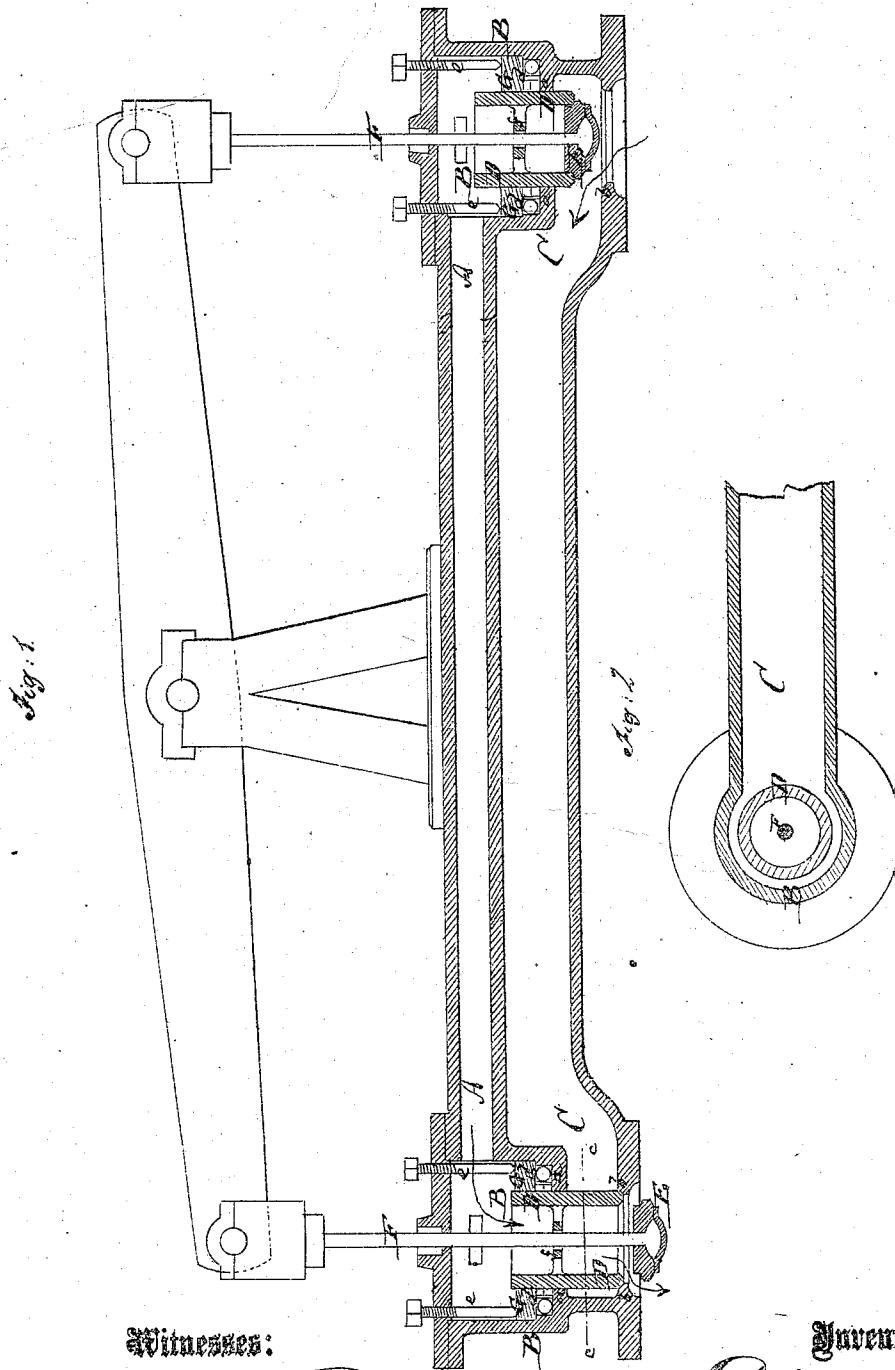


A. M. HALEY.

Improvement in Valves for Steamboat Engines.

No. 120,269.

Patented Oct. 24, 1871.



Witnesses:

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UNITED STATES PATENT OFFICE.

ANDREW M. HALEY, OF SIOUX CITY, IOWA.

IMPROVEMENT IN VALVES FOR STEAMBOAT ENGINES.

Specification forming part of Letters Patent No. 120,269, dated October 24, 1871.

To all whom it may concern:

Be it known that I, ANDREW M. HALEY, of Sioux City, in the county of Woodbury and State of Iowa, have invented a new and useful Improvement in Valve for Steamboat Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

Figure 1 represents a longitudinal section of a steam-receiving and exhaust-pipe which is provided with my improved valve. Fig. 2 is a detail horizontal section of the valve on the line *c c*, Fig. 1.

Similar letters of reference indicate corresponding parts.

My invention consists in the improvement in steamboat engine valves, as hereinafter fully described and subsequently pointed out in the claim.

A in the drawing is the steam supply-pipe, terminating in the upper part of an upright cylindrical chamber, B, whose open lower end communicates with the steam cylinder. C is the exhaust-pipe leading from the lower part of the chamber B. D is a tube open at both ends, fitted within the chamber B through an annular plate, *a*, which separates the lower from the upper part of said chamber. The lower edge of the tube D is so shaped as to fit the valve-seat *b* at the lower end of the chamber B. The tube D, when lowered upon the seat *b*, as shown at the left-hand side of Fig. 1, constitutes a valve for preventing the escape of steam from the steam-cylinder to the exhaust-pipe, while, when elevated, as on the right-hand side of Fig. 1, it opens the exhaust. E is a circular valve, suspended from a rod, F, and shaped to fit the lower end of the tubular valve D. When the valve D is raised to open the exhaust the valve E is also elevated, as at the right-hand side of Fig. 1, to prevent the supply of steam to the cylinder. When the hollow valve is lowered, as at the left-hand side of Fig. 1, the valve E is also

lowered, to permit the entrance of steam to the steam-cylinder, the exhaust being meanwhile closed by the hollow valve. To form the cut-off the valve E is drawn up into the hollow valve, and the dead-plate in that part of the valve E which first closes into the valve D forms the cut-off as it is stopped on the up-motion with the cut-off before it quite draws into the seat of the valve D. To make the exhaust, the valve E is started on the up-motion and draws the hollow valve out of its seat. *dd* are packing-rings, held down upon the plate *b* by an annular follower, G, so that they contract around the tube D. Other suitable packing devices may be used instead. *ee* are screws, which pass through the cap of the chamber B, to hold the follower G firm on the packing-rings. The pressure of steam on top of the hollow valve makes it follow the valve E down until it reaches the seat *b*. The valve E presses them still further down until the valve D is fully opened. There may be perforated guides *ff* in the tube D, steadying the motion of the stem F.

By the use of my hollow valve the exhaust-chamber is done away with, as well as considerable top-rigging of the engine, and a certain proportion of steam revolutions economized.

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

1. A steam supply-pipe, A, and exhaust-pipe C, combined with a chamber, B, communicating with steam-cylinder and with said exhaust-pipe, as described.

2. The combination with said chamber B of the open-ended tube D, movable therethrough, and the exhaust C having valve-seat *b*, for the purpose specified.

3. The combination with said chamber B, open-ended tube D, and exhaust C having valve-seat *b*, of the circular valve E, all constructed to operate in the manner described.

ANDREW M. HALEY.

Witnesses:

JAMES A. SAWYERS,
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