

W. C. MITCHELL.

TILTING PAN COKE DISCHARGING APPARATUS.

APPLICATION FILED OCT. 11, 1910. RENEWED MAR. 14, 1912.

1,024,141.

Patented Apr. 23, 1912.

4 SHEETS—SHEET 1.

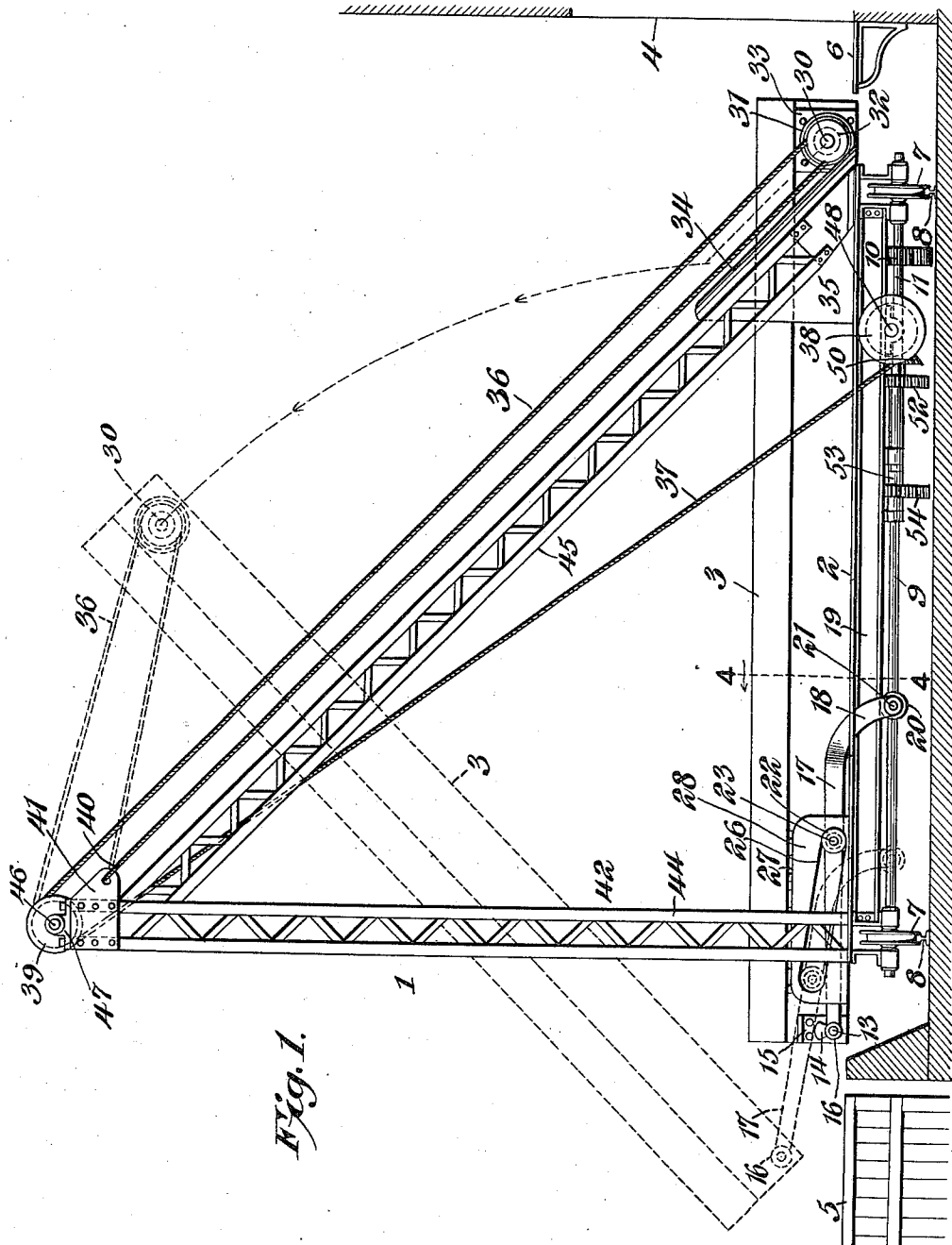


Fig. 1.

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BY

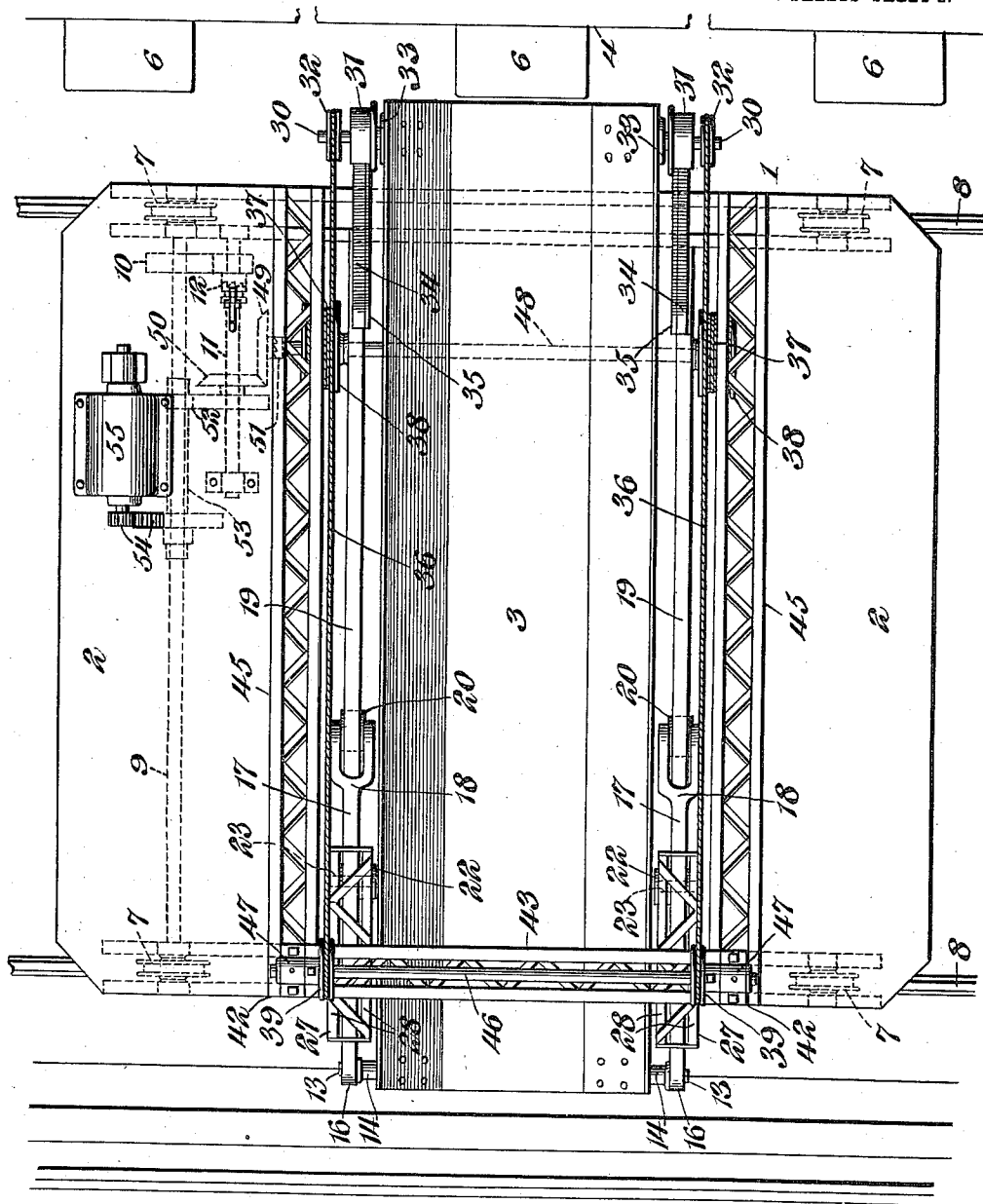
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WITNESSES

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 4 SHEETS-SHEET 2.



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Fig. 2.

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4 SHEETS—SHEET 3.

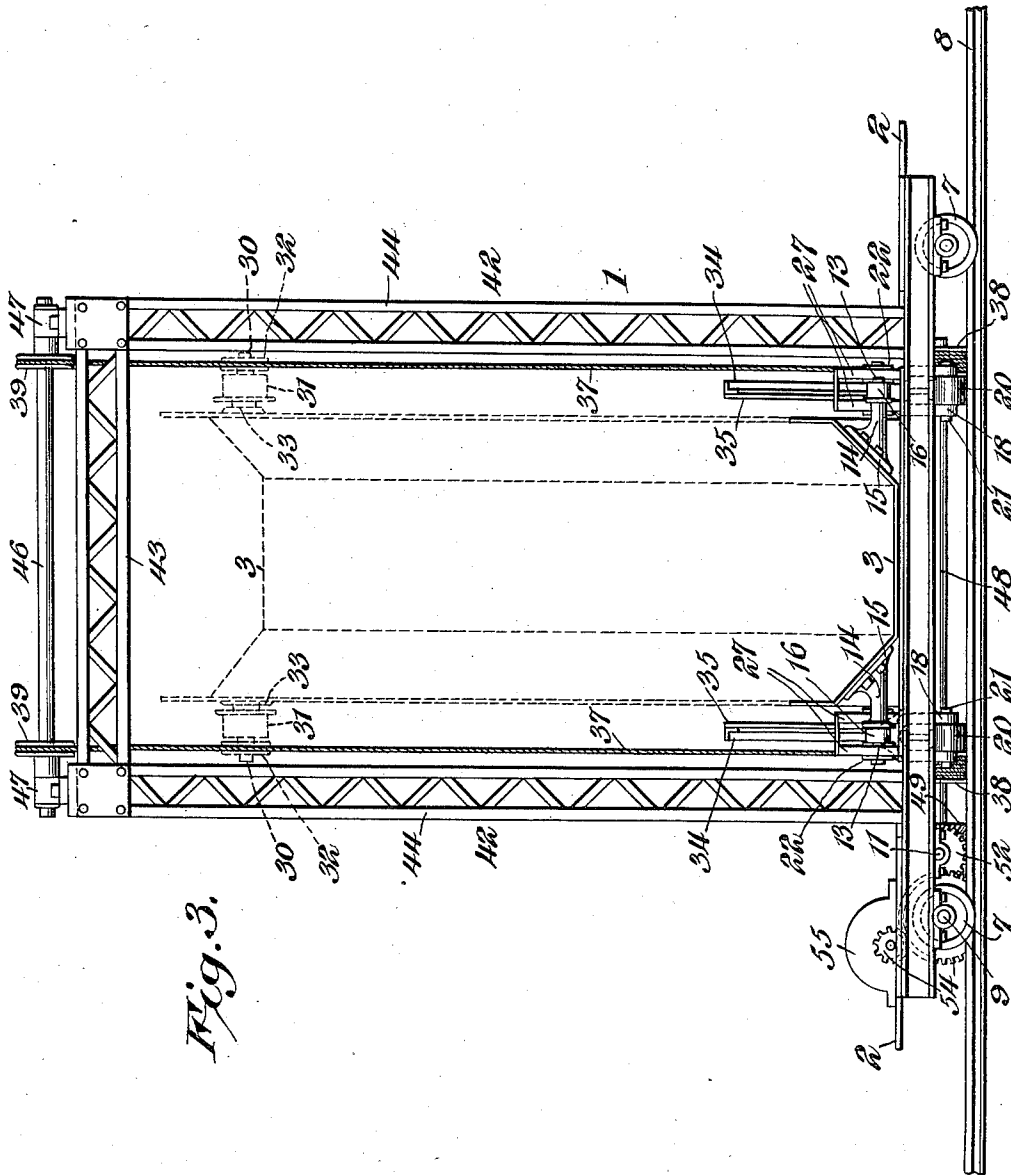


Fig. 3.

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4 SHEETS-SHEET 4.

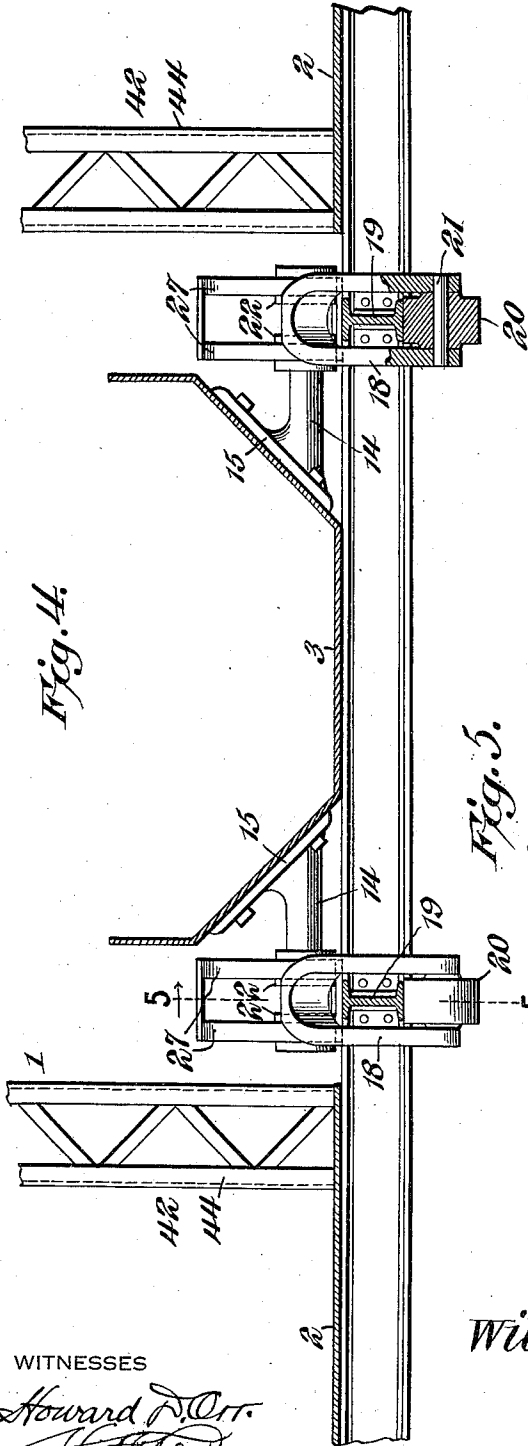


Fig. 4.

Fig. 6.

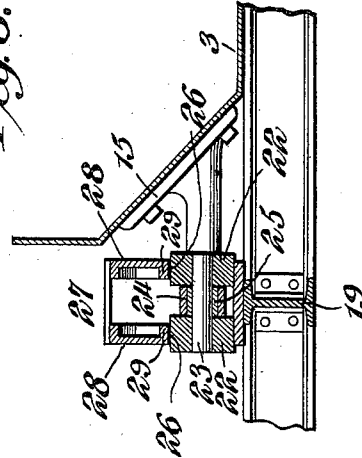
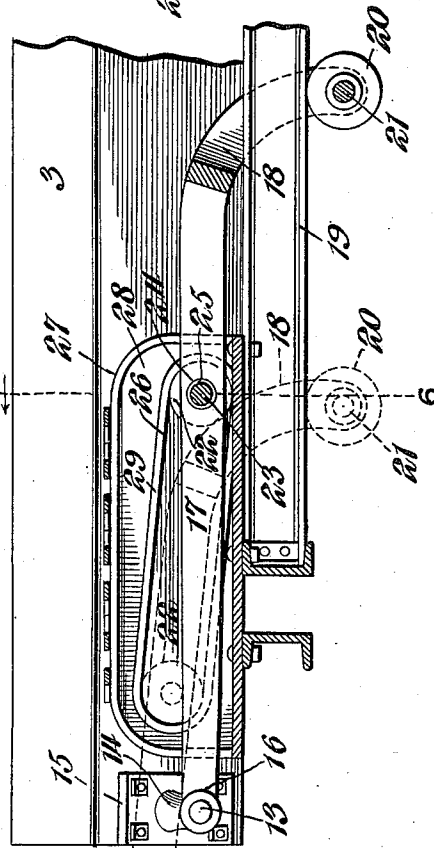


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM C. MITCHELL, OF SYDNEY, NOVA SCOTIA, CANADA.

TILTING-PAN COKE-DISCHARGING APPARATUS.

1,024,141.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed October 11, 1910, Serial No. 586,521. Renewed March 14, 1912. Serial No. 683,707.

To all whom it may concern:

Be it known that I, WILLIAM C. MITCHELL, a citizen of the United States, residing at Sydney, Province of Nova Scotia, and Dominion of Canada, have invented a new and useful Tilting-Pan Coke-Discharging Apparatus, of which the following is a specification.

The invention relates to an apparatus for handling coke and similar loose material and for transferring the same from ovens and like receptacles to railroad cars, canal boats, barges, and similar means of transportation, and for loading it into the same.

The object of the present invention is to simplify and improve the construction of machines for handling coke and similar loose material, and to increase the efficiency of the same and to enable such machines to project outwardly to carry the material out over the car or vessel to be loaded, and at the completion of each dumping operation to move inwardly out of the way of such cars, boats or vessels into which the machine is loading.

Another object of the invention is to provide a coke handling apparatus, adapted to cooperate with a whole line of ovens, and capable of being rapidly transferred from one oven to another and being controlled both as to such movements and also in its coke handling operations from a single source of power.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended: it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a side elevation of a coke handling apparatus constructed in accordance with this invention. Fig. 2 is a plan view of the same. Fig. 3 is a front elevation of the apparatus. Fig. 4 is an enlarged transverse sectional view, taken substantially on the line 4—4 of Fig. 1. Fig. 5 is a longitudinal sectional view on the line 5—5 of Fig. 4. Fig. 6 is a detail sectional view on the line 6—6 of Fig. 5.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

In the embodiment of the invention illustrated in the accompanying drawings, the coke handling apparatus comprises in its construction a wheeled frame 1, designed to be constructed of any suitable material and provided at its bottom portion with spaced platforms 2, located at opposite sides of a tiltable coke receiving platform or pan 3, arranged centrally of the wheeled frame and adapted when in a horizontal position to receive a charge of coke from an oven 4, and capable of having its inner or rear end elevated to arrange it in an inclined position, as illustrated in dotted lines in Fig. 1 of the drawings for discharging its contents into a car 5. The coke ovens 4 are provided with projecting ledges 6, and the charge of coke is transferred from the oven to the tiltable platform 3 by any suitable means. The frame 1 is provided at opposite sides of the tiltable platform with grooved supporting wheels 7, arranged to run on tracks 8 and adapted to enable the coke handling apparatus to be moved laterally to transfer it from one coke oven to another, in order to handle the coke of an entire series of ovens. The wheels 7 at one side of the frame are connected by a longitudinal shaft or axle 9, and motion is communicated to the same for propelling the apparatus by means of spur gearing 10, which connects the longitudinal shaft or axle with a motor actuated driving shaft 11, a clutch 12 of any suitable construction being employed for throwing the propelling gearing into and out of operation.

The tilting pan or platform, which is constructed of metal, or other suitable material, is composed of a horizontal bottom and sides, having downwardly and inwardly inclined lower portions and vertical upper portions. The tiltable pan is provided at its front end with laterally extending pivots 13, preferably in the form of studs and having shanks 14, provided with integral attaching plates 15, arranged at an inclination and bolted or otherwise secured to the sides of the tiltable pan, as clearly illustrated in Fig. 4 of the drawings, but the laterally extending front pivots 13 may be mounted on the pan in any other desired manner. The pivots 13 are arranged in openings or

bearings 16 at the outer or front ends of slidable supporting bars or members 17, extending longitudinally of the pan at opposite sides thereof and adapted to support the
 5 pivoted end of the tiltable pan in an extended position over the car or vessel into which the coke or other material is being loaded. The slidable supporting bars or members are provided with forked or bifurcated inner end portions 18, curved
 10 downwardly and straddling longitudinal beams 19 of the frame of the apparatus. Anti-friction wheels 20 are mounted in the forked or bifurcated inner portions of the supporting bars or members and are arranged to run along the lower face of the
 15 beams 19, which are preferably I beams, but any other form of track may be employed. The anti-friction wheels 20 are mounted on suitable pivots or axles 21, which pierce the sides of the bifurcated or forked portions of the supporting bars or members and suitably secured to the same.

The slidable supporting bars or members
 25 are equipped at points intermediate of their ends with anti-friction wheels 22, arranged in pairs and located at opposite sides of the supporting bars or members and mounted on suitable shafts or pivots 23. The shafts or pivots 23 pass through bearing openings
 30 24 of the supporting bars or members, sleeves 25 or other suitable anti-friction devices being preferably arranged on the shafts or pivots 23. The intermediate wheels 22 operate in inclined longitudinally disposed guiding slots 26 of guides 27, which are mounted on the frame of the apparatus at opposite sides of the tiltable pan. Each
 35 of the guides 27 preferably consists of a pair of spaced parallel side plates 28, suitably connected at the top and bottom and reinforced by marginal flanges and by means of flanges 29, which extend around the inclined guiding slots 26. The weight of the
 40 tiltable pan and its contents maintains the inner anti-friction wheels in engagement with the track beams 19 and holds the intermediate wheels against the bottom of the inclined guides, formed by the slotted side
 45 plates. The tiltable pan when raised to dump its contents is moved outward simultaneously with the tilting movement to arrange it over the car or vessel into which the coke or other material is to be dumped,
 50 and it is automatically moved inward and returned to its initial position after each dumping operation has been completed, in order to arrange it out of the way of a locomotive, box cars, or other medium of transportation.
 60

The tiltable pan is also equipped at its inner or rear end with laterally projecting studs or pivots 30, upon which are mounted flanged anti-friction wheels 31 and pulleys
 65 or sheaves 32. The studs or pivots 30 are

provided with attaching plates or portions 33, which are secured to the pan at opposite sides thereof. The wheels 31 are arranged to engage and run on inclined guides 34, rigidly mounted on the frame of the apparatus at opposite sides of the inner or rear
 70 end of the tiltable pan and extending upwardly and forwardly and preferably consisting of angle bars or members, secured to the inclined edges of triangular plates or supports 35, but any other form of inclined or substantially inclined guide may be employed for permitting a gradual outward
 75 movement of the tiltable pan, when the latter is raised and for causing a positive inward movement of the pan and a return of the same to its initial position when the pan is lowered.

The pulley 32 receives loops 36 of hoisting ropes 37, extending upwardly and forwardly from drums 38 and passing over
 85 overhead pulleys 39 and extended therefrom to and around the pulleys 32 and back to the top of the frame, forming the loops 36. The outer terminals 40 of the hoisting ropes are attached to projecting plates 41 of the frame at points adjacent to the overhead
 90 pulleys, as clearly shown in Fig. 1 of the drawings. The pull on the tiltable pan or platform through the upwardly and forwardly inclined loops of the hoisting ropes tends to elevate the inner or rear end of the platform and to urge the same outwardly. In the drawings, the frame of the machine is provided with spaced upwardly
 95 extending sides 42, connected at the top by a transverse portion 43 to form a derrick and consisting of vertical supporting posts or portions 44 and inclined bracing portions 45, but any other suitable form of framework may be employed. The overhead pulleys 39 are mounted on a transverse shaft
 100 46, journaled in suitable bearings 47 at the top of the frame. The drums 38, which are spaced apart to arrange the hoisting ropes at opposite sides of the pan, are mounted on a transverse drum shaft 48, located beneath the frame and journaled in suitable bearings thereof, and connected at one end by beveled gears 49 and 50 with the motor
 105 actuated shaft 11, a suitable clutch 51 being employed for throwing the hoisting mechanism into and out of operation when desired. The shaft 11 is connected by spur gearing 52 with a tubular shaft 53, arranged on the longitudinal shaft or axle 9 and connected by spur gearing 54 with the shaft of an electric motor 55. Any other arrangement of gearing, however, may be employed for transmitting motion from the
 110 electric motor to the shaft 11. By connecting the motor actuated shaft 11 with the gearing of the hoisting mechanism and with the gearing of the propelling mechanism, the means for moving the apparatus from
 115 120 125 130

one oven to another and for raising and lowering the tiltable platform are operated from a single source of power.

When it is desired to tilt the coke receiving platform or pan, the motor is started and the clutch 51 is operated to connect the drum shaft 48 with the motor actuated or driving shaft 11. This causes the drums to revolve and wind up the hoisting ropes, which raise the inner or rear end of the pan. At the same time as a result of the force exerted by the pull of the inclined portions of the ropes and the force exerted by gravity, the pan is carried both forwardly and upwardly, and is slightly elevated at its front end through the inclined front guides. The forward longitudinal movement of the tiltable pan or platform, which occurs simultaneously with the raising of the inner or rear end, is controlled by the rear inclined guides, and when the pan reaches the limit of its forward longitudinal movement by reason of the intermediate anti-friction wheels 22 having reached the front terminals of the inclined front guides, the pan swings upward on its front pivots 13 and moves away from the rear guides until it is inclined sufficiently to discharge its contents into the car or vessel, as clearly illustrated in dotted lines in Fig. 1 of the drawings. The motor is then reversed to lower the inner or rear end of the tiltable pan or platform, and when the inner or rear anti-friction wheels 31 engage the inner or rear inclined guides, they cause a positive inward sliding movement of the pan or platform and return the same to its initial position, where it is out of the way of the locomotive, box cars, vessels and the like. The weight of the inner or rear end of the platform is sufficient to cause the wheels 31 to roll down the rear inclined guides and draw the pan or platform inwardly. By throwing into action the other clutch 12, a lateral motion is imparted to the apparatus, which may thereby be moved along the track and arranged at any desired point, so that the apparatus may be employed for unloading and handling the coke of an entire series of ovens, and may be transferred successively from one oven to another.

While I have illustrated in the drawings hoisting mechanism having spaced hoisting ropes connected with the tiltable pan or platform, yet it will be clear that other forms of hoisting mechanism may be employed. When necessary the coke is quenched and cooled while within the apparatus, and any suitable means may be employed for this purpose.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. An apparatus for handling coke, etc., including a pivoted tiltable platform, hoist-

ing mechanism comprising spaced drums, overhead pulleys, hoisting ropes arranged over the pulleys and connected with the drums and with the tiltable platform for raising and lowering the same, and means for automatically moving the platform outwardly and inwardly simultaneously with the up and down pivotal movements thereof.

2. An apparatus for handling coke, etc., including a frame having a derrick and provided at the front thereof with a guide, a tilting platform, means slidable in the said guide and having the front end of the platform pivoted to it, pulleys arranged, respectively, at the top of the derrick and at the rear end of the platform, a drum mounted in fixed relation with the frame, and a rope leading from the drum to the pulley at the top of the derrick and the pulley of the platform.

3. An apparatus for handling coke, etc., including a frame having a derrick and provided at the front and back thereof with guides, a tilting platform, means slidable in the front guide and having the front end of the platform pivoted to it, pulleys arranged, respectively, at the top of the derrick and the rear end of the platform, a drum mounted in fixed relation with the frame, a rope leading from the drum to the pulley at the top of the derrick and the pulley of the platform, and an anti-friction roller mounted at the end of the platform opposite the pivoted end thereof to engage with the rear guide.

4. An apparatus for handling coke, etc., including a pivoted tiltable platform, hoisting mechanism comprising spaced drums, overhead pulleys, hoisting ropes connected with the drums and arranged on the pulleys and having looped outer portions, pulleys mounted on the platform and arranged within the loops of the hoisting ropes, and means for automatically moving the platform outwardly and inwardly simultaneously with the upward and downward movement of the platform on its pivot.

5. An apparatus for handling coke, etc., including a frame, a pivoted tiltable platform, means connected with the pivot for permitting an inward and outward movement of the platform, hoisting mechanism provided with a hoisting rope having an inclined portion connected with the platform and adapted to move the same upwardly and outwardly, and means for positively moving the platform inwardly when the same is lowered.

6. An apparatus for handling coke, etc., including a pivoted tiltable platform, slidable means for receiving the pivot of the platform and permitting the latter to move outward and inward in addition to the pivotal or tilting movement of the same to project the platform for discharging its con-

tents into a car or vessel, and means for raising and lowering the platform.

7. An apparatus for handling coke, etc., including a pivoted tiltable platform, slidable means for receiving the pivot of the platform and permitting the latter to move outward and inward in addition to the pivotal or tilting movement of the same to project the platform for discharging its contents into a car or vessel, and a hoisting rope attached to the free end of the platform and pulling from a point above and in advance of the said free end of the platform.

8. An apparatus for handling coke, etc., including a supporting frame, a platform, slidable bars to the outer ends of which the platform is pivoted, said platform being adapted to swing upward and downward and supported at its pivoted end by the said bars when it is in an elevated position, means for guiding the movement of the bars on the frame, and hoisting means connected with the other end of the platform for raising and lowering the same and shifting the bars outward so as to project the platform beyond the supporting frame.

9. An apparatus for handling coke, etc., including a pivoted tiltable platform, slidable means for receiving the pivot of the platform and permitting the latter to move outward and inward in addition to the pivotal or tilting movement of the same to project the platform for discharging its contents into a car or vessel, means for raising and lowering the platform, and means for elevating the front end of the platform during the forward or outward movement thereof.

10. An apparatus for handling coke, etc., including a pivoted tiltable platform, slidable means for receiving the pivot of the platform and permitting the latter to move outward and inward in addition to the pivotal or tilting movement of the same to project the platform for discharging its contents into a car or vessel, means for raising and lowering the platform, and means for guiding the slidable means, said guiding means imparting a progressive vertical movement to the platform during the outward movement of the same.

11. An apparatus for handling coke, etc., including a pivoted tiltable platform, a slidable supporting bar receiving the pivot of the platform and movable outwardly and inwardly for supporting the platform in a projecting position over a car or vessel, and means for raising and lowering the platform.

12. An apparatus for handling coke, etc., including a frame, a tiltable platform provided with pivots, supporting members slidably mounted on the frame and connected with the pivots and adapted to support the platform in a projecting position over a car

or vessel; and means for raising and lowering the platform.

13. An apparatus for handling coke, etc., including a tiltable platform provided with a pivot, a slidable supporting member receiving the pivot and movable outwardly and inwardly and adapted to support the platform in a projecting position over a car or vessel, means for raising and lowering the platform on its pivot, and guiding means connected with the supporting member and arranged to elevate the same in the outward movement thereof.

14. An apparatus for handling coke, etc., including a frame, a tiltable platform having a pivot, a slidable supporting bar receiving the pivot at its outer end and slidably connected at its inner end with the frame, guiding means connected with the bar at a point intermediate of the ends thereof and arranged to elevate the same during the outward movement thereof and lower the supporting bar on the inward movement thereof, and mechanism for raising and lowering the platform on its pivot.

15. An apparatus for handling coke, etc., including a frame provided with a track, a tiltable platform having a pivot, a supporting bar connected at its outer end with the pivot and slidably connected at its inner end with the track of the frame, and an inclined guide connected with an intermediate portion of the supporting bar to raise and lower the same during the sliding movements thereof.

16. An apparatus for handling coke, etc., including a frame having a track beam, a tiltable platform provided with a pivot, a slidable supporting bar receiving the pivot of the platform and having a forked or bifurcated portion straddling the track bar and provided with an anti-friction device to run against the same, an inclined guide mounted on the frame, and an anti-friction device mounted on the supporting bar at a point intermediate of the ends thereof and operating in the inclined guide.

17. An apparatus for handling coke, etc., including a frame having a track beam, a tiltable platform provided with a pivot, a slidable supporting bar connected at its outer end with a pivot and having a forked inner end straddling the track beam and provided with an anti-friction device arranged to run against the lower face of the track beam, intermediate anti-friction devices mounted on the slidable supporting bar at opposite sides thereof, and a guide having spaced sides located at opposite sides of the slidable supporting bar and receiving the intermediate anti-friction devices thereof.

18. An apparatus for handling coke, etc., including a frame having a track beam, a tiltable platform provided with a pivot, a slidable supporting bar connected at its outer

end with a pivot and having a forked inner end straddling the track beam and provided with an anti-friction device arranged to run against the lower face of the track beam, intermediate anti-friction devices mounted on the slidable supporting bar at opposite sides thereof, and a guide having spaced sides located at opposite sides of the slidable supporting bar and provided with inclined slots extending upwardly and outwardly and receiving the intermediate anti-friction devices of the supporting bar.

19. An apparatus for handling coke, etc., including a frame having parallel guiding members, a tiltable platform provided at opposite sides with pivots, slidable supporting bars located at opposite sides of the platform and connected at their outer ends to the said pivots and having forked inner ends straddling the parallel guiding members and having means for engaging the lower faces thereof, guides mounted on the frame at opposite sides of the platform and having spaced sides located at opposite sides of the supporting bars, said guides being also provided in their sides with slots, projecting means carried by the supporting bars and extending laterally therefrom and operating in the slots of the said guides, and means connected with the platform for raising and lowering the same on its pivot.

20. An apparatus for handling coke, etc., including a frame, a tiltable platform having a pivot, a supporting bar slidably connected with the frame and receiving the pivot of the platform, means connected with the supporting bar for limiting the sliding movement thereof, and hoisting mechanism including means connected with the platform for raising and lowering the same and for urging the platform outwardly.

21. An apparatus for handling coke, etc., including a frame, a tiltable platform having a pivot, a supporting bar slidably connected with the frame and receiving the pivot of the platform, means connected with the supporting bar for limiting the sliding movement thereof, hoisting mechanism including means connected with the platform

for raising and lowering the same and for urging the platform outwardly, and means for positively moving the platform inwardly during the downward movement thereof.

22. An apparatus for handling coke, etc., including a frame, a tiltable platform having a pivot, a supporting bar slidably connected with the frame and receiving the pivot of the platform, means connected with the supporting bar for limiting the sliding movement thereof, hoisting mechanism including means connected with the platform for raising and lowering the same and for urging the platform outwardly, and a guide located in the path of the platform and arranged to move the same inwardly during the downward movement thereof.

23. An apparatus for handling coke, etc., including a wheeled frame, a tiltable platform mounted on the frame, hoisting mechanism for raising and lowering the platform, a motor, a shaft connected with and actuated by the motor, separate gearing for connecting the motor actuated shaft with the hoisting mechanism and with the wheels of the frame, and separate clutches for throwing such gearing into and out of operation.

24. An apparatus for handling coke, etc., including a wheeled frame having an axle, a tiltable platform carried by the frame, hoisting mechanism connected with the tiltable platform for raising and lowering the same, a driving shaft, separate gearing connecting the driving shaft with the axle and with the hoisting mechanism, clutches for throwing such gearing into and out of operation, a motor mounted on the frame, a tubular shaft or sleeve arranged on the said axle, and gearing connecting the tubular shaft or sleeve with the motor and with the driving shaft.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM C. MITCHELL.

Witnesses:

WALTER CROWE,
A. M. MACKENZIE.