

Dec. 30, 1924.

1,521,035

H. H. MERCER

FORGING FURNACE

Filed March 17, 1921

Fig. 1.

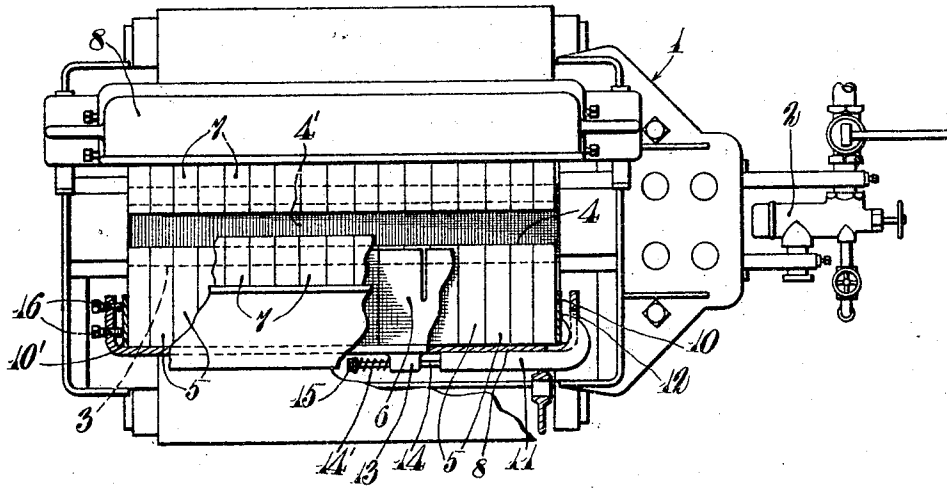


Fig. 2.

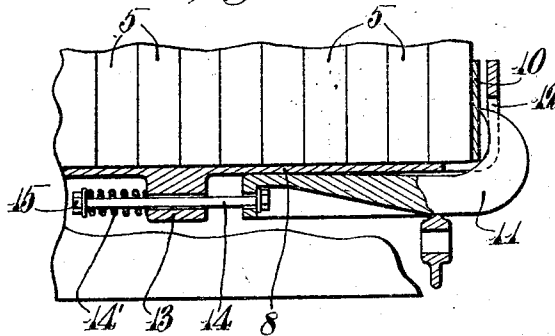
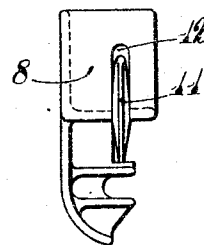


Fig. 3.



Inventor:
Henry H. Mercer.
by
Horace L. Lake
att'y.

UNITED STATES PATENT OFFICE.

HENRY H. MERCER, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNOR TO SULLIVAN MACHINERY COMPANY, A CORPORATION OF MASSACHUSETTS.

FORGING FURNACE.

Application filed March 17, 1921. Serial No. 453,105.

To all whom it may concern:

Be it known that I, HENRY H. MERCER, a citizen of the United States, residing at Claremont, in the county of Sullivan, and State of New Hampshire, have invented certain new and useful Improvements in Forging Furnaces, of which the following is a full, clear, and exact specification.

My invention relates to forging furnaces and more particularly to improved means for retaining the hearth bricks thereof in proper position.

An object of my invention is to provide an improved forging furnace. Another object of my invention is to provide an improved means for retaining the hearth or other fire bricks of a forging furnace in proper position, which means shall provide for the expansion and contraction of the parts of the furnace at the high temperature variations which occur in the use of furnaces. A further object of my invention is to provide an improved means for retaining these bricks in position without weakening them by perforations or subjecting them to equal strain and for holding them firmly irrespective of heating of the furnace. Other objects of my invention will appear in the course of the following specification and appended claims.

In the illustrative form of my invention, I have shown for purposes of illustration, one form which my invention may assume in practice.

In these drawings,—

Fig. 1 is a plan view with parts broken away showing a forging furnace provided with my improved mechanism for retaining the hearth bricks thereof in proper position.

Fig. 2 is an enlarged view of my retaining means, the same being shown in horizontal section.

Fig. 3 is a fragmentary end view of my retaining means.

For purposes of illustration I have shown my improved mechanism used with a forging furnace generally indicated by 1 and comprising a suitable oil atomizing device 2 discharging into a combustion chamber 3 which combustion chamber is provided, extending longitudinally along the top thereof, with a flue 4 for the discharge of products of combustion. This flue is

formed by series of fire bricks 5 arranged on opposite sides of the flue and limiting the area thereof. The tops of these hearth bricks make up a hearth which is protected against fracture of the bricks by means of a sheet metal protecting plate 6. Arranged at the top of the hearth is a second flue 4' whose lateral boundaries are formed by a series of fire bricks 7, 7. For the purpose of holding the bricks 5, 5 forming the hearth in position, I employ a metal housing 8 which partially surrounds said brick. This housing is of iron and according has a relatively high coefficient of expansion. The coefficient of expansion of the fire bricks, however, is relatively very small and accordingly no system of rigid locking means between the fire bricks 5, 5 and the housing 8 would suffice to retain the fire brick firmly in place when the furnace was heated up without subjecting the brick to danger of breakage upon cooling down of the furnace. I accordingly have provided an improved brick retaining means comprising a plate 10 arranged at the end of the series of fire brick and have secured to the side of the housing 8 a clamping hook 11 which projects through a slot 12 in the corner of the housing and engages with its point the plate 10. The clamp member 11 is provided with a rod 14 passing through a guide 13 secured to the housing member 8 and a spring 14' surrounds the rod 14 and is placed under compression by means of a nut 15. It will be obvious that the spring 14' constantly exerts a pull upon the clamping member 11 and so tends to hold the bricks 5, 5 in tight engagement with each other. Upon heating up of the furnace, the housing 8 will naturally expand more than the bricks but this does not result in a material loosening of the brick by reason of the fact that the spring 14' always maintains the brick under pressure. For adjusting the position of the brick relative to the frame of the furnace, I employ a plate 10' similar to the plate 10 and adjustable relative to the housing 8 by a plurality of adjusting screws 16. The hook 11 and spring 14' maintain the brick tightly pressed against the plate adjusted by the screws 16.

While I have in this application speci-

cally described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a furnace, a wall exposed to combustion products and made up of a series of fire brick, and means for yieldingly holding them in position comprising a plate engaging one end of said series and means for applying an elastic pressure perpendicularly to said plate at a point adjacent the center thereof.

2. In a furnace, a wall exposed to combustion products and made up of a series of alined fire brick, and means for resiliently holding them in position including means for applying a yielding pressure perpendicularly thereto substantially uniformly under all conditions over a large area of the last brick at one end of the series.

3. In a forging furnace, a hearth comprising a series of fire brick, a housing therefor, and means for maintaining said fire brick in said housing comprising a hook carried by said housing and operative to apply pressure to the end of said series of brick, and spring means for placing said hook under tension.

4. In a forging furnace, a hearth comprising a series of fire brick, a housing therefor, means for adjusting said brick relative to said housing, and means for maintaining said fire brick in said housing comprising a hook carried by said housing and operative to apply pressure to the end of said series of brick, and spring means for placing said hook under tension.

5. In a furnace, a wall exposed to combustion products and made up of a series of abutting fire brick, and means for yieldingly supporting said brick including plates engaging the outer sides of the end bricks of the series, and means including a slidable member for applying a yielding pressure in a direction perpendicular to said plates to at least one of the latter and at a point opposite said end brick.

6. In a furnace, a wall exposed to combustion products and made up of a series of abutting fire brick, and means for yieldingly supporting said brick including plates engaging the outer sides of the end bricks of the series, and means for applying a yielding pressure in a direction perpendicular to said plates to at least one of the latter including a spring drawn hook slidable in a direction parallel to said first mentioned direction.

7. In a furnace, a wall exposed to the products of combustion and made up of a

series of fire brick, and means for yieldingly holding them in position comprising a plate engaging one end of said series, and means for applying an elastic pressure to said plate engaging the latter only over a small area remote from every edge thereof.

8. In a furnace, a refractory wall exposed to the products of combustion and comprising a series of fire brick, a metallic casing therefor, and means carried by said casing to hold said bricks in position including manually adjustable means constituting a fixed end abutment for one end of said series and means resiliently applying pressure to the other end of said series.

9. In a furnace, a refractory wall composed of a series of fire bricks, a metallic casing therefor, and means including a slidable member carried and guided by said casing for resiliently applying pressure in a plane lengthwise of said wall to permit heat expansion therebetween.

10. In a furnace, a straight refractory wall composed of fire brick, a metallic casing therefor, and means acting between said casing and wall for directly exerting pressure in a plane perpendicular to the ends of said wall.

11. In a furnace, a refractory wall composed of fire bricks and plates engaging the ends thereof, a metallic casing therefor, and means to permit different expansions between said wall and casing while applying a substantially equal pressure throughout the length of said wall comprising a plurality of respectively rigidly and resiliently adjustable members engaging said end plates.

12. In a furnace, a wall exposed to the products of combustion and made up of a series of fire brick, a metallic casing therefor, and means carried by the exterior of said casing and extending into the interior thereof for resiliently applying pressure to said brick to hold them in position during relative movement between said wall and casing on heating them.

13. In a furnace, a wall exposed to the products of combustion and made up of a series of fire brick, a metallic casing therefor, and means carried by said casing and including a slidable member guided thereby for resiliently exerting a pull upon one end of said wall.

14. In a furnace, a refractory wall exposed to the products of combustion and comprising a series of fire brick, a metallic support for the same, a member slidable on the exterior of said support, and means acting on said member for applying a constant pressure to said brick for holding the latter in position.

15. In a furnace, a refractory wall exposed to the products of combustion and comprising a series of fire brick, a metallic casing enclosing the same, a member slidable

on the exterior of said casing including a portion extending into the interior of the same, and means acting on said member for applying a constant pressure to said brick for holding the latter in position. 5 for, and means for maintaining said fire brick in said hearth comprising a hook carried by said support operative to apply pressure to the fire brick and means for placing said hook under pressure. 10

16. In a furnace, a hearth comprising a series of fire brick, a metallic support there-

In testimony whereof I affix my signature.
HENRY H. MERCER.