

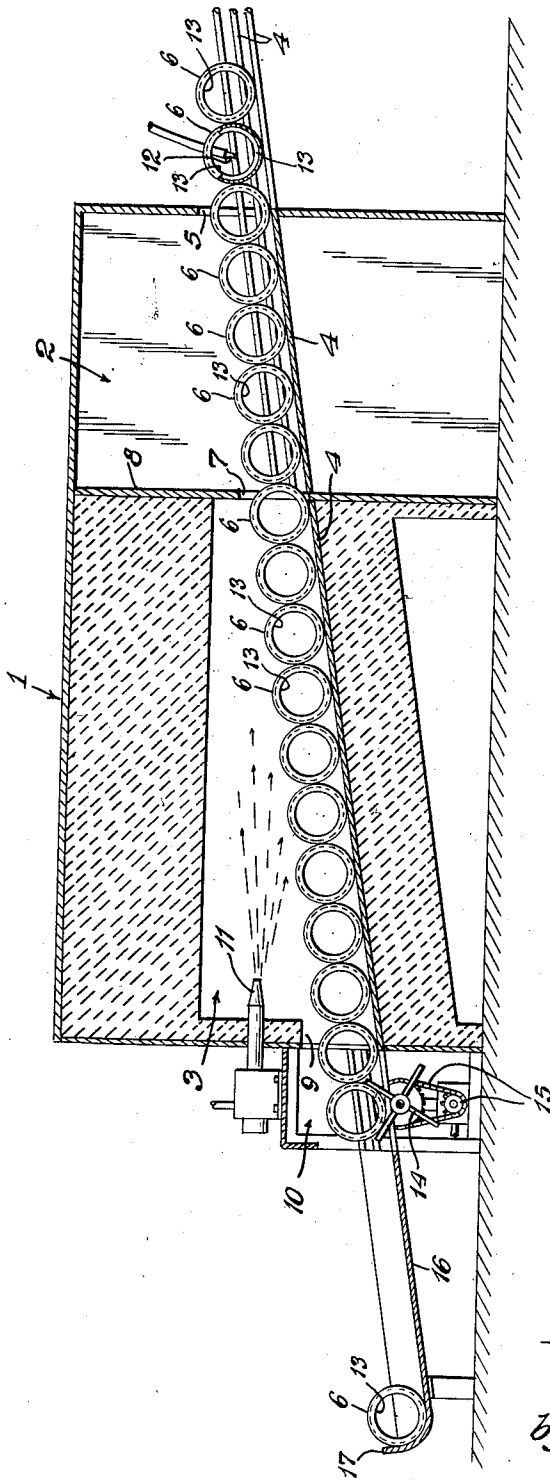
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METHOD AND APPARATUS FOR FLUXING STEEL RINGS

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METHOD AND APPARATUS FOR FLUXING STEEL RINGS

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9 Claims. (Cl. 117-97)

Our invention relates to improvements in means for fluxing and heating steel rings.

One object of our invention is to provide means for heating steel rings which are intended to be used as molds into which cast iron linings will be deposited while preventing formation of oxides which might prevent the perfection of the fused bond.

Another object of the invention is to insure that the flux will be completely deposited over the entire inner periphery of the ring before it is heated to a point at which scale formation might take place.

Our invention is specifically directed toward the preparation of rings which, when lined with cast iron, will serve as brake drums for automobiles and the like, but since the invention is not limited to that, we have not illustrated the particular use to which the rings are placed.

The invention is illustrated more or less diagrammatically in the accompanying drawing which is a vertical section through the device of our invention.

1 is a furnace divided up into a preheating and vaporizing chamber 2 and into a heating chamber 3. Tracks 4 extend downwardly from one end of the furnace to the other through the preheating and the heating chambers. The port 5 in the wall of the preheating chamber permits steel rings 6 to travel downwardly along the tracks 4 into the preheating chamber. The port 7 in the wall 8 between the preheating and heating chamber permits continuous movement of the rings downwardly. A port 9 in the wall of the heating chamber permits the rings to travel into the control chamber 10. 11 indicates diagrammatically the fuel nozzle through which gas or oil may be introduced into the heating chamber to raise the temperature of the rings to the desired point, preferably to a cherry red.

The port between the heating chamber and the preheating chamber, while it furnishes opportunity for the rings to travel down the incline track from one chamber to another, also permits the escape of sufficient heat from the heating chamber to the preheating chamber to vaporize the liquid carrier of any suitable fluxing material which may be deposited on the inner periphery of the ring by the nozzle 12. It will be noted that the rings have at each end interned flanges 13 so that a measured supply of flux liquid may be deposited in each ring by the nozzle controlled by any suitable means not herein shown, or even by an operator ladling the flux in as he deposits the ring on the track so that each ring as it enters the preheating chamber is supplied with a pre-measured quantity of flux in a liquid carrier.

In the control chamber at the down-stream side of the heating chamber is a paddle wheel 14 driven by any suitable means 15 for continuous movement. This paddle wheel has a plurality of blades which extend upwardly above the track and engage one of the drums to arrest its movement, the other drums piling up behind it tending to move by gravity along the track are limited in their downward movement as result of the limit applied to the lowermost drum by the paddle wheel. It will be understood that since the paddle wheel is continuously rotating, the drums are never brought fully to rest. Their movement is a gradual one, not necessarily constant in speed, but the result of this is that as the rings travel down into and through the preheating chamber the entire inner periphery of each ring is wetted by the fluxing liquid and as the drum travels downwardly in the preheating chamber, that fluxing liquid is gradually evaporated so that by

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the time the drum has made its full travel into the heating chamber, such evaporation will have continued to such a point that the entire inner periphery of the ring will be coated and since the ring never comes to a full stop, but is always rotating such a coating will be substantially uniform throughout. Then, as the ring passes down into the heating chamber, it will be raised to red heat without scale formation.

As the paddle rotates it releases one ring after another and so the ring finally released never having come to a full stop rolls down the trough 16 to be brought to rest by the stop 17 at the point where the ring is to be used. Thus, by the arrangement shown, I am able to supply a series of rings one at a time in such wise that each ring is fluxed and heated by a continuous movement through the fluxing and heating zones and each ring is only brought to rest at the point at which it is to be used.

We claim:

1. The method of preparing flanged metallic rings for the receipt of a molten metal lining which consists in the steps of depositing in each ring a measured quantity of liquid flux, continuously rotating said ring while causing it to travel, substantially immediately thereafter, through a preheating, fluxing-vaporizing chamber, heating said ring during its rotation and travel through said vaporizing chamber to a temperature sufficient only to vaporize the liquid in said flux, continuing the rotation and travel of said ring through said vaporizing chamber until the inner periphery of said ring is coated with a generally-uniform layer of solid flux material, then while continuing the rotation of said ring, causing it to continue its travel into and through a heating chamber, heating said ring during its rotation and travel through said heating chamber to a temperature above the casting temperature, then releasing said ring from said heating chamber and causing it to move rapidly to a work zone and there arresting its movement.

2. The method of preparing flanged metallic rings for the receipt of a molten metal lining which consists in the steps of depositing in each ring a measured quantity of liquid flux, continuously rotating said ring while causing it to travel, substantially immediately thereafter, through a preheating, flux-vaporizing chamber, heating said ring during its rotation and travel through said vaporizing chamber to a temperature below casting temperature, continuing the rotation and travel of said ring through said vaporizing chamber until the inner periphery of said ring is coated with a generally-uniform layer of solid flux material, then while continuing the rotation of said ring, causing it to continue its travel into and through a heating chamber, heating said ring during its rotation and travel through said heating chamber to a temperature above the casting temperature, then releasing said ring from said heating chamber and causing it to move rapidly to a work zone and there arresting its movement.

3. The method of preparing flanged metallic rings for the receipt of a molten metal lining which consists in the steps of depositing in each ring a measured quantity of liquid flux, continuously rotating said ring while causing it to travel, substantially immediately thereafter, through a preheating, flux-vaporizing zone, gradually heating said ring during its rotation and travel through said vaporizing zone to a temperature sufficient only to vaporize the liquid in said flux, continuing the rotation and travel of said ring through said vaporizing zone until the inner periphery of said ring is coated with a generally-uniform layer of solid flux material, then while continuing the rotation of said ring, causing it to continue its travel into and through a heating zone, gradually heating said ring during its rotation and travel through said heating zone to a temperature above the casting temperature, then releasing said ring from said heating zone and causing it to move rapidly to a work zone and there arresting its movement.

4. The method of preparing flanged metallic rings for the receipt of a molten metal lining which consists in the steps of depositing in each ring a measured quantity of liquid flux, continuously rotating said ring while causing it to travel, substantially immediately thereafter, through a preheating, flux-vaporizing chamber, heating said ring during its rotation and travel through said vaporizing

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chamber to a temperature sufficient to vaporize the liquid in said flux but insufficient to cause flash vaporization thereof, continuing the rotation and travel of said ring through said vaporizing chamber until the inner periphery of said ring is coated with a generally-uniform layer of solid flux material, then while continuing the rotation of said ring, causing it to continue its travel into and through a heating chamber, heating said ring during its rotation and travel through said heating chamber to a temperature above the casting temperature, then releasing said ring from said heating chamber and causing it to move rapidly to a work zone and there arresting its movement.

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5. The method of preparing flanged metallic rings for the receipt of a molten metal lining which consists in the steps of depositing in each ring a measured quantity of liquid flux, continuously rotating said ring while causing it to travel, substantially immediately thereafter, through a preheating, flux-vaporizing chamber, coordinating the period of travel of said ring through said vaporizing chamber with the temperature therein to vaporize gradually the liquid in said flux during said travel, continuing the rotation and travel of said ring through said vaporizing chamber until the inner periphery of said ring is coated with a generally-uniform layer of solid flux material, then while continuing the rotation of said ring, causing it to continue its travel into and through a heating chamber, heating said ring during its rotation and travel through said heating chamber to a temperature above the casting temperature, then releasing said ring from said heating chamber and causing it to move rapidly to a work zone and there arresting its movement.

6. Means for fluxing and heating annular metal drums, including an inclined track along which the drums are free to travel by gravity, a furnace enclosing the track intermediate its ends, means at the upper end of the track

for supplying to the inner periphery of each drum liquid flux, means at the lower end of the track for retarding but never preventing downward movement of a series of drums along a track, the drums engaging one another at their outer peripheries, said means being adapted to successively release one drum after another for free travel under gravity along a track, the furnace including a partition dividing said furnace into a vaporizing chamber adjacent the upper end of the track and a second chamber above the drum-retarding means along the track and means for heating the area within said vaporizing chamber to one temperature and the area within said second chamber to a higher temperature.

7. The structure of claim 6 wherein said vaporizing chamber is substantially larger in area than said second chamber.

8. The structure of claim 6 wherein said heating means includes a burning instrumentality in said second chamber and a port in said partition positioned to permit the upward flow of hot gases from said second chamber to said vaporizing chamber.

9. The structure of claim 8 wherein said port surrounds said track and is of sufficient size to permit the passage therethrough of said drums as they travel from said vaporizing chamber to said second chamber.

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