C. W. ERVIEN.

STEAM-ENGINE.

No. 182,183. Patented Sept. 12, 1876.

Fig. 1.

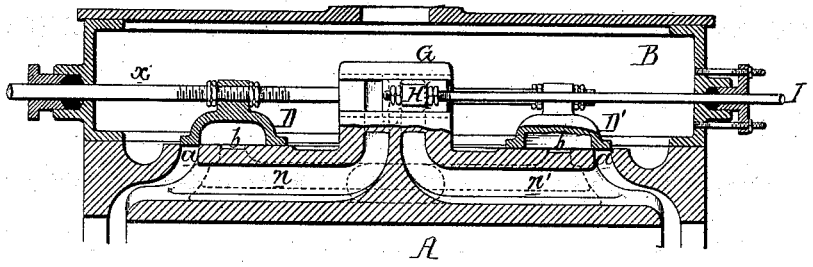


Fig. 2.

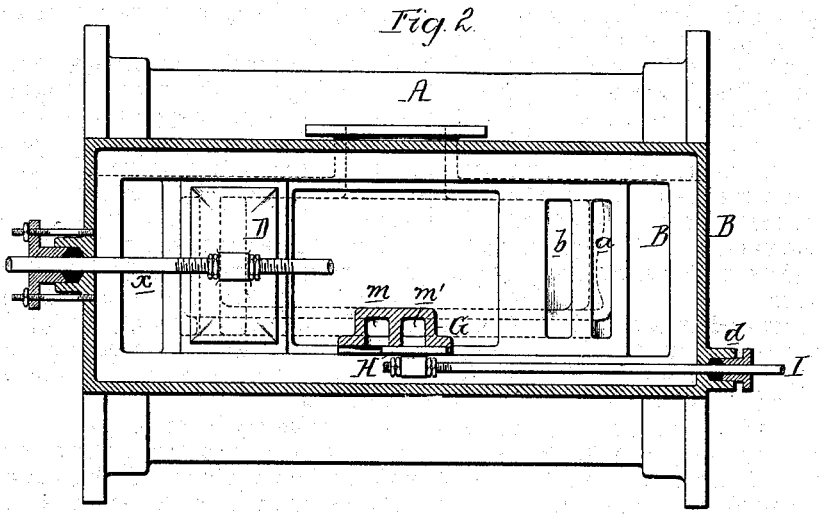
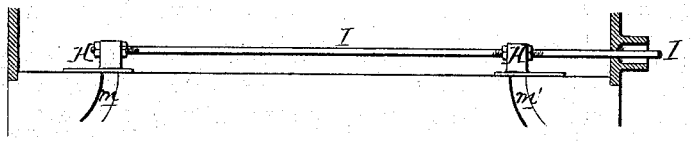


Fig. 3



Witnesses
Richard L. Gardiner
Harry Smith

Charles W. Ervien
by his Attorneys
Howson and Sons

UNITED STATES PATENT OFFICE.

CHARLES W. ERVIEN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **182,183**, dated September 12, 1876; application filed August 4, 1876.

To all whom it may concern:

Be it known that I, CHARLES W. ERVIEN, of Philadelphia, Pennsylvania, have invented an Improvement in Steam-Engines, of which the following is a specification:

The object of my invention is to afford facilities for starting a steam-engine when the valve or valves cover both steam-ports and exclude the steam from the usual passages.

In the accompanying drawing, Figure 1 is a sectional view of part of a steam-cylinder with steam-chest and valve, and containing my improvement; Fig. 2, a sectional plan on the line 1 2, and Fig. 3 a modification of my invention.

A represents part of the cylinder of a steam-engine, and B the steam-chest. In the present instance there is a duplex valve, D D′, connected to the valve-spindle *x*, and adapted to the steam-ports *a* and exhaust-ports *b* in the usual manner.

When the engine has stopped at such a point that the valve covers both steam-ports, as shown in Fig. 1, the operation of the valve by hand becomes necessary in starting an ordinary engine, and this is usually accomplished by throwing the end of the eccentric rod out of gear and manipulating a lever connected to the valve-spindle—operations demanding costly appliances, which I dispense with by arranging within the steam-chest a supplementary valve-seat, G, having two ports, *m m′*, the former communicating, through a passage, *n*, with the main steam-port at one end of the cylinder, and the other, through a passage, *n′*, with the steam-port at the opposite end of the cylinder. To the valve-seat G is adapted a small valve, H, attached to a spindle, I, which passes through a stuffing-box on the steam-chest.

By operating this valve, which may be accomplished by a light lever or other device, the steam within the valve-chest may be directed to either end of the cylinder, in order to start the engine in the direction desired, after which both of the ports *m m′* must be closed until the operation of the valve G is again demanded for starting the engine, should the movements have been arrested at such a point that the main valve covers both steam-ports *a a*.

Instead of making long passages *n n′*, communicating with the steam-ports, and a single seat for a single supplementary valve, there may be within the chest two seats for a duplex supplementary valve, H H, adapted to ports *m*, communicating through short passages with the main steam-ports.

I do not desire to claim, broadly, the use of a supplementary valve for introducing steam to the cylinder when both steam-ports are closed; nor do I restrict the application of my invention to a valve of the class shown, as it may be applied to different styles of valves; but

I claim as my invention—

The combination, with the steam-chest B and its main valve, of the supplementary valve seat or seats G, arranged within the chest, the ports *m m′*, communicating with the main steam-passages, and the supplementary valve or valves H, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES W. ERVIEN.

Witnesses:

HARRY HOWSON, Jr.,

HARRY SMITH.