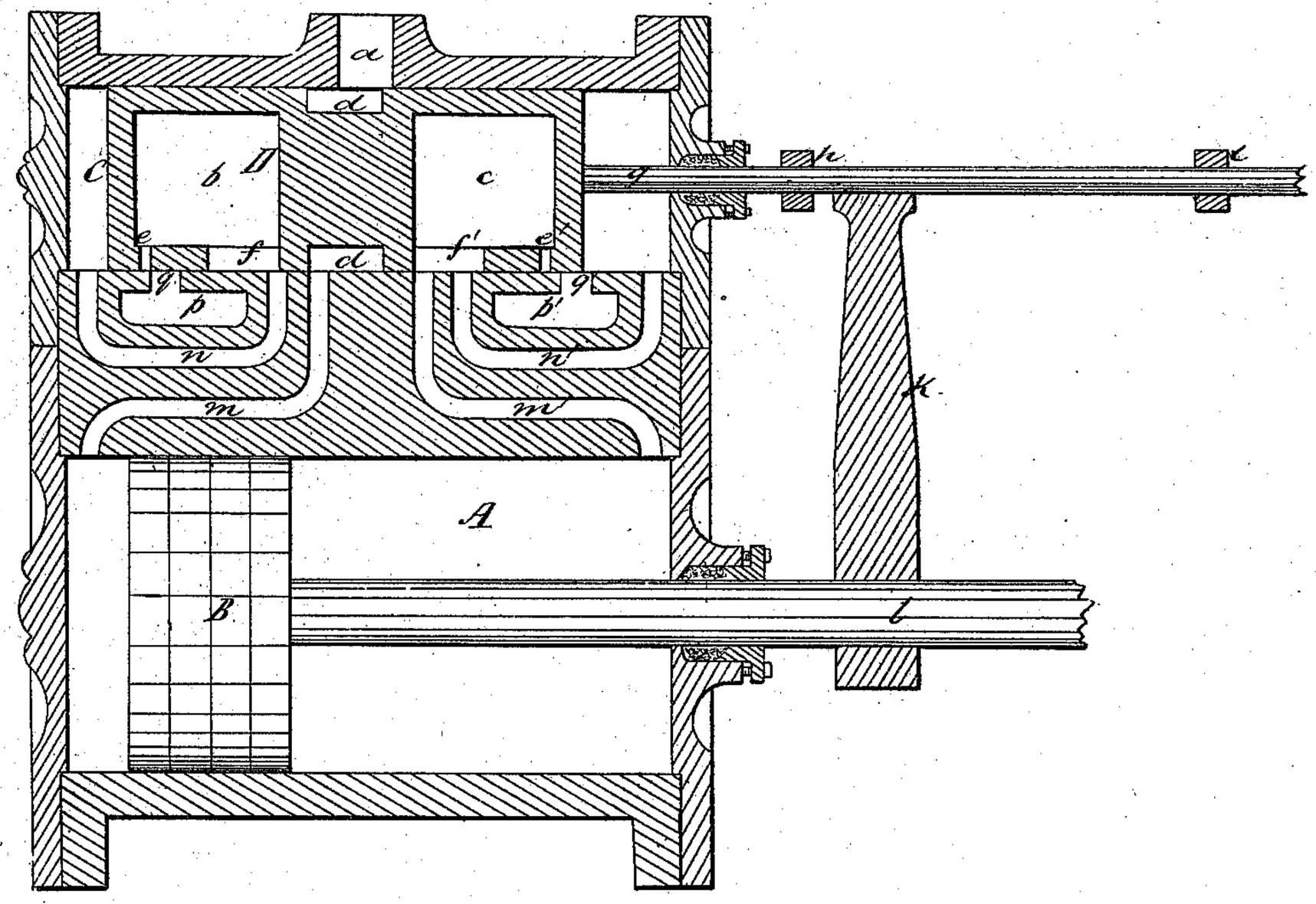
E. Post.

Steam Valve.

No. 94,973. Patented Sept. 21, 1869.



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ELTING POST, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 94,973, *dated September* 21, 1869.

IMPROVEMENT IN STEAM-ENGINE VALVES.

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

To all persons to whom these presents may come:

Be it known that I, ELTING POST, of Boston, of the county of Suffolk, and State of Massachusetts, have invented a new and useful Improvement in Steam-Engines; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawing, which denotes a vertical and longitudinal section of a steam-engine cylinder and piston, the steam-chest and valve, and the passages thereof, as provided with my invention.

The objects of my improvement are to effect the longitudinal movements of the valve by the action of the exhaust steam, to discharge from the valve-case the surplus steam thereof, and to cushion the valve at each stroke.

In the drawings—

A denotes the cylinder, and B, the piston thereof.

C is the valve-case, which is a hollow cylinder, provided with an induct, *a*, arranged in the middle of its top.

The valve is shown at D, it being cylindrical, and provided with two chambers, *b c*, which are arranged within it, and on opposite sides of a channel, *d*, that extends around and within it at its middle.

There are two openings or ports leading out of the bottom of each of the chambers *b c*, they being arranged as shown at *e f e′ f′*.

Furthermore, the valve-stem *g* has two shoulders, *h i*, arranged on it in manner as represented, there being extended between them an arm, *k*, projecting upward from the piston-rod *l*.

The passages for leading steam to the opposite ends of the cylinder are exhibited at *m* and *m′*, the steam-exhaust passages being also shown at *n* and *n′*. Each of the said exhaust-passages opens at its inner end into one of the chambers *b c* of the valve, and at its outer end into the valve-case C.

Furthermore, there are two auxiliary exhaust-passages *p p′*, which are arranged with respect to the main exhaust-passages *n n′*, in manner as shown in the drawing.

Each of such passages *p p′* may open at one end into a common educt or discharge-pipe, and each of such passages should have a port or opening leading upward out of it and into the valve-case; such ports or openings being shown at *q q′*, they being arranged with respect to the passages *e e′*, in manner as shown.

The novel features of the above-described mechanism may be stated as follows:

First. The auxiliary passages *e e′*, leading out of the chambers *b c* of the piston.

Second. The passages *q q′* and the auxiliary exhaust-passages *p p′*.

Third. The opening of each of the main exhaust-passages *n n′* at its opposite ends into the valve-case.

These features, arranged and employed with others, as hereinbefore described, will operate in manner as may be thus explained:

We will suppose the valve D to be at the exact middle of the valve-chest C, that is, so that the passage *d* shall be midway between the conducting-passages *m m′*, leading from the valve-case to the two ends of the cylinder A. In this instance, the piston will be at rest. Next, in order to start the engine, the valve should be moved endwise a little, or just far enough to cause the passage *d* to lap a short distance over one of the mouths of the passages *m m′*. The steam will next rush through the passage so overlapped, which we will suppose to be the passage *m*, and will enter the cylinder and move the piston therein. The exhaust steam will escape from the cylinder through the passage *m′* and into the chamber *e*, from whence it will flow into and through the passage *n′*, and into the valve-case and against one end of the valve, and, by its elastic power, it will instantly move the valve endwise. The valve will continue its movement until the passage *e* may have been carried beyond the passage *q*.

During this movement of the valve, the main portion of the steam which may have been in advance of it in its case will escape through the passages *n f*, the chamber *b*, and the passages *e*, *q*, and *p*. The steam remaining in the valve-case in advance of the valve, not being able to escape, will serve by its elasticity as a spring to cushion the valve.

During this movement of the valve, the passage *d* will have been carried fully over the mouth of the passage *m*, so as to supply the cylinder with the necessary amount of steam to complete the back stroke of the piston.

During this back stroke, the arm *k* of the piston will be forced against one of the tappets or shoulders *h i*, and will move the valve, so as to lap the passage *d* a little over the mouth of the passage *m′*. The steam will next rush from the said passage *d* into and through the passage *m′*, thence into the cylinder, and will advance the piston. The exhaust steam in the cylinder will at once rush through the passage *m* into the chamber *b*, thence through the passages *f* and *n* and into the valve-case and against the valve, which instantly will be driven by such exhaust steam in a direction opposite to its former movement, and will continue to so move until the passage *e′* shall have passed by the passage *q′* and the valve been cushioned by the steam remaining in that part of the case which is in advance of the valve. The surplus exhaust steam, during the advance of the valve, will have escaped through the passages *e′*, *q′*, and *p′*.

Thus it will be seen that, with my invention, the objects herein first mentioned will be completely obtained.

Should we dispense with the passages *e e'*, we could not effect the cushioning of the valve, but still we could effect its movements by the exhaust steam, and the escape of the balance of such exhaust steam.

What, therefore, I claim as of my invention, is as follows:

I claim the combination and arrangement of the auxiliary exhaust-passages *p p' q q'* and the main exhaust-passages *n n'*, with the passages *m m'* and with the valve D, as constructed, with the chambers *b c* and the passages *d*, *f*, and *f'*, and passages *e e'*, substantially as specified.

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Witnesses:
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