Oct. 18, 1927. 1,645,587

A. H. CHALMERS

COKE QUENCHING CAR

Filed Jan. 28, 1925 2 Sheets-Sheet 1

Fig. 1.

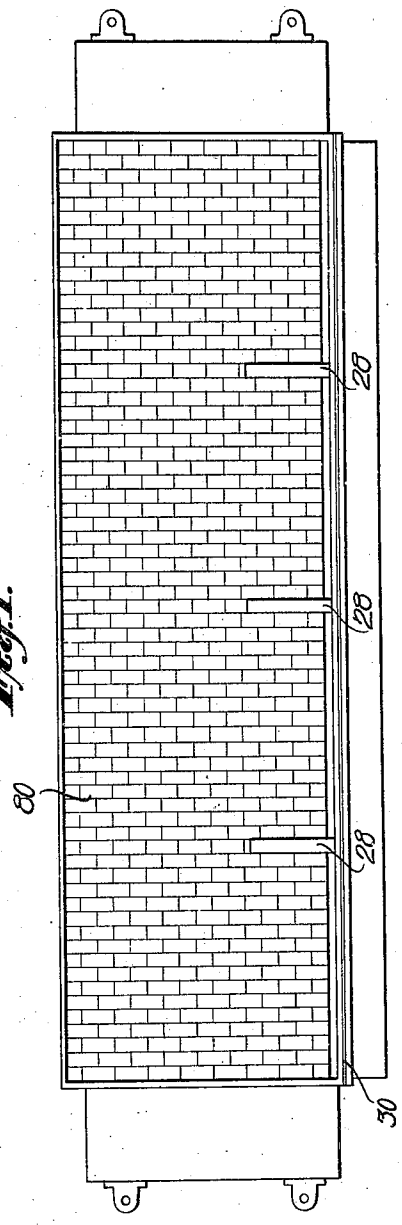
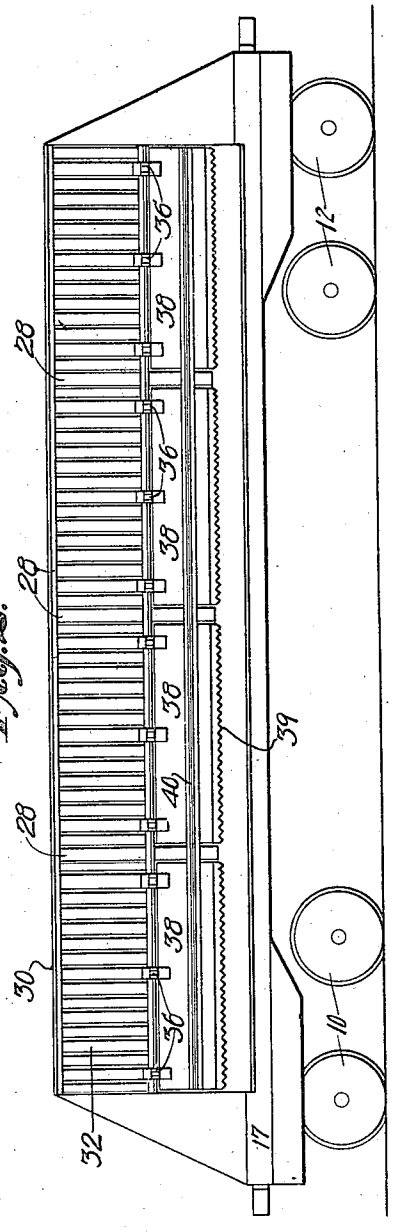


Fig. 2.



Inventor

ALBERT H. CHALMERS

By his Attorney

D. Authon, Mecina

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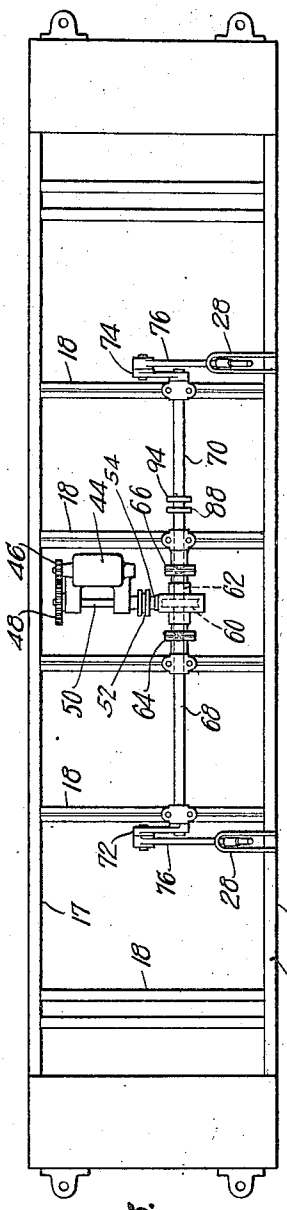


Fig. 3.

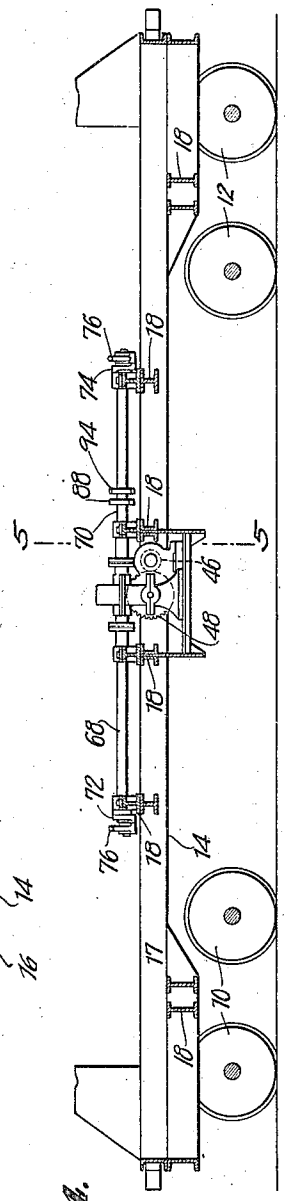


Fig. 4.

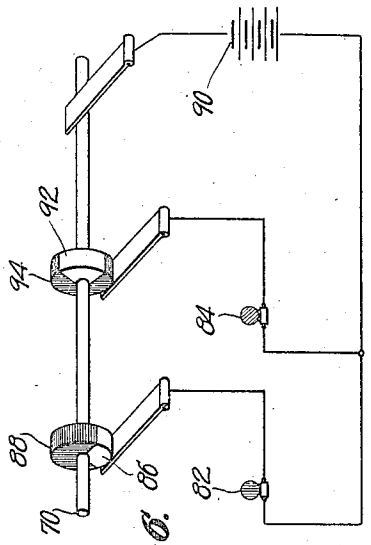


Fig. 6.

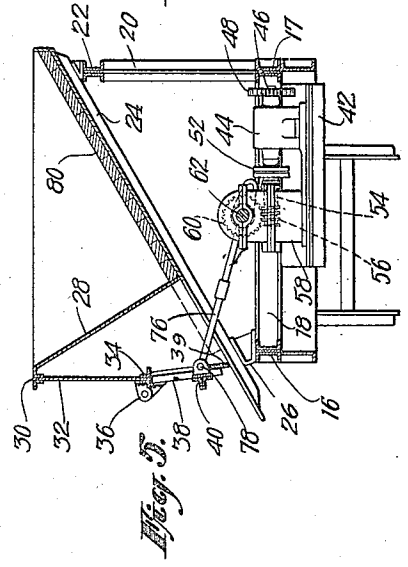


Fig. 5.

Inventor

ALBERT H. CHALMERS

By his Attorney

D Anthony Reina

Patented Oct. 18, 1927. 1,645,587

UNITED STATES PATENT OFFICE.

ALBERT H. CHALMERS, OF FAIRFIELD, ALABAMA.

COKE-QUENCHING CAR.

Application filed January 28, 1925. Serial No. 5,318.

This invention relates to cars arranged to discharge their contents by gravity upon the opening of a door. While not limited thereto the invention is particularly directed to the provision of a car for handling coke and adapted to permit the same to be drenched with water.

The coke quenching cars in use at coke oven plants receive incandescent coke from the carbonizing chambers of the several ovens contained in a battery of ovens. The incandescent coke thus loaded on the quenching car is then propelled by an electric locomotive into a quenching chamber containing overhead pipes which spray water over the coke in the quencher car thus thoroughly cooling it. The quenching car is then propelled by the locomotive and is brought in front of a coke wharf into which the quenched coke is unloaded, thence delivered onto a belt conveyor, screened and loaded into railroad cars for shipment.

The floors of the quenching cars heretofore used for receiving the incandescent coke to be quenched are usually constructed of supporting beams placed at intervals to which are secured cast iron plate sections. This construction does not provide a water tight bottom and as a consequence the door operating machinery under the car floor is subject to the injurious effects of the hot impure water dripping on the working parts of the mechanism. It also has the added disadvantage of requiring very frequent replacement of floor castings on account of wear due to abrasion and cracking of plates due to sudden changes of temperature during the process of quenching coke. Constant attention and repairs due to wear and tear on air operated door opening device, damages to machinery due to leaky floors and the necessity of frequent replacement of cast floor plates, are expenses incurred by cars heretofore used, which increase the cost of coke produced.

My invention aims to overcome these objectionable features and also to minimize the initial cost of installation and the cost of maintenance.

I provide electrically operated means for actuating the doors controlling the discharge of coke and form the floor in such a way and of such materials that it performs the double function of preventing the rapid wearing away of the car bottom and also serves as a shield which prevents the drippage of water onto the door operating mechanism located beneath the floor.

An embodiment of the invention is illustrated in the accompanying drawings in which

Fig. 1 is a plan of a coke quenching car;

Fig. 2 is a side elevation thereof;

Fig. 3 is an enlarged plan of the door operating mechanism;

Fig. 4 is a side elevation of parts shown in Fig. 3;

Fig. 5 is an enlarged cross-section on line 5—5 of Fig. 4;

Fig. 6 is a diagram illustrating a signal for indicating the open and closed partitions of the discharge door.

Referring in detail to the drawings, 10 and 12 represent standard railway car trucks of any suitable type which support the car frame 14 which includes suitable longitudinal side walls 16 and 17 and cross-beams 18 at spaced intervals. Secured to the side walls 17 at spaced intervals are a series of uprights one of which is indicated at 20 in Fig. 5. These serve as columns or struts for supporting the upper longitudinal girder 22 which forms a support for the upper ends of a plurality of inclined floor beams 24 the lower ends of which rest on an angle shaped member 26 secured to the side wall 16. A series of U-shaped castings 28 are secured to the floor beams 24 at their lower ends and at their upper ends to longitudinal angle bars 30 at the top of the car. The castings 28 and bars 30 form supports for a grating 32, the lower end of which is secured to the longitudinally extending angle bars 34. These bars support a number of hinge brackets 36 which pivotally support the door 38 controlling the discharge of coke from the car. The door 38 is preferably made of a series of sections which, however, are tied to one another by longitudinal angle bars 40 so that they all move as a unit. The lower edge of the door is serrated or cut away to form a plurality of grooves 39 for the escape of the quenching water flowing down the inclined floor.

Located below the floor beams 24 and supported on a suitable platform 42 suspended from the cross-beams 18 of the car frame is an electric motor 44 to the armature shaft of which is secured a pinion 46 which meshes with a gear 48 on a shaft 50 extending trans-

versely of the car. This shaft is connected by means of a flexible coupling 52 with a shaft 54 to which is secured a worm 56 located within a suitable housing 58. Said worm meshes with a worm wheel 60 carried by the shaft 62 which is provided on its ends with couplings 64 and 66. The latter are connected respectively to the shaft sections 68 and 70 extending longitudinally from each side of the center of the car. These shafts carry on their outer ends cranks 72 and 74 which are connected by means of suitable pitman rods 76 to pivot bearings 78 secured near the lower ends of the door 38. This arrangement provides a simple yet powerful electrically operated door mechanism. The use of the flexible joints between the motor and the shaft 54 relieves the driving motor somewhat from the strain in starting and also provides a construction in which no extreme accuracy is required in assembling or installing the door operating mechanism, the flexible joint being adapted to yield somewhat to compensate for slight misalignment of parts. There is also some little flexibility at the couplings 64 and 66.

To shield the door operating mechanism from the injurious effects which would result from the drippage of quenching water through the floor, I provide a floor of novel construction comprising a sheet metal plate 80, over which I lay a course of hard burned brick, the texture of which is adapted to endure the abrasion of the coke as it is discharged from the ovens and also to resist the wear occasioned by the coke sliding over the floor when the car is being emptied. This construction in addition to resisting wear and shedding water also provides a floor bottom which can be readily renewed at a small expense.

To ensure against running the car with the doors open and also to indicate to an operator at a remote point the position of the doors, I preferably provide a signal operated in synchronism with the discharge door. In the construction illustrated, the signal consists of two electric lights which will usually be of different color, one red, for example, indicating that the doors are open and the other green indicating that the doors are closed. These lights indicated at 82 and 84, respectively, will be located in the engineer's cab of the locomotive which propels the coke cars and connected by suitable wiring as indicated diagrammatically in Fig. 6. When the door is open, the contact sector 86 on the drum 88 will close the circuit through a source of energy indicated at 90 through the red light 82, and when the doors are open the circuit through the green light 84 will be broken as indicated and when the doors are closed this circuit will also be closed through the sector 92 on the drum 94. The drums 88 and 94 are carried by the section 70 of the door operating shaft and, therefore, they are actuated each time the doors are moved.

Though I have described with great particularity the specific construction of the embodiment of the invention illustrated, it is not to be construed that I am limited thereto as various modifications and substitutions of equivalents may be made by those skilled in the art without departing from the invention as defined in the appended claims.

What I claim is:—

1. A coke quenching car having a transversely inclined brick lined floor, a door controlling the discharge of coke, and electrically operated mechanism for actuating said door, said brick lined floor being adapted to shield the electric door actuating mechanism against damage from the quenching water.

2. A coke quenching car having an inclined flat water-proof brick lined floor, a door controlling the discharge of coke, an electrically operated door actuating mechanism shielded by said waterproof floor.

3. A car having a transversely inclined substantially waterproof brick covered floor, a longitudinally extending door hinged at the top controlling the discharge of material from the car, a crank-shaft below said floor connected with said door and an electric motor below the floor for driving said shaft.

4. A car having a transversely inclined substantially waterproof brick covered floor, a longitudinally extending door hinged at the top controlling the discharge of material from the car, a crank-shaft below said floor connected with said door and an electric motor below the floor for driving said shaft, the driving connection between the motor and said shaft including a flexible coupling.

5. A car having a transversely inclined floor, a brick covering thereon, a longitudinally extending door hinged at the top controlling the discharge of material from the car, a door operating shaft including separate sections coupled to one another, cranks on the outer sections operatively connected with said doors, a worm wheel on an intermediate section of said shaft and a motor driven worm for driving said worm wheel.

6. A car having a transversely inclined floor, a waterproof lining thereon, a longitudinally extending door hinged at the top controlling the discharge of material from the car, a door operating shaft including separate sections coupled to one another, cranks on the outer sections operatively connected with said doors, enclosed worm gearing operatively associated with said shaft, an electric motor and a flexible coupling between the motor and said worm gearing.

7. A coke quenching car having an inclined metal floor covered with a layer of brick adapted to protect the metal from the

abrasive action of the coke and a hinged door controlling the discharge of coke from the car, the lower edge of the door having serrations therein forming ports for the escape of quenching water while the door is closed.

8. A coke quenching car having a transversely inclined floor, a grating forming part of the car side, and a built up plate-like door hinged to said grating, said door having serrations formed along its edge to permit the escape of quenching water only along the lower edge thereof.

9. A coke quenching car having a floor whose surface is inclined to the horizontal so as to shed water along only one side and a multiplicity of bricks forming a covering for said floor adapted to protect the same from the abrasive action of the coke as it slides by gravity down the inclined surface.

10. A coke quenching car having a floor whose surface is inclined to the horizontal so as to shed water along only one side, metallic frame work fixedly secured to the car and supporting the inclined floor, and a lining of refractory material for said floor adapted to protect the same from the abrasive action of the coke as it slides by gravity down the inclined surface.

In witness whereof I have hereunto signed my name.

ALBERT H. CHALMERS.