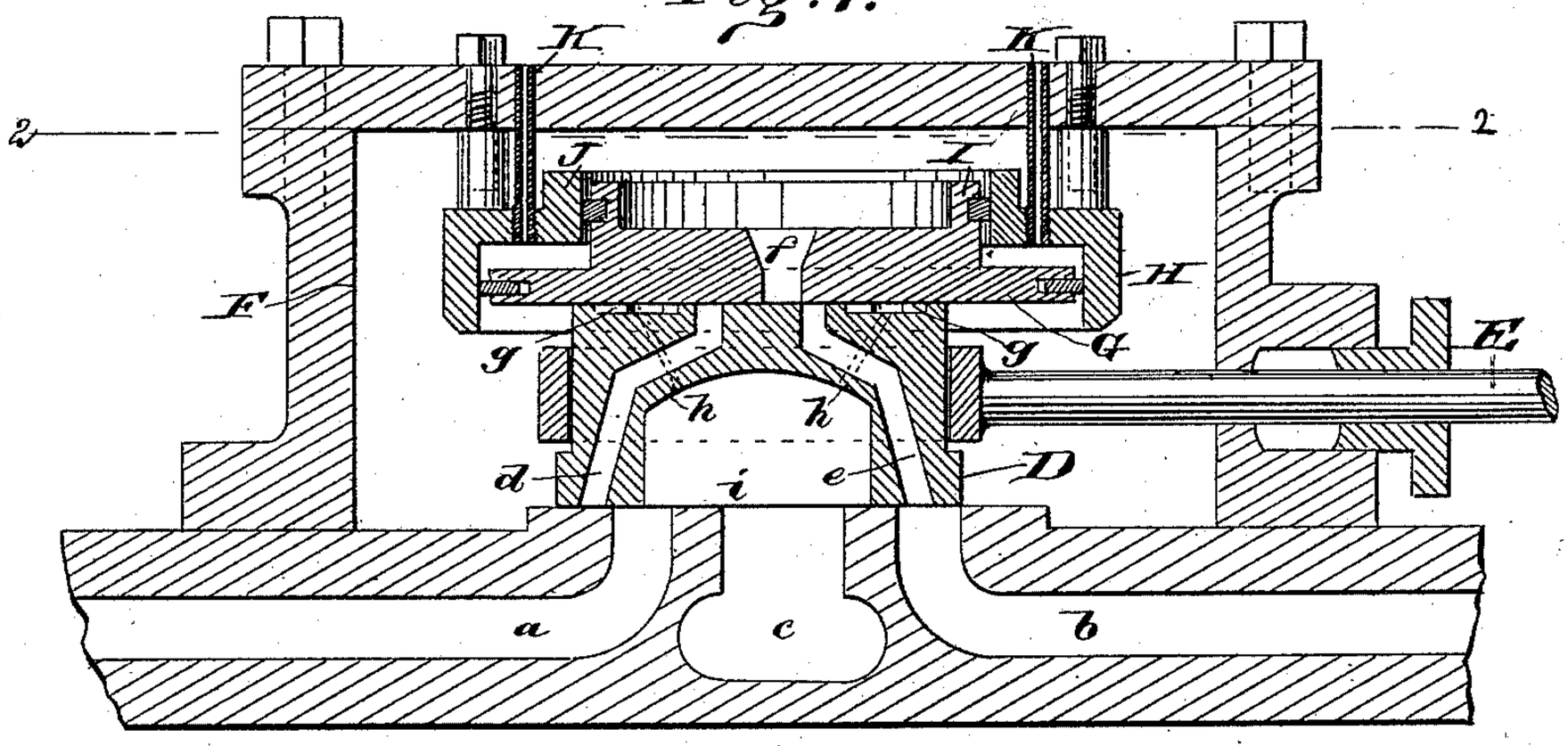
(No Model.)

W. T. HARRISON.

BALANCED SLIDE VALVE.

No. 473,744. Patented Apr. 26, 1892.

Fig: 1.



A Fig: 2.

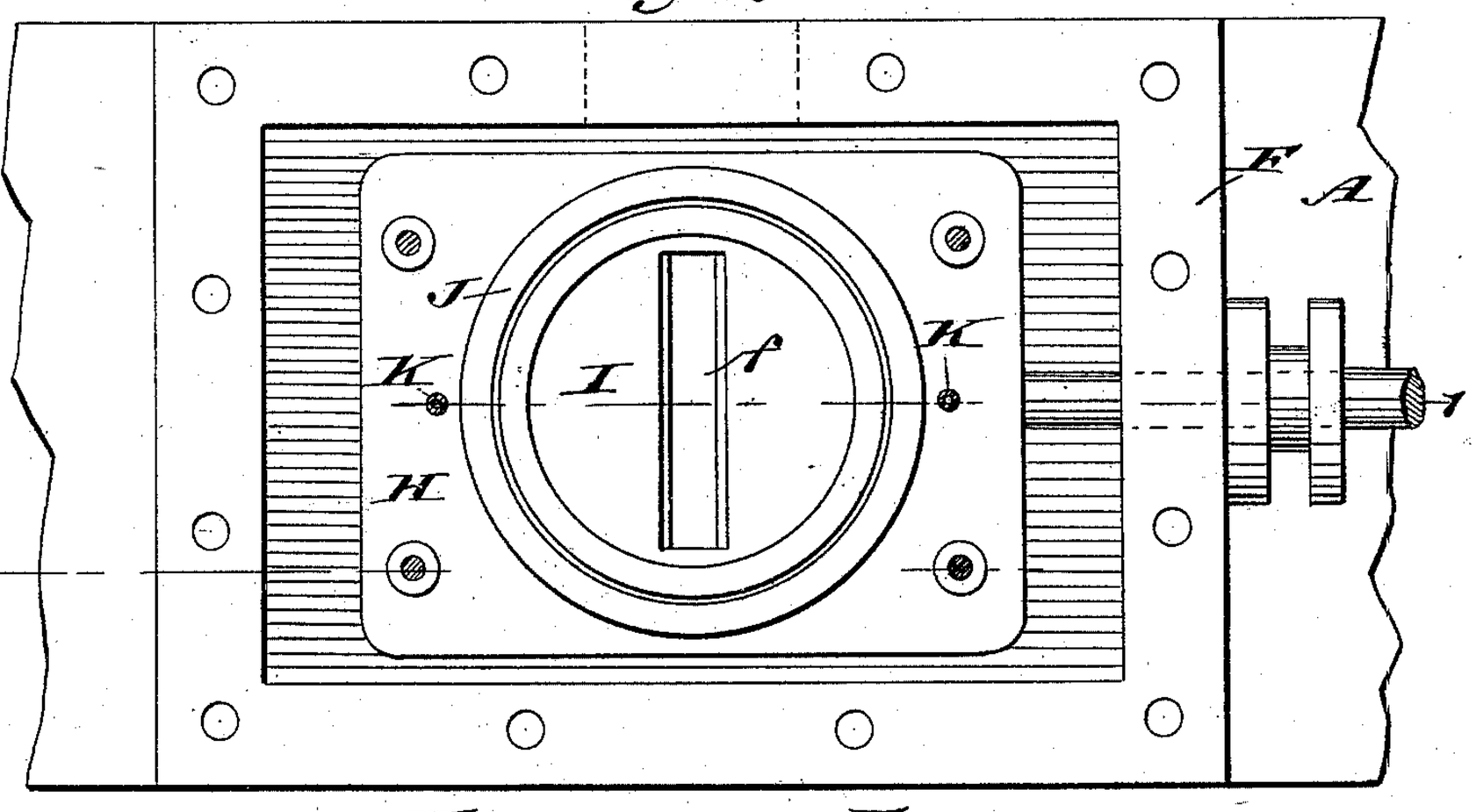


Fig: 3.

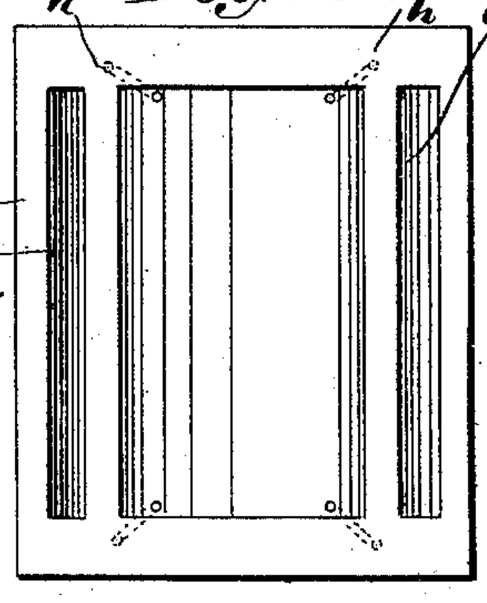
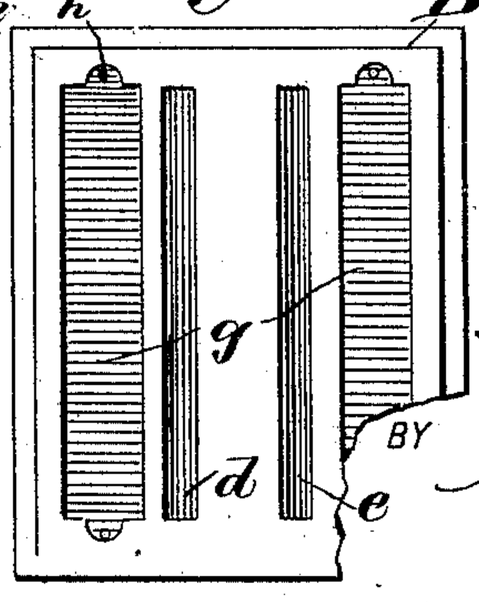


Fig: 4.



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UNITED STATES PATENT OFFICE.

WILLIAM T. HARRISON, OF POOLER, GEORGIA, ASSIGNOR TO HIMSELF AND JOHN SMITH, OF SAME PLACE.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 473,744, dated April 26, 1892.

Application filed December 10, 1891. Serial No. 414,582. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. HARRISON, of Pooler, in the county of Chatham and State of Georgia, have invented a new and Improved Balanced Slide-Valve, of which the following is a full, clear, and exact description.

The invention relates to balanced slide-valves for use on locomotives.

The object of the invention is to provide an improved balanced slide-valve which is simple and durable in construction and arranged to supply the cylinder with a full charge of motive agent at the time the piston is at the commencement of the stroke.

The invention consists of inlet-ports formed in the slide-valve and a balance-plate provided with a port adapted to connect with the valve inlet-ports at the time the motive power is admitted to the end of the cylinder.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1 1 of Fig. 2. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1. Fig. 3 is an inverted plan view of the slide-valve, and Fig. 4 is a plan view of the same.

The cylinder A is provided with the usual inlet-ports *a* and *b* and the exhaust-port *c*, over which operates the slide-valve D, connected in the usual manner with the valve-stem E, so that a reciprocating motion is given to the slide-valve within the steam-chest F. On top of the slide-valve D is arranged the balance-plate G, fitted to slide in a suitable casing H, supported from the steam-chest cover in any suitable manner. On top of the balance-plate G is arranged a piston I, fitted to slide in a cylinder J, formed on top of the casing H and opening into the interior of the steam-chest, as is plainly shown in Fig. 1.

In the slide-valve D are arranged two inlet-ports *d* and *e*, adapted to connect at their lower ends with the cylinder-ports *a* and *b*, respectively, at the time the respective end of the slide-valve D opens to admit motive power to the respective port *a* or *b*. The upper ends of the ports *d* and *e* are adapted to register alternately with a port *f*, formed centrally in the balance-plate G, the said ports registering with the said balance-plate port *f* at the time the respective end of the slide-valve opens to admit motive agent to the respective cylinder-port *a* or *b*. It will be seen that as soon as one end of the slide-valve opens the respective port to admit the motive agent to the end of the cylinder the corresponding port *d* or *e* registers with the port *f*, so that motive agent from the steam-chest can pass through the said port *f* and the respective port *d* or *e* into the respective cylinder-port *a* or *b*, thus increasing the supply of motive agent to the end of the cylinder at the time the piston is at the beginning of its stroke.

Into the space above the plate G, within the casing H, lead a series of pipes K, extending upward through the steam-chest cover to open into the outer air, so that any steam which might leak into the said space above the plate G can pass to the outer air, thus relieving the balance-plate G of undue pressure. In the top of the slide-valve D are formed recesses *g*, connected by ports *h* with the exhaust-cavity *i* of the slide-valve D. Motive agent which may pass between the top of the valve D and the under side of the balance-plate G can readily escape from the recesses *g* into the ports *h* and to the exhaust, thus relieving the valve D and the balance-plate G of undue pressure of motive agent passing between the two.

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

1. In a balanced slide-valve, the combination, with an open casing held in the steam-chest, of a balance-plate fitted to slide in the said casing and formed with a port adapted to connect the interior of the steam-chest alternately with inlet-ports in the slide-valve, substantially as shown and described.

2. In a balanced slide-valve, the combination, with the slide-valve having inlet-ports adapted to register with the cylinder inlet-ports, of a balance-plate held on top of the said slide-valve and provided with a central

port adapted to alternately register with the said valve inlet-ports, and a casing in which the said balance-plate is fitted to slide vertically, substantially as shown and described.

3. In a balanced slide-valve, the combination, with the slide-valve having inlet-ports adapted to register with the cylinder inlet-ports, of a balance-plate held on top of the said slide-valve and provided with a central port adapted to alternately register with the said valve inlet-ports, a casing in which the said balance-plate is fitted to slide vertically, and a piston formed on top of the said balance-plate and fitted to slide in a cylinder formed in the said casing, substantially as shown and described.

4. In a balanced slide-valve, the combination, with the slide-valve having inlet-ports adapted to register with the cylinder inlet-ports, of a balance-plate held on top of the said slide-valve and provided with a central port adapted to alternately register with the said valve inlet-ports, a casing in which the said balance-plate is fitted to slide vertically, and air-pipes connecting with the interior of the said casing above the balance-plate, substantially as shown and described.

WILLIAM T. HARRISON.

Witnesses:
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R. E. EPPS.