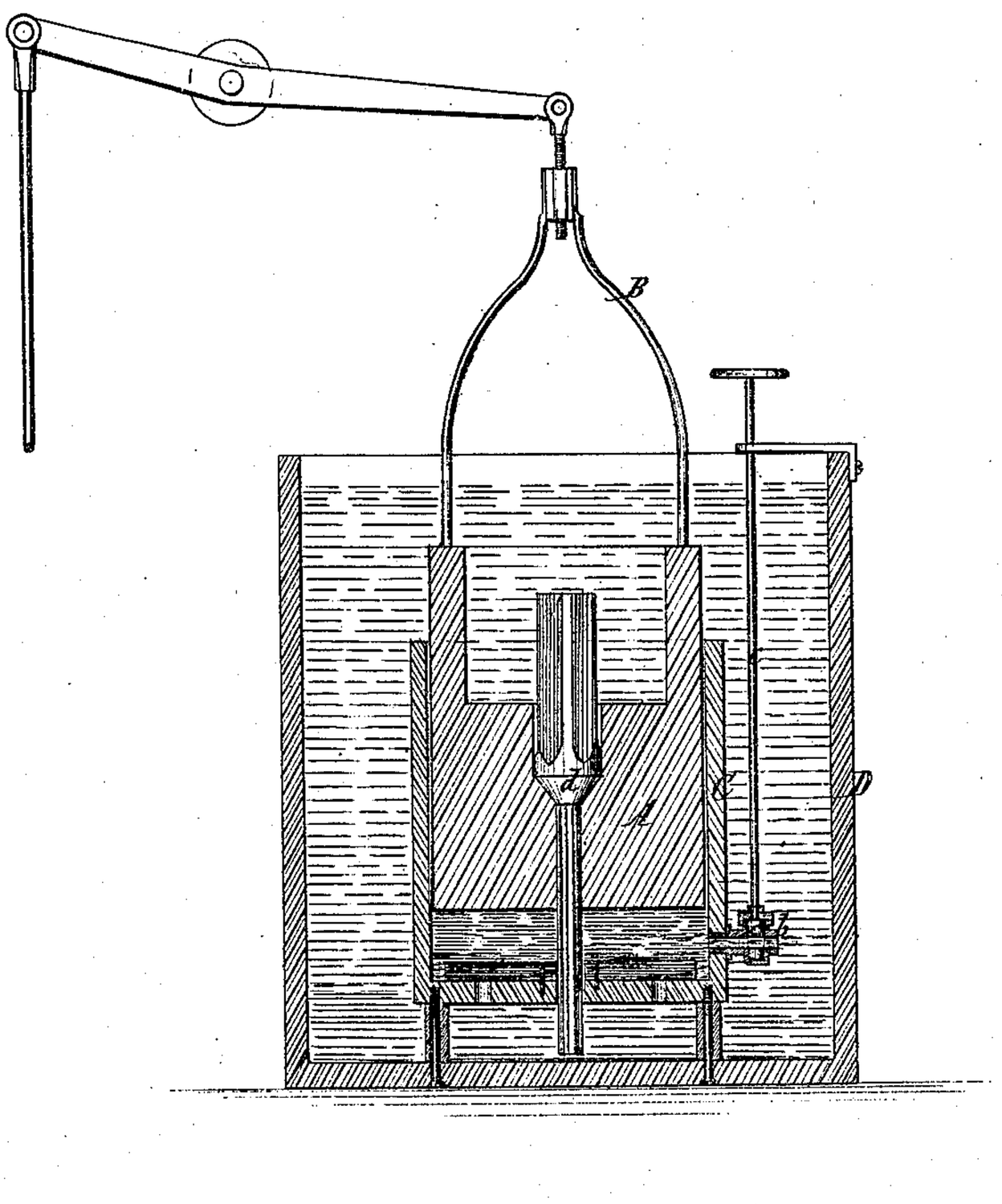
J. Storer,

Governor.

No. 104,226. Patented June 14. 1870.



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JOHN STORER, OF NEW YORK, N. Y.

Letters Patent No. 104,226, *dated June* 14, 1870; *antedated June* 3, 1870.

CATARACT MECHANISM FOR STEAM-ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN STORER, of the city, county, and State of New York, have invented a new and improved Cataract Mechanism for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

The drawing represents a vertical central section of this invention.

This invention relates to a cateract mechanism for steam-engines, in which the cylinder is placed into a cistern filled with water or other suitable liquid, and the plunger or weight, which serves to open the equilibrium or exhaust-valve of the steam-cylinder, is provided with a valve which opens at the required point, and allows the plunger to drop and open the equilibrium-valve.

In the drawing—

The letter A designates the plunger, which connects by a lever extending from the stem of the balance-valve, or otherwise connected to said valve, so that, when the plunger is allowed to descend, the balance-valve will be opened.

Said plunger works in a cylinder, C, which is situated in a cistern, D, filled with water or other suitable fluid, and which is provided with a valve, *a*, at its bottom, so that, if the plunger is raised, the liquid from the cistern will follow said plunger, and, when the plunger descends, the valve *a* closes and the liquid is confined in the bottom part of the cylinder.

In order to allow this liquid to escape from the bottom part of the cylinder, a pipe, *b*, is provided, which can be opened or closed by means of a stop-valve or cock *c*. If this cock is opened, the liquid in the bottom part of the cylinder will be gradually forced out by the weight of the plunger; the plunger will gradually descend, and, finally, the balance-valve will be opened, and the time which it takes for the plunger to descend will be regulated by the area of the discharge-opening, which can be increased or decreased by means of the stop-cock *c*.

In the plunger A is fitted a valve, *d*, the stem of which extends through the bottom of the cylinder C, and, as the plunger descends, said stem strikes the bottom of the cistern D, the valve *d* is raised from its seat, and the liquid under the plunger is allowed to rush up through the center of said plunger, allowing the same to descend suddenly and to open the balance-valve with the required rapidity, and at the proper moment.

The seat of the valve *d* is below the surface of the liquid in the cistern, so that the entrance of air through said valve is effectually prevented.

When the piston of the steam-cylinder approaches the bottom end of its stroke, (said cylinder being placed in an upright or inclined position,) the cross-head or any other part connected to it strikes a tappet-rod, and thereby the balance-valve is closed and the plunger A is raised. The steam-piston now ascends, while the plunger A gradually descends with more or less velocity, according to the area of the discharge-opening *b* in the bottom part of the cataract cylinder C, and, by the time the steam-piston has reached the top end of its stroke, the plunger A has descended a certain distance, and it continues to descend (the steam-piston remaining stationary in the meantime) until the stem of the valve *d* strikes the bottom of the cistern D, when, by lifting said valve, the plunger A is permitted to drop suddenly and thereby the balance-valve is opened, the steam in the lower part of the steam-cylinder is allowed to exhaust, and the steam-piston begins its downward stroke.

It will be readily understood that the time when the plunger A will trip the balance-valve can be regulated by lengthening or shortening the stem of the valve *d*, and said stem can be so arranged that it can be lengthened or shortened either by a screw-thread or otherwise.

By imparting to the plunger a descending motion, in the manner above described, the exhaust-valve can be opened gradually and the steam-piston allowed to start on its downward stroke before the valve in the plunger, and with it the exhaust-valve, are thrown wide open, and by these means sudden jars or jerks are avoided, which are unavoidable if the main piston, with all the rods attached to it are suddenly started from a state of rest.

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

1. The mechanism herein described, for operating the equilibrium or exhaust-valve of a steam-cylinder, consisting of a plunger which operates in a cylinder, and is provided with a valve which is lifted from its seat when the plunger has reached the desired point in its descent, substantially as set forth.

2. The combination of the cistern D, cylinder C, plunger A, and valves *a b d*, substantially as herein shown and described.

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Witnesses:

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