No. 886,516. PATENTED MAY 5, 1908.

R. KABLITZ.

FEED WATER HEATER FOR BOILERS.

APPLICATION FILED MAR. 6, 1907.

2 SHEETS—SHEET 1.

Fig. I

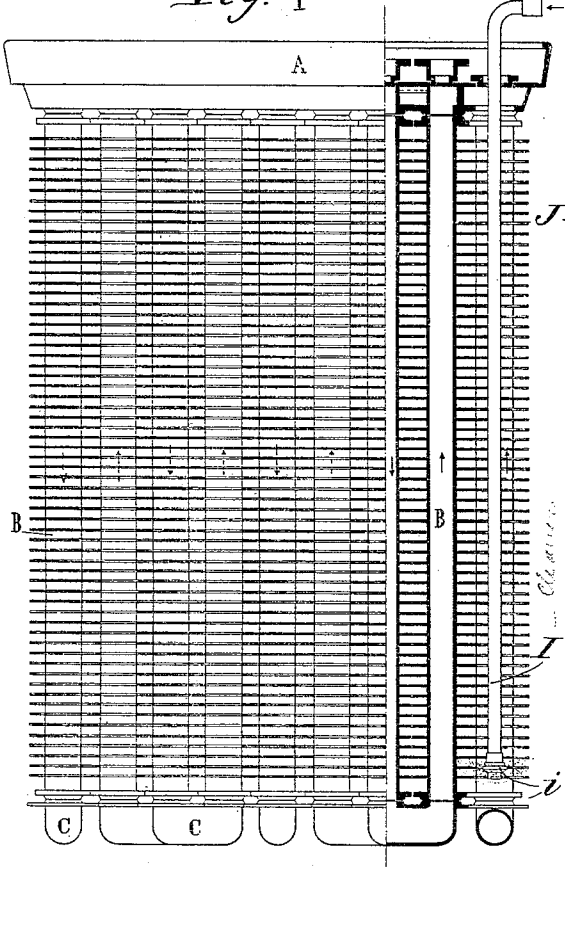


Fig. II

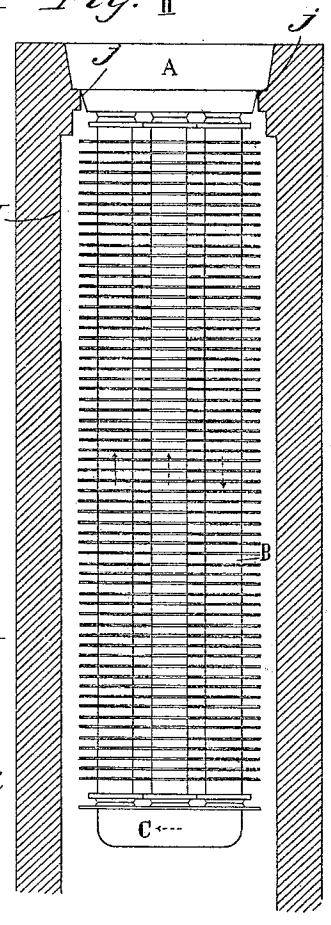
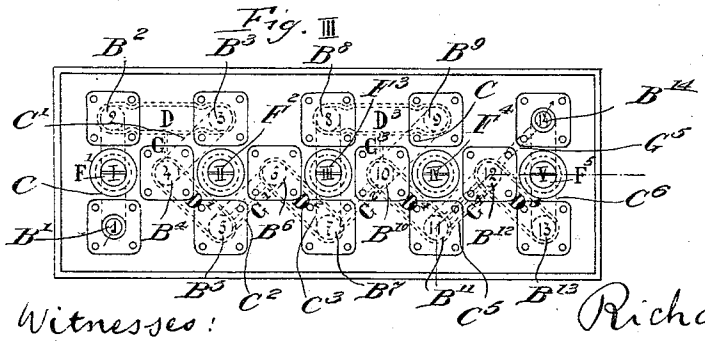


Fig. III



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2 SHEETS—SHEET 2.

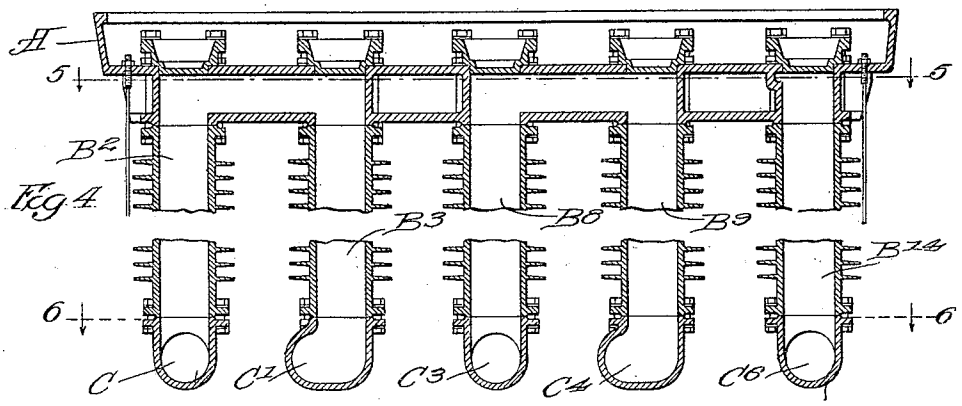


Fig. 4.

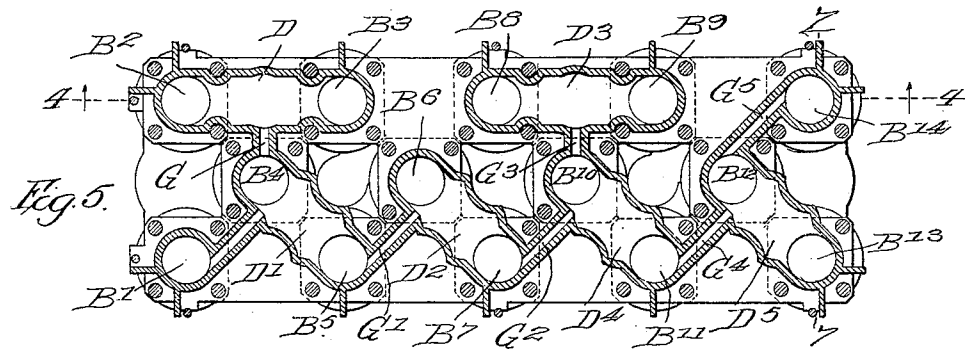


Fig. 5.

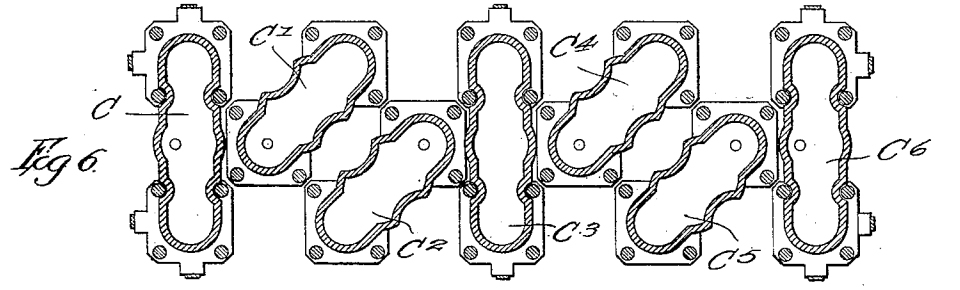


Fig. 6.

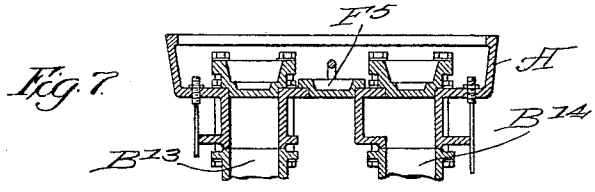


Fig. 7.

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PATENT OFFICE.

RICHARD KABLITZ, OF RIGA, RUSSIA.

FEED-WATER HEATER FOR BOILERS.

No. 886,516. Specification of Letters Patent. Patented May 5, 1908.

Application filed March 6, 1907. Serial No. 360,866.

To all whom it may concern:

Be it known that I, RICHARD KABLITZ, of Riga, Russia, have invented certain new and useful Improvements in Feed-Water Heaters, of which the following is a full specification.

This invention relates to improvements in feed water heaters for boilers and is designed to receive the feed water, prior to its admission to the boiler and heat the same.

The novel feature of the invention consists in the provision of a bearing or supporting member provided in its interior with a plurality of pipe connecting channels and gas by-passes connecting the same together with a plurality of ribbed tubes or pipes registering with said channels and connected with each other in such a manner that the feed water flows serially through all of said pipes from the point of ingress to the point of egress, the said supporting body being provided with cleaning openings and the said tubes or pipes being grouped about said openings in such a manner that the exterior ribbed portions of a plurality of pipes will be accessible to a cleaning device inserted through any one of said openings.

The invention will be more fully described in connection with the accompanying drawing and will be particularly pointed out and ascertained in and by the appended claims.

In the drawing: Figure 1, is a view in side elevation, partly broken away, of a heater embodying the main features of my invention. Fig. 2, is an end elevation of the heater showing the same disposed in a chamber adapted to receive the products of combustion from a furnace. Fig. 3, is a plan view of the heater. Fig. 4, is a sectional view on line 4—4 of Fig. 5. Fig. 5 is a sectional view on line 5—5 of Fig. 4. Fig. 6, is a sectional view on line 6—6 of Fig. 4. Fig. 7, is a sectional view on line 7—7 of Fig. 5.

Like characters of reference designate similar parts throughout the different figures of the drawing.

The supporting or bearing body is designated at A and is of hollow construction. Said body A is provided with a plurality of cleaning openings designated by F′ to F^5 inclusive, there being five of such openings shown and disposed in alinement with the longitudinal axis of said body A. Said openings are for the purpose of admitting a cleaning device, the purpose of which will hereinafter more fully appear. A plurality of pipe connecting channels are arranged in said body A and are designated by D to D^5 inclusive. Said channels are shown in dotted lines in Fig. 3 and adjacent channels are shown connected by by-passes indicated by G to G^5 inclusive. A plurality of ribbed tubes or pipes is secured to the member A and said pipes are designated by B′ to B^{14} inclusive, there being 14 of said pipes and the point of ingress being at pipe B′ while the point of egress is at pipe B^{14}. Said pipes are connected with each other at their ends remote from the body A by connections C′ to C^6 inclusive and the specific arrangement of said connections and also the arrangement of the pipes with respect to the channels is as follows:—

Pipe B′ is connected with pipe B^2 by connection C, pipe B^2 is connected with pipe B^3 by channel D, pipe B^3 is connected with pipe B^4 by connection C′, pipe B^4 is connected with pipe B^5 by channel D′, pipe B^5 is connected with pipe B^6 by connection C^3, pipe B^6 is connected with pipe B^7 by channel D^2, pipe B^7 is connected with pipe B^8 by connection C^3, pipe B^8 is connected with pipe B^9 by channel D^3, pipe B^9 is connected with pipe B^{10} by connection C^4, pipe B^{10} is connected with pipe B^{11} by channel D^4, pipe B^{11} is connected with pipe B^{12} by connection C^5, pipe B^{12} is connected with pipe B^{13} by channel D^5 and pipe B^{13} is connected with pipe B^{14}, which is the point of egress, by connection C^6. The arrangement of the by-passes is as follows:—Channels D and D′ are connected by by-pass G, channels D′ and D^2 are connected by by-pass G′, channels D^2 and D^4 are connected by by-pass G^2, channels D^3 and D^4 are connected by by-pass G^3, channels D^4 and D^5 are connected by by-pass G^4 and channel D^5 is connected with pipe B^{14} by by-pass G^5.

It will be noted that the pipes B′ to B^{14} inclusive are grouped about the several openings F′ to F^5 inclusive so that when a cleaning device is inserted through any one of said openings it will be in close proximity with the exterior portions of a plurality of pipes thereby greatly facilitating the cleaning operation. The ribs on said pipes present surfaces, which collectively speaking are of a relatively great area, and said surfaces rapidly collect portions of soot from the products of combustion and as they lose their efficiency when coated with soot it is essential to clean the same. The improved

arrangement hereinbefore set forth affords an easy and relatively rapid means for cleaning a plurality of tubes or pipes during or within the time in which it would be necessary to expend in cleaning one pipe.

I designates a cleaning device which is designed to be flexibly connected with a source of supply of steam or compressed air and which is adapted to be moved up and down through the several cleaning openings adjacent said pipes. Said device I may be provided with a suitable nozzle *i* adapted to discharge the air or steam onto said ribbed pipes to remove the material collected thereon.

The feed water entering at the top of pipe B′ passes downwardly therein through connection C and upwardly in pipe B^2 and this up and down course is continued until the water passes successively through each pipe and is discharged from pipe B^{14}. Throughout such course the water is subjected to the action of a relatively extensive heating surface since the exterior portions of all the pipes, connections and the bearing portion A are subjected to the action of the products of combustion and therefore the water is quickly and effectively heated prior to its admission to the boiler. The gases or steam which may accumulate in the heater will rise in the several pipes and will pass into the channels to which the pipes are connected and the several by-passes will afford ready escape of such confined gases to the outlet B^{14} and the course of the water will not be impeded or retarded in any way. In order to avoid short circuiting of the course of the water as a result of the presence of these by-passes the latter are relatively reduced in size with respect to the channels, between which they establish communication, therefore while the water is free to run through these by-passes only a relatively small quantity of water can be accommodated by them and therefore the efficiency of the heater is in no way impaired by the presence of these by-passes.

As hereinbefore stated the feed water is heated by the waste gases or products of combustion that pass out the chimney and as shown the device of my invention is disposed in a chamber J through which the products of combustion may pass if desired. In this arrangement the structure A acts as a supporting body and the pipes depend therefrom, however I do not wish to be limited to this specific arrangement. As shown in Fig. 2 the walls of the chamber J are provided with projections *j* and the supporting body A is constructed in a manner to seat on said projection and close the upper end of said chamber.

I claim:—

1. A feed water heater comprising in combination, a body structure provided with a plurality of cleaning openings and a plurality of pipe connecting channels, by-passes connecting said channels, and a plurality of ribbed pipes or tubes connected with each other and secured to said body structure in communication with said channels, the disposition of said pipes being such that a plurality thereof are closely grouped about each opening.

2. A feed water heater comprising in combination, a supporting structure provided with a plurality of cleaning openings and a plurality of pipe connecting channels, by-passes connecting said channels, a plurality of ribbed pipes or tubes depending from said structure and connected with each other and in communication with said channels, a plurality of said pipes being grouped about each opening in close proximity thereto, and a cleaning device adapted to be inserted through any one of said openings to clean the exterior portions of the plurality grouped about the used opening.

3. A feed water heater comprising in combination, a body structure provided with a plurality of pipe connecting channels serially arranged to provide a serial course for the feed water from a point of ingress to a point of egress, by-passes connecting said channels to provide a short circuit egress for the confined gases therein, and a plurality of ribbed pipes or tubes communicating with said channels and connected with each other to form with said channels a complete serial course for the water from the point of ingress to the point of egress, said structure being provided with a plurality of cleaning openings and a plurality of said pipes being grouped about each opening in close proximity thereto in a manner to be accessible to a cleaning device inserted through any one of said openings.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD KABLITZ.

Witnesses:
MAX DÝMSCHÜ,
LAURANCE HILL.