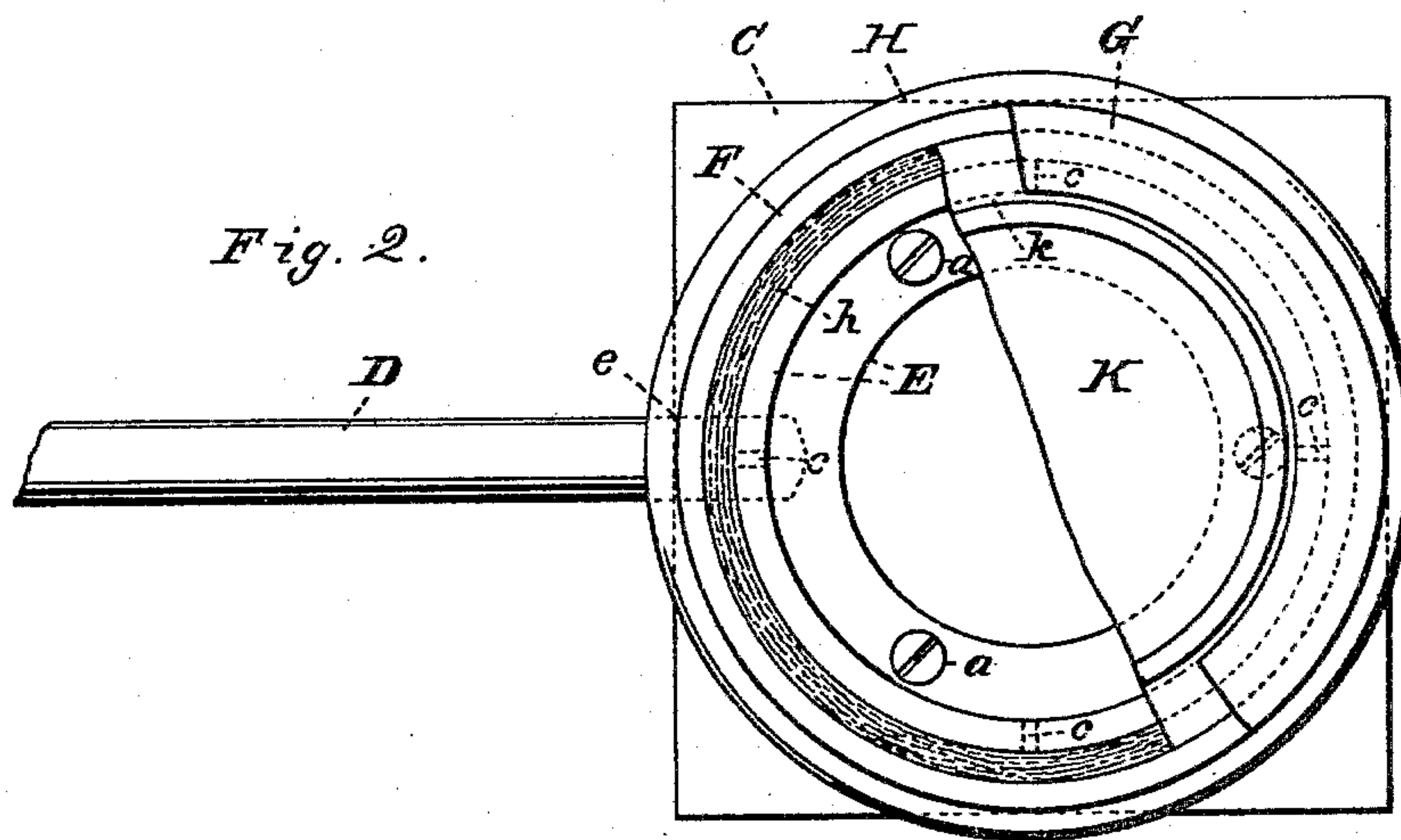
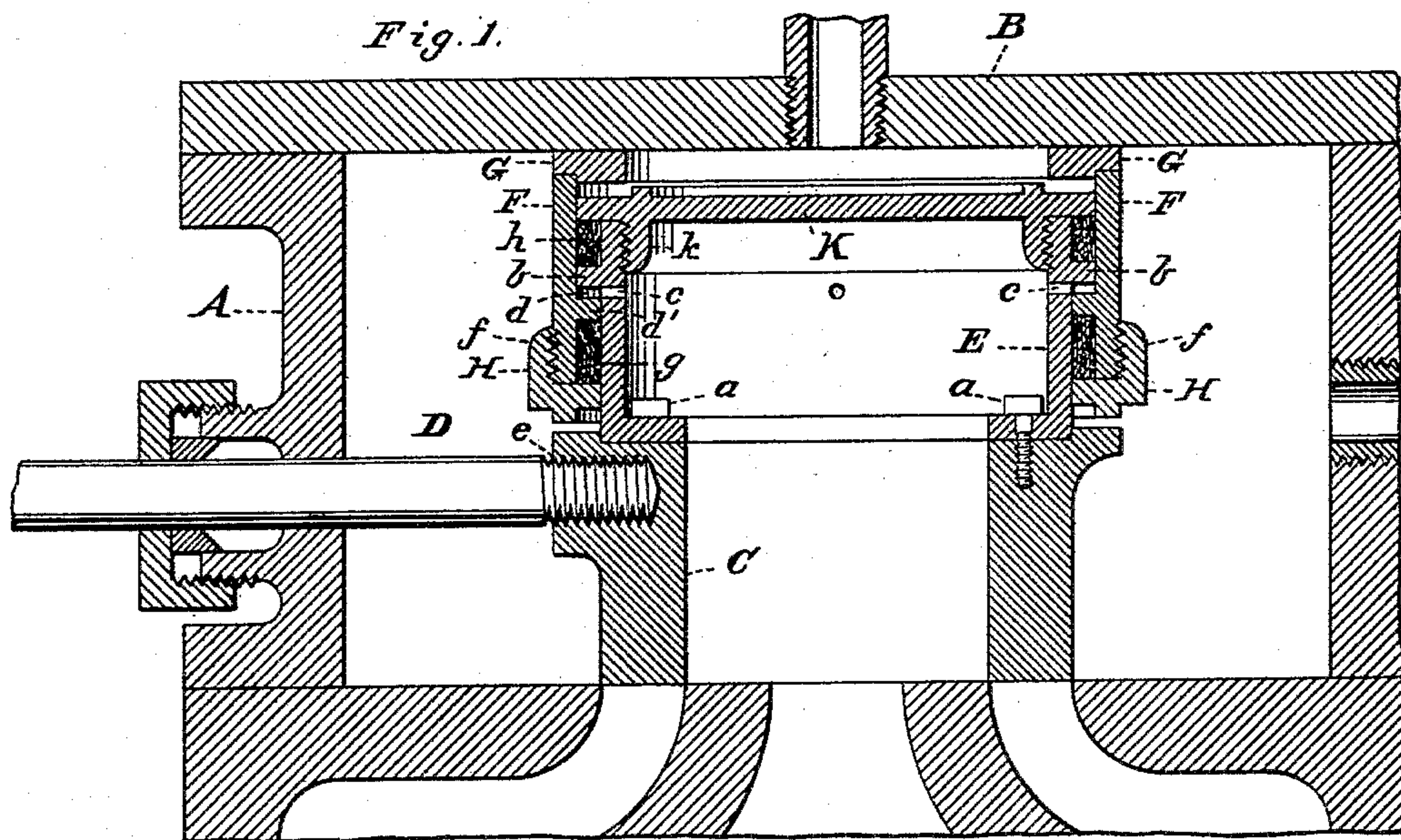


(No Model.)

W. A. & J. J. VREELAND.
BALANCED SLIDE VALVE.

No. 411,911.

Patented Oct. 1, 1889.



Witnesses
Villette Anderson,
Mary Boykin

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UNITED STATES PATENT OFFICE.

WILLIAM A. VREELAND AND JOHN J. VREELAND, OF CHICAGO, ILLINOIS.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 411,911, dated October 1, 1889.

Application filed January 28, 1889. Serial No. 297,862. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. VREELAND and JOHN J. VREELAND, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Balanced Slide-Valves; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a central vertical section of this invention. Fig. 2 is a top view of the valve.

This invention has relation to balanced slide-valves for steam-engines; and it consists in the construction and novel combination of devices, all as hereinafter set forth.

In the accompanying drawings, the letter A designates the steam-chest, and B the steam-chest cover.

C represents the valve, adapted to reciprocate on the ported bottom of the steam-chest, and D the valve-rod, connected to said valve at e.

E is an annular extension of said valve bolted to the body thereof, as indicated at a, and provided with an exterior annular flange b, under which are perforations c, leading from the annular way d between the flange b of the valve-extension and the interior annular flange d' of the follower F to the interior of the valve, forming vents for said way, which is liable in time to take steam through the packings. This follower is of annular form and is applied on the outside of the annular extension E of the valve, which forms a guide therefor. The lower portion of the follower is of larger diameter than the upper portion, and said follower is provided with a bearing-piece G, which is designed to move in contact with the valve-chest cover; and it is also provided with a ring H, which is formed with a threaded flange f to engage a

thread of the follower, and said ring is designed to form the lower wall of the packing-chamber g below the flange d'. The upper wall of the packing-chamber h, above the flange b, is formed by the cover-plate K, which is provided with a threaded lip k, to engage an interior thread of the annular extension E of the valve. The follower is free to move upward and is held up against the cover of the steam-chest by the steam-pressure, the parts of the follower which react against the upward pressure of the steam being of larger area than the parts of said follower which react against downward pressure.

The packings between the valve and follower are made very secure, that of the lower packing-chamber g in the follower facing inward to engage the outer wall of the valve-extension, while the packing of the chamber h above faces outward to engage the inner wall of the follower. Should the packings in the course of time leak, the steam entering the way d is relieved through the perforations c, communicating with the exhaust-chamber.

Having described this invention, what we claim, and desire to secure by Letters Patent, is—

1. The balanced slide-valve provided with a hollow extension having steam-passages, in combination with the follower encircling said valve-extension and having between itself and said extension a packing-chamber the upper wall of which is formed by an inner flange upon the follower about midway the height of said follower, said flange forming the bottom of a steam-space communicating with said steam-passages of the valve-extension, substantially as set forth.

2. The balanced slide-valve provided with a hollow extension having steam-passages, and a covering-plate connected thereto, in combination with the follower encircling said valve-extension and having connected to its lower end a ring, and provided with a steam-space communicating with said steam-passages, said valve-extension having a flange forming with the valve-covering plate the

bottom and top walls of a packing-chamber,
and said follower having a flange forming
with an inwardly-projecting flange of said
ring the bottom and top walls of an addi-
5 tional packing-chamber, intermediately of
which packing-chambers is arranged the
aforesaid steam-space, substantially as set
forth.

In testimony whereof we affix our signatures
in presence of two witnesses.

WM. A. VREELAND.
JOHN J. VREELAND.

Witnesses:

A. STARK,
J. W. HALPIN.