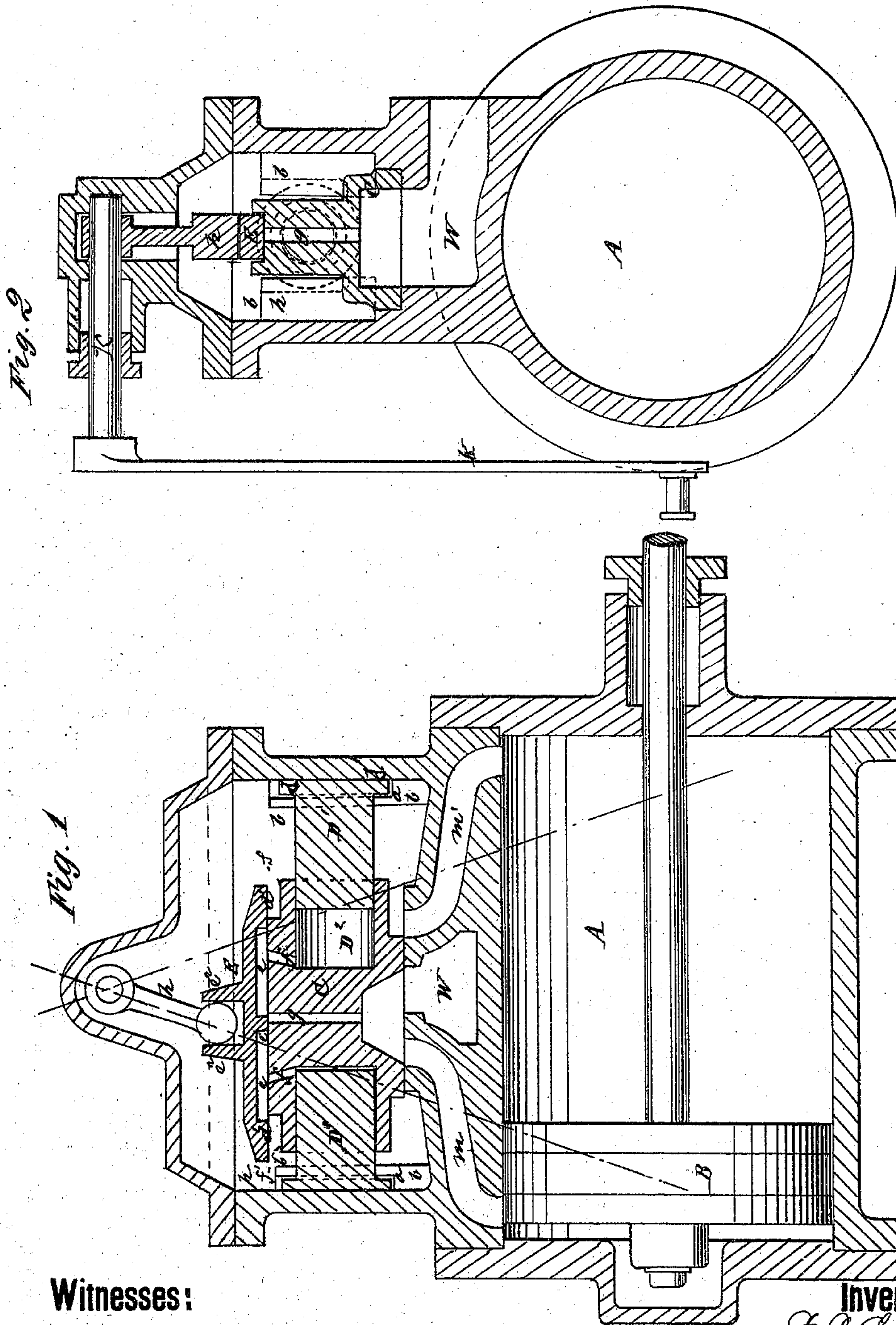


**E. E. GILBERT.**  
**Slide-Valve Mechanisms.**

No. 143,819.

Patented Oct. 21, 1873.



**Witnesses:**

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# UNITED STATES PATENT OFFICE.

EBENEZER E. GILBERT, OF MONTREAL, CANADA.

## IMPROVEMENT IN SLIDE-VALVE MECHANISMS.

Specification forming part of Letters Patent No. **143,819**, dated October 21, 1873; application filed May 10, 1873.

*To all whom it may concern:*

Be it known that I, EBENEZER E. GILBERT, of Montreal, in the Province of Quebec, Canada, have invented a new and Improved Slide-Valve Mechanism; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a longitudinal, and Fig. 2 a transverse, section of a steam-cylinder with my improved valve mechanism attached.

The invention consists in the improvement of valve mechanism for steam-engines, as hereinafter described, and pointed out in the claim.

A represents a steam-cylinder, having a piston, B, steam inlet and outlet ports  $m m'$ , and exhaust W. C is the main slide-valve, which has end tubes  $D^2$  that slide upon the close-fitting guide-rods  $D^1 D^1$ . These guide-rods have rear flanges,  $d$ , that hold them movably between guide-brackets  $b$ . When the friction between the valve C and its seat creates wear, the valve is thus enabled to lower itself and automatically take up the wear.

As the reciprocation of the valve upon its guide-rods is liable to be attended with a clapping and disagreeable noise, it has been quite an object to prevent this, if possible. I have accomplished this object by the use of an auxiliary valve, E, peculiarly constructed, and arranged in the steam-chest  $p$  and over the main valve. This valve E has two subjacent cavities,  $e e$ , which alternately connect with the exhaust W by a vertical passage,  $g$ , and are separated by a partition,  $e^1$ .  $f f$  are the ports, through which steam passes into and out of the tubes  $D^2$ , to alternately force the main valve C in opposite directions, while  $f' f'$  are recesses, over which pass the ends of the valve E, to admit steam into chambers  $e e$ , and thence to tubes  $D^2$ . My object is to cut off the egress of steam from these cylinders in time to form a cushion, to prevent their percussive impact upon the rods  $D^1$ . For that purpose the exhaust-passage  $g$  is so locally ar-

ranged with respect to the partition  $e^1$  that the latter covers the former and cuts off the exhaust steam before the main valve has reached the end of its throw. This construction effectually removes a difficulty hitherto generally perceived and appreciated, but not before remedied.

In order to render the valve E self-adjusting, to take up its own wear, and also to drop according to the wear that takes place on the main valve below it, I place this auxiliary valve on top of the main valve, and provide it with two upward projections,  $e^2 e^2$ , between which works loosely a free end of the crank-arm  $h$  of the rock-shaft K, which is connected by a pitman,  $k$ , to the reciprocating rod of the piston B. By this means the auxiliary valve becomes automatically adjustable by its own gravity, both as respects its own wear and that of the main valve.

My novel mode of constructing and arranging my auxiliary valve upon the main one embodies the following mode of operation: As shown in Fig. 1 of the drawing, the valve E has begun to admit steam to the chamber  $e$ ; but just before this has occurred the partition  $e^1$  has covered the passage  $g$ , thus cutting off the escape of a portion of the steam in tube  $D^2$ , and forming a cushion against the rod  $D^1$ .

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with main valve C, having end tubes  $D^2$ , of guide-rods  $D^1$ , having flanges  $d$  arranged loosely in brackets  $b$ , as and for the purpose described.

2. The auxiliary slide valve E, having the subjacent cavities  $e e$  and partition  $e^1$ , combined with the main slide-valve C, having passage  $g$ , end recesses  $f' f'$ , and tubes  $D^2$  with passages  $f$ , as and for the purpose set forth.

EBENEZER EDWIN GILBERT.

Witnesses:

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JOHN C. GRIFFIN.