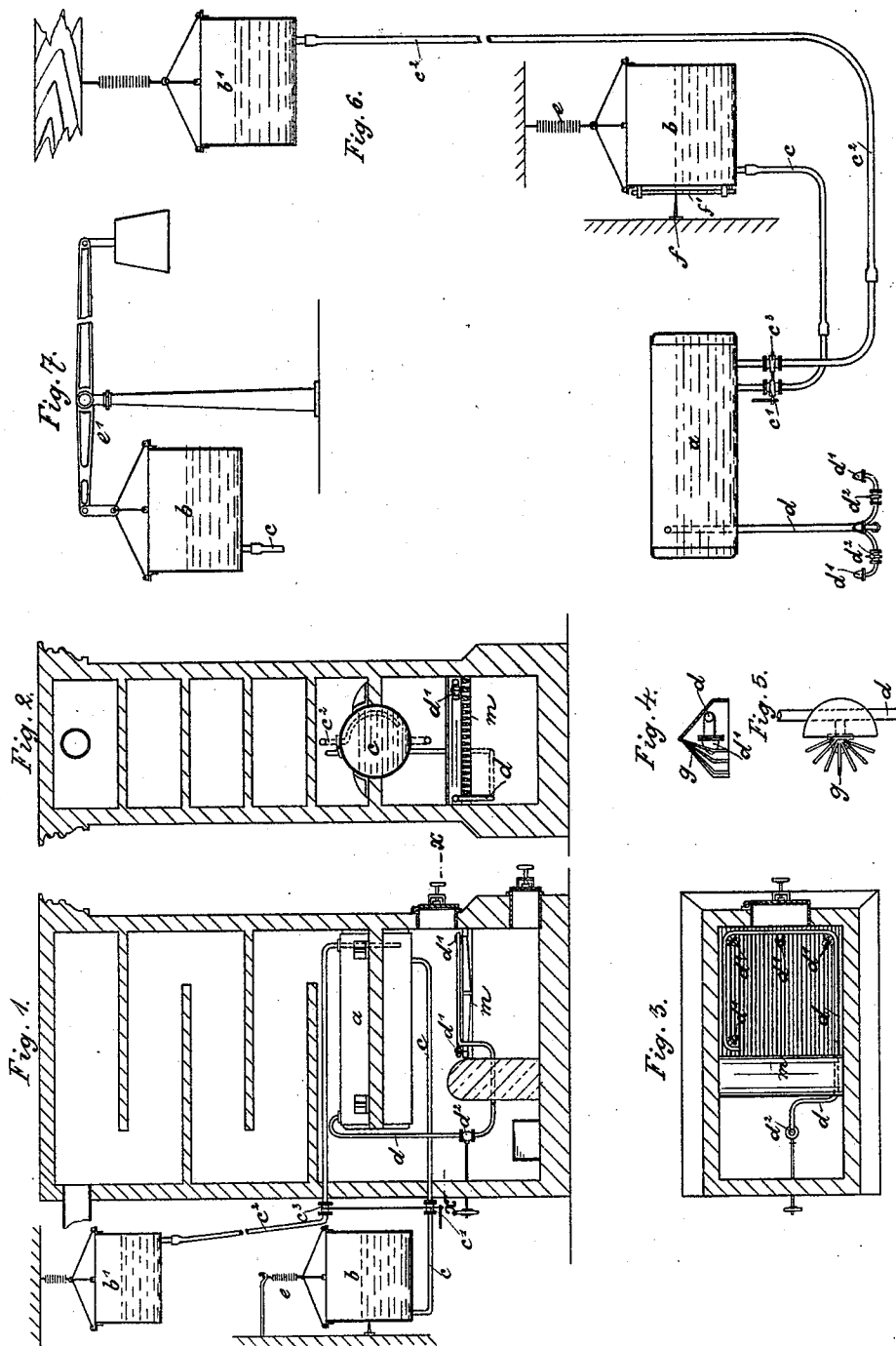


(No Model.)

P. HELLMICH.
BOILER FEEDER.

No. 519,709.

Patented May 15, 1894.



WITNESSES:

Wm. Schulz.
A. Jonghman.

INVENTOR

P. Hellmich
BY *Roeder & Briesen*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

PAUL HELLMICH, OF BEUTHEN-ON-THE-ODER, GERMANY.

BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 519,709, dated May 15, 1894.

Application filed May 6, 1893. Serial No. 473,206. (No model.)

To all whom it may concern:

Be it known that I, PAUL HELLMICH, a subject of the King of Prussia, residing at Beuthen-on-the-Oder, in the Province of Silesia, Germany, have invented a certain new and useful Boiler-Feeder, of which the following is a specification.

This invention relates to a novel feeding device for boilers, which is so constructed that water is supplied to the boiler from two reservoirs suspended at different elevations, so that a uniform feed under a varying steam pressure may be obtained.

In the accompanying drawings: Figure 1 represents a vertical longitudinal section of my improved boiler feeder, showing it applied to a steam jet apparatus. Fig. 2 is a vertical cross section of Fig. 1; Fig. 3 a horizontal section on line x, x , Fig. 1; Fig. 4 a detail section of the steam nozzle; Fig. 5 a plan thereof; Fig. 6 an elevation of the entire apparatus detached, and Fig. 7 an elevation of a modification of the suspending mechanism.

I have shown my improved feeding device applied to a boiler a , located above the grate m , of a stove and provided with steam nozzles, so as to aid combustion, but it is evident that my invention may be applied to a steam boiler generally, without regard to its function or specific construction.

From a water vessel b , suspended outside the stove, a feed pipe c , leads to the boiler, while a second steam pipe d , ending in several jet nozzles d' , conducts the steam to the grate surface. The feed pipe c , is provided with a valve c' , and the steam pipe d , is provided with one or several valves d^2 .

The water vessel b , is suspended from a spring e , (Fig. 6) or from a weighted lever e' , (Fig. 7) so as to be in a state of repose when filled with a certain quantity of water. Through the vessel b , and through the partly flexible pipe c , water is let into the boiler up to a certain height. The vessel, as it becomes heavier, descends a little and at an empirical place, a pointer f , is arranged, which shows, by means of a water level indicator f' , that the water has reached the height required in the boiler. The water levels in the vessel and in the boiler are then equally high, Fig. 6. During this time, the cock d^2 , re-

mains closed. As soon as the steam develops in the boiler, it presses part of the water from the boiler back into the vessel b , which becomes heavier and descends. The valve 55 or valves d^2 , being now opened, the steam is allowed to flow in jets from the nozzles d' , to the grate m . Thus the steam pressure upon the surface of the water in the boiler diminishes and when the water surface in the boiler 60 has become lower than that in the vessel b , the water will flow from the latter into the boiler, until the ratio of pressure is re-established. According to the quantity of water escaping from the vessel b , the latter will 65 grow lighter and will be lifted by the spring e , or the weighted lever e' . Thus the height of the water level in the vessel, and consequently that in the boiler, will remain constant, or alter to but a very small extent. 70 This constancy is the more exact, the more careful the tension of the spring e , or the ratio of the weighted lever e' , has been adapted to the weight of the vessel and to the relatively decreasing height of the water level in 75 the vessel.

With more extensive firings, it is of advantage—on account of the greater steam pressure in the boiler—to arrange a second water vessel above the vessel b , the water level of 80 which is to be situated at a certain height above that of the boiler. This height is necessary in order that on account of the greater development of the fire, the steam should have the necessary back pressure. The second 85 vessel b' , is connected to the boiler by a pipe c^2 , provided with valve c^3 .

When starting the apparatus, the vessel b , only, is placed into communication with the boiler in the manner already described. If 90 during the operation, the water is pressed over too vehemently from the boiler into the vessel, the vessel b , is disconnected by closing the valve c' , and the vessel b' , is connected by opening the valve c^3 . The pressure 95 of a water column between the two water levels in the boiler and in the vessel b' , will now act against the steam pressure and according to the proportions of pressure, the water will be exchanged between the boiler 100 and the vessel b' .

If desired, the valve c' , of pipe c , may be

connected to the valve c^3 , of pipe c^2 , so that as one valve is opened, the other valve is closed.

In order to protect the nozzles d' , and to keep the fuel at a certain distance from the steam ports, the nozzles are covered with caps g , Figs. 4 and 5. If the steam jets would act direct upon the burning fuel, the favorable effect of the jets upon the development of the flames would be somewhat diminished.

What I claim is—

The combination of a steam boiler with two

independent feed water chambers movably suspended at different elevations, pipes c , c^2 , of different lengths for separately connecting said chambers to the boiler and cocks within said pipes, substantially as specified.

Signed at Breslau, Province of Silesia, Empire of Germany, this 21st day of April, 1893.

PAUL HELLMICH.

Witnesses:

AUGUST DUSSWANGRO,
EDUARD ERY.