

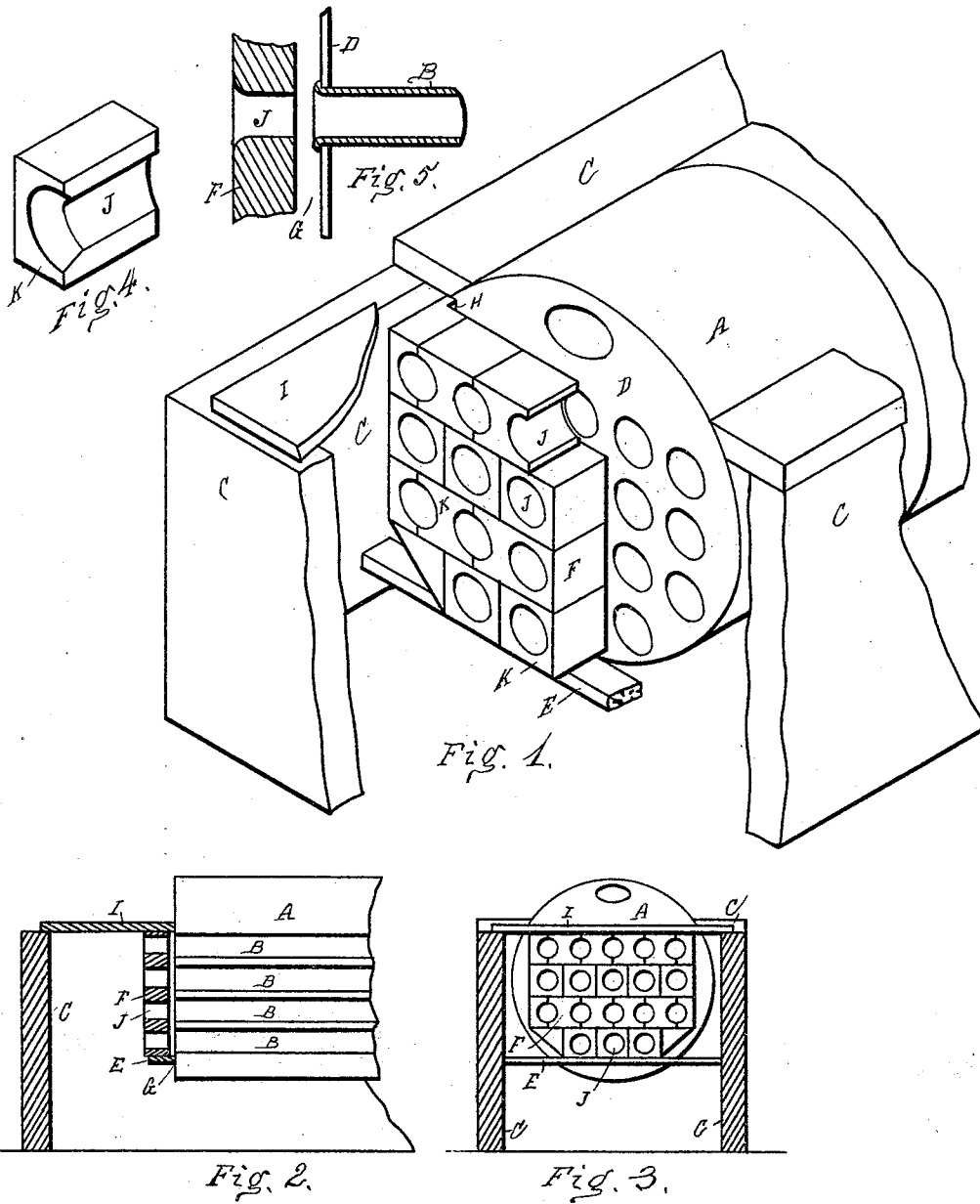
(No Model.)

H. WIGGE.

METHOD OF PROTECTING ENDS OF BOILER TUBES, &c.

No. 517,372.

Patented Mar. 27, 1894.



WITNESSES
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METHOD OF PROTECTING ENDS OF BOILER-TUBES, &c.

SPECIFICATION forming part of Letters Patent No. 517,372, dated March 27, 1894.

Application filed June 29, 1893. Serial No. 479,126. (No model.)

To all whom it may concern:

Be it known that I, HENRY WIGGE, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Methods of Protecting the Ends of Boiler-Tubes and Means Therefor, of which the following is a specification.

My invention relates to an improved method of protecting the ends of boiler tubes, and of means therefor, whereby the heat to which they are exposed is kept more constant, and the direct contact therewith of the cinders and variable flame is prevented.

The object of my improvement is to prevent the occurrence of leaks between the flues and boiler head in which they are secured. This object is attained in the following described manner as illustrated in the accompanying drawings, in which—

Figure 1 represents in perspective the rear portions of a boiler and furnace; Fig. 2 a longitudinal sectional elevation of rear portion of boiler and furnace; Fig. 3 a rear elevation of a boiler showing parts of the furnace in section; Fig. 4 a perspective view of a tile used in the construction of the fire wall; Fig. 5 a sectional detail of flue and fire wall.

In the drawings A represents the rear portion of a steam boiler, B the draft flues or tubes therein, C portions of the furnace in which the boiler is set. D is the rear boiler head in which one end of the flues is secured by swaging and calking as is usual. E is an iron beam extending across the furnace. F is a fire wall of incombustible material erected on said beam and covering the ends of the flues. G is an air space existing between the fire wall and the boiler head, and inclosed by a marginal projection H of the fire wall, and I an iron plate which serves to cover the top of air space G and the rear portion of the furnace. Openings J are formed through the fire wall directly opposite the ends of the respective flues, and are preferably of less diameter than the interior of the flues. K is a tile used in the construction of the fire wall. The heat is generated in the front portion of the furnace whence it passes rearwardly under the boiler and returns through the flues to the chimney. The intensity of the heat is subject to sudden variations from various causes, as by the

opening of the furnace door, replenishing the fuel, changing the draft dampers, &c. These sudden variations are especially injurious to the exposed flue joints, by causing irregular and incessant changes in the expansion and contraction of the parts, and soon result in producing leaks therein. This objection is remedied by my method of intercepting the heat in its passage to the flues by a fire wall provided with openings, said openings separate and conduct the heat to the interior of the respective flues, and prevent its coming in direct contact with the ends thereof. When the fire wall becomes heated its temperature remains substantially constant and is not sensitive to sudden variations, the temperature in the air space surrounding the ends of the flues is regulated by the heat of the wall, and is therefore less variable. The heated wall also serves to modify sudden variations in the currents of heat while passing through the openings therein to the flues. The smaller the size of the openings through the wall in relation to the size of the flues the farther the current of heat will be projected within the flues before expanding in contact with the sides thereof, and the more protection will be afforded to the ends of the flues from variations in the heat currents. The air space between the fire wall and boiler may be omitted and the wall be built against the boiler head. The holes through the wall may be enlarged or flaring on the outside to admit the heat more readily. The fire wall may consist of any incombustible material as iron, clay, or asbestos, and may be constructed and supported in any desirable manner, a single slab made of fire clay similar to furnace or stove linings, and of the proper dimensions and provided with the necessary openings opposite the ends of the flues, serves the purpose well for small boilers. It is convenient however in the construction of the walls, for large boilers to use prepared tiles of the forms shown in Figs. 1 and 4 and securing them properly together with fire clay. The fire wall should intercept the heat in its entrance to the flues, which in boilers of the locomotive type, would necessitate its location in the fire box where the heat passes directly to the flues, instead of first passing under the boiler

as is usual in stationary boilers set in separate furnaces.

By locating the wall in front of the end of the flues without having any portion of it projecting into the ends of the flues, it can expand and contract without being affected or broken, which would not be the case if any portion of it projected into the ends of the flues, as such portion must necessarily be very thin to prevent closing the ends of the flues, which would render such portion liable to be cracked or broken by the least movement of the wall.

I am aware that prior to my invention intermediate fire walls have been used in smoke consuming furnaces and that protectors have been inserted into the ends of the tubes or flues. I therefore do not claim such combination broadly, but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The herein described method of protecting the ends of boiler tubes which consists in separating the current of heat in its passage to the tubes and distributing the same, through a strata of air of substantially constant temperature, to the interior of the respective tubes without contact with the ends thereof.

2. The herein described method of protect-

ing the ends of boiler tubes which consists in maintaining the temperature, substantially constant, of a strata of air in contact with a boiler head, and passing currents of heat through the same to the interior of the respective tubes without coming in contact with the ends thereof.

3. The combination, with a tubular boiler and furnace, of a fire wall of incombustible material provided with openings of a less diameter than the boiler tubes and that register with the ends of the tubes respectively, whereby an air chamber is formed between said wall and the boiler head whereby the heat is admitted to the interior of the tubes through the openings in the fire wall and through said air chamber all portions of said wall being out of contact with the interior of the flues.

4. The combination, with a tubular boiler and furnace, of an iron beam across the furnace, near the end of the boiler, a perforated fire wall upon the beam, said wall consisting of a series of tiles of incombustible material, whereby an air chamber is formed between the end of the boiler and the wall.

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Witnesses:

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