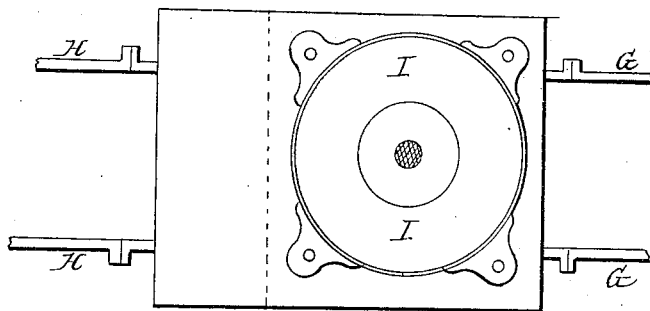
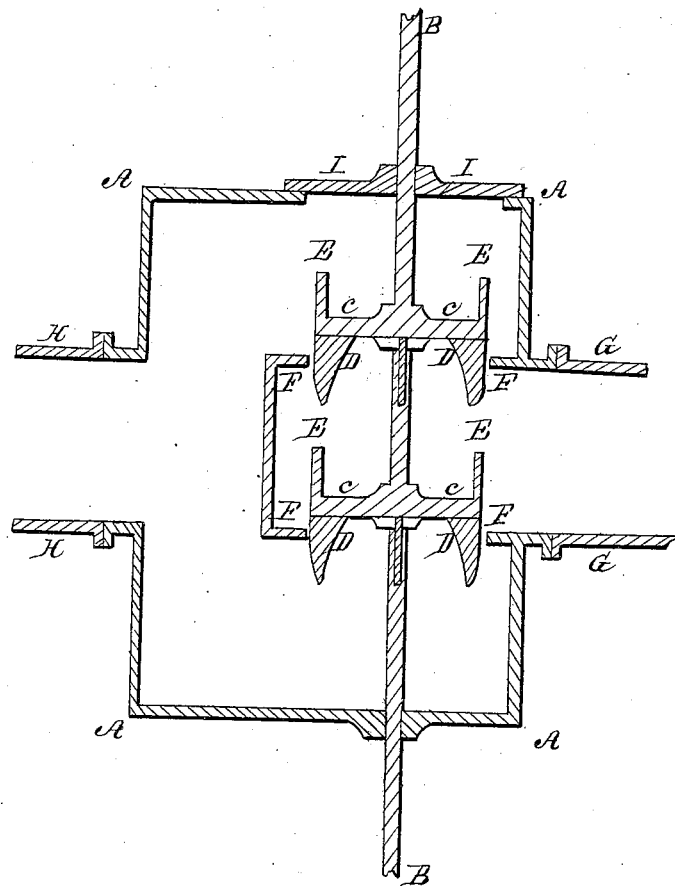


W. A. Lighthall,
Steam Puppet Valve.
No. 1,870. Patented Nov. 26, 1840.



UNITED STATES PATENT OFFICE.

WM. A. LIDTHALL, OF ALBANY, NEW YORK.

CUT-OFF VALVE OF STEAM-ENGINES.

Specification of Letters Patent No. 1,870, dated November 26, 1840.

To all whom it may concern:

Be it known that I, WILLIAM A. LIGHT-HALL, of the city and county of Albany, State of New York, have discovered certain

5 Improvements in Half-Stroke or Cut-Off Valves for Steam-Engines, which I call the "Double-Plunge Half-Stroke Valve," and of which the following is a full description.

10 A A A A, the steam chest; B B, the valve stems; C C, the plunge valves of equal diameter, with their rims or collars E E being from three to six inches deep in accordance with the required throw and recoil of the valve, thus allowing the valves sufficient play

15 or motion while they are in the openings and still continuing to close them; D D, four "lugs" or "guides" upon each valve having their outer edges gradually tapering inward toward the stem or rod which together

20 with said stem or rod secures the entrance of the valves into; F F, the valve seats or openings, which being "turned" or bored square instead of beveling or conical, allow the cylindrical formed valves to enter in and partially

25 through said opening and work as "plungers" with little or no friction. Thus it will be seen that this valve differs in structure and mode of working from any valves now or heretofore used. The collar part of

30 the valve being cylindrical instead of conical the lugs or guides being sufficiently tapered inward, and the seat or valve openings being also turned square or cylindrical on their edges instead of conical or beveling the

35 valves work by plunging into and partially through the seat or opening. the lugs or guides are never entirely withdrawn from the openings when lifted but on the return stroke or motion may pass completely

40 through the openings, the collars or rims still continuing to close the apertures. G G the opening to the side pipes. H H the opening to the steam pipe. I I the top view showing the top and bonnet of the steam

45 chest.

The whole apparatus will thus be seen to consist of a cast iron steam chest or box A A A A partially divided by an interior apartment division or chest with apertures

50 F F for admitting the steam from the exterior into the interior chest. The valves C C play or work in those openings and alternately close and open the communication between the steam apartments. The steam

pipe H H from the boiler opens into the exterior box or chest, and the steam pipe G G to the cylinder communicates with the interior box chest or apartment, when therefore the valves are lifted out of the openings the steam is admitted from the exterior chest

60 or apartment into the interior and thence to the side pipes upon the cylinder.

The advantages obtained by my improvements in the "cut off valve" as set forth in the specification and drawings herewith submitted may be thus briefly enumerated:

65 First. It shuts off the steam more perfectly than the cut off valves now in use, and sufficiently perfect for all the practical purposes of "a half stroke valve." Second. It requires less power from the engine to work it, because having two valve plates on one stem of equal superficies it is, when *in situ* in equilibrium, floating as it were, in the steam that surrounds it, the least possible force

75 destroys that equilibrium, and admits the steam. In this respect it is an improvement on the ordinary double balance valve for that requires the diameter or superficies of one valve plate, larger than the other to keep it in its seat, consequently greater force to displace it to admit the steam is necessary.

Third. It works without noise and consequently obviates the wear and tear from the collision which in the ordinary valves occurs

85 that noise. The conical or beveled rims or edges of the ordinary double valves strike on thin seats and "bring up" with a jar and recoil that soon renders readjustment and repair necessary and the recoil impairs their effect. If force be applied to counteract the recoil, then they bring up the harder.

Fourth. By passing through instead of on the seat these difficulties are obviated—the valve will wear longer without getting out

95 of order and the collars or rims allow it to vibrate (or work up and down) in the openings still keeping them closed, which is not accomplished in the ordinary half stroke valve.

100 In the foregoing specification I claim as my invention or improvement—

The combination of two valves working on one stem constructed as herein before described, to wit—with rims or collars of sufficient depth to allow the requisite degree of motion while in their seats, and yet continuing to keep the openings closed, and with

105

lugs or guides which prevent the valves from being displaced and at the same time, allow the steam to pass freely through the spaces between them.

5 In testimony whereof, I the said WILLIAM A. LIGHTHALL, hereto subscribe my name in the presence of the witnesses whose names

are hereunto subscribed on the twenty first day of October A. D. eighteen hundred and forty.

WM. A. LIGHTHALL.

Witnesses:

WASHN. Q. MORTON,
HML. MORTON.