(No Model.) 2 Sheets—Sheet 1.

E. F. PEACOCK.

STEAM ENGINE.

No. 497,987. Patented May 23, 1893.

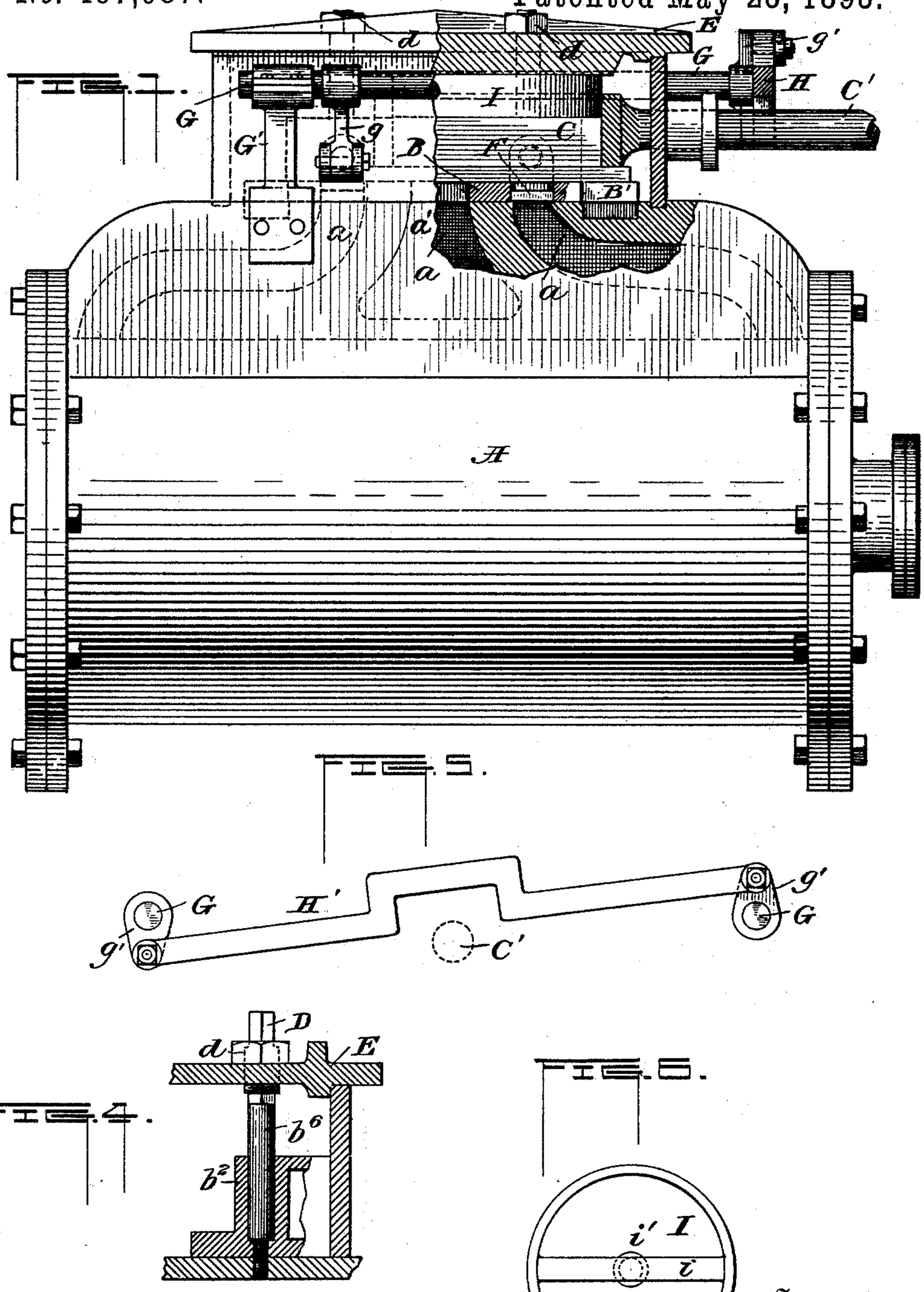

FIG. 5.

FIG. 4.

FIG. 6.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

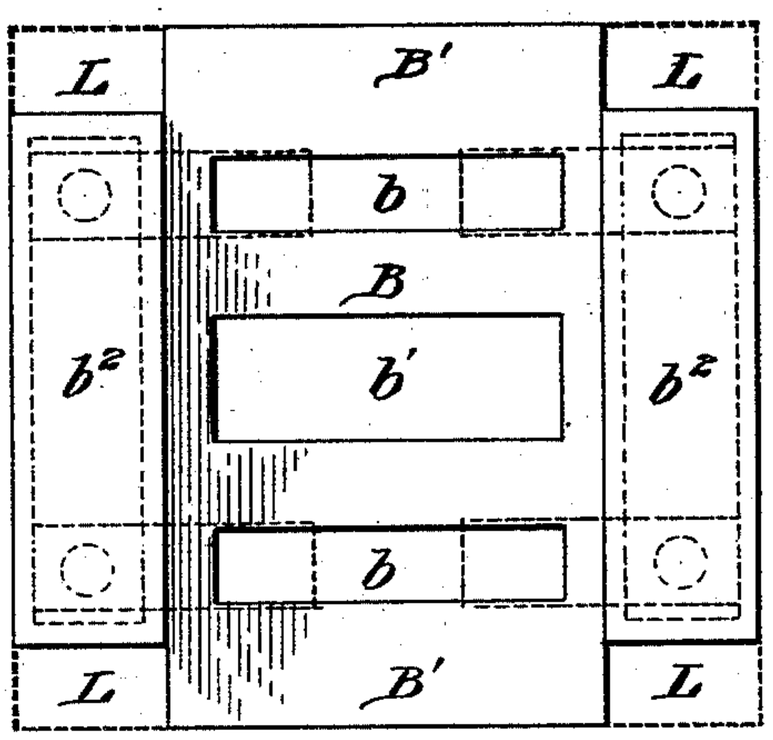
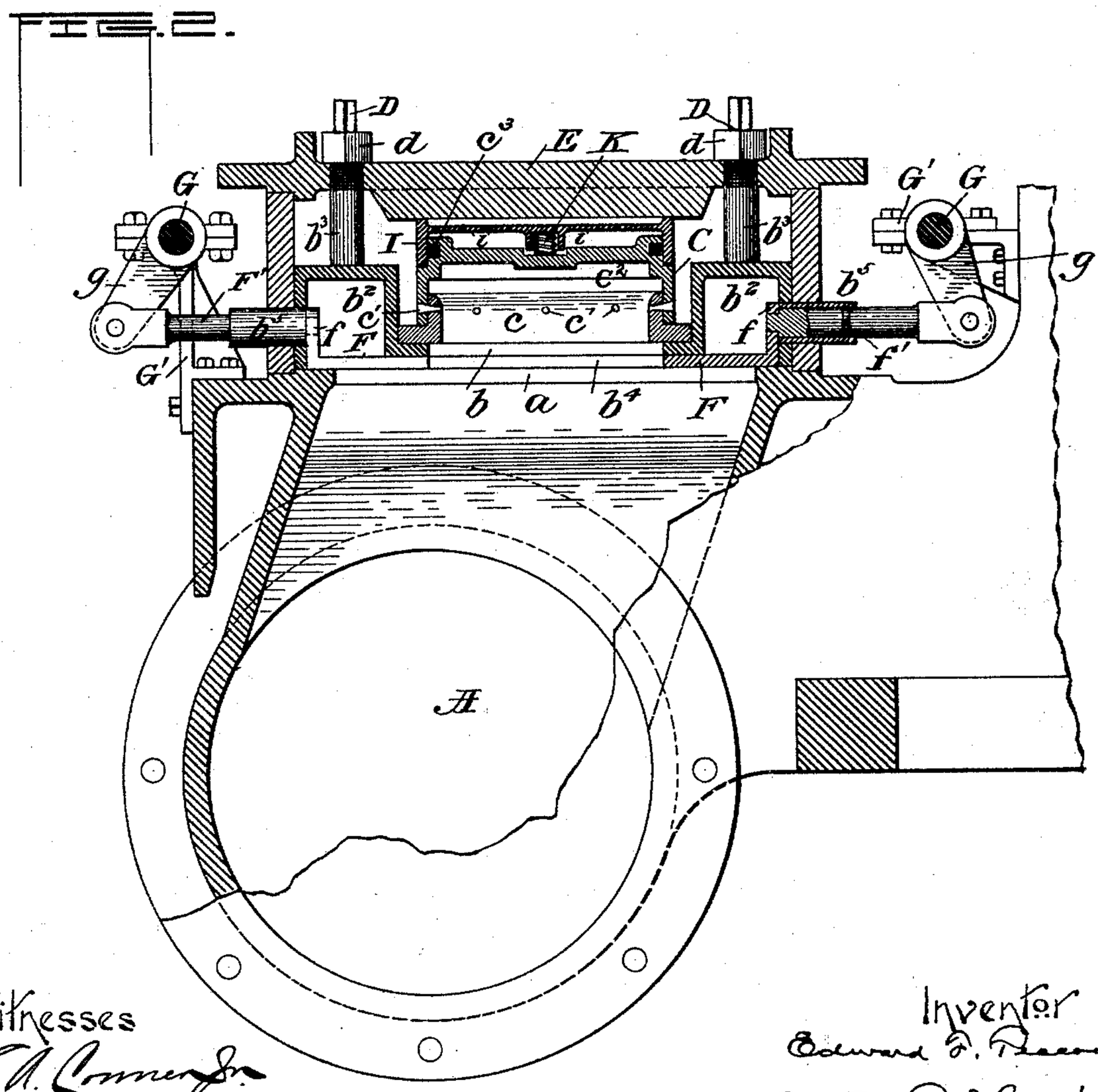


FIG. 2.



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UNITED STATES PATENT OFFICE.

EDWARD FRANKLIN PEACOCK, OF PHILADELPHIA, PENNSYLVANIA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 497,987, dated May 23, 1893.

Application filed June 27, 1892. Serial No. 438,124. (No model.)

To all whom it may concern:

Be it known that I, EDWARD FRANKLIN PEACOCK, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Engines; and I 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 the letters of reference marked thereon, which form a part of this specification.

My invention relates to steam engines, and its objects are to render their operation more economical, to reduce the strain and wear on the crank pin, and valve, to prevent the valve from tilting up when working at full stroke and so permitting steam to escape, and in other ways to improve the operation of the machine.

The invention is applicable to any class of steam engines, but I shall describe and illustrate it as embodied in a locomotive, for which it is especially adapted.

The invention consists in means for varying the size of the steam ports; and means for bridging a portion of the admission ports to prevent the incoming steam from lifting the end of the valve.

In the accompanying drawings, Figure 1 is a side elevation, partly broken away, of a steam engine cylinder equipped with my improvements. Fig. 2 is a cross section. Fig. 3 is a plan of the valve seat. Fig. 4 is a modification. Fig. 5 is a view of the connecting link. Fig. 6 is a plan of the balance ring.

The ordinary locomotive cylinder A shown in the drawings usually has long steam ports a, and exhaust ports a', in order to admit and exhaust the steam quickly.

When applying my invention to old engines, I provide a false valve seat B, containing ports b b' adapted to register in width with the ports a a', but considerably shorter in length. The valve C is made correspondingly narrower, and is guided between flanges on the valve seat. I prefer to make these flanges in the shape of boxes b^2, in order to fill a portion of the steam space. The false valve seat is held upon the cylinder by set screws D which are tapped through the cover E of the valve chest and bear upon the tops of the boxes b^2, or upon the short columns b^3 rising therefrom. A jam-nut d locks each set screw. In order to still further reduce the effective area of the steam ports, and to render them adjustable in size, a slide valve F is provided at one or both ends of each steam port.

Any other device capable of answering the purpose may be used, and though I prefer a slide, I do not limit myself thereto. These valves may be operated in any suitable manner, either singly or together.

In the drawings, each slide F moves in a groove b^4, cut transversely in the false valve seat B, and coinciding with a steam port b. The outer end of the slide has a flange or lug f, to which is attached a stem F′ which reciprocates in a tubular guide b^5 projecting from the box b^2 through the side of the valve chest. A packing ring f' makes the stem steam tight. The outer end of the stem is jointed to a rock arm g on a rock-shaft G, running along the side of the valve chest, and supported in bearings G′. At one end of each shaft is an arm g', the two arms being preferably connected by a link H, which may be bent to clear the valve rod C′. Since one arm g' extends above its shaft, and the other below, the slides F are all moved outward or inward simultaneously. When moved in to their full extent, the area of the ports b is reduced one half as shown in Fig. 3; or to a greater or less amount, as desired.

The rock shafts may be operated by hand; or, if desired, they may be connected with the reversing lever so that when the valve is working at full stroke the slide will be properly adjusted.

The valve C is preferably made in the two parts, to wit: a body, and a separate face c attached to the body by rivets c', which are preferably tapering, the larger end being outermost, so that in case a rivet gets loose it cannot work out on the inside of the cavity of the valve on account of the taper of the rivet and is prevented from working out the other way on account of the valve yoke. The face c may be of any suitable metal, and can be replaced when worn out. The top of the

valve carries a cylindrical boss c^2, preferably integral with the body of the valve. A shallow cylindrical ring I fits nicely over the boss c^2, the joint being made steam tight by a packing ring c^3, sprung into a groove, preferably in the periphery of the boss, as shown. A cross-bar i extends diametrically across the ring, and carries on its under side a pocket i in which is held a spring K, resting on top of the valve, and keeping the ring pressed up snugly against the top of the valve chest. The top of the valve inside the ring is thus shut off from the pressure of the steam in the chest, and to this extent the valve is balanced. The circular shape of the ring permits it to revolve around the boss, and thus wear evenly and keep a tight joint, where it comes in contact with the balance plate or the chest lid.

When a slide valve works at full stroke, it runs over the ends of the valve seat and overlaps the admission ports. The incoming steam lifts the valve, and a portion of it escapes through the exhaust port. Moreover, the valve is caused to wear unevenly. To obviate this, I extend the false valve seat B over the admission ports L forming a bridge B′ for the valve, to travel on, and compelling the steam to enter the chest through the spaces shown inclosed in dotted lines in Fig. 3. In new work, these bridges can be cast integral with the valve seat. So, too, in new engines, the ports can be made short and the false valve seat dispensed with, the grooves for the slides F being cored or planed out in the valve seat.

Instead of the columns b^3 being cast integral with the boxes b^2, they may be separate studs b^6 screwed down through suitable holes into the valve seat, as shown in Fig. 4. I do not however, make any claim in this application to the means above described for balancing the valve, since this constitutes a separate invention reserved for another application.

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

1. A false valve seat having ports to register with those of a steam engine cylinder, and having slides adapted to vary the size of said ports, and means for adjusting said slides independently of the valve motion substantially as set forth.

2. A false valve seat, having ports to register with those of a steam engine cylinder, and having transverse grooves in line with said ports, slides reciprocating in said grooves, and means for adjusting said slides independently of the valve motion substantially as set forth.

3. The combination with a cylinder and valve chest, of a false valve seat having ports shorter than those in the valve seat, side flanges adjacent to the ends of said ports, and a valve fitted between said flanges, substantially as set forth.

4. The combination with a cylinder and valve chest, of a false valve seat having boxes on each side, a valve guided between said boxes, and slides operating transversely in said boxes, to vary the effective area of the ports, substantially as set forth.

5. The combination with a cylinder and valve chest, of a false valve seat B having boxes b^2, and grooves b^3, slides F in said grooves, stems F′ attached to said slides and projecting outside of said chest, and rock shafts G connected with said stems and with each other, substantially as set forth.

6. A valve comprising an upper part and a separate valve face united thereto by tapering rivets having their larger ends outermost, substantially as set forth.

7. A steam engine having a bridge across the admission ports, to the valve chest to prevent the incoming steam from tilting the valve, substantially as set forth.

8. The combination with a steam engine cylinder, of a false valve seat having at each end an extension to bridge the admission ports, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD FRANKLIN PEACOCK.

Witnesses:
W. W. FERGUSON,
JOSEPH THOMASSON.