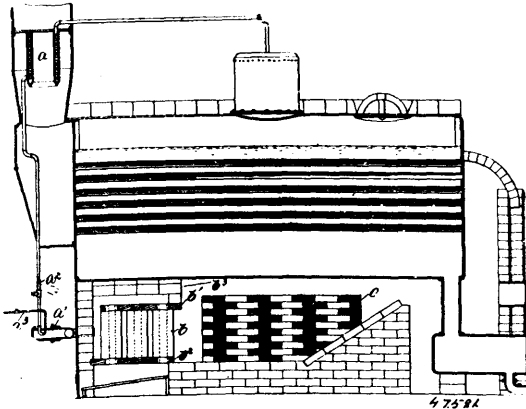
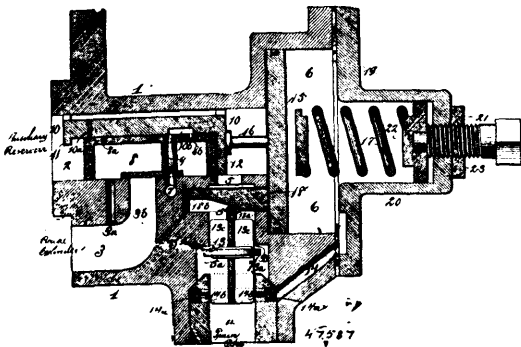


hearth, of regenerating chambers situated one on each side thereof, a flue leading from each of said chambers, a steam superheater situated in each of said flues, said superheaters being continuously in communication with a source of steam supply, each of said superheaters being in the form of an open-ended hollow



cylinder, the axis thereof lying in the line of travel of the escaping gases of combustion, a mixing chamber provided in each of said flues, said mixing chamber being in the form of a hollow open-ended cylinder, the axis thereof lying in the line of travel of the escaping gases of combustion, a steam duct and an oil duct opening into each of said mixing chambers, said steam ducts being adapted to communicate with said superheaters, and valve mechanism for sealing one or the other of said flues and opening the steam and oil ducts leading thereto, whereby the passage of the escaping gases of combustion prevents the accumulation of carbon in the mixing chambers, or of soot and ash on the superheaters, substantially as described. 2nd. The combination with the hollow tiles *b*, disposed between the plates *b*¹, *b*², of refractory material, of the oil and steam nozzles disposed opposite said tiles, air inlets beneath said tiles, and the wall *b*³ of refractory material above said tiles, substantially as described. 3rd. The combination with upper and lower walls, of hollow tiles of refractory material disposed between the same, oil and steam nozzles disposed opposite said tiles, air inlets beneath said tiles, and a passageway leading from the upper ends of said tiles to the mingled jet or steam and oil issuing from said nozzles, whereby the air is passed through the tiles before coming in contact with the oil and steam, substantially as described. 4th. The combination with the refractory material, of oil and steam nozzles disposed opposite the same, interior channels provided in said refractory material inaccessible to the oil and steam issuing from said nozzles, air inlets in communication with said interior channels, and a passageway leading from said channels to the mingled jet of steam and oil issuing from said nozzles, whereby the air is passed through the interior channels before coming in contact with the oil and steam, substantially as described.

No. 47,587. Triple Valve for Air-Brakes.
(*Triple soupape pour freins à air.*)



Henry Lawrence Howe, Canadaigua, New York, U.S.A., 4th December, 1894; 6 years.

Claim.—1st. A triple valve having train-pipe, auxiliary reservoir, exhaust and brake-cylinder openings, a valve-chamber with which said openings communicate, a valve in said chamber adapted to control communication between the exhaust and brake-cylinder openings and normally holding the brake-cylinder open to the exhaust, and also controlling communication between the auxiliary reservoir and brake-cylinder openings, a piston to operate said valve communication between the respective sides of said piston and the

train-pipe, and a double seated check valve controlling communication between the train-pipe and the valve-chamber and one side of the piston. 2nd. In a triple valve having brake-cylinder, exhaust and auxiliary reservoir openings, a recessed valve, the recess of which communicates with the exhaust and the brake-cylinder openings, and another valve controlling the communication of the brake-cylinder opening through the recess of the recessed valve with the exhaust, and with the auxiliary reservoir opening, substantially as described. 3rd. A triple valve having a valve-chamber, with auxiliary reservoir, brake-cylinder and train-pipe openings, each leading into said chamber, and a valve in said chamber controlling communication between the auxiliary reservoir and the brake-cylinder openings, and also communication between the train-pipe and the brake-cylinder openings, and a double-seated check-valve in said train-pipe opening, substantially as described. 4th. A triple valve having a valve-chamber, auxiliary reservoir, exhaust and brake-cylinder openings, each communicating directly with said chamber, a slide valve in said chamber controlling communication between the brake-cylinder and the exhaust openings and normally holding the brake-cylinder open to the exhaust, and also controlling communication between the auxiliary reservoir and the brake-cylinder openings, and a train-pipe passage opening into said valve-chamber independent of the auxiliary reservoir opening, and thence through the valve chamber to the auxiliary reservoir, whereby the train-pipe is in constant communication with the auxiliary reservoir during the controlling movements of said valve, substantially as described. 5th. The combination with the triple valve, having the valve-chamber and the auxiliary reservoir opening, the brake-cylinder opening, and the train-pipe opening in combination with the valve-chamber of the sliding valve in said valve-chamber adapted to establish communication between the valve-chamber and brake-cylinder by a partial movement in one direction and to establish communication between the train-pipe opening and said brake-cylinder by a continued movement in the same direction, a piston with which said valve is connected, communication between the respective sides of the piston and the train-pipe opening, and a two-seated check-valve between the train-pipe and one side of the piston. 6th. A triple valve of the character described, having a piston operating a valve for opening and closing communication between the auxiliary reservoir and the brake-cylinder, a check-valve in the train-pipe passage, and a projection on the piston adapted to engage the check-valve when communication with the brake-cylinder is closed, so that the auxiliary reservoir may be charged when communication with the brake-cylinder is closed, substantially in the manner explained. 7th. A triple valve for fluid pressure brakes, having a valve-chamber, a passage from the auxiliary reservoir to said valve-chamber, a passage from the brake-cylinder to said valve-chamber, a valve controlling the brake-cylinder passage, a piston controlling said valve, a passage communicating between the train-pipe and the valve-chamber and one side of the piston, a two-seated check-valve in said train-pipe passage, an independent passage between the train-pipe and the other side of the piston, and means carried by the piston for holding the check-valve from its seat against pressure in the train-pipe when the brake-cylinder is open to the train-pipe through the valve, substantially as and for the purpose set forth. 8th. A triple valve for fluid pressure brakes having passages for communication with the brake-cylinder and train-pipe, a valve for connecting the brake-cylinder and train-pipe passage, a piston for moving said valve, communication with one side of the piston from the train-pipe passage, a two-seated check-valve in said train-pipe passage, an independent passage for communication between the train-pipe and the other side of the piston, and an arm on the piston for engaging the two-seated check-valve and preventing it from seating by air pressure in the train-pipe, substantially as explained. 9th. A triple valve having train-pipe, auxiliary reservoir and brake-cylinder openings, a valve-chamber interposed between and forming a communicating passage from the train-pipe opening to the auxiliary reservoir opening, a valve in said chamber controlling communication with the brake-cylinder opening, and normally holding said cylinder open to atmosphere, a solid piston controlling said valve interposed between said train-pipe opening that leads into the valve-chamber on one side of said piston, and another opening from the train-pipe leading only to the opposite side of said piston, substantially as described. 10th. A triple valve having openings communicating independently with the auxiliary reservoir, brake-cylinder and train-pipe passages, a single valve-chamber into which said passages lead, and forming a connecting passage from the train-pipe to the auxiliary reservoir, and a single valve in said chamber controlling communication between the brake-cylinder and the train pipe passages, and also communication between the train-pipe and said valve-chamber, and a double seated check-valve in said train-pipe passage, substantially as set forth. 11th. The combination with a triple valve of an air-brake apparatus, of a check-valve in the train-pipe passage seating upwardly, and a movable stop positively preventing the seating of said check-valve, substantially as described. 12th. The combination with a triple valve of an air-brake apparatus, of a check-valve in the train-pipe passage seating upwardly, and a movable stop carried by a part of the triple valve to positively obstruct the seating of said check-valve, substantially as described. 13th. A triple valve having a valve-chamber with brake-cylinder, exhaust, auxiliary reservoir and train-pipe openings, each communicating with said chamber, and said valve-chamber forming a com-