No. 871,838. PATENTED NOV. 26, 1907.

J. F. WARWICK.

TILE CONSTRUCTION.

APPLICATION FILED MAR. 16, 1907.

Fig. 1.

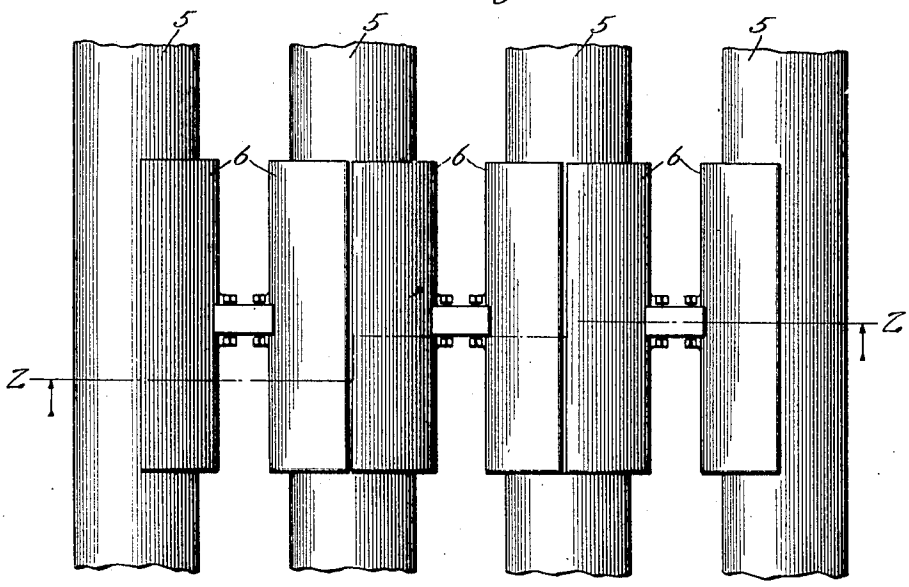


Fig. 2.

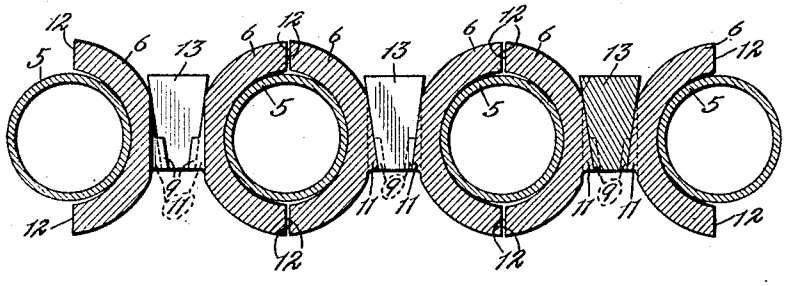


Fig. 3.

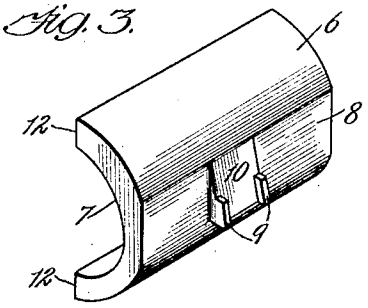
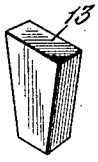


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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TILE CONSTRUCTION.

No. 871,838. Specification of Letters Patent. Patented Nov. 26, 1907.

Application filed March 16, 1907. Serial No. 362,653.

To all whom it may concern:

Be it known that I, JOHN F. WARWICK, a citizen of the United States of America, and resident of Chicago, Illinois, have invented a certain new and useful Improvement in Tile Construction, of which the following is a specification.

My invention relates to improvements in the form of tiling, especially that kind designed for use in connection with water-tube boilers, the object being to provide a tile that will not only provide protection for the tubes nearest the fire-box without materially reducing the flue space, but also to provide tiles that can be readily removed when desired.

A further object is to provide a tile that can be cheaply constructed and readily assembled in place about the tubes.

These and such other objects as may hereinafter appear, are attained by my device, an embodiment of which is illustrated in the accompanying drawings, in which

Figure 1 represents a series of tubes, showing a section of my improved tile in place. Fig. 2 is a cross-section on line 2—2 of Fig. 1, looking in the direction indicated by the arrows. Fig. 3 is a perspective view of my improved tile. Fig. 4 is a perspective view of the key.

Referring by numeral to the accompanying drawings, 5 represents boiler tubes or flues; 6 represents the tiles, which are preferably provided with recesses 7 extending longitudinally of the tile; the bottom of the tile is preferably flattened, as shown at 8, and has on the under surface thereof projecting ribs 9. That portion of the bottom 10 between the ribs is beveled, the lower edge of the beveled surface 10 extending above the bottom of the tile as shown at 11. The ribs 9—9 on adjacent tiles form with the beveled sides 10 a channel within which can be fitted the removable key 13. The angle of the beveled edge may be varied, and the angle of the key 13 made to correspond therewith. The depth of the recess 7 is so arranged with relation to the diameter of the tube 5 that when the tiles 6 are in place, the abutting ends 12—12 do not quite meet, leaving a space of possibly an eighth of an inch or so to allow for possible expansion of the tile under intense heat, to which it is subjected. This is quite an important feature, as in the event that no provision is made for expansion, the tile would be very apt to break, and possibly in such a way as to allow the bottom portion to drop down, leaving the tube exposed to the flame.

In the use of water-tube boilers, it has been found that the lower tier of tubes—that is, those subject to the direct action of the flame—become blistered, and burn in a very short time, necessitating the putting out of the fires and the renewal of the tubes, occasioning both loss of time and great expense. In the tile construction shown in applicant's Patent No. 828,355, issued August 14, 1906, the injurious effect of a direct action of the flames on the tubes was prevented, but it has been found that in the event that it became necessary for any purpose to remove one of the tubes in the lower tier, or if it became necessary to remove one of the tile jackets, it was a difficult task, as it also became necessary to remove the entire section. By the use of my improved construction, it will at once be evident that after the tiles have been put in place and the keys 13 dropped in the channels therebetween, when it is desired to remove a section, it is simply necessary to remove two keys and turn the tiles to an angle of ninety degrees, which allows the bottom tile to drop off, after which the top tile can be turned around to occupy the lower position, and drops readily from the tube. The height of the ribs may be so arranged with respect to the distance between the tubes as to render it impossible for more than the desired number of tiles to be removed when the keys are removed; or in the event that the spaces between the tubes are so great as to allow the adjacent tiles to drop from the tubes, a false key may be slipped into place, holding the tile in place if desired. By this construction, it will at once be seen that the fitting of the tiles in place and removal of any portion of the same when desired becomes an extremely simple task. It will be noted, in this construction, that there is plenty of clearance between the adjacent tiers of tiles to permit the free passage of the products of combustion, so as in no way to impair the efficiency of the boiler.

A further advantage accruing from the use of my device is that the heated products of combustion, in passing in close proximity to the highly heated fire brick, tend to oxidize

the free carbon and the gases, and prevent smoke as well as tending to economy in the use of fuel.

I claim:

1. A tile construction comprising pairs of tile having oppositely disposed recesses adapted to form a series of channels, a series of outwardly extending ribs on the sides opposite said recesses forming channels therebetween, and a tapered key fitting within said channel holding said tiles in place.

2. A tile construction comprising pairs of tile having oppositely disposed semi-cylindrical recesses adapted to form a series of tubular channels, a series of outwardly extending ribs on the sides opposite said recesses forming channels therebetween, and a tapered key fitting within said channel holding said tiles in place.

3. A tile construction comprising pairs of tile having oppositely disposed semi-cylindrical recesses adapted to form a series of tubular channels, a pair of outwardly extending ribs oppositely disposed to said recess forming with the ribs on the adjacent tile an angularly disposed channel, and interlocking means for holding said tile in place.

4. A tile construction comprising pairs of tile having oppositely disposed semi-cylindrical recesses adapted to form a series of tubular channels, a pair of outwardly extending ribs oppositely disposed to said recess, forming with the ribs on the adjacent tile a channel at right angles to said tubular channel, and interlocking means for holding said tile in place.

5. A tile construction comprising pairs of tile having oppositely disposed semi-cylindrical recesses adapted to form a series of tubular channels, a pair of outwardly extending ribs oppositely disposed to said recess, forming with the ribs on the adjacent tile a channel at right angles to said tubular channel, and a key adapted to fit within said channel and to lock said tiles securely in place.

6. A tile construction comprising pairs of tile having oppositely disposed semi-cylindrical recesses adapted to form a series of tubular channels, a pair of outwardly extending ribs oppositely disposed to said recess, forming with the ribs on the adjacent tile a channel at right angles to said tubular channel, and a tapered key adapted to fit within said channel and to lock the said tiles securely in place.

7. A tile construction comprising a pair of tiles adapted to fit together inclosing a tubular recess, pairs of outwardly projecting ribs adapted to register with the ribs on an adjacent tile, that portion of the face of the tile between said ribs being beveled, forming with said ribs a channel between abutting tiles, and a key adapted to be removably seated within said channel.

8. A tile construction comprising pairs of tiles adapted to fit closely together but not abutting, forming a tubular recess therebetween, pairs of outwardly projecting ribs adapted to register with the ribs on an abutting tile, that portion of the face of the tile between said ribs being beveled, forming a channel between adjacent tiles at right angles to said recess, and a key adapted to be removably seated within said channel.

Signed by me at Chicago, Illinois, this 13th day of March, 1907.

JOHN F. WARWICK.

Witnesses:
SARAH LEWIS,
F. H. DRURY.