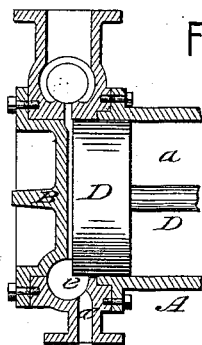
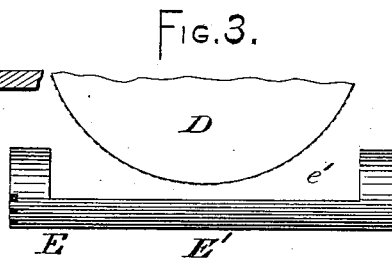
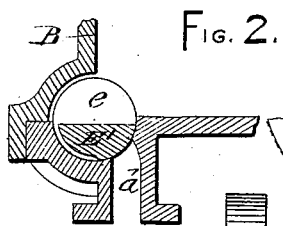
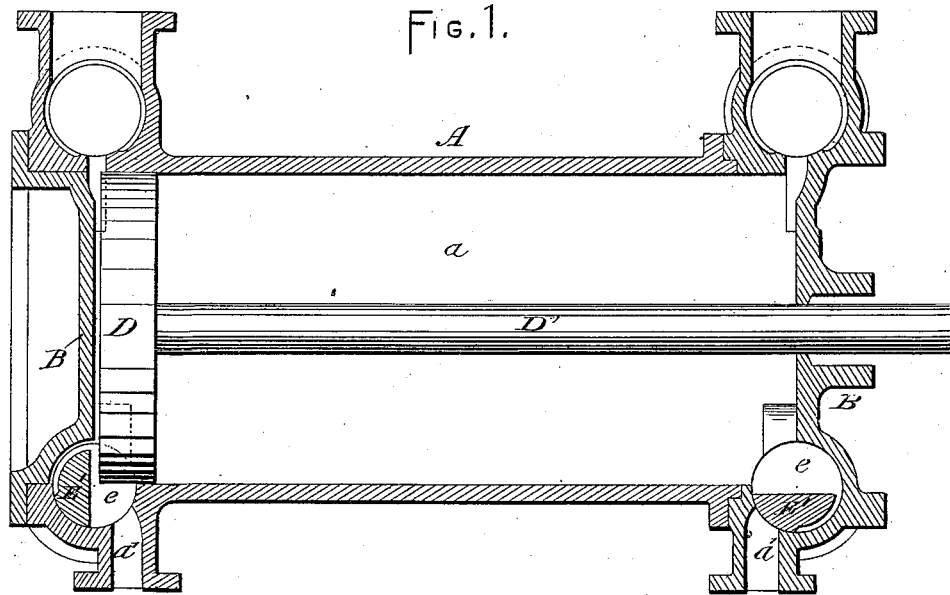


G. H. CORLISS.
Exhaust-Valve for Steam-Engines.

No. 215,806.

Patented May 27, 1879.



—WITNESSES:—

E. B. Bolton
W. Colborne Brooks

—INVENTOR:—

George H. Corliss
by his attorney
Thomas L. Seton

UNITED STATES PATENT OFFICE.

GEORGE H. CORLISS, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN EXHAUST-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **215,806**, dated May 27, 1879; application filed October 22, 1878.

To all whom it may concern:

Be it known that I, GEO. H. CORLISS, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements relating to Steam-Engines; and I do hereby declare that the following is a full and exact description thereof.

My invention applies to the construction and arrangement of exhaust-valves adapted to operate by being partially turned in cylindrical cavities which are portions of the interior space in or connected with the main cylinder.

I have discovered that by giving a peculiar form to the valve I can have the valve-cavity partly intersect the main cavity of the main cylinder, and yet can turn the valve while the piston is at the extreme end of the stroke.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification. Figure 1 is a central longitudinal section through an entire cylinder, with my valves in operation near the termination of the stroke of the piston to the left; Fig. 2, a corresponding section of a portion of the lower part alone, with the exhaust-valve shifted, showing how there is room for the required motion without striking the piston; Fig. 3, a view of one of the exhaust-valves detached; and Fig. 4, a cross-section, showing a modification.

Similar letters of reference indicate like parts in all the figures.

A is the body of the main or steam cylinder, and B the cylinder-head. The cavity in the steam-cylinder is marked *a*. The exhaust-port leading to the condenser is marked *a'*. D is the piston, and D' the piston-rod.

The cavity for the exhaust-valve is marked *e*, and it partly intersects the steam-cavity *a*, as shown.

E is the exhaust-valve, semi-cylindrical in mid-length at E', and cylindrical at each end.

The cavity *e'*, occupying half of the entire cross-section of the valve at its mid-length, allows the exhaust-steam to flow past the valve when open, and allows the presence of the piston D without contact in all the required working positions of the valve. This form, it will be observed, allows the valve to be turned to

the fullest extent ever required while the piston is in any part, or even at the extreme end, of the stroke.

The semi-cylindrical form E' is continued to near each end, where it changes to a complete cylinder and completely fills the valve-cavity *e*.

In my improvement, as shown on the left-hand side in Fig. 1, the valve-cavity *e* is formed partly in the material of the cylinder and partly in the material of the cylinder-head. It will be understood that with this construction the cylinder is prolonged considerably beyond the traverse of the piston, and that the head is correspondingly formed to apply within it.

In a patent issued to me dated January 2, 1877, No. 185,855, I have shown a mode of connecting the stem of a circular sliding valve so as to allow the valve to freely adjust itself upon its seat. I prefer to use such connection with this valve, but it is not absolutely essential.

I have not deemed it necessary to show the mode of working the valve. It will be understood that I give the valve the proper vibrating or turning motion by means of suitable connections to a stem or axis extending out through a stuffing-box. (Not represented.)

It is not necessary that the exhaust-valve should fit steam-tight to the interior of the valve-cavity *e*, except along the surfaces adjacent to the exhaust-port *a'*. The other portions of the cavity need not fit closely. It is only essential that it be large enough to allow the valve to turn, and not so much too large as to needlessly increase the capacity of the valve-cavity.

My invention has nothing to do with steam-induction valves. I prefer to mount said steam-induction valves in very close proximity to the cylinder, and can attain this end in a very desirable manner by making the cavity for the steam-valves entirely in the cylinder-heads B, as shown in Fig. 1.

The partial intersection of the main cylinder by the valve-cavities *e* for the exhaust-valves by reducing the capacity of the space to be filled with steam at each end of the cylinder, makes a material addition to the economic effect of the steam over that which would be attained by the ordinary arrangement; and the form of the valves, having the valve only

a half-cylinder, E', at its mid-length, allows the valve to be closed therein without striking the piston, even if the closing is delayed, as I prefer to do, until the piston is at the extreme end of its stroke.

I do not claim anything shown in British Patent No. 2,265 of 1876. My construction differs therefrom, and is superior thereto, in allowing the valve to be closed while the piston is at the end of its stroke. It makes the valve independent of the piston, so that it may be turned at any time with the piston in any position.

I claim as my invention—

The exhaust-valve E, semi-cylindrical in its mid-length at E', and cylindrical at each end, as shown, arranged to operate in the valve-cavity *e*, which cavity partly intersects the interior *a* of the steam-cylinder A, as and for the purposes herein set forth.

In testimony whereof I have hereunto set my hand this 16th day of October, 1878, in the presence of two subscribing witnesses.

GEO. H. CORLISS.

Witnesses:

JEREMIAH MILLER,
ED. W. RAYNSFORD.