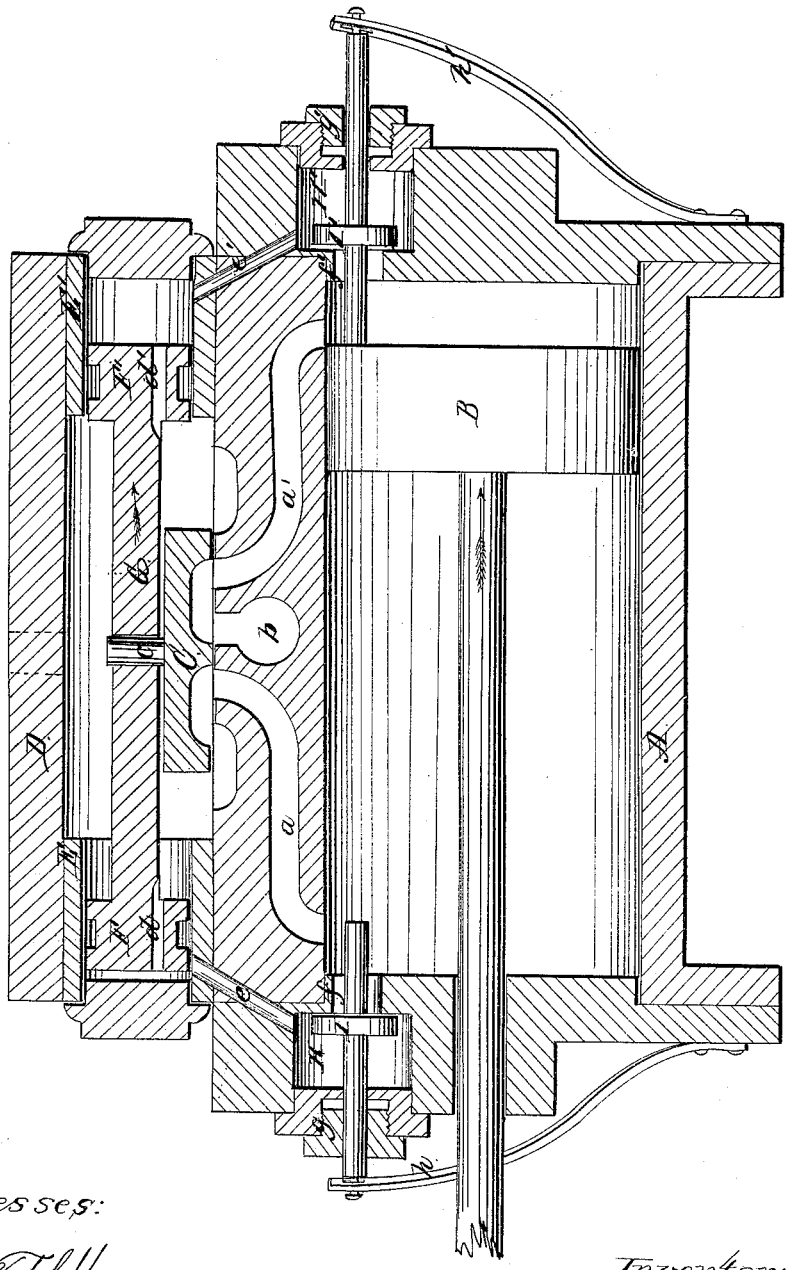
A. S. Cameron,

Steam Slide Valve.

No. 50,218. Patented Oct. 3, 1865.



Witnesses:

C. L. Tyloff

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ADAM S. CAMERON, OF NEW YORK, N. Y.

IMPROVEMENT IN VALVE-GEAR FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **50,218**, dated October 3, 1865.

To all whom it may concern:

Be it known that I, A. S. CAMERON, of the city, county, and State of New York, have invented a new and Improved Reversing-Gear for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

The drawing represents a longitudinal central section of a steam-cylinder constructed according to my invention.

The object of this invention is to change the motion of the slide-valve at the end of each stroke of the piston by the action of parts which are arranged in the interior of the cylinder and operated by the piston or parts attached to the same. This object is effected by connecting the slide-valve to a rod which connects two pistons working in cylinders that are formed by the ends of the valve-chest, and the outer ends of which connect by suitable channels with chambers which are situated in the cylinder-heads and communicate with the cylinder through openings that are closed by spring-valves. Whenever the piston approaches one of the ends of its stroke it strikes the stem of one of said spring-valves, and by opening the same allows the steam contained in the end of the supplementary cylinder to escape, and thereby the equilibrium on both ends of the small pistons connecting with the slide-valve is disturbed and the slide-valve is changed automatically. Small channels passing through said pistons allow the steam to pass into the supplementary cylinders; but these channels are so small in proportion to the channels leading from the supplementary cylinders to the chambers in the cylinder-heads that if one of the spring-valves is opened the steam from the supplementary cylinders escapes much quicker than it can be replenished through the small channel, and thus the equilibrium is disturbed and the slide-valve changed, as above stated.

A represents an ordinary steam-cylinder, provided with a piston, B. Steam is admitted to this cylinder through ports *a a'*, and it exhausts through the port *b*, and these ports are opened and closed by the action of the slide-valve C, which is of ordinary construction, and which may be arranged so as to admit steam under the valve, as shown in the drawing, or which may be constructed in any other suitable manner. This slide-valve is seated on the bottom of the steam-chest D, the ends of which form small cylinders E E′ to receive pistons F F′, which are connected to each other by a rod, G, and this rod is perforated transversely to receive a stud, *c*, which rises from the back of the valve. Small channels *d d'*, passing through the pistons F F′, form a communication between the interior of the steam-chest and the outer ends of the supplementary cylinders E E′, so that said small pistons are exposed to a uniform pressure of steam from all sides. The supplementary cylinders E E′ communicate through channels *e e'* with chambers H H′, which are formed in the cylinder-heads, and communicate with the interior of the main cylinder A by means of openings *f f'*. These openings are closed by valves I I′, the stems of which extend out through stuffing-boxes *g g'*, and also through the openings *f f'* into the interior of the cylinder A. Springs *h h'*, which act on the outer ends of the valve-stems, have a tendency to keep said valves closed. The area of the cross-sections of the channels *e e'* is much larger than that of the small channels *d d'*, passing through the supplementary pistons F F′, and if the main piston approaches one end of its stroke it strikes the stem of one of the valves, I′, and opens the same. The steam contained in the end of the small cylinder E′ is thereby allowed to escape through the channel *e'*, port *a'*, and exhaust-port *b*, and the equilibrium of the supplementary pistons F F′ is disturbed, causing said pistons to move in the direction of the arrow marked thereon in the drawing. By this motion the slide-valve is changed and the main piston begins its return-stroke. The valve I′ closes as soon as the main piston begins to recede by the action of the spring *h'*, and the equilibrium of the small pistons is restored by the steam passing in through the small channel *d'*. The same action takes place at the opposite end of the stroke of the main piston, and the slide-valve

is changed automatically by the action of mechanism chiefly situated in the main cylinder, so that in applying my reversing-gear to a steam-pump, for instance, the pump-cylinder can be brought close up to the steam-cylinder.

I claim as new and desire to secure by Letters Patent—

The valve-chambers H H′ and valves I I′ in the heads of the main cylinder A, in combination with supplementary cylinders E E′, pistons F F′, and slide-valve C, constructed and operating substantially as and for the purpose described.

A. S. CAMERON.

Witnesses:
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