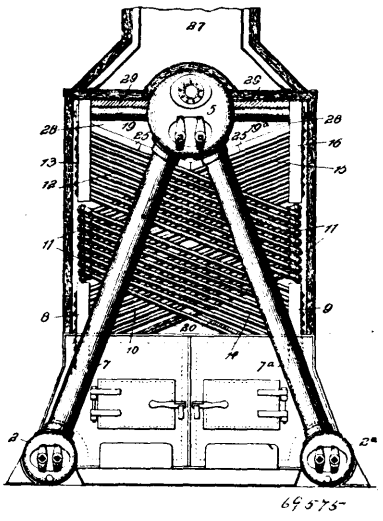
lower drums, two upper headers connected to opposite sides of the upper drum, and two diverging banks of tubes connecting each



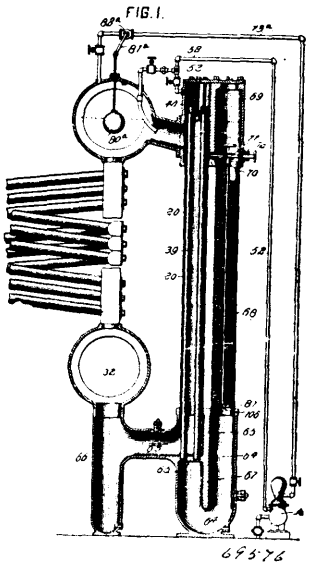
series of upper headers to the upper portions of the corresponding series of lower headers, substantially as set forth. 3rd. A header for boilers having its body bent so that the portion at one end will lie in a plane at an angle to a plane passing through the other portion, one of said portions being constructed to permit of the attachment of tubes to one side and the removal of tubes through the opposite side, substantially as set forth. 4th. In a boiler, the combination of two parallel or approximately parallel lower drums, tubular columns connected to said drums, two series of headers connected respectively to said drums, and forming the sides of the fire box, two series of upper headers the headers of each upper series being connected by diverging banks of tubes to the headers of the corresponding lower series, and connected upper drums connected to the tubular columns and to the upper headers, substantially as set forth. 5th. In a boiler, the combination of two parallel or approximately parallel lower drums, tubular columns connected to said drums, two series of headers connected respectively to said drums and forming the side of the fire box, two series of upper headers, the headers of each upper series being connected by diverging banks of tubes to the headers of the corresponding lower series, two upper drums arranged at or approximately at right angles to the lower drums and connected to the tubular columns, the connection between the upper drums being connected to the upper series of headers, substantially as set forth. 6th. In a boiler, the combination of two parallel or approximately parallel lower drums, two parallel or approximataly parallel upper drums arranged at or approximately at right angles to the lower drums, tubular columns connecting the upper and lower drums, one or more drums connecting the upper drums, two series of lower headers connected respectively to the lower drums and forming the sides of the fire box, two series of upper headers connected to the drum or drums forming the connection between the upper front and rear drums, and two diverging banks or series of tubes connecting each series of lower headers with the corresponding series of upper headers, substantially as set forth. 7th. In a boiler, the combination of two lower drums, two upper connected drums, tubular columns connecting the upper and lower drums, two series of lower headers connected to the lower drums, two series of upper headers having inwardly bent necks connected to the connection between the upper drums, and two diverging banks of tubes connecting each of the upper series of headers with the corresponding lower series of headers, substantially as set forth. 8th. In a boiler, the combination of two parallel or approximately parallel lower drums, a transverse drum connecting the latter at points adjacent to their rear ends, tubular columns connected to said drum, two series of headers connected respectively to the lower side drums and forming the sides of the fire box, two series of upper headers the headers of each upper series being connected by diverging banks of tubes to the headers of the corresponding lower series, connected upper drums connected to the tubular columns and to the upper headers, and a series of tubes connected to the lower transverse drum and to the upper drums and forming the rear wall of the combustion chamber, substantially as set forth.

No. 69,576. Feed Water Heater and Purifier.

(Chauffeur et purificateur d'eau d'alimentation.)

Archie Gerry Hohenstein, New Haven, Connecticut, U.S.A., 4th December, 1900; 18 years. (Fiied 20th October, 1900.)

Claim.—1st. A feed water heater having in combination one or more tubes for the passage of feed water, a chamber for the collection of precipitates at the discharge end of the tube or tubes, and a rising tube or gas separating chamber connected to the collecting chamber and the boiler, substantially as set forth. 2nd. A feed water heater



having in combination one or more tubes for the passage of feed water, a chamber for the collection of precipitates at the discharge end of the tube or tubes, and a rising tube or gas separating chamber connected to the collecting chamber and the boiler at points below the normal water level in the heater, substantially as set forth. 3rd. A feed water heater having in combination a chamber at its upper end adapted to receive the feed water, a heating chamber below the receiving chamber having connections to the boiler for the circulation of water or steam therethrough, a chamber for the collection of precipitates arranged below the heating chamber, tubes connecting the receiving and collecting chambers, and passing through the heating chamber, and a rising tube or gas separating chamber connected to the collecting chamber, and to the boiler, substantially as set forth. 4th. In a boiler, the combination of downtakes, feed water tubes passing through the downtakes, a settling chamber connected to said tubes, and rising tubes connected to the settling chamber and to the boiler, substantially as set forth. 5th. The combination of a boiler, feed water tubes passing through a portion of the boiler, a settling chamber connected to said tubes and rising tubes connected to the settling chamber and the boiler, substantially as set forth. 6th. The combination of a boiler, feed water tubes passing through a portion of the boiler, settling chambers connected to said tubes and rising tubes extending from the settling chamber to a point above the normal water level in the boiler, and having a connection with the boiler below the normal water level substantially as set forth. 7th. The combination of a boiler, feed water tubes subjected to the heat of the water of the boiler, a settling or collecting chamber connected to said tubes, a rising tube or gas separating chamber connected to said tubes and to the boiler, and a filtering material arranged in the rising tube, substantially as set forth. 8th. The combination of a boiler, a feed water heater, a connection between the boiler and heater to permit of the flow of water from the boiler, an injector having its nozzle connected to the feed water portion of the heater and its feed inlet connected to the heating portion of the heater, and its outlet connected to the boiler, and means for feeding water to the heater, substantially as set forth. 9th. The combination of a boiler, a feed water heater, in and out connections between the boiler and heater, an injector having its nozzle connected to the feed water portion of the heater, and its feeding portion forming a part of the connection between the boiler and heater, means for feeding water to the heater, and means operative on changes of water level in the heater or boiler for controlling the means for feeding water to the heater, substantially as set forth. 10th. The combination of a boiler, means for feeding water to the boiler and means for effecting a circulation of water in the boiler proportional to the rate of feed of water to the boiler, substantially as set forth. 11th. The combination of a boiler, means for feeding water to the boiler, means operative on a change of water level in the boiler for controlling the rate of feed of water to the boiler, and means controlled by the feed water for producing a circulation of the water in the boiler, substantially as set forth. 12th. In a feed water heater having in combination a receiving chamber, a settling chamber, an intermediate heating chamber, tubes extending from the receiving chamber through heating chamber into the settling chamber, and a rising tube connected to the settling chamber and extending above the normal water level in the receiving chamber, substantially as set forth. 13th. A feed water heater having in combination a receiving chamber, a heating chamber arranged below the receiving chamber, tubes extending from the