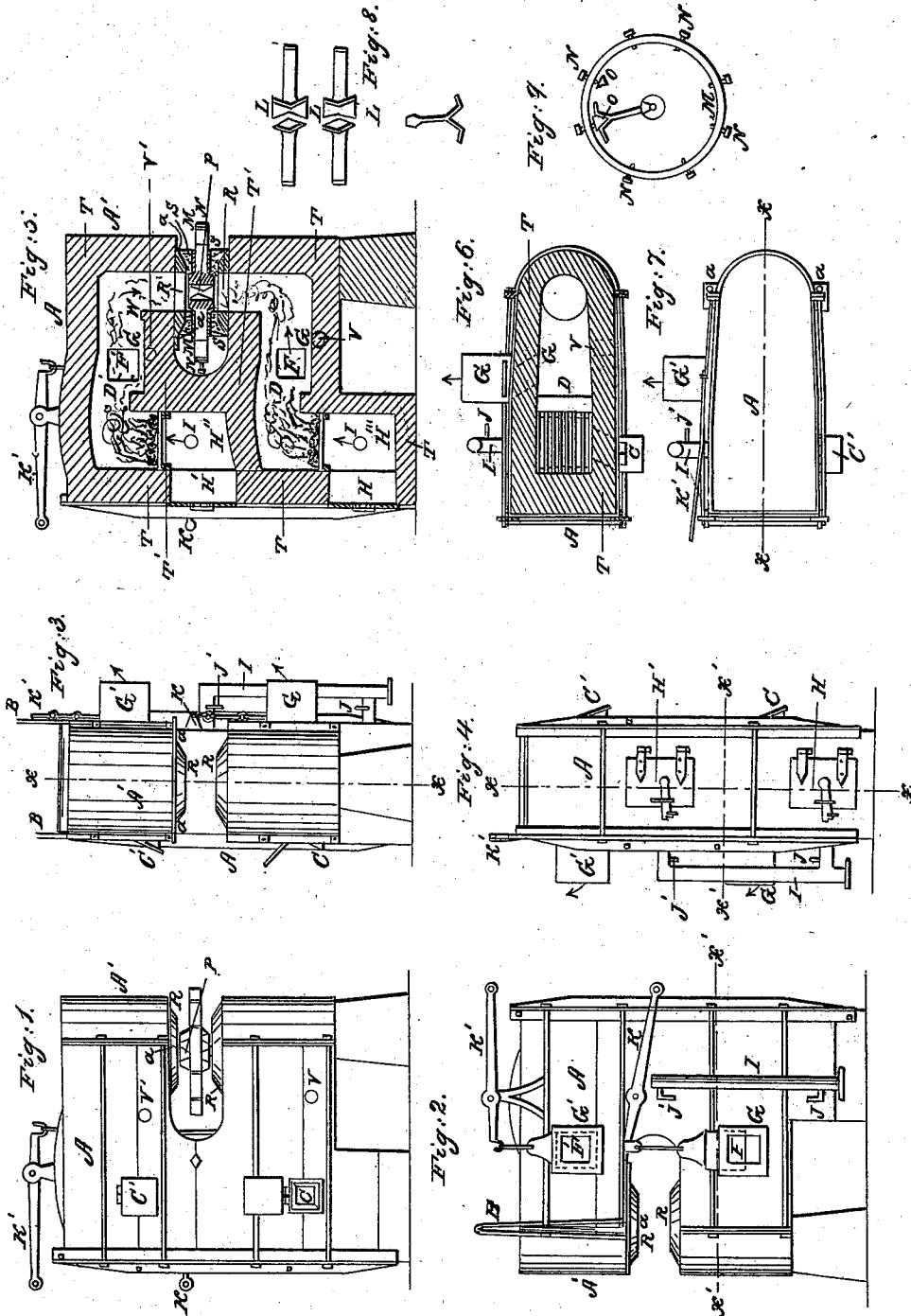


W. R. THOMSON.

Furnace for Heating Wrought Iron Wheels for Forging.

No. 12,800.

Patented May 1, 1855.



UNITED STATES PATENT OFFICE.

WILLIAM R. THOMSON, OF CLEVELAND, OHIO.

FURNACE FOR HEATING WROUGHT-IRON WHEELS FOR FORGING.

Specification of Letters Patent No. 12,800, dated May 1, 1855.

To all whom it may concern:

Be it known that I, W. R. THOMSON, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Furnaces for Heating and Welding Wrought-Iron Railroad-Wheels and for other Similar Purposes; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The nature of my invention consists in the peculiar arrangement of a double furnace, by which the sections of which the wheel is composed, are welded together at the butts, forming the hub in such a manner that the heat from the furnace passes around and through the center of the hub, from above and below, alternately, as may be required, without moving the wheel during the process of heating. The furnace may be used for other similar purposes.

Figure 1, is a side elevation of my improved furnace; Fig. 2, a view of the reverse side of Fig. 1; Fig. 3, an end elevation; Fig. 4, a view of the opposite end of Fig. 3; Fig. 5, a vertical section in the direction of the lines $x x$ in Figs. 3, 4 and 7. Fig. 6, a horizontal section in the direction of the lines $x' x'$ in Figs. 2 and 4, and Fig. 7, a top view.

The other views will be referred to in description.

Like letters refer to like parts in the several views.

The furnace, A, may be constructed of any size, that the nature of the case may require, and is built of fire brick or other suitable material, and sheathed on the sides and ends with iron plates secured by bolts and nuts, or their equivalents.

For the purpose of supporting the projecting end A', it is secured by bolts B B, on each side, which are attached to the iron plates a , upon which the projection A' rests, and to a frame work above, so as to sustain the end A' by aid of the bolts attached to the plate a .

C C' are the fuel doors to the upper and lower furnaces D D' as seen in Fig. 5, which are provided with grates in the ordinary way.

F F' are the dampers of the flues G G'

connecting the chimney with the furnaces at G G', seen in Figs. 5 and 6.

H H' Figs. 4 and 5, are the ash pit doors. The wind pipe I enters the ash pits H'' H''' as seen in Fig. 5, for the purpose of blowing the respective furnaces D D' above. The blast for the purpose may be obtained by any of the ordinary means. The wind pipe I, is provided with valves having handles on the outside, as shown at J J', for the purpose of cutting off the blast, and blowing either of the furnaces separately, as may be required.

The levers K K' Fig. 2, are connected by a rod to the dampers F F' by which they are opened and closed. The wheel is first forged in sections according to the number of spokes, the butts of which have curved or angular sides as seen at L L, Fig. 8, so as to prevent any one section from moving out of place when being welded together, which is the case when the sides are straight; the furnace, however, may be used in welding wrought iron hubs, of any form of construction.

When the sections comprising the wheel are put together, they are secured in place by a band or clamp M, Fig. 9, provided with set screws N, in number according to the spokes. These screws are set into angular blocks O, placed between the arms of the spokes f , as seen in Fig. 7, by which means the sections are firmly held together inside of the clamp during the process of being welded, and swaged or hammered into form. The sections being thus secured by the clamp and screws so as to form the wheel, it is placed so that the hub P, will be between the norrels R R of the furnace, as seen in Figs. 1 and 5. In this position the wheels are supported, and the hub temporarily surrounded with fire brick or other suitable material, as represented at S S Fig. 5, for the purpose of confining the heat to the hub; in this position the wheel remains until sufficiently heated or welded, when it is removed for the purpose of swaging or hammering the heated hub together, into shape.

The heat from each furnace is alternately directed to the hub above, and below, and while the hub is being heated, the spokes are protected by the material which surrounds the hub, so that they are not burnt, to which they are liable in the ordinary process of heating or welding the hub.

For the purpose of giving draft to the fires when first made in the furnaces, the dampers F F' are opened, and afterward closed as may be required. By opening the damper F', and closing the damper F, and shutting off the blast from the furnace D, and by closing the valve J', and opening the valve J, the furnace D will then receive the blast, and the fire will pass from the furnace D, to the underside of the hub P, and surround it upon all sides as it ascends to the upper furnace and passes out through the flue G', to the chimney.

When the hub is sufficiently heated on the underside, the direction of heat to the hub is reversed by closing the damper F', and opening the damper F, and by shutting off the blast from the furnace D, and opening the valve J', so as to blow the furnace D'; by this means the fire from the furnace D is stopped, and the fire from the furnace D', passes to the top of the hub, and surrounds it on all sides as it descends to the furnace D, and passes out through the flue G to the chimney. The degree of heat or draft, to the furnaces may be controlled by the dampers F F', and valves in the wind pipe I, and at the same time the fire from either of the furnaces D, or O', may be alternately directed to the upper and lower side of the hub, until it has acquired the necessary degree of heat.

As the blast is cut off from one furnace, while the other is being blown, the fires do not interfere with each other; the circuit or draft being cut off from one furnace, the fire remains at rest while the other furnace is in action, as before described.

The usual mode of welding or heating wrought iron rail-road wheels, is by an ordinary forge fire, and only one side of the hub at a time is heated and welded together, as follows; as soon as the hub is sufficiently heated on one side, it is removed to the anvil, and a washer or ring which has been heated in another forge, is welded to the end of the hub, as the sections or butts comprising the hub, are being hammered together by hand. Both sides of the hub are treated

in this manner, separately, consequently while one end of the hub is at a welding heat, the other is not, thereby the hub is imperfectly welded, and is unsound, and the spokes liable to be burnt. These difficulties do not occur with my improvement as the hub is not treated and hammered together one side at a time, but on both sides and entirely through by the furnaces before it is swaged or hammered together.

The wheel is not moved in the furnace until the hub is at a welding heat. Then it is compressed, swaged and welded together on all sides, by the actions of dies corresponding to the shape of the hub and spokes, which I have described in a previous application; or it may be done by any of the ordinary means in use for such purpose. The fire which is at rest may be replenished with fuel, so that when it is again in action, the fire will be clear as possible in heating the metal, hub, or other article.

T represents the outside walls of the furnace, and T' the inside wall between the upper and lower fire places, which are built in with the outside walls.

V V', are slag holes to draw off the slag which may accumulate from the fires. The ridge W, is for the purpose of preventing the slag from running down the nozzle upon the hub or other article which is being heated. The slag may be drawn off through the slag hole V', as fast as it forms inside of the ridge.

What I claim, as my improvement, and desire to secure by Letters Patent, is,

The arrangement of the furnace A, with double fire places or chambers D D', furnished with flues G G', and dampers F F', in combination with the wind pipe I, and valves J J', for the purpose of alternately heating both sides of the hubs of wrought iron wheels, or other articles between the nozzles h h in the manner herein specified.

WILLIAM R. THOMSON.

Witnesses:

W. W. BURRIDGE,
ERASTUS SMITH.