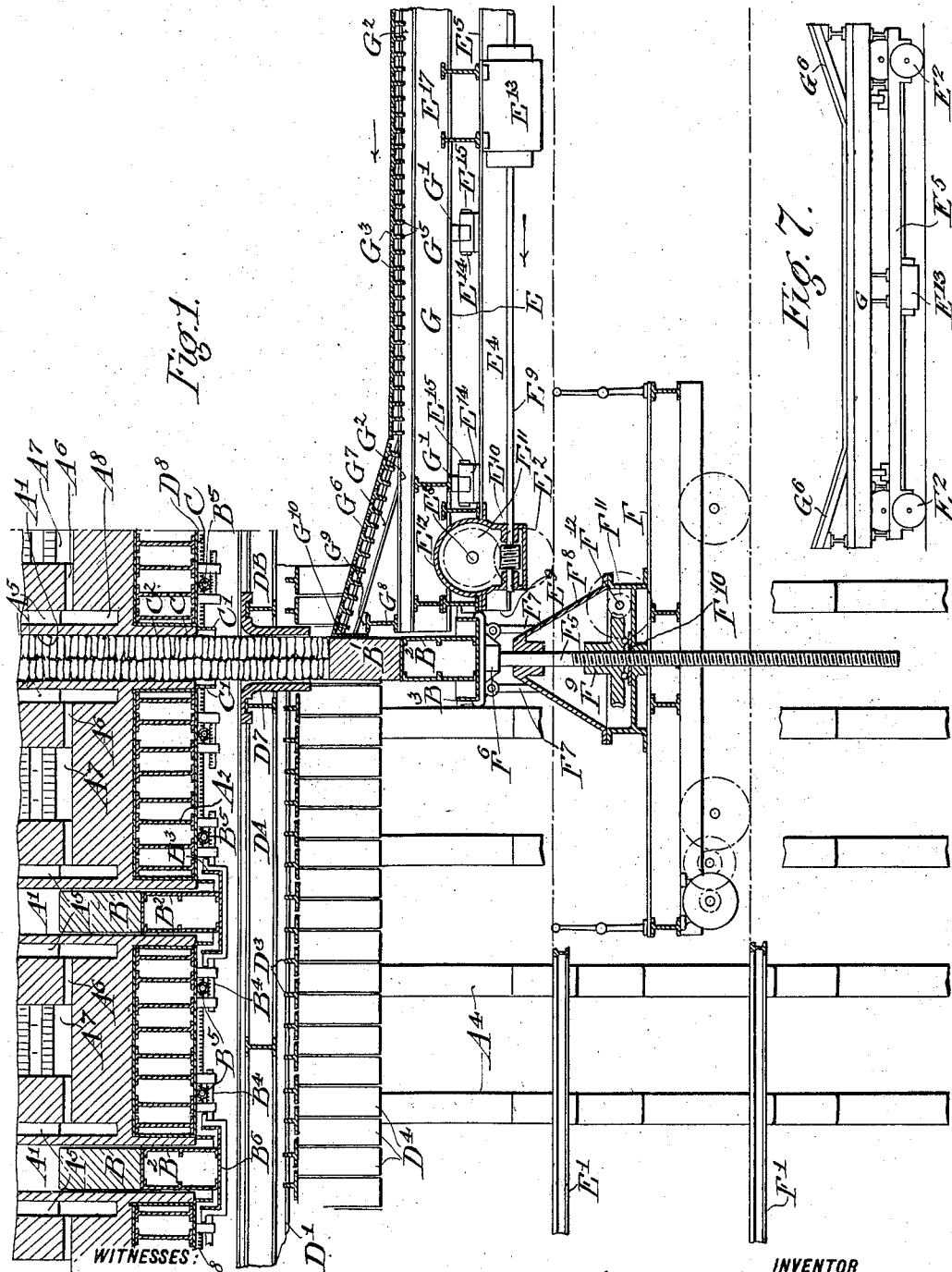


F. W. C. SCHNIEWIND.
 COKE OVEN DISCHARGING APPARATUS.
 APPLICATION FILED OCT. 24, 1907. RENEWED OCT. 22, 1910.

976,934.

Patented Nov. 29, 1910.

3 SHEETS-SHEET 1.



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F. W. C. SCHNIEWIND.
COKE OVEN DISCHARGING APPARATUS.

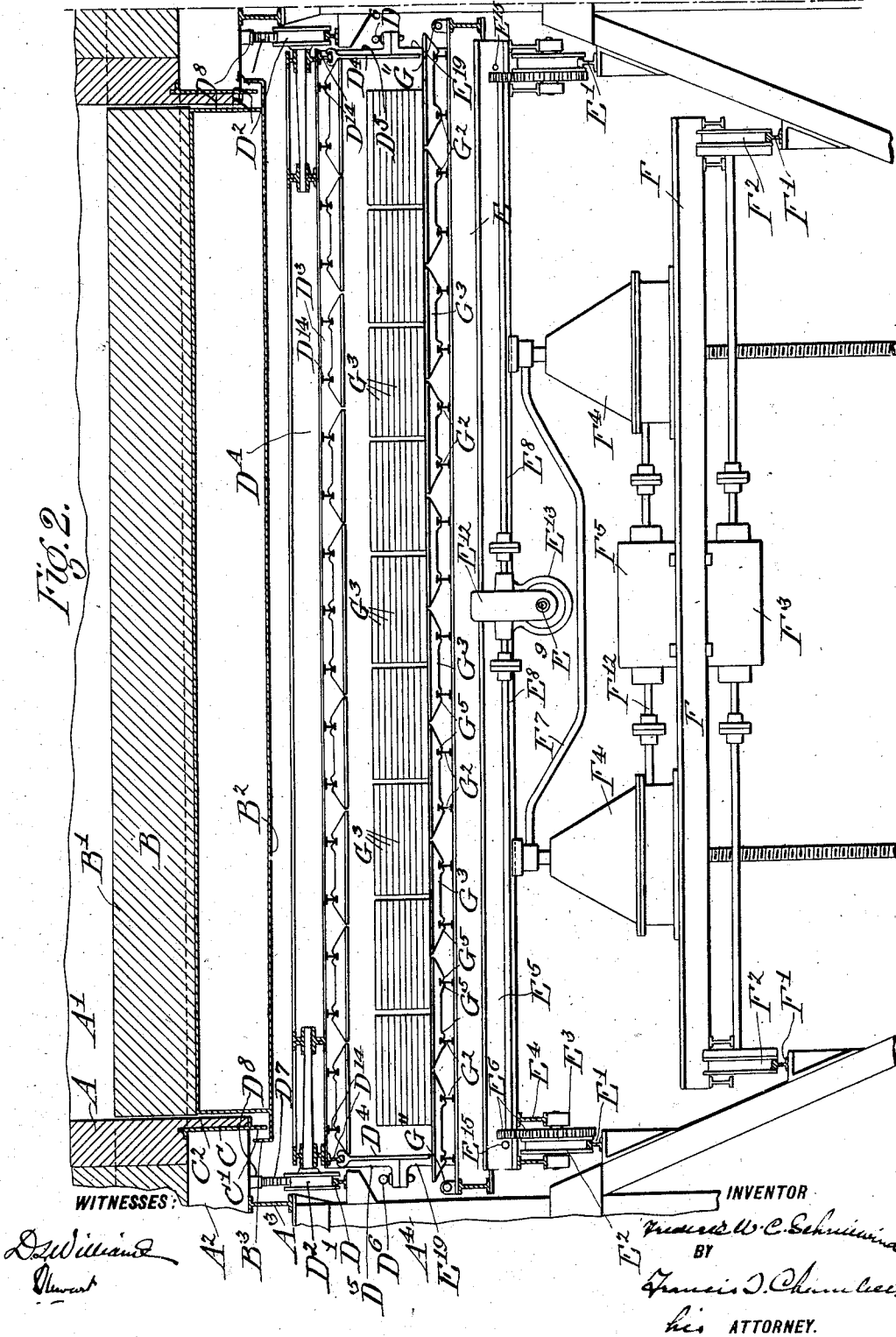
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3 SHEETS—SHEET 2.

FIG. 2.

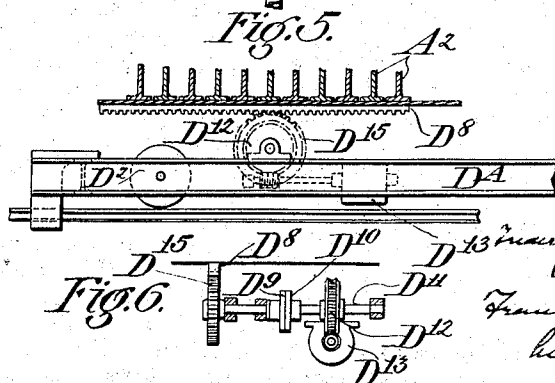
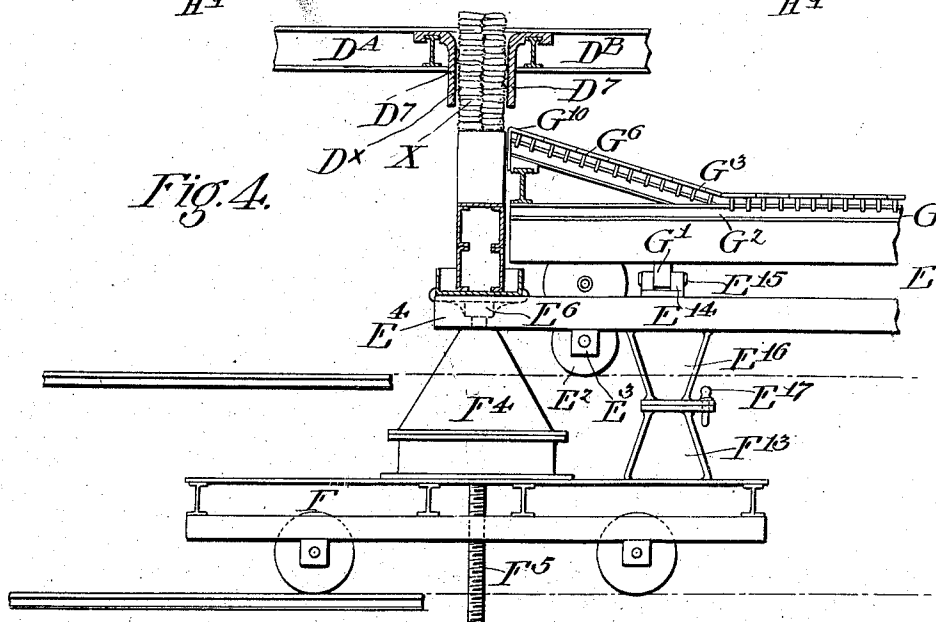
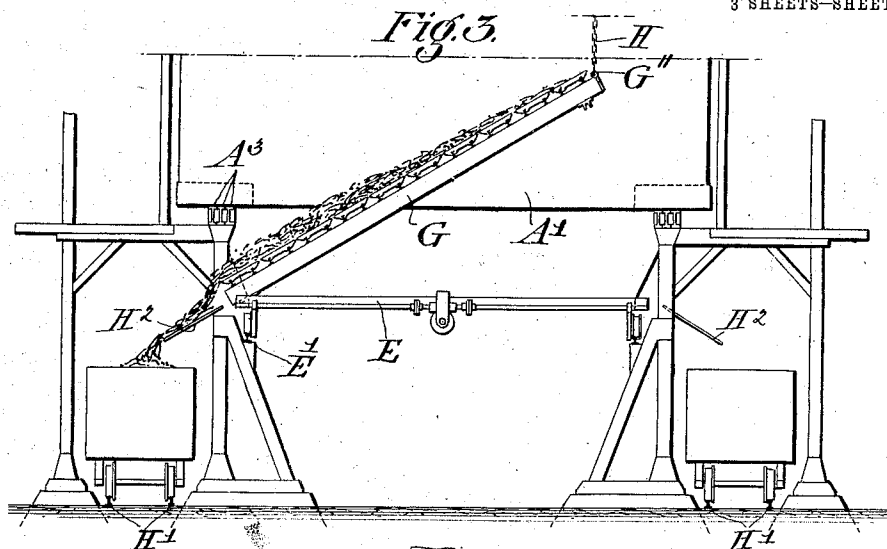


COKE OVEN DISCHARGING APPARATUS.

APPLICATION FILED OCT. 24, 1907. RENEWED OCT. 22, 1910.

Patented Nov. 29, 1910.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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COKE-OVEN-DISCHARGING APPARATUS.

976,934.

Specification of Letters Patent. Patented Nov. 29, 1910.

Application filed October 24, 1907, Serial No. 398,901. Renewed October 22, 1910. Serial No. 588,539.

To all whom it may concern:

Be it known that I, FREDERIC W. C. SCHNIEWIND, a citizen of the United States of America, residing in the city, county, and State of New York, have invented a certain new and useful Improvement in Coke-Oven-Discharging Apparatus, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

The present invention relates to apparatus for removing coke from the retorts or coking chambers of coke oven structures, and for receiving and discharging the coke removed from the retorts to a receiving station, where the coke is discharged either into cars for railway transportation or into other storing devices.

The object of the present invention is to provide apparatus so constructed and arranged that the coke from each retort can be readily and easily transferred to a suitable coke receiver without undue jarring of the coke and in a gradual manner so that the coke will neither jam in the retort being emptied or be broken up, thus avoiding injury to the oven walls and undue crumbling of the coke, with a consequent material reduction in the amount of coke "breeze" or waste coke dust formed.

Another object of the invention is the provision of means by which the coke may be covered during the discharging operation and during the transportation of the coke to the discharge station by a movable cover or lid.

The apparatus disclosed is particularly designed for discharging coke ovens in which the ovens proper are emptied through their lower ends. In this form of the invention, the cover or lid is formed or carried by a carriage movable on a level above that on which the coke receiver runs, and serves to cover the hot coke and protect the oven structure from the heat of the coke on the receiver.

A further object of the invention is to so arrange the instrumentalities employed that they may be properly coordinated in their operation and require a minimum of manual attendance.

The invention also has for its object the provision of novel features of construction

and arrangement of the various instrumentalities which will insure good mechanical structures and ease and reliability of operation.

In the claims annexed to and forming a part of this specification it has been aimed to point out with particularity the various features of novelty which characterize the invention. For a better understanding of the invention, however, and the advantages possessed by it, reference may be had to the accompanying drawings and descriptive matter in which I have illustrated and described forms in which the invention may be embodied.

Of the drawings, Figure 1 is a sectional elevation taken parallel to one of the sides of the coke oven structure or battery of ovens, and showing a portion only of the oven structure. Fig. 2 is a section taken at right angles to Fig. 1, but on a larger scale, and also showing a portion only of the coke oven structure. Fig. 3 is an end elevation of the lower portion of the oven structure, illustrating the discharge of the coke from the coke receiver of the discharging apparatus into a railway car located on one of the pair of railroad tracks at opposite sides of the coke receiver. Fig. 4 is a sectional elevation taken similarly to and showing a part of the apparatus shown by Fig. 1, the apparatus shown being modified somewhat from that shown in Fig. 1. Fig. 5 is an elevation, partly in section, of a portion of the coke receiver carriage, illustrating the devices which may be employed for positioning the carriage with respect to the oven structure. Fig. 6 is a view taken at right angles to Fig. 5. Fig. 7 is a diagrammatic elevation of the coke receiver.

In the apparatus shown by the drawings, A represents the masonry walls of the oven proper, which are supported in any suitable manner, as by means of the floor beams A² carried by the main side-beams A³, the latter being supported by or rather forming a part of the structural metal understructure A⁴. In the masonry walls are formed a plurality of horizontal elongated and deep vertical retorts A'. By preference, the retorts A' are heated by straight vertical flues A⁵ at the sides of the retorts; and the adjacent flues of adjacent retorts are connected

by passages A⁶ with regenerators A⁷ located between the retorts, burner chambers A⁸ being provided at the upper and lower ends of the flues, all as described and claimed in my copending application Serial No. 398,902 filed of even date herewith, though the present invention is not limited to any special form of heating arrangements.

The bottom wall of each retort is formed by a removable door B, which comprises an upper portion B' of firebrick or tile which normally extends to about the level of the upper edges of the burner chambers A⁸ and is supported by a metal frame B². The metal frame B² is provided at its outer edge with a rib or flange B³ which forms with the body of member B², a sealing trough into which projects the rib C' of a rim member C which extends around the lower end of a retort, and is preferably lined with firebrick C² to shield it and the adjacent floor beams A² from the heat of the glowing coke when the retort is being emptied. The doors or bottom walls B are normally held in place by bolts or rack bars B⁴ operated by pinions B⁵ and engaging ears formed on stiffening yokes B⁶ secured to the members B².

The understructure A⁴ is provided at different levels with rails D', E', and F', on which run the movable lids or coke cover carriages D A and D B, and coke receiver carriage E, and bottom door lift carriage F respectively. The coke receiver carriage E comprises wheels E² running on the rails E' journaled in boxes E³ on which rest the end beams E⁴ supporting the body E⁵ of the carriage E. The wheels E² are driven through gears E⁶ upon cross shafts E⁸ which are in turn driven from the shaft E⁹ of the motor E¹³ secured to the under side of the carriage bottom, the driving connection being formed of pairs of worm wheels E¹⁰ and gear wheel E¹¹ inclosed in casing E¹². On the body portion E⁵ is mounted the coke receiving platform proper G. The platform G is hinge connected to the platform E⁵ at both side edges to tilt relative thereto about one or the other of two axes located one above each rail E'. This arrangement permits coke to be discharged from the receiver into cars located at either side of the carriage on tracks H' as shown in Fig. 3. The hinge connections may be formed by pairs of bearings E¹⁴ formed on the body E⁵, each supporting a shaft or pintle E¹⁵ which is engaged by open ended bearing members G' secured to the under side of the platform G at its opposite side edges. Ears G¹¹ are provided at the side edges of the platform G, those at one edge or the other being engaged by suitable hoisting mechanism located at the end of the battery to tilt the platform about the pintles E¹⁵ at the opposite edge of the platform when it is desired to discharge the coke into the coke

receiving car or other receptacle located at one side or the other of the track rails H', as shown in Fig. 3. The platform G is provided with I-beams G² extending parallel to the track rails E' upon which are removably placed the cast iron plates or bars G³, each provided with the ears G⁵ apertured or grooved to receive the upper flanged edges of a pair of beams G², as shown clearly in Fig. 2. At each end of the platform G is located an inclined and preferably removable end portion G⁶, which comprises inclined beams G⁷ supported at their outer ends on saddle members G⁹ resting on the transverse I-beams G³, and having their inner ends directly supported by the body of the platform G. On the rails or beams G⁶ are secured platform bars G³, like those secured on the beams G². The outer ends of the beams G⁶ are faced by end members G¹⁰.

With the construction shown it will be observed that a broken or injured platform bar G³ may be readily removed by sliding out the other bars G³ at one side of it which engage the same pair of beams G² or G⁷. Preferably to facilitate the removal of the bars G² the end portions G⁶ are secured to the body portion of the platform by readily detachable connections, not shown. The carriage E proper may be protected from water employed in quenching by a floor or covering between the platform E and the bars G³ if thought necessary.

The mechanism for dropping and raising each retort door B at the beginning and closing of the retort emptying operation is arranged on the carriage F having wheels running on the track rails F' which may be geared to an operating motor F³. On the platform of the carriage F are located two hoisting devices F⁴ which may both be geared to and operated by the motor F⁵. In the form shown, each hoisting device comprises a conical shell F⁸ in which is mounted a vertically movable hoisting shaft F⁵, having its lower end threaded and carrying at its upper end a head F⁶ adapted to engage the door. The heads F⁶ of the two hoisting devices shown are connected by bars F⁷ which prevent rotation of the shafts F⁵. Within casing F⁸ is located a nut for the corresponding shaft F⁵, the nut having a thrust bearing F¹⁰. Within each casing also is located a worm gear meshing with the teeth formed on the nut F⁹. The worms F¹¹ are carried by the shaft F¹² which may be geared to, or, as shown, may be the shaft of motor F⁵.

In the construction shown in Figs. 1 and 2 the carriages E and F are entirely independent. As it is desirable however that each door B be dropped to a definite level, viz: that on which the upper edge of the door is flush with the upper ends of the inclined platform portions G⁶, an arrange-

ment may be employed with advantage in which the door is dropped down on to the platform E. Such an arrangement is shown in Fig. 4, where the beams E^4 of the carriage 5 E are extended to form supports on which the door B may be dropped by the hoisting device F^4 . As it is desirable that the carriages E and F should move together during certain stages of the discharging operation, an arrangement may be employed for 10 detachably coupling the two carriages together. In the arrangement for this purpose shown in Fig. 4 the carriage E is provided with downwardly extending arms or 15 brackets E^{10} , which of course should be so arranged as to clear the hoisting mechanism, and the carriage F is provided with similar upwardly extending brackets F^{13} , which, when the two carriages are in the position 20 in which they should be coupled together, are located immediately beneath the brackets E^{10} so that the two carriages may be secured together by the pin E^{17} passing through suitable apertures formed in the brackets 25 E^{10} and F^{13} .

The means for covering the coke on the platform G and thereby protecting the under oven structure proper from the heat of the coke comprise one or more lids or 30 covers in the form of carriages running on the track rails D' . In the arrangement shown in the drawings there are two of these covers D A and D B employed in discharging each retort. Each of these carriages, which may both be identical in construction, has wheels D^2 running on the track rails D' . The body of the carriage is provided at its under side with a series of 35 I beams running parallel to the rails D' . The I beams D^3 support plates D^8 , which may be similar to the platform bars G^3 , thus forming the lid or cover proper for the glowing coke. To protect the carriages proper against the heat conducted from the 45 faces D^8 , which are preferably made of cast iron, a suitable non-conducting material like mineral wool may be packed above the faces of the bars D^8 . To prevent the coke from 50 spilling off the sides of the receiver and also to protect the adjacent portions of the supporting structure A^4 each side edge of each cover is provided with an apron or depending shield. This apron or shield is formed by metal pieces D^4 which are provided at 55 their upper ends with grooves receiving the base of the side I beams D^{14} . For the purpose of connecting carriages D A D B to the carriage E, the body portion of the latter may be provided with posts E^{10} arranged 60 in the same vertical planes with posts or brackets D^5 depending from the sides of the cover carriages. By this arrangement the corresponding posts D^5 and E^{10} may be readily connected as by a pin D^6 or the like.

65 In discharging each retort A' , the car-

riage E is moved in the direction of the arrow shown in Fig. 1 so that the coke is first transferred from the top of the door B to the top of the forward inclined platform G^6 , and is then distributed along the plat- 70 form G as the movement of the carriage in the direction of the arrow is continued. As the sliding of the platform under the coke is accompanied with considerable friction means must be provided for support- 75 ing the coke cake, against the lateral pressure exerted on it. In the form shown in the drawings, the carriages D A and D B are provided at their ends with depending guides D^7 . Adjacent guides D^7 of the two 80 carriages employed thus unite to form a chute through which the coke passes. With the apparatus operating as shown in Fig. 1, it is of course necessary to hold the left hand cover carriage D A stationary in order to 85 prevent its being displaced by the thrust of the coke as the carriage E moves to the left. The carriage may of course be held stationary in any suitable manner as by locking it to the track rails D' or to the overhead oven 90 beams A^2 . It is also desirable in some cases to regulate the movement of the coke on to the receiving platform. This may be obtained by providing an arrangement whereby the guides D^7 , may serve in effect as 95 clamping jaws, and be moved relatively to each other in order to clamp and release the coke cake. For the purpose of holding the carriages D A and D B stationary and of adjusting them as desired, as well as for 100 the purpose of obtaining the clamping action referred to between the guides D^7 , the arrangement shown particularly in Figs. 5 and 6 may be employed, although it will be understood that the mechanism shown in 105 these figures is merely illustrative of one of many arrangements which may be employed.

In the construction shown best in Figs. 5 and 6, each cover carriage D A or D B is provided at its side between the wheels 110 D^2 with spur gears D^{15} which mesh rack bars D^8 secured to the overhead oven beams A^2 , and extending parallel to the rails D' . Each spur gear D^{15} has a shaft carrying at its inner end a clutch member D^9 which co- 115 operates with a clutch member D^{10} carried by a shaft D^{11} . The shaft D^{11} is, by motor D^{13} , driven through the spiral gear D^{12} carried by the shaft D^{11} on a worm wheel on the shaft of the motor. 120

When the clutch members D^9 and D^{10} are released, the spur gear D^{15} is free to rotate when the carriage D A or D B is moved on the track D' and does not interfere with the movement of the carriage. When, however, 125 the clutch members D^9 and D^{10} are locked together the carriage is effectively locked to the stationary oven structure through the spiral and worm gear connections to the motor D^{13} . Such movements of the carriage 130

as is necessary in adjusting the position of the carriage and particularly for obtaining the clamping action between the guides D' of adjacent cover carriages may be obtained by operating motors D¹³. It will of course be understood that the motors D¹³ may be used to propel the carriages D A and D B along the entire length of the track formed by rails D' if desired, but this is not the primary purpose of the motors in the particular construction illustrated, since, the cover carriages may be given large movements by the coke receiver carriage. The clutch members D⁹ and D¹⁰ may be controlled in any suitable manner, for instance, they may unite with suitable electrical connections to form an electro magnetic clutch.

It will be understood that the rails D', E' and F' all extend at least to the end of the battery to which they belong, and that the rails D' extend beyond the battery, and that a suitable quenching apparatus is located beyond the end of the battery for spraying water on the coke and cooling it before discharging it from the coke receiver into the cars or other coke receptacles.

Each retort may be discharged as follows: The cover carriages D, the coke receiver carriage E, and the door operating carriage F are all moved to the position shown in Fig. 1. The motor F⁵ is then operated to bring the hoisting heads F⁶ up into engagement with the bottom of the door B. The bolts B⁴ are then withdrawn and the hoisting motor is operated to drop the door to the position shown in Fig. 1. The carriage E and the carriage F are then moved slowly and gradually to the left to allow the coke to descend on to the coke platform G of the carriage E. On account of the gradual upward inclination of the advancing end G⁶ of the receiver platform, the coke cake may be transferred with little or no crumbling from the top of door B to the body of the platform G. Further advancing movement of the platform G on account of the greater friction on the horizontal portion of the platform causes the lower end of the cake to break up but in relatively large pieces. The descent of the coke and thereby the manner in which it is broken up may be regulated as before described by the adjustable clamping action exerted on the coked cake by the guides D'. To increase the friction between the guides and the coke the former may be roughened as indicated at D X in Fig. 4. When the coke from the retort being discharged has all been placed upon the coke receiving platform the carriage E is moved to the left, as is also the carriage F, which has preferably been coupled to the carriage E. The carriages E and F are then uncoupled and the clutches are operated to release cover carriages D, and the left hand cover carriage D is moved

to the left to get it out of the road; at the same time the right hand cover carriage D is coupled to the carriage E as by the coupling connection D⁶. After the door B and carriage F are disengaged from the carriage E the latter is moved to the right to the quenching station located at the end of the battery, and the hoisting apparatus on the carriage F returns the door to the normal position where it is secured by the bolts B⁴. If, as may be desirable to obtain the necessary clearance, the tracks D' do not extend beyond the end of the battery, the right hand cover D B will be disengaged from the carriage E when the former arrives at the end of the battery, and the coke carriage will then be moved on to the quenching station, where after the coke is quenched it is discharged either into the right hand car or the left hand car as desired by the chains H of the stationary hoisting mechanism, not shown, which engages the ears G¹¹ at the left or right hand edge respectively of the platform G.

Aprons or guides H² are provided for insuring that the coke reaches the cars. When the guides H² are suitably perforated they serve as sieves permitting the coke breeze to drop through them. It will of course be understood that where there are more than one battery or unitary coke oven structures in a single plant, the hoisting and receiver tracks may be extended to permit the receiver and hoist to operate under all the batteries. The tracks for the covers may also be so extended though in case of such extension some modification would be necessary as otherwise the cover tracks would interfere with the operation of discharging between the batteries. It will be observed that with the apparatus disclosed the various carriages can readily pass each other and that they can operate in either direction.

The discharging apparatus disclosed is highly advantageous in its general operation. All of the devices employed are located on one side beneath the furnace where their operation can be observed and controlled from a single point and by a single attendant. It will of course be understood that the various motors can be controlled from any one point, as from the carriage E, though no attempt to illustrate the controller connections has been thought necessary in view of the present state of the art of controlling motors from a distance. Because of these conditions the labor cost of discharging the furnaces is reduced to a minimum, the operator or operators work under favorable conditions and are not exposed to oppressive temperatures and the various devices are properly timed.

Certain novel features in the construction and arrangement of the coke receiver carriage, disclosed but not specifically claimed

herein, are specifically claimed in my co-
pending application, Ser. No. 471,046, filed
January 7, 1909, as a division of this appli-
cation.

5 Having now described my invention, what
I claim as new and desire to secure by Let-
ters Patent is,

1. In combination with a coke oven hav-
ing a vertical retort discharging through its
10 lower end, a coke receiver movable under
said retort to receive the coke as it is dis-
charged from the retort, said receiver having
its coke receiving surface extended in the di-
15 rection of movement of the receiver to per-
mit a movement of the latter under the re-
tort while it is being discharged of a length
several times greater than the dimension of
the retort parallel to the direction of move-
20 ment of the receiver, said surface being up-
wardly inclined at its forward end.

2. In combination with a coke oven having
a vertical retort discharging from its lower
end, a coke receiver movable under said re-
tort to receive the coke as it is discharged
25 from the retort, said coke receiver having
its coke receiving surface extended in the
direction of movement of the receiver to per-
mit a movement of the latter under the re-
tort while it is being discharged through a
30 distance several times as long as the dimen-
sion of the retort parallel to such movement,
and having the front and rear ends of said
surface upwardly inclined.

3. In a coke oven structure having a ver-
35 tical retort discharging through its lower
ends, a coke receiver movable beneath the re-
tort to receive coke from the retort and
transport it to a discharge station, and a
cover arranged to extend over the coke on
40 the receiver during the discharging opera-
tion and to be bodily movable independ-
ently of the receiver and means for moving
said cover with the receiver as the latter
moves to carry the coke to the discharge
45 station.

4. In combination with a coke oven struc-
ture, having a plurality of retorts which are
emptied through their lower ends, and hav-
ing a track for a coke receiving carriage run-
50 ning under the retorts, a coke receiving car-
riage running on said track, a second track
parallel to the first, and a cover carriage run-
ning on said second track and movable with
and above the coke receiver to protect the
55 oven structure from the heat of the coke on
the coke receiver.

5. In combination with a coke oven struc-
ture having a plurality of horizontally elon-
gated retorts discharging through their
60 lower ends, a receiver carriage movable
transversely to the direction of the horizon-
tal elongation of the retorts, and a pair of
cover devices located above and movable in a
direction parallel to that of the coke receiv-

ing carriage, means for causing said covers 65
to have a relative movement to grip the coke
between them with regulated pressure in dis-
charging a retort, one of said covers being
movable with said receiver when the latter
having received a charge from one retort 70
moves away to discharge the same.

6. In combination with a coke oven struc-
ture having retorts discharging from their
lower ends and having a track for a pair of
carriages running under the retorts, a coke 75
receiver carriage running on one of said
tracks, and a cover carriage running on the
other of said tracks and movable to extend
between the coke receiver and the oven struc-
ture, said cover carriage having depending 80
aprons at its side edges whereby the coke on
the receiver may be covered on top and at its
sides by said cover.

7. In combination with a coke oven struc-
ture having a plurality of retorts discharg- 85
ing through their lower ends, a coke receiver
moving transversely under each retort in the
discharging operation and onto which the
coke body projecting from the retort rests, a
guide for taking the lateral thrust on the 90
coke caused by the transverse movement of
the receiver, and means for securing said
guide in operative position at the side of
each retort.

8. In combination with a coke oven struc- 95
ture having a plurality of retorts discharg-
ing from their lower ends, a coke receiver
carriage beneath and movable transversely
of said retorts during the discharging opera-
tion, an independently movable coke cover 100
located between the coke receiver and the re-
torts and movable to cover the coke on the
receiver, and means for coupling the coke re-
ceiver and the cover together for simultane-
ous movement. 105

9. In a coke oven structure having retorts
discharging from their lower ends, a receiver
movable under said retorts to receive the
coke from each retort as the latter is dis-
charged and to carry it away to a discharge 110
station, and a coke cover located above the
coke receiver and between it and the retorts
and movable with said coke receiver toward
the discharge station to limit the radiation
of heat from the coke on the receiver, said 115
cover having its face exposed to the coke
formed of readily removable and relatively
small units.

10. In combination with a coke oven
structure having a plurality of retorts dis- 120
charging through their lower ends, a pair
of guides movable to positions beneath the
various retorts, and means for moving said
guides relative to each other in discharging
each retort so that the coke discharged is 125
gripped with a varying pressure and its de-
scent is thereby regulated.

11. In combination with a coke oven

structure having a plurality of retorts discharging through their lower ends, a pair of guides movable to positions beneath the various retorts, said guides having rough-
 5 ened coke engaging surfaces, and means for moving said guides relative to each other in discharging each retort so that the coke discharged is gripped with a varying pressure and its descent is thereby regulated.

10 12. A discharging mechanism for a coke oven having a plurality of retorts arranged side by side and provided with a movable bottom wall for each retort which may be lowered to permit the retort to discharge
 15 through its lower end, said mechanism comprising in combination a coke receiver movable beneath and transversely of the retorts, means for lowering the bottom wall of the retort to be discharged to the level of the
 20 coke receiver, means for thereafter moving the coke receiver and the bottom wall transversely of the retort and means for causing the coke from said retort to be transferred by such movement from the bottom wall of
 25 the retort onto the coke receiver.

13. A discharging mechanism for a coke oven having a plurality of retorts arranged side by side and provided with a movable
 30 bottom wall for each retort which may be lowered to the proper level relative to the coke receiver so that the coke may be transferred from the bottom wall to the receiver in an even and regular manner, said mechanism comprising in combination a coke re-
 35 ceiver movable beneath and transversely of the retorts, means for lowering the bottom wall of the retort to be discharged, means for thereafter moving the coke receiver and the lowered bottom wall trans-
 40 versely of the retort, and means engaging the coke above the top of the bottom wall when the latter is lowered and arranged to prevent the movement of the portion of the coke engaged in a direction parallel to the
 45 movement of the receiver.

14. A discharging mechanism for a coke oven having a plurality of retorts arranged side by side and each provided with a movable bottom wall to permit the retort to dis-
 50 charge from its lower end, said mechanism comprising in combination a coke receiver carrier movable beneath and transversely of each retort as the latter is being discharged, mechanism for dropping the bottom wall of
 55 each retort onto said coke receiver at the beginning of the discharging operation, and means for causing the coke from said retort to be transferred by the transverse movement of the carrier from the bottom wall
 60 of the retort onto the said receiver.

15. In combination with a coke oven structure provided with a plurality of retorts each having a movable bottom wall, a coke receiver moving under and transversely of

each retort as the latter is being discharged, and mechanism for dropping the bottom wall of each retort onto the said coke receiver at the beginning of the discharging operation said receiver having the forward end of its receiving platform upwardly inclined
 70 to the approximate level of the upper surface of said bottom wall when the latter is lowered, whereby as the receiver moves transversely the coke is transferred from the bottom wall on to the receiver without an-
 75 due jarring.

16. In combination with a coke oven structure having a plurality of retorts, each provided with a movable bottom wall, a coke receiver beneath the retorts and movable
 80 transversely of each retort as the latter is discharged, an independently movable hoisting device for raising and lowering the bottom walls, and means for coupling the hoist to the receiver during the discharging oper-
 85 ation.

17. In combination with a coke oven structure having a plurality of horizontal elongated coking retorts arranged side by side and provided each with a movable bottom
 90 wall, a track beneath the retorts, and extending transversely to the direction in which the retorts are horizontally elongated, a coke receiving carriage on said track and extending beneath the ovens means for low-
 95 ering the bottom wall of each retort in discharging the same to bring the bottom edge of the coke at the proper level with respect to the coke receiver, whereby when the coke receiver moving on said track is thereafter
 100 caused to traverse said retort the coke is discharged on it, and means for regulating the descent of the coke during the discharging operation.

18. In combination with a coke oven structure having a plurality of horizontally elongated and deep coking retorts arranged side by side and provided each with a movable bottom wall, a track beneath the retorts and
 110 extending transversely to the direction in which the retorts are horizontally elongated, a coke receiving carriage on said track, means for moving the bottom wall of each retort in discharging the same to thereby bring the bottom edge of the coke at the
 115 proper level with respect to the coke receiver, whereby when the coke receiver moving on said track is caused to traverse the coke is discharged on it, and means for regulating the descent of the coke, said means
 120 comprising clamping guides at opposite sides of the retort and relatively movable with respect to each other.

19. In combination with a coke oven structure having a plurality of vertical retorts
 125 and a movable bottom wall for each retort and apparatus for discharging said retorts, said apparatus including a device movable

into positions beneath the various retorts for
lowering each retort bottom wall in dis-
charging that retort with the coke resting on
it, receiving means for receiving the coke
5 from the bottom wall when it is so lowered,
and means for moving said receiving means
and the lowered bottom wall of the retort

to be discharged transversely of the retort
to cause the coke resting on said bottom wall
to be transverse to said receiving means.

FREDERIC W. C. SCHNIEWIND.

Witnesses:

ROBERT C. METCALFE;

D. W. KINCAID.