R. C. Bristol,

Steam Balanced Valve.

No. 58,980. Patented Oct. 23, 1866.

Fig. 1.

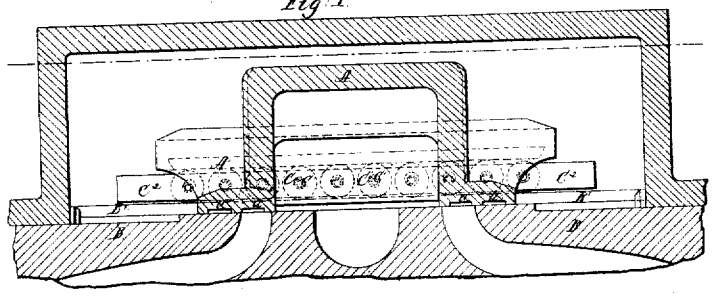


Fig. 2.

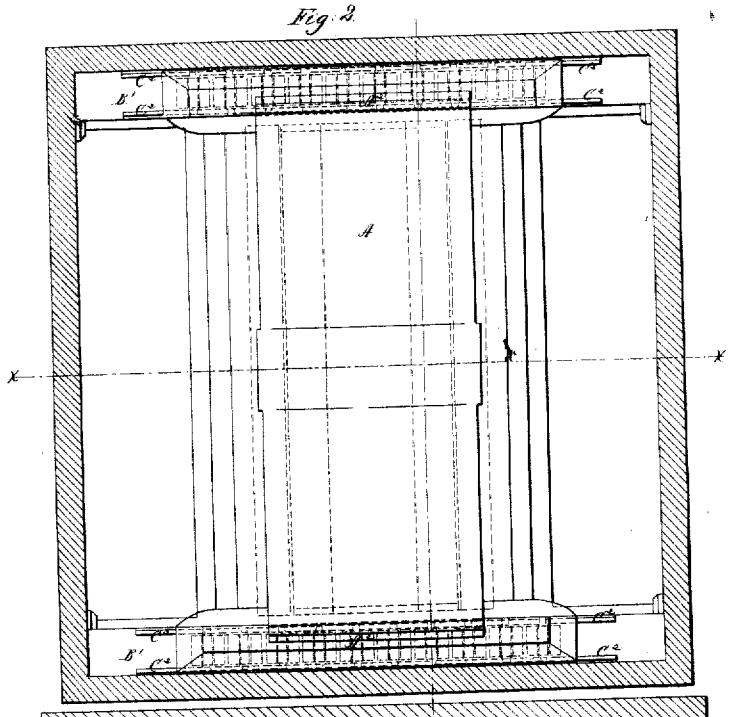


Fig. 3

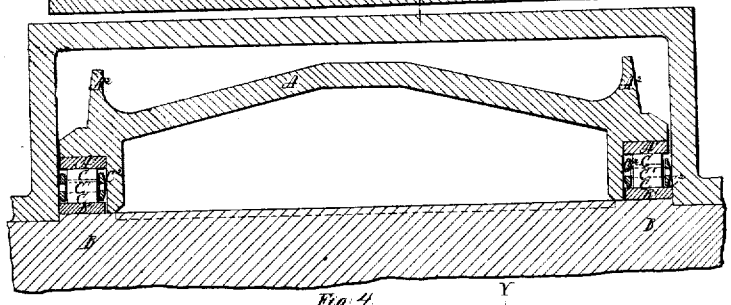


Fig. 4

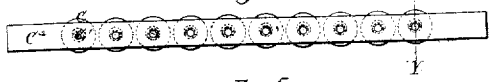
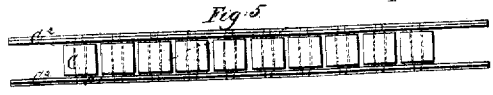


Fig. 6.



Fig. 5



Witnesses:

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by his attorney

Thomas D. Sutton

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UNITED STATES PATENT OFFICE.

RICHARD C. BRISTOL, OF ST. CLAIR, MICHIGAN.

IMPROVEMENT IN STEAM-ENGINE SLIDE-VALVES.

Specification forming part of Letters Patent No. **58,980,** dated October 23, 1866.

To all whom it may concern:

Be it known that I, RICHARD C. BRISTOL, of St. Clair, in the county of St. Clair, in the State of Michigan, have invented certain new and useful Improvements relative to Slide-Valves; and I do hereby declare that the following is a full and exact description thereof.

My improvements relate to that class of valves which are carried on small rollers, arranged in two or more series, and adapted to reduce the friction by rolling backward and forward, traversing half the extent to which the valve travels. My present invention is intended to overcome some of the difficulties experienced in the use of such devices, and to make the same operate more perfectly and reliably.

I will first describe what I consider the best means of carrying out my invention, and will afterward designate the points which I believe to be new.

The accompanying drawings form a part of this specification.

Figure 1 is a central section across the valve on the line X X in Fig. 2. Fig. 2 is a plan view. Fig. 3 is a longitudinal section. These figures represent the valve complete in a form adapted for use in locomotive-engines. These figures also indicate the position of the steam-chest which incloses the valve, and which is relied upon to keep the rollers in position. Fig. 4 is a side view of one of the sets of rollers disconnected from the other parts. Fig. 5 is a plan view of the same. Fig. 6 is a cross-section on the line Y Y in Fig. 4.

Similar letters of reference indicate corresponding parts in all the figures. The figures represent the novel parts, with so much of the other parts as is necessary to indicate their relation thereto.

A is the body of the valve. A^1 A^1 are bars, of hardened steel, fitted in the ends of the valve in the position represented, and held in place by being beveled at their ends, so as to lock or dovetail. These bars form the bearing-surfaces by which the valve rests upon the series of rollers.

B is the cylinder-face. B′ are bars, of hardened steel, placed as represented, so as to bear fairly on the cylinder-face under each end of the valve A. These bars B′ form the lower surfaces which receive the weight of the valve through the series of rollers.

C C, &c., are rings or hollow cylinders, of hardened steel, employed as rollers. They are all of uniform size, and turned so as to traverse truly and easily.

C^1 C^1, &c., are cylindrical cross-bars, of something less diameter than the hole in C. C^2 C^2 are longitudinal bars projecting considerably beyond the series of rollers C at each end, and mounted along each side of each series of rollers. Each pair of bars is firmly connected by the pins C^1, by riveting or heading the latter therein, as indicated in the drawings, and the bars C^1 being each made to guide a roller, C, in the manner indicated, the entire arrangement forms a very strong and reliable frame to guide and keep in position each roller of the series without allowing them to touch each other. The length of the bars C^2 is so proportioned to the interior of the steam-chest and to the greatest traverse of the valve A that the ends of the bars C^2 will nearly touch the interior of the steam-chest, first at one end and then at the other, as the valve reciprocates.

The bearing-faces of the valve A are hollowed with longitudinal grooves, as indicated by *a*. These grooves become filled with steam when the valve overhangs its seat at each movement; and I find by practice that they do not interfere with the tightness of the valve, while, I believe, they materially conduce to lightening the load on the rollers, and particularly to the rapid and easy adjustment of the valve-face to the diameter of the rollers C, it being understood that I fit the valve itself so that no weight will be taken upon the rollers C in first fitting up a new engine or new valve, it not being necessary to scrape the valve or its seat; but, as the wearing of the valve and of the cylinder itself ultimately lowers the valve, the rollers C commence to receive a portion of the load and soon relieve the rubbing-surface of the valve from all abrasion, and it becomes self-fitting in regard to subsequent wear.

I have before received several patents for improvements in this class of valves. My present invention has been experimented with very successfully on a number of large steam-

vessels and on several severely-worked locomotives, and it has been found to greatly promote the ends in view.

In the arrangements described in my former patents the rollers were liable to rub together or turn diagonally, and thus create considerable unnecessary friction, and sometimes do great injury, as also to become huddled together toward either end of their path, and to support the valve unequally. My present arrangement prevents this very effectually. I introduce the elevated projections A^2 only to aid in supporting the valve in planing its face.

I claim—

In connection with a slide-valve, the within-described arrangement of rollers C, mounted concentrically upon the cross-bars C^1 and between the longitudinal bars C^2 C^2, and arranged to operate relatively to the valve and to the cylinder face and to the steam-chest, substantially as and for the purposes herein specified.

RICHARD C. BRISTOL.

Witnesses:
I. S. WRIGHT,
E. S. WRIGHT.