

W. REUBOLD.
 APPARATUS FOR QUENCHING COKE.
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Fig. 2.

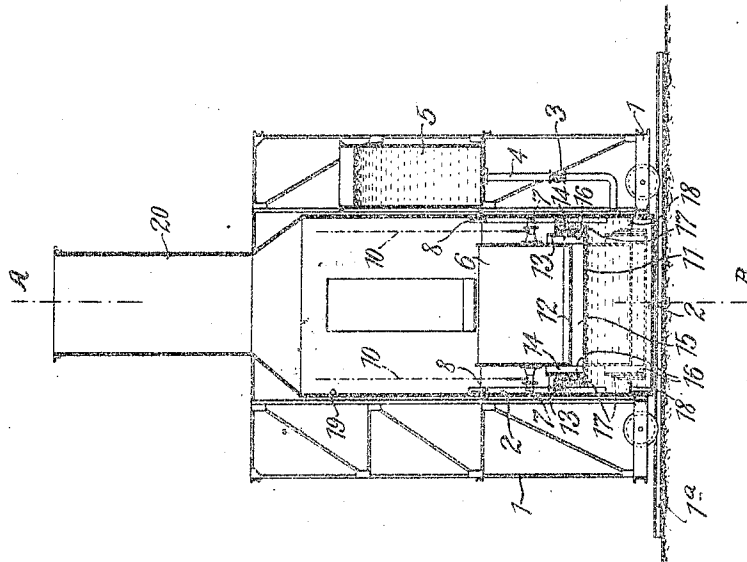
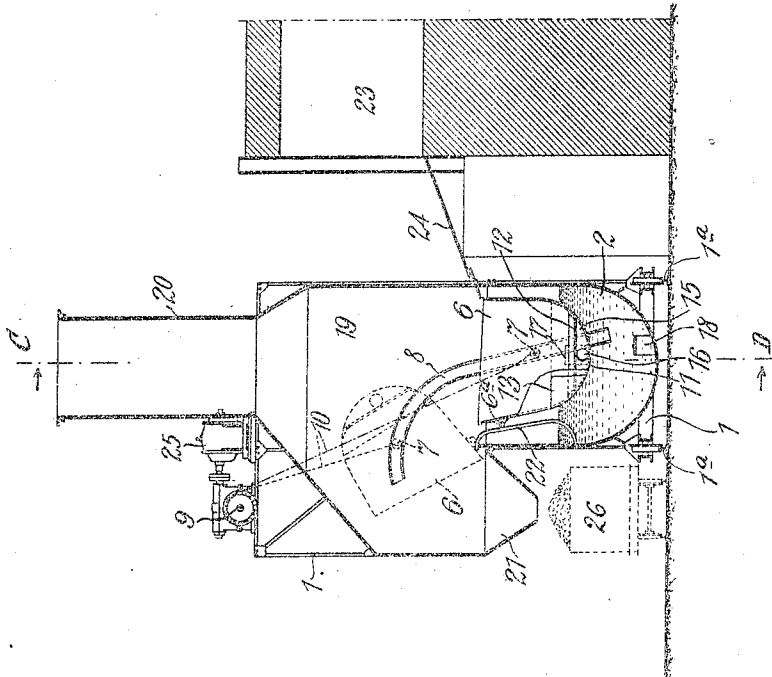


Fig. 1.



Witnesses

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APPARATUS FOR QUENCHING COKE.

1,065,081.

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To all whom it may concern:

Be it known that I, WILHELM REUBOLD, a subject of the German Emperor, and resident of Charlottenburg, Germany, have invented certain new and useful Improvements in Apparatus for Quenching Coke, of which the following is a specification.

My invention relates to a device for quenching coke, particularly in cases where large masses of incandescent coke are to be quenched, as in the operation of coke ovens, chamber ovens for the production of illuminating gas, etc.

The object of my invention is to provide a coke-quenching apparatus which will be of very simple construction and great reliability in operation, enabling the incandescent coke to be quenched thoroughly with the use of a minimum quantity of quenching liquid, for instance water, that is to say, without drenching the coke with too great a quantity of quenching fluid.

Another object of my invention is to subject the trough receiving the incandescent coke, to an efficient cooling action during the entire time that the coke is discharged into said trough, so as to protect the trough against excessive wear and premature destruction.

In the accompanying drawings I have shown as an example, one form of quenching apparatus embodying my invention, Figure 1 being a vertical section on the line A—B of Fig. 2, and Fig. 2 being a vertical section on the line C—D of Fig. 1.

The coke-quenching apparatus shown comprises a frame 1, preferably mounted to travel, as on tracks 1^a, so that the apparatus may be brought into operative relation to any coking chamber of a group or bench, one such chamber being indicated at 23 in Fig. 1. On the frame 1 is firmly secured the receptacle or tank 2 adapted to contain the quenching liquid (say, water) supplied from a storage tank 5 (likewise carried by said frame) through a pipe 4 provided with a valve 3. The tank or trough 6 adapted to receive the incandescent coke from the oven chamber 23 (say with the aid of a stationary incline or chute 24) is provided at its central portion with lateral guide rollers 7 adapted to travel along two parallel curved guides 8 the lower portions of which are on the side walls of the receptacle 2 while the up-

per portions of the guides are on the side walls of a box or casing 19 forming in part an upward continuation of the said receptacle. A winch or drum 9, connected with a wire, chain or cable 10 attached to the axles of the rollers 7, serves to draw up the coke trough 6 or to let it down. The drum 9 is actuated by a suitable motor 25, an electric motor being preferred when the apparatus is constructed to travel relatively to the ovens.

In its lower position, the trough 6 dips into the quenching water contained in the tank 2. The trough has a double bottom 11, 12; the lower watertight portion 11 is extended laterally beyond the perforated false bottom 12, and in conjunction with vertical side walls or cheeks 13 forms chambers or pockets 14 communicating with the space or compartment 15 intervening between the bottom walls 11, 12. Each of the cheeks 13 is provided with an opening 16 adapted to be closed by a slide 17 or other suitable device. At the lower portion of the tank 2 stops 18 are provided in the path of the slides 17. The box or casing 19 has at the top a chimney or outlet pipe 20 for the escape of the steam evolved during the quenching of the coke. On that side of the apparatus where the quenched coke is to be discharged, a funnel or hopper 21 is arranged; at a proper height to deliver the coke, say to a car 26. On that side of the tank 2 which is near the hopper 26, I provide a guide 22 adapted to engage a projection 6^a on the trough 6 and to govern the vertical movement and tilting of said trough, the guides 8 and 22 cooperating to produce the desired motion of the trough as it is raised or lowered by the cable or chain 10.

According to my invention the weight and the dimensions of the coke trough 6 are so selected that before receiving its charge of coke, the trough will float in the quenching liquid contained in the tank 2, as indicated in the drawings by solid lines. In this position, the cheeks 13 connected with the bottom 11 will project partly above the level of the liquid, and since the slides 17 are in the closed position, the quenching liquid will be in contact only with the outer surface of the tank, at its lower portion, but will have no access to the interior of the tank. The only effect of the liquid at this

time will be to cool the lower part of the tank 2 externally.

As soon as the trough 6 is weighted by incandescent coke delivered thereto (say from the chamber 23), the trough will sink more and more in the quenching liquid, until the upper edges of the cheeks 13 are below the surface so that the liquid may flow into the pockets 14 through the inlets formed by their open upper ends and thus reach the compartment 15 from which it passes through the perforated false bottom 12 into the body of the trough 6, that is to say, into the chamber containing the incandescent coke. Finally, when the trough has received its full charge, it takes the lower position indicated in Fig. 2 by dotted lines, the slides 17 being arrested by engaging the stops 18, while the trough continues to move downward for a short distance, thus uncovering the openings 16. It will be understood that the water or other liquid rising through the perforated false bottom 12 will quench the incandescent coke contained in the trough 6.

The coke having been quenched, the winding drum 9 is actuated to pull the trough 6 up from the quenching liquid, the drippings and the excess of liquid escaping through the openings 16 which are still uncovered. The guides 8, 22 cause the trough 6 to be tilted as it is raised, bringing it into the dumping position illustrated by dotted lines in Fig. 1. This causes the quenched coke to be discharged through the hopper 21, say into a car 26.

Before the trough 6 is again lowered into the liquid, to receive a new charge of incandescent coke, the slides 17 are closed by the attendant or in any other suitable manner.

The amount of liquid used up at each quenching operation is practically limited to that converted into steam and escaping through the chimney 20. Thus only a very small amount has to be supplied from the storage tank 5 after each operation in order to restore the liquid in the tank 2 to its original level.

Various modifications may be made without departing from the nature of my invention as set forth in the appended claims.

I claim:

1. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided with an opening at its lower portion, movable means for closing said opening, and mechanism for opening said movable means when the trough reaches its lower position.

2. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid

and adapted to contain the material to be quenched, said trough being provided with an inlet at a sufficient distance above its bottom to cause the trough to float before it has received its charge of material, the trough being freely movable in the liquid in response to the weight of the charge, and means for controlling the raising and lowering of said trough out of and into the liquid.

3. In a quenching apparatus, a tank adapted to contain a quenching liquid, and a trough having a perforated support on which the material to be quenched may rest and through which the quenching liquid may rise into said material, the trough being provided with a passage for conducting the quenching liquid below said perforated support, the inlet of said passage being above said support.

4. In a quenching apparatus, a tank adapted to contain a quenching liquid, and a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided with a perforated false bottom above its bottom proper, with a compartment intervening between the two bottoms, and a liquid inlet communicating with said compartment and located above the level of the false bottom.

5. In a quenching apparatus, a tank adapted to contain a quenching liquid, and a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided with a perforated false bottom, above its bottom proper, with a compartment intervening between the two bottoms, lateral chambers communicating with said compartment and extending upwardly therefrom, and liquid inlets located at the upper ends of said chambers.

6. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided with a perforated false bottom above its bottom proper, with a compartment intervening between the two bottoms, an inlet to the upper part of said compartment, an outlet at the lower part of said compartment, and movable means for normally closing said outlet.

7. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided with a perforated false bottom above its bottom proper, with a compartment intervening between the two bottoms, an inlet to the upper part of said compartment, an outlet at the lower part of the compartment, movable means for normally closing said outlet, and a member adapted to cooperate with said

means as the trough is lowered, to cause the outlet to be opened.

8. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided with a perforated false bottom above its bottom proper, with a compartment intervening between the two bottoms, an inlet to the upper part of said compartment, an outlet at the lower part of the compartment, a slide for normally closing said outlet, and a stop adapted to engage said slide as the trough is lowered and to open said outlet.

9. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided with a perforated false bottom above its bottom proper, with a compartment intervening between the two bottoms, and cheeks extending exteriorly of the trough's side walls, from the bottom proper to points above the false bottom, forming pockets provided with inlets at their upper ends and communicating with said compartment at their lower ends.

10. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid

and adapted to contain the material to be quenched, said trough being provided with an outlet for draining surplus liquid, and means for normally closing said outlet.

11. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided with an outlet for draining surplus liquid, means for normally closing said outlet, and a member adapted to cooperate with said means as the trough is lowered, to cause the outlet to be opened.

12. In a quenching apparatus, a tank adapted to contain a quenching liquid, a trough movable into and out of said liquid and adapted to contain the material to be quenched, said trough being provided at its central portion with laterally extending projections, and inclined guides for engaging said projections and causing the trough to tilt and to discharge its contents exteriorly of the tank when said trough is raised.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILHELM REUBOLD.

Witnesses:

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HENRY HASPER.