

S. M. VAUCLAIN & W. S. HODGES.

PISTON VALVE.

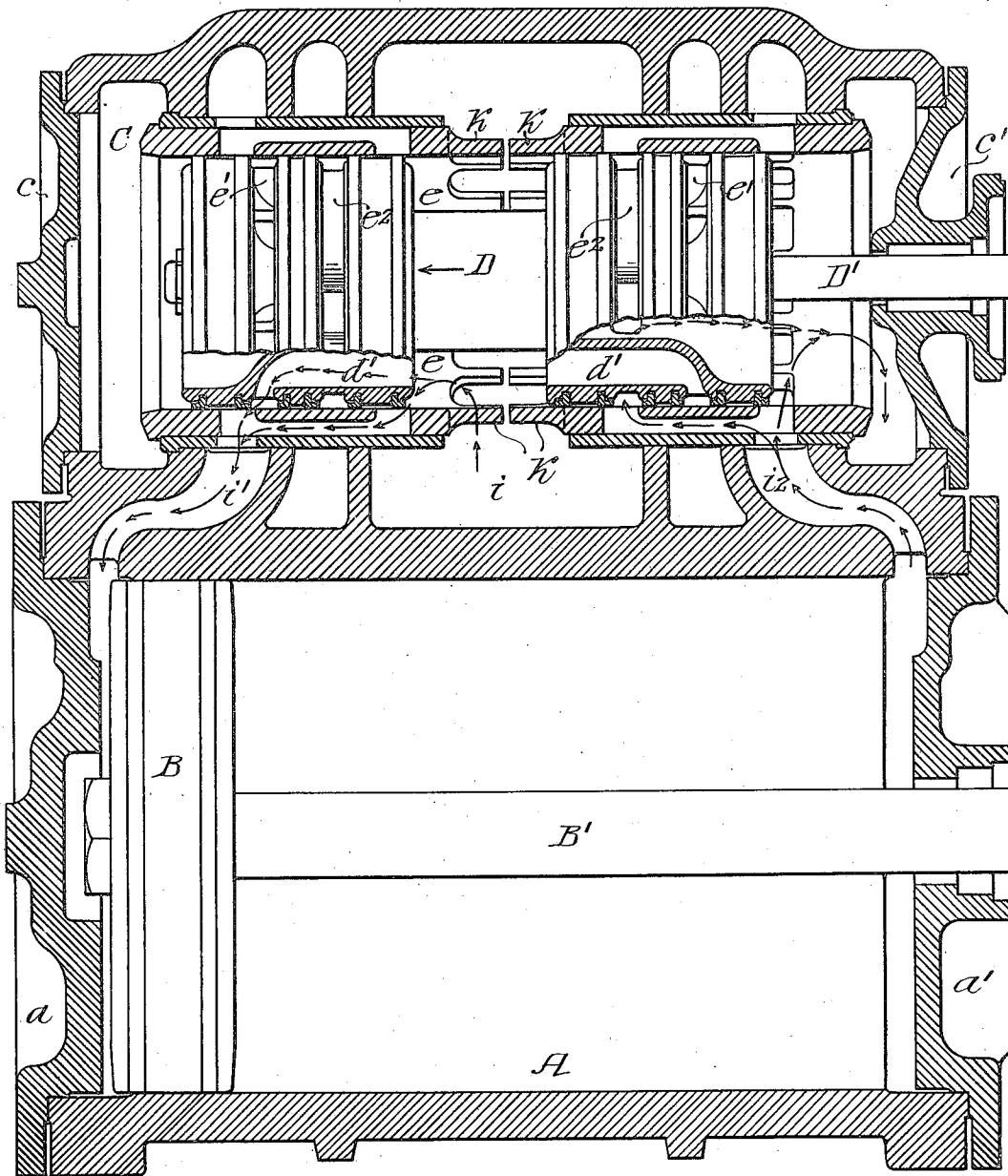
APPLICATION FILED SEPT. 30, 1911.

1,045,644.

Patented Nov. 26, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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Inventors—

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2 SHEETS—SHEET 2.

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Fig. 2.

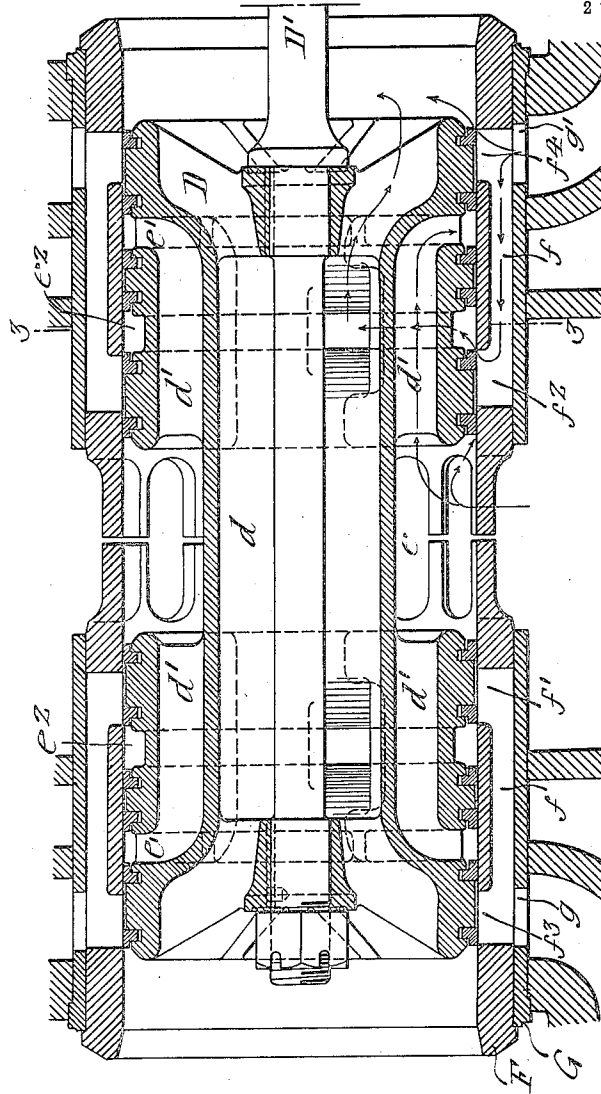
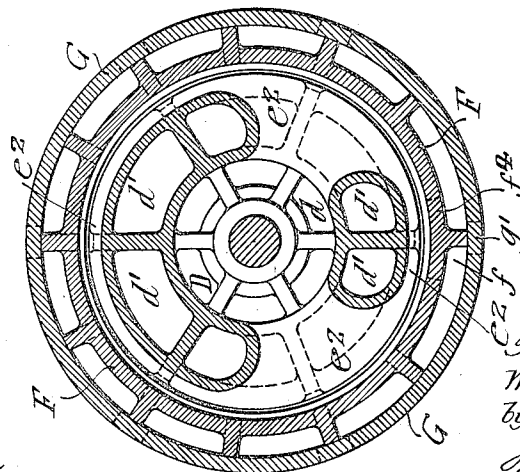


Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL M. VAUCLAIN AND WILLIAM S. HODGES, OF PHILADELPHIA, PENNSYLVANIA,
ASSIGNORS TO THE BALDWIN LOCOMOTIVE WORKS, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PISTON-VALVE.

1,045,644.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed September 30, 1911. Serial No. 652,111.

To all whom it may concern:

Be it known that we, SAMUEL M. VAUCLAIN and WILLIAM S. HODGES, citizens of the United States, residing in Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain Improvements in Piston-Valves, of which the following is a specification.

One object of this invention is to improve the construction of piston valves used particularly in connection with the cylinders of locomotives, but it will be understood that the invention may be used in connection with the cylinders of stationary and marine engines without departing from the essential features of the invention.

Another object of the invention is to construct the valve so that on a comparatively short movement thereof it will open the ports to a greater extent than will valves of the ordinary construction. By the use of this valve for short cut-offs, we provide twice the port area, both for the admission and exhaust, over that given by the ordinary valve.

In the accompanying drawings:—Figure 1, is a longitudinal sectional view through the cylinder and valve chest; the valve being in position to admit steam to the forward end of the cylinder, the rear end of the cylinder being open to exhaust; Fig. 2, is a longitudinal sectional view of part of the valve chest and the valve; and Fig. 3, is a sectional view on the line 3—3, Fig. 2.

A is the cylinder of the locomotive, having a forward head *a* and a rear head *a'*.

B is the piston mounted in the cylinder and connected to a piston rod B'.

C is the valve chest formed in an integral casting with the cylinder in this instance, and this valve chest has a forward head *c* and a rear head *c'*.

D is a cylindrical valve having a valve rod D', which extends through a stuffing box in the rear head in the ordinary manner.

i is the steam inlet port and *i'* is the port connecting the forward end of the cylinder with the steam chest, and *i''* is the port connecting the rear end of the cylinder with the steam chest. The ends of the steam chest in the present instance connect with the exhaust and the valve is hollow, as at *d*, so

that both ends of the chest are connected through the hollow valve.

The valve D has not only the longitudinal passage *d*, but an annular central passage *e* and annular ports *e'* near each end, which are connected to the annular passage *e* by passages *d'*. Located between each port *e'* and the passage *e* is an annular exhaust port *e''*, which connects with the longitudinal passage *d* as illustrated in Fig. 3.

F is a bushing having port openings *f'*, *f''*, *f'''* and *f''''* and longitudinal passages *f*, *f'*, one set of passages connect the port openings *f'* and *f''* and the other set of passages connect the port openings *f'''* and *f''''*. Surrounding the bushing F is a bushing G having port openings *g*, *g'* which aline with the ports *i'*, *i''* leading to and from the cylinder and connecting with the passages *f'*, *f'* respectively in the bushing F. Both bushings F and G are made in two parts as shown, and the two parts of the bushing F have fingers *h* which bridge the steam inlet space *i*, so as to properly hold the valve rings when the valve reciprocates.

The valve is provided with a series of annular rings located in annular grooves, as indicated in Fig. 2 of the drawings, so as to make a steam tight joint between the piston valve and the bushing.

The above construction of the valve chest and its bushings may be modified without departing from the essential features of the invention.

By the above construction the opening is doubled for the same amount of movement of an ordinary valve. When the valve is moved in the direction of the arrow, Fig. 1, and when the parts are in the position of said figure, steam begins to enter the forward end of the cylinder and exhaust at the rear end of the cylinder. The piston will then begin to move rearward as the valve opens the ports. Steam will enter directly from the steam space through the ports *f'* and indirectly through the passages *d'* in the valve and through the ports *f'''*; both the ports *f'* and *f'''* being uncovered simultaneously.

The steam, as it escapes from the rear of the cylinder, passes through the ports *i''* and ports *f''*, *f''*, escaping through the port *f''* di-

rectly to the end of the valve chamber and indirectly from the port f^2 through the channel e^2 to the interior of the valve to the exhaust passage at the end of the valve chest.

The above construction of valve can be readily substituted for the ordinary piston valve, when a valve of this character is desired on a locomotive, by simply detaching and removing the bushing from the valve chest and substituting therefor the bushings F and G and the valve D, which is then coupled to the ordinary valve mechanism; the valve having the same travel as the valve for which it was substituted, yet the area of the opening will be materially increased.

The valve can be used either as a central admission valve or one having end admissions. The steam in the latter case entering through the central passage d in the valve D and through the passage e^2 , and the steam will exhaust through the passages e, e' .

We claim:—

1. The combination of a valve chest, two bushings mounted therein, one located within the other, the inner bushing having central steam inlet passages and two port openings at each side of the central passages and

having channels connecting the port openings, the outer bushing closing the said channels and having port openings forming communication with the said channels in the first mentioned bushing and the ports leading to the cylinder, a cylindrical valve adapted to reciprocate in the inner bushing and having ports and passages arranged to aline with the port openings and passages in the inner bushing.

2. The combination of a valve chest having a bushing, ports in the valve chest leading to a cylinder, said bushing having port openings communicating with the cylinder ports, the said bushing being made in two parts, each part having fingers at the center projecting toward each other and spanning a central opening in the valve chest, a reciprocating cylindrical valve located within the bushing and having ports and passages, and a series of piston rings on the valve.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

SAMUEL M. VAUCLAIN.
WILLIAM S. HODGES.

Witnesses:

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