Meanwhile the valve B' is open to permit the escape of exhaust-steam above the piston. By operating the lever or treadle 90 V the valve S is reversed, so as to shut off steam, and the escape-valve B' is closed. The exhaust-steam now expands from the lower into the upper end of the cylinder, where it acts expansively against the upper side of the 95 piston, which is larger by the size of the piston-rod than the under side of the same, thus serving to give impetus to the downward move-

ment of the piston and hammer, and greatly increasing the force of the blow. The upper springs, K, as they expand, serve to promote the same object.

5 Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The cylinder arranged and operating substantially as described, and provided with
10 grooved flanges parallel to its bore, by means of which it is fitted between vertical uprights so as to be capable of moving longitudinally when the hammer is operated, as set forth.

2. In a steam drop-hammer, the cylinder
15 fitted between and supported upon vertical guides, cushion-springs being interposed, as described, for the purpose set forth.

3. In a steam drop-hammer, the cylinder fitted between and supported upon vertical
20 guides, cushion-springs being interposed and superimposed, as described, for the purpose set forth.

4. In a steam drop-hammer, the cylinder having the interior cushion-spring, N, vertically adjustable above the piston, said cylinder being supported upon the vertical guides B between two sets of cushion-springs, K K, substantially as and for the purpose set forth. 25

5. In a steam drop-hammer, the combination of the cylinder, the steam-chest, the port
30 W, the slide-valve S, the pipe Z, and the exhaust-pipe A', having valve B', with mechanism for operating the valves S and B' simultaneously, substantially as herein described, for the purpose shown and specified. 35

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

JULIUS C. RICHARDSON.

Witnesses:

J. WM. BALDWIN,
CHARLES TAPPAN.