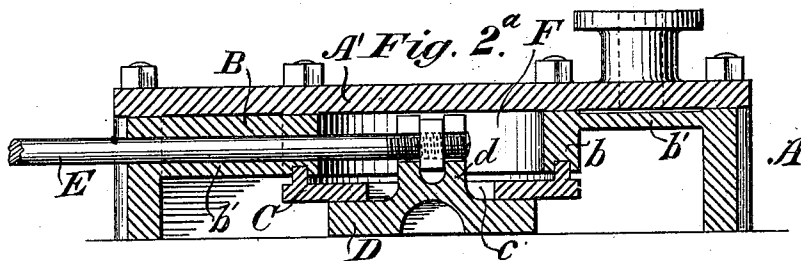
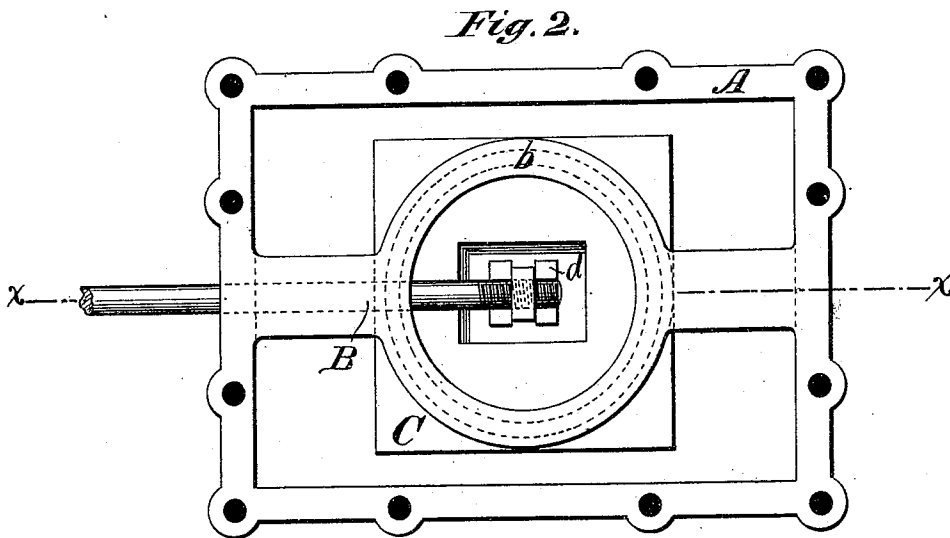
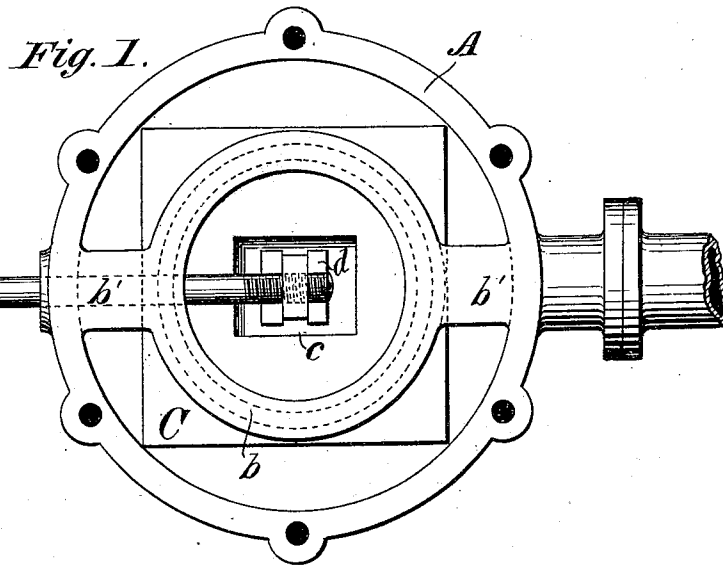


J. R. KELLY & C. O. GARDINER.

SLIDE VALVE FOR STEAM-ENGINE.

No. 171,819.

Patented Jan. 4, 1876.



WITNESSES
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Fig. 3.

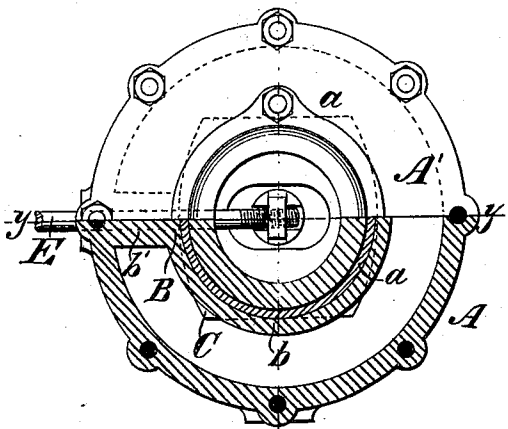


Fig. 5.

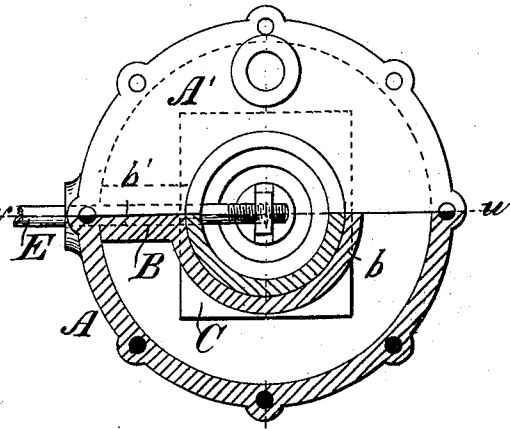


Fig. 4.

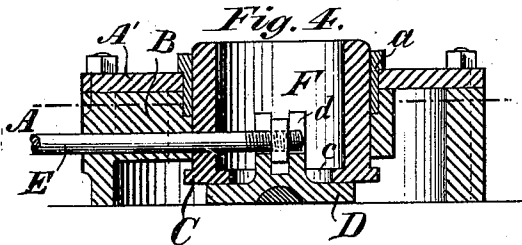


Fig. 6

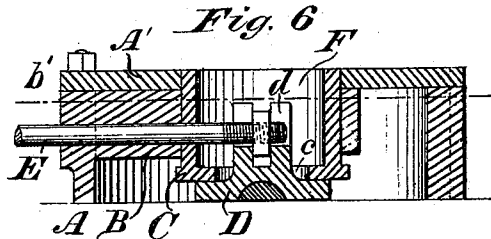


Fig. 7.

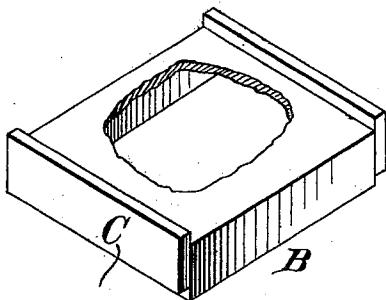
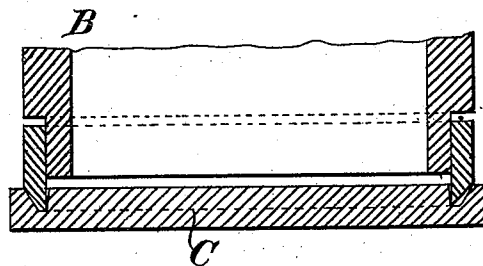
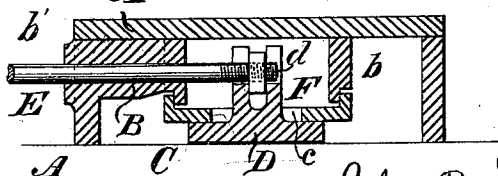


Fig. 8.



A' Fig. 9.



WITNESSES

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UNITED STATES PATENT OFFICE

JOHN R. KELLY AND CHARLES O. GARDINER, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN SLIDE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **171,819**, dated January 4, 1876; application filed November 27, 1875.

To all whom it may concern:

Be it known that we, JOHN R. KELLY and CHARLES O. GARDINER, of Springfield, in the county of Clarke and State of Ohio, have invented certain new and useful Improvements in Slide-Valves for Steam-Engines, of which the following is a specification:

Our invention relates to balanced slide-valves; and its object is to regulate the pressure of such valves upon their seats. Various ways and means have been devised for attaining this end, one of which is to connect the back of the valve to the top of the chest by a hinged link; and others again by exposing only a portion of the back of the valve to the action of the steam.

To a certain extent our invention embodies the latter-mentioned principle; and consists, first, in providing the steam-chest casing with an extension, the upper surface of which is steam-tight with the cover of the chest, to which is jointed (steam-tight, but having slight vertical play) a suitable disk or plate, the face of which fits the back of the valve steam-tight, and entirely covers the same, whereby steam-pressure upon the back of the valve is prevented, except through the medium of said disk, which may expose more or less surface for the purpose, as desired; second, in the combination of the steam-chest, an extension thereof provided with a central opening, a pressure disk or plate steam-tight in this extension, and the valve steam-tight with the pressure-disk, said disk being slotted, to permit of the passage of the valve ears or lugs into the extension-space, to which lugs the valve-stem is attached, whereby, as this space is steam-free, all packing of the valve-stem is dispensed with.

In the accompanying drawings, which show the best ways now known to us of embodying our invention, Figure 1 is a plan or top view of a cylindrical steam-chest with its cover removed; Fig. 2, a similar view of a rectangular steam-chest; Fig. 2^a, a vertical central section therethrough on the line *x x* of Fig. 2. Fig. 3 is a plan or top view of a cylindrical chest, partly in section, showing a modification of our invention; Fig. 4, a vertical central section therethrough on the line *yy* of Fig. 3; Fig. 5, a view, similar to Fig. 3, of another modification; Fig. 6, a vertical central section

therethrough on the line *ww* of Fig. 5. Figs. 7, 8, and 9 show modified forms of joint for connecting the pressure-disk and steam-chest extension.

The steam-chest A, which may be of any desired form—cylindrical, rectangular, or otherwise—has formed or cast with it an extension, B, which preferably consists of a circular portion, *b*, with a central space or opening, joined to the casing proper by suitable necks or arms *b'*. The upper face of this extension and the cap or cover A' of the steam-chest fit steam-tight. To the under side of this extension B, and joined steam-tight therewith, but having slight vertical play, is a pressure disk or plate, C, of any desired configuration, with a portion of its surface, more or less, projecting into the steam-space. In Figs. 1, 2, and 2^a this joint is shown as consisting of a circular upwardly-projecting flange on the pressure-disk, which closely fits in a corresponding groove in the circular portion of the chest-extension. The face of the pressure disk or plate C rests upon the back of the valve D, steam-tight, and has, in this instance, a slot, *e*, therein, to permit of the passage of the valve ears or lugs *d*, to which the valve-stem E, which has its bearings in one of the necks *b'* of the extension B, is connected, in any suitable manner. (Shown in the present instance as by screw-threads and nut.)

It will be obvious, by reason of the steam-tight joints, that the space F, occasioned by the peculiar construction of parts described, is entirely steam-free, and that consequently no packing-glands whatever are needed for the valve-stem.

Steam is admitted to the chest in the usual way, conducting-pipes being shown in the several figures, and the face of the valve D may be of any of the ordinary styles.

In Figs. 3 and 4 we have shown a modification of the pressure-disk C, said disk extending up through the central space of the steam-chest extension, and through a packing-ring, *a*, fitting tightly in an opening in the chest-cover and in the upper portion of the extension.

In Figs. 5 and 6 still another modification of pressure disk or plate is shown, it, however, being the same as that shown in Figs. 3 and 4, except that it does not extend beyond the

top of the chest-cover, and has no packing-ring.

In Fig. 7 a modified form of joint is shown between the chest-extension and pressure-disk, the extension having depending side walls; and the disk upwardly-projecting end walls, or vice versa; and in Figs. 8 and 9 other modified forms of joint are shown, which will be understood from the drawing.

Other forms of pressure disks or plates may be employed, which will suggest themselves as advantageous in particular instances; and we propose, in some cases, to render the disk adjustable, so as to expose more or less surface to be acted upon in the steam-space, and wish it to be distinctly understood that we do not limit ourselves to the precise construction shown. For instance, the space in the steam-chest extension may be dispensed with, the pressure-disk being connected therewith in any suitable way, and the valve-stem secured to the valve in the usual way, and packed by suitable glands.

We claim as our invention—

1. The combination, substantially as hereinbefore set forth, of the steam-chest, its extension, the pressure disk or plate fitting steam-tight therewith, and projecting into the steam-space, and the valve covered and overlapped by said pressure-disk, whereby steam-pressure upon the back of the valve is prevented, except through the medium of said disk.

2. The combination, substantially as hereinbefore set forth, of the steam-chest, its extension provided with a central opening, a pressure-plate, steam-tight with said extension, and the valve steam-tight with said pressure-plate, and having its ears or lugs protruding through a slot therein into said extension-space, whereby, as this space is steam free, all packing of the valve-stem is dispensed with.

In testimony whereof we have hereunto subscribed our names.

JOHN R. KELLY.
C. O. GARDINER.

Witnesses:

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ROBT. C. ROGERS.