

E. D. RATLIFF.
 APPARATUS FOR DRAWING COKE.
 APPLICATION FILED MAR. 31, 1908.

934,215.

Patented Sept. 14, 1909.
 2 SHEETS—SHEET 1.

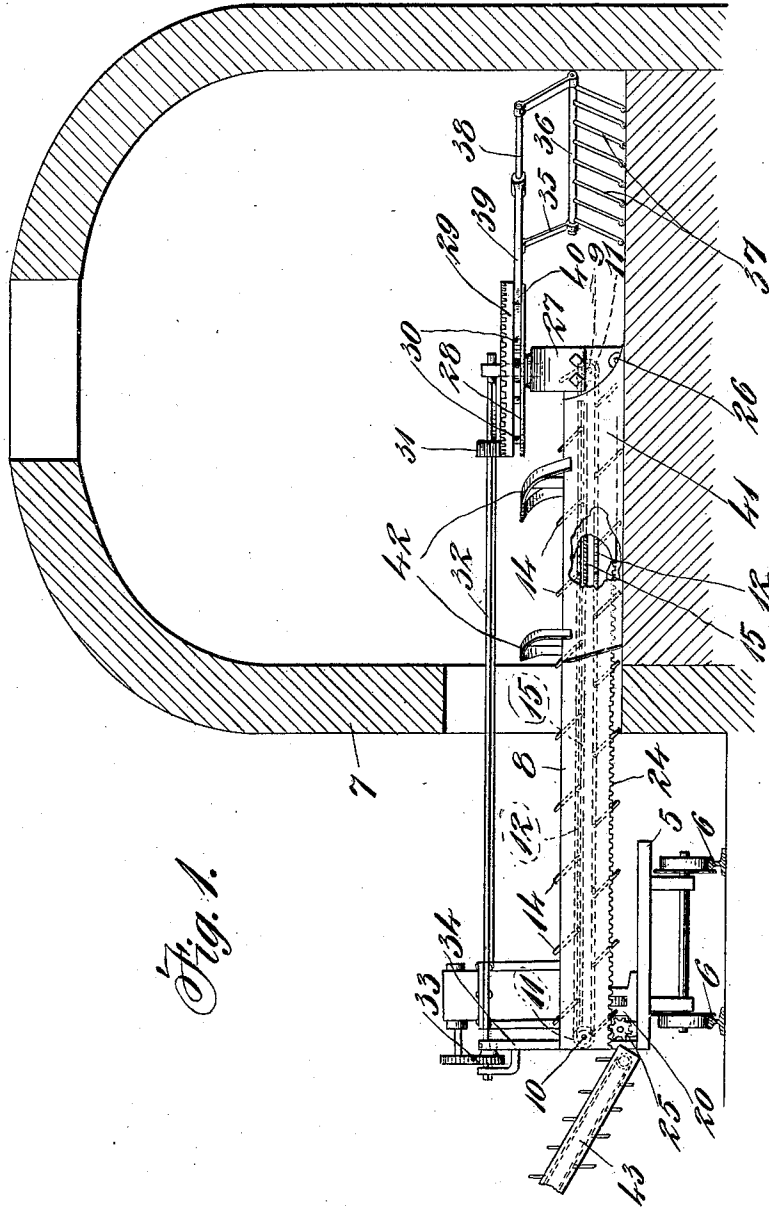


Fig. 1.

Witnesses

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Fig. 2.

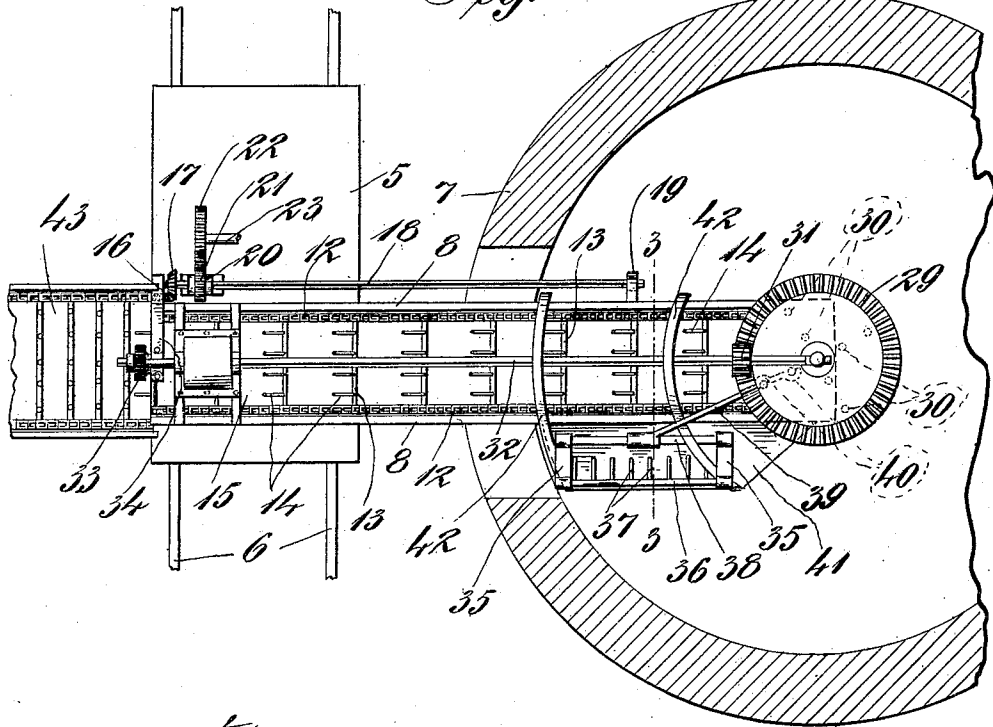


Fig. 3.

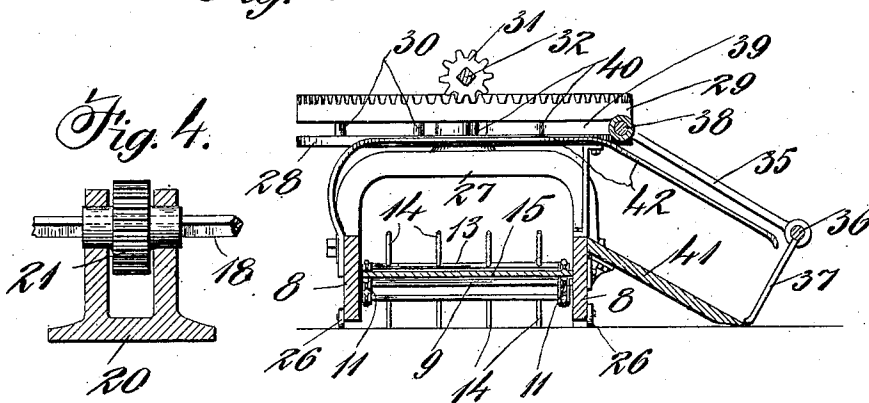
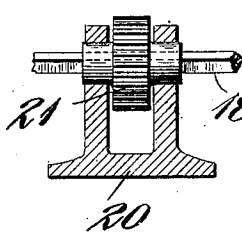


Fig. 4.



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UNITED STATES PATENT OFFICE.

ELDRED DUDLY RATLIFF, OF BIRMINGHAM, ALABAMA.

APPARATUS FOR DRAWING COKE.

934,215.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed March 31, 1908. Serial No. 424,426.

To all whom it may concern:

Be it known that I, ELDRED DUDLY RATLIFF, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Apparatus for Drawing Coke, of which the following is a specification.

This invention is an apparatus for drawing coke or other products from ovens, and it has for its object to provide an improved apparatus of this kind which automatically removes the coke from the oven, and discharges it outside thereof on the ground, or on a conveyer to be carried to a car or suitable dumping place.

The invention also has for its object to provide an apparatus of this kind which is simple in structure, and speedy and efficient in operation.

In the accompanying drawings, Figure 1 is a longitudinal section of the apparatus in operative position in the oven. Fig. 2 is a plan view. Fig. 3 is a cross section on the line 3—3 of Fig. 2. Fig. 4 is a sectional detail.

Referring specifically to the drawings, 5 denotes a car which travels on rails 6 arranged in front of and parallel with a line of coke ovens, one of the latter being indicated at 7. On the car is mounted a conveyer which is arranged transversely thereon and is adapted to be run into the oven through a door opening thereof. The conveyer comprises a supporting-frame consisting of spaced longitudinal side-plates 8 at the ends of which are mounted shafts 9 and 10, respectively, fitted with sprocket-wheels 11 over which travel endless chains 12 connected by cross-bars 13 from which project outwardly, and at an incline, prongs 14. The bottom of the conveyer is a plate 15 secured to and extending between the side-plates 8. This plate is so arranged that the chain and its associated parts pass over the top thereof and under the same. The conveyer is driven by means of a bevel-gear 16 on the shaft 10 and meshing with a bevel-gear 17 on a shaft 18 mounted in a bearing 19 secured to one of the side-plates 8. On top of the car is a bearing 20 in which is mounted a pinion 21 through which the shaft 18 loosely extends. Said shaft is square and the opening in the pinion is also square so that upon rotating the pinion the shaft will also rotate, and as the shaft passes loosely through the pinion

the conveyer can be operated at all times even when it is being run into the oven so that it will begin to catch the coke as soon as it starts into the oven and will pick up the coke and carry it out and so clear its own path. This also prevents the conveyer chains from becoming too hot. The pinion is driven by a spur-wheel 22 meshing therewith and mounted on the drive-shaft 23 of a suitable motor (not shown).

At the lower edge of each of the side-plates is a rack 24 which meshes with a pinion 25 connected in any suitable manner to an operating-mechanism. By means of these racks and pinions the conveyer is run into and out of the oven. The front end of the conveyer is mounted on rollers 26 carried by the side-plates 8. These rollers run on the bottom of the oven, thus supporting the inner end of the conveyer when it is in operating position.

The mechanism for raking the coke onto the conveyer when the latter reaches the center of the oven comprises one or more rakes which rotate in a horizontal plane and carry the coke up an incline to the conveyer.

The front ends of the side-plates 8 are connected by an arch 27 at the center of which is rotatably mounted a horizontally disposed disk 28 and above the same and spaced therefrom a crown gear 29, said disk and gear being connected by pins 30 so that they will rotate together. The gear meshes with a pinion 31 on a shaft 32 which is square and passes loosely through a gear-wheel 33 mounted in a bearing 34 on the car 5. The gear 33 is operatively connected to the drive-shaft of the motor 50 which is supported on brackets 51 on the car 5. The connection between the shaft 32 and gear 33 permits the gear 29 to be driven while the conveyer is being moved back and forth into and out of the oven.

The rake comprises spaced bars 35 connected at one end by a cross-bar 36 to which the rake-teeth 37 are secured. At the opposite end, the bars 35 are hinged to a cross-rod 38 connected at the middle to a rod 39 adapted to be connected to the disk 28 and the gear 29 whereby the rake will be revolved in a horizontal plane to scrape up the coke. On the rod 39 are hooks 40 which are engageable with the pins 30 whereby the connection between said rod and the disk and gear is made. By the means herein described the rake can be readily applied and

removed, and a number of pins 30 are provided so that several rakes of various sizes and length according to the size of the oven may be attached. If desired the rakes may
5 be replaced with a brush to clean the floor of the oven after the coke has been removed.

On one side of the conveyer, and leading thereto, and in the path of the rake, is an incline 41. This is secured to one of the
10 side-plates 8 and extends to the top thereof. Above the incline and the conveyer is located a railing 42 which is adapted to be engaged by the bars 35 of the rake to elevate the same
15 above the conveyer. This railing is mounted on the side-plates 8 a suitable distance above the same so as to lift up the rake sufficiently to clear the conveyer as stated.

The apparatus operates as follows: The car 5 is run opposite the door opening in the
20 oven, and the conveyer is started thereinto, its front end resting on the rollers 26. The prongs 14 of the conveyer rake up the coke and carry it to the outside of the oven where it is delivered to a car or other suitable
25 dumping place by means of a conveyer 43. This conveyer is not attached to the main machine, and can be moved to one side or lowered when the main apparatus is to be withdrawn from the oven. One of the rakes
30 above described may be applied or attached to its supporting parts before the conveyer is run into the oven and will be positioned above the conveyer so that it will enter the oven through the door thereof. After the
35 apparatus is entered into the oven more of the rakes may be inserted between the disk 28 and the gear 29 by means of long handled tongs. Said parts are then set in motion through the gearing described. The rake re-
40 volves in a horizontal plane over the top of the coke and upon reaching the incline 41 the bars 35 tilt upwardly so that the rake-teeth may travel up the incline. When the bars 35 engage the railing 42 the rake is
45 further tilted so as to clear the prongs 14 of the conveyer. The coke is thus raked up the incline and dropped onto the conveyer. After passing over the conveyer the rake slides off the railing 42 and descends on the
50 coke on the other side of the conveyer and the operation herein described is repeated until all the coke is removed from the oven, the broken annulus of coke at the center of the oven being reached and removed by shift-
55 ing the conveyer and thereby changing the path of the rake as much as necessary. By means of the conveyer and the rake every part of the oven is reached and all of the

coke is withdrawn. The apparatus is speedy
in operation because the conveyer is con- 60
stantly running and digging up the coke while it is being pushed into the oven. When it reaches the center of the oven and the rakes are in operation the apparatus will
65 remain stationary.

I claim:

1. An apparatus for drawing coke comprising a horizontally revolving rake, a conveyer in the path thereof, and means for
70 elevating the rake to clear the conveyer.

2. An apparatus for drawing coke comprising a horizontally revolving rake, a conveyer and an incline leading thereto in the path of the rake, and means for carrying the
75 rake up the incline and elevating it to clear the conveyer.

3. An apparatus for drawing coke comprising a horizontally revolving rake having a pivoted head, a conveyer in the path thereof, and means for tilting the rake head to
80 clear the conveyer.

4. An apparatus for drawing coke comprising a supporting-frame, a horizontally disposed and spaced rotatable disk and gear-wheel, a fork carried by the disk and gear-
85 wheel, said fork having a supporting-arm which is removably secured between the disk and gear-wheel, and means for turning the gear-wheel.

5. An apparatus for drawing coke comprising a supporting-frame, an endless conveyer having means to dig up the coke, means for moving the conveyer into and out
90 of the oven and means for delivering coke onto the conveyer from the side thereof.

6. An apparatus for drawing coke comprising a supporting-frame, an endless conveyer having means to clear the coke in a path at the front of the conveyer and deliver the coke thereon, means for moving the
100 conveyer into and out of the furnace, means for operating the conveyer during said movement, and means to gather the coke at the sides of the conveyer beside said path, and deliver the same onto the conveyer.

7. An apparatus for drawing coke comprising an endless conveyer having means to dig up the coke, and a horizontally revolving rake discharging on the conveyer.

In testimony whereof I affix my signature, 110
in presence of two witnesses.

ELDRED DUDLY RATLIF.

Witnesses:

C. M. GILLESPIE,
F. S. WILSON.