

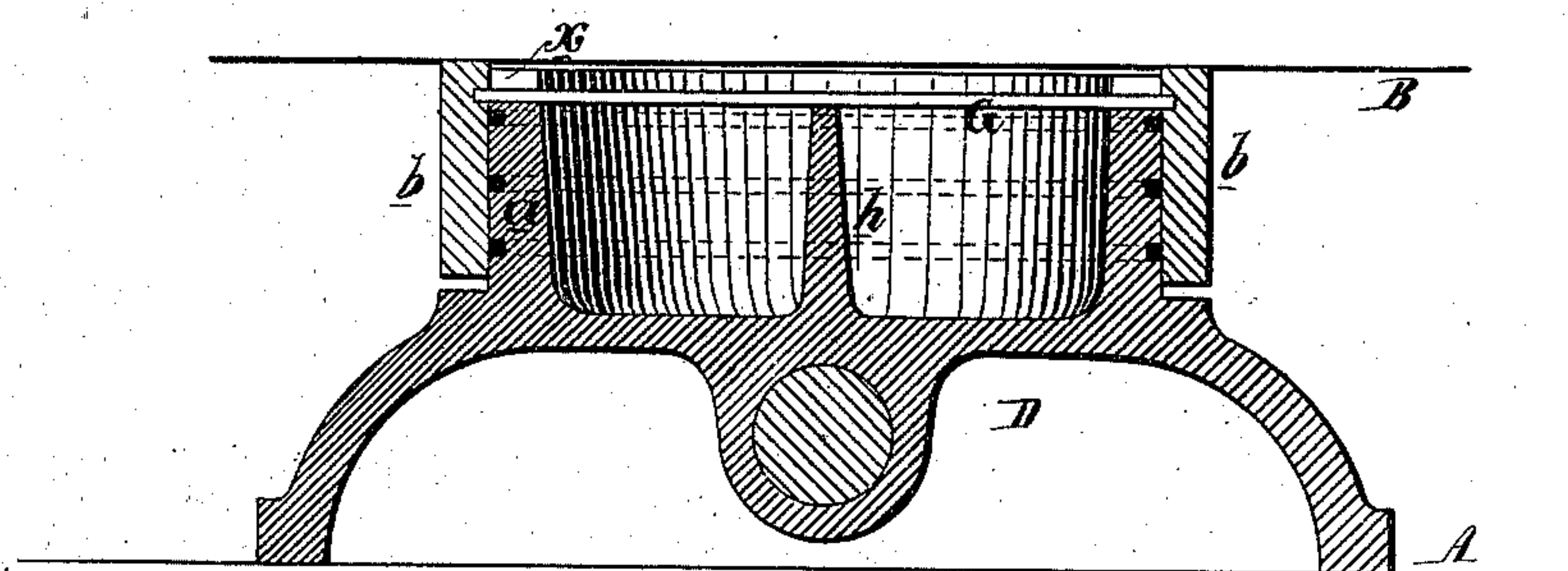
J. H. COOPER & A. D. EMERY.

Improvement in Slide-Valves for Steam-Engines.

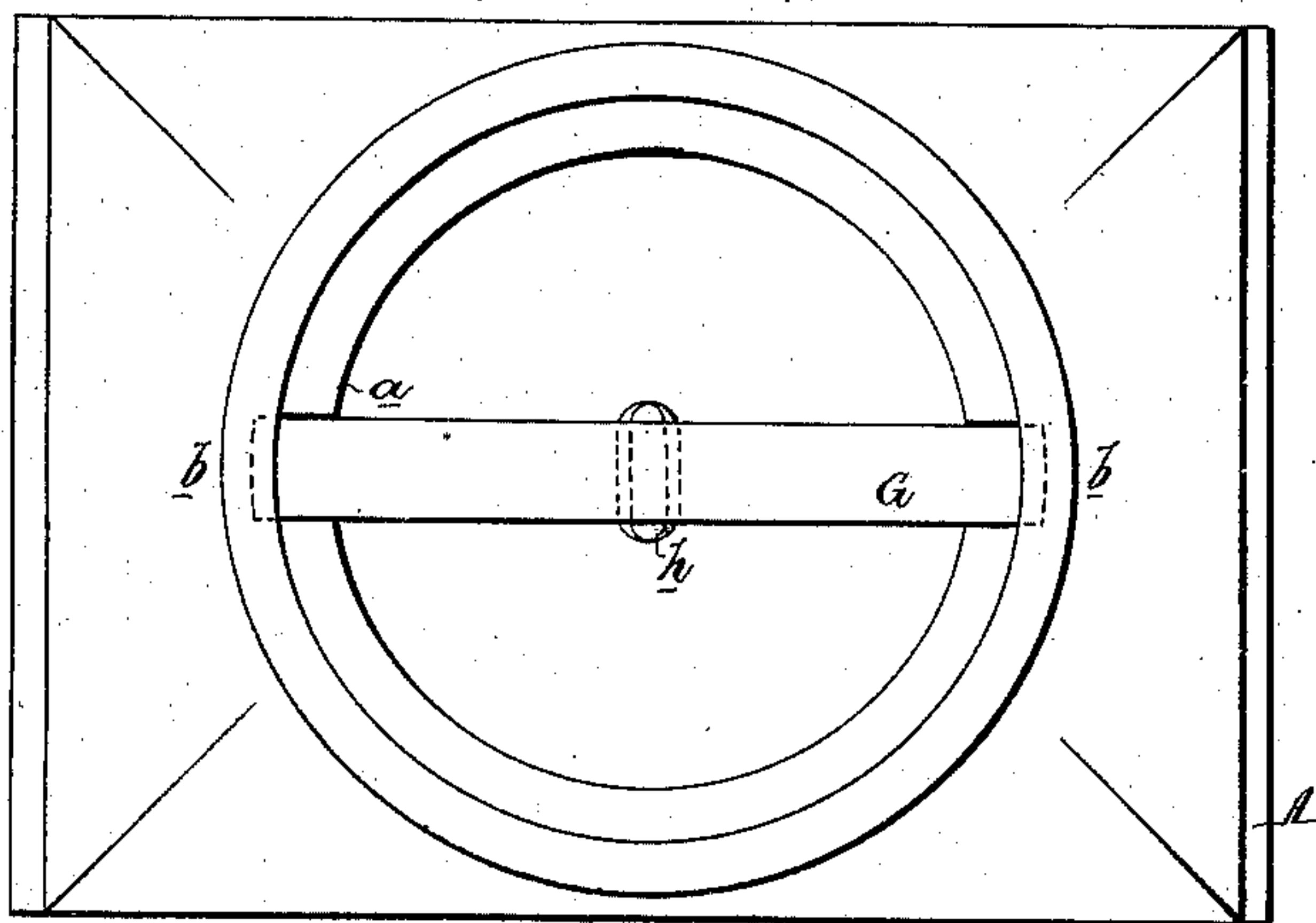
No. 129,794.

Patented July 23, 1872.

*Fig. 1*



*Fig. 2*



Witnesses.

Henry Smith  
John Rupertus

John H. Cooper  
and Abram D. Emery  
by their attors.  
Horsman and Son



# UNITED STATES PATENT OFFICE.

JOHN H. COOPER AND ABRAM D. EMERY, OF PHILADELPHIA, PA.

## IMPROVEMENT IN SLIDE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 129,794, dated July 23, 1872.

Specification describing Improvements in Slide-Valves for Steam-Engines, invented by JOHN H. COOPER and ABRAM D. EMERY, both of Philadelphia, Pennsylvania.

### *Improvements in Slide-Valves for Steam-Engines.*

Our invention has for its object the improvement, both as regards simplicity in construction and practical efficiency, of disburdened slide-valves of a well-known type. The nature of our invention may be briefly described as follows, reference being had to the vertical section, Figure 1, in the accompanying drawing, in which the line A represents the face of the steam-cylinder; B, the inner face of the steam-chest cover; and D, the slide-valve, on the back of which is cast an annular rib, *a*, adapted to the plain cylindrical ring *b*, the pressure of steam on the lower edge of the latter being exerted on an area equal to that of the upper edge of the ring, which bears against the steam-chest cover. The French patent of Disgrange (March 10, 1851) affords an early example of disburdened or so-called balanced slide-valves of this class. It will be understood, therefore, that no new principle is involved in our invention, which is restricted to a specific construction of parts and adaptation of these parts to each other. The ring *b*, unlike the rings heretofore used for removing the excess of pressure from slide-valves, is perfectly plain and cylindrical; hence it is easily cast and readily finished by boring and turning. We are enabled to make the ring of this simple and inexpensive shape by adapting it to the exterior of the rib *a*. A ring fitted to the interior of this rib would demand a flange against which the steam could exert an upward pressure, and one of the objects of our invention is to dispense with this flange. While the ring *b* can slide freely on the rib *a* it is accurately fitted to the latter, so that

there is but little chance of the steam penetrating between the two; but to prevent the possibility of such penetration of the steam we place, in grooves formed in the rib *a*, light rings, which, owing to their expansible property, bear with a constant pressure against the interior of the ring *b*. In order to insure the contact of the ring against the steam-chest cover under all circumstances a spring, G, bears upon a central projection, *h*, of the valve, extends across the annular rib *a*, and each end enters a groove in the ring *b*, upon which the spring exerts a constant upward pressure, the spring being always maintained in its proper position by its adaptation to recesses *x* in the upper edge of the annular rib. The ring *a* extends very nearly to the steam-chest cover; hence the valve is prevented from being forced from its seat when steam is excluded from the chest, and the movement of the engine is continued, as in case of locomotives running down grade.

In case of any derangement of the ring it can be readily removed, and the valve may be permitted to operate as an ordinary slide-valve until it is convenient to replace the ring or apply a new one.

We claim—

1. The combination, with a slide-valve, of a plain cylindrical ring, *b*, adapted to the exterior of an annular rib on the said valve, as set forth.

2. The spring G, adapted to the valve and to the ring *b*, as specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN H. COOPER.  
ABRAM D. EMERY.

Witnesses:

WM. A. STEEL,  
H. HOWSON.