

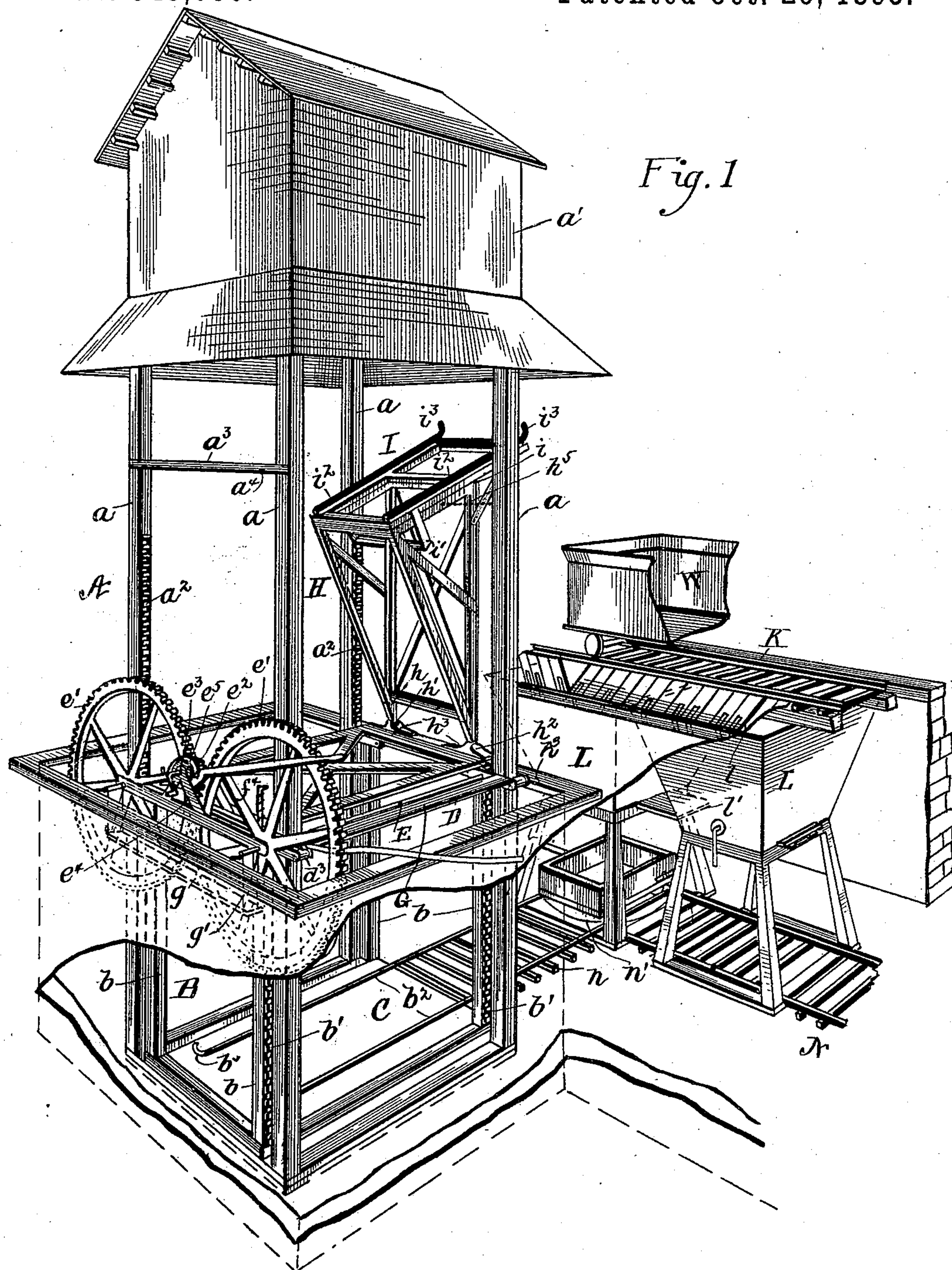
(No Model.)

3 Sheets—Sheet 1.

C. L. CHAPMAN.  
COAL RECEPTACLE AND ELEVATOR.

No. 549,090.

Patented Oct. 29, 1895.



Witnesses  
Washington H. Gaunt  
Charles F. Field

Inventor  
Chapman & Chapman  
By *his* Attorney *John W. Field*



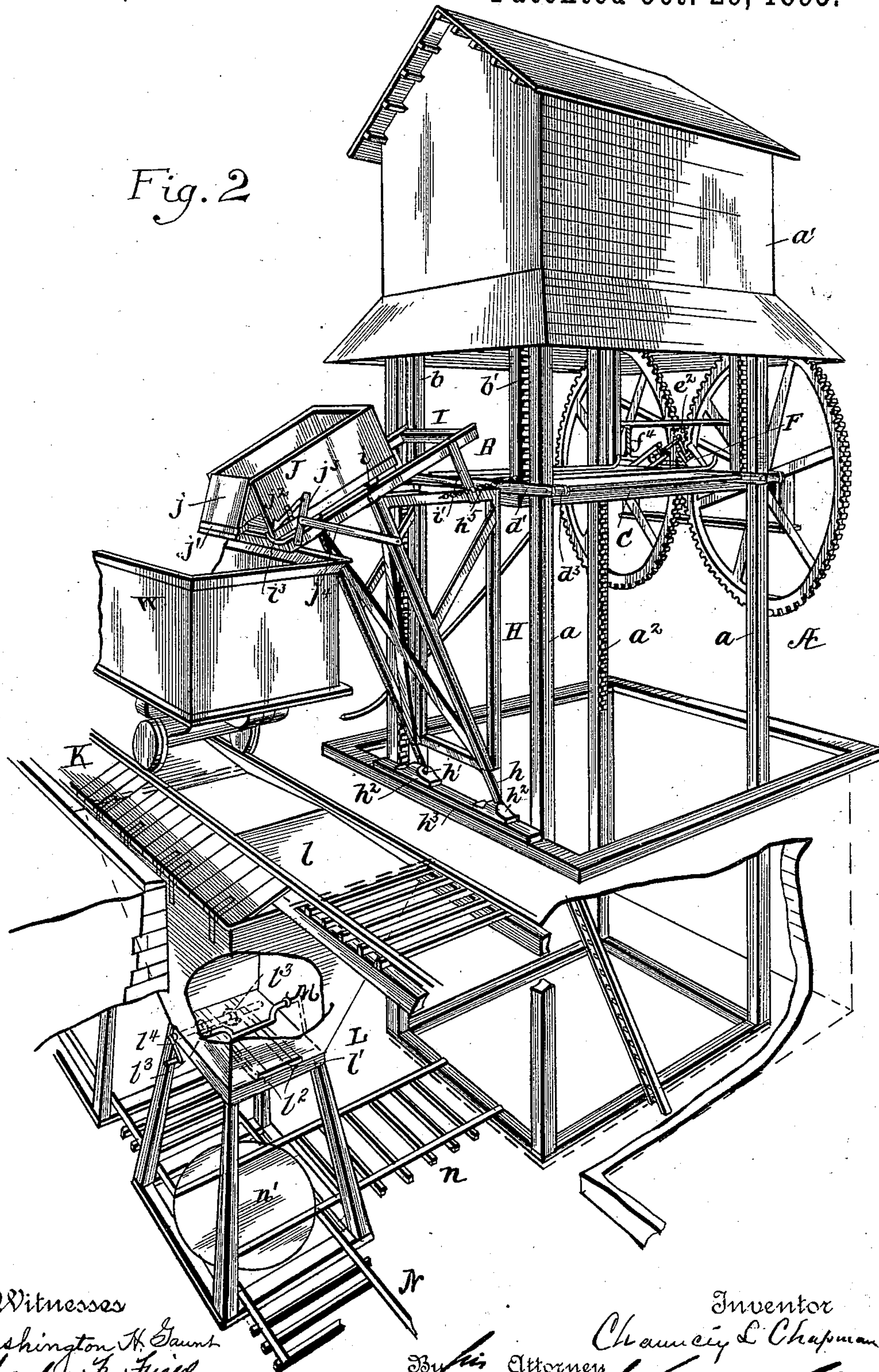
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Inventor  
Chauncy L. Chapman  
By *[Signature]* Attorney



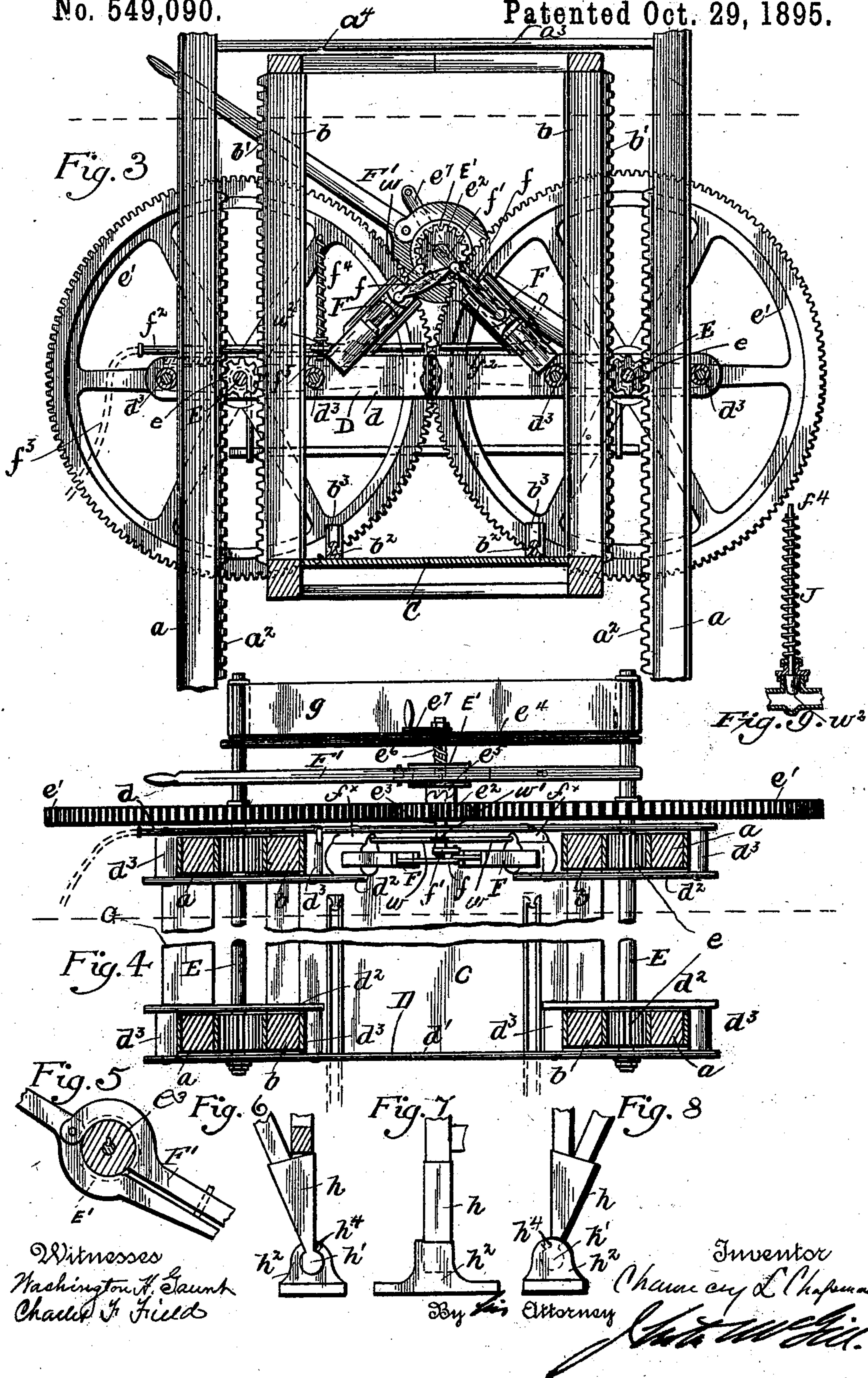
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3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

CHAUNCEY L. CHAPMAN, OF DUNLAP, IOWA.

## COAL RECEPTACLE AND ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 549,090, dated October 29, 1895.

Application filed September 25, 1894. Serial No. 524,097. (No model.)

*To all whom it may concern:*

Be it known that I, CHAUNCEY L. CHAPMAN, of Dunlap, in the county of Harrison and State of Iowa, have invented certain new and useful Improvements in Coal Receptacles and Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention contemplates certain new and useful improvements in coal receptacles and elevators, and is especially designed for use in connection with steam-railroads.

It has for its objects, first, to provide efficient subterranean storage-bins beneath the main tracks of a railroad, whereby coal can be dumped thereinto from dump-cars on said track; second, to provide simple and highly-efficient means for withdrawing from said bins any desired amount of coal, the same falling into suitable transfer-cars, and, third, to provide a new and improved form of elevator for rapidly raising said transfer-cars to a point above a car or tender on the main track and dumping the contents of said transfer-car into said car or tender, then quickly lowering said transfer-car, the parts of said elevator not projecting in any way to form obstruction to the main track when the elevator is not in use.

To these ends the invention comprises the novel features of construction and the combination and arrangement of parts substantially as hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective, with parts broken away, showing the elevator in its lowermost position. Fig. 2 is a similar view looking at the opposite side to that on which Fig. 1 is taken, the elevator being shown at the upper limit of its movement. Fig. 3 is an end view, enlarged, of the elevator-frame and operating mechanism therefor, parts being broken away. Fig. 4 is a plan of Fig. 3. Fig. 5 is a detail of the brake. Figs. 6, 7, and 8 are details. Fig. 9 is a view of the air or steam inlet-valve with parts broken away.

Referring to the drawings, A designates the stationary frame, having four posts or uprights *a*, supporting at their upper end a gable

roof or covering *a'*. Upon the inner opposed faces of each two of the posts or uprights *a* are secured rack-bars *a<sup>2</sup>*, which extend from about the center of said posts to near the top thereof. A cross bar or rod *a<sup>3</sup>* is connected to two of the posts or uprights *a* at a point above the upper ends of the rack-bars *a<sup>2</sup>*, and a notch *a<sup>4</sup>* is formed in the under side of said cross bar or rod.

B designates the movable frame of the elevator, the same comprising four corner posts or uprights *b*, which are designed to fit and move within the space formed by the bars or uprights *a* of frame A. These posts or uprights *b* have on their outer faces rack-bars *b'*, corresponding to and located opposite the rack-bars *a<sup>2</sup>* of posts *a*, a space being left between said rack-bars, as shown in Fig. 3.

C is a horizontally-disposed platform secured to the lower ends of posts or uprights *b*, and upon it are two rails *b<sup>2</sup>*, having bent or upwardly-curved ends *b<sup>3</sup>*.

D is a movable frame or carriage composed of outer end bars *d d'* and four inner short bars *d<sup>2</sup>*, in which and in said outer bars *d d'* are journaled the ends of rollers *d<sup>3</sup>*, thus providing four pairs of rollers, one pair at each corner. The rollers of each pair are designed to bear, respectively, against the outer and inner longitudinal edges of the posts or uprights *a b*, thus preventing any spreading of the latter and providing for easy movement of the frame D. Extending longitudinally through this frame D are two shafts E, upon each of which are rigidly secured pinions *e*, which are located between and intermesh with the rack-bars *a<sup>2</sup>* and *b'* of the posts or uprights *a b*. Upon the projecting ends of these shafts E are mounted two large gear-wheels *e'*, which are designed to intermesh with each other. The gear-wheels *e'* receive their motion from a pinion *e<sup>2</sup>*, mounted on a shaft *e<sup>3</sup>*, journaled at its inner end in a cross-bar *d* of frame D and at its outer end in a cross-bar *e<sup>4</sup>*, supported by shafts E, said pinion *e<sup>2</sup>* meshing with one of the gear-wheels *e'*. This pinion is loose on its shaft and is caused to revolve with the latter by a two-part clutch *e<sup>5</sup>*, which is normally held closed or locked by a spring *e<sup>6</sup>*. One part of this clutch is secured to or formed with the pinion *e<sup>2</sup>*, while the other part is attached to a brake-drum



E', both of which are held by a spline on shaft  $e^3$ , so as to revolve therewith and be capable of being moved longitudinally thereon. The spring  $e^6$  normally holds the two parts of the clutch united. Motion is imparted to this shaft  $e^3$  either by a crank  $e^7$  or two engines F, having pitmen  $f$ , connected to a crank-arm  $f'$  at one end of said shaft. These engines are supported by the frame D, and into the steam-chest  $f^x$  thereof opens a pipe  $f^2$ , (see Figs. 3 and 4,) to which is connected a tube  $f^3$ , leading from a compressed-air reservoir or boiler of a locomotive or other source of pressure. The valve-rods  $w$  are indicated in Figs. 3 and 4, and at their outer ends they engage an eccentric  $w'$  on shaft  $e^3$ . (See Fig. 4.) From this pipe  $f^2$  projects a perpendicular spring-pressed valve-rod  $f^4$ , (see Figs. 3 and 4,) which, when raised in the valve-casing  $f^5$  unseats its valve  $w^2$  and allows the air or steam to pass to the chests of the engines F and thereby set said engines in motion, causing the turning of the shaft  $e^3$  and the revolution of gear-wheels  $e'$ , which, through the agency of the pinions  $e$ , engaging rack-bars  $a^2 b'$ , will effect the rapid elevation of the frame B. The elevator-frame ascends at double the rate of the movable frame D and the propelling or operating mechanism carried thereby. The ascent of the elevator-frame is automatically stopped by the lowering of valve-rod  $f^4$ , which causes the valve to be re-seated when the upper end of said valve-rod strikes against cross-bar  $a^3$ , entering the notch thereof, after which the supply of air or steam is cut off by any suitable valve (not shown) at or near the reservoir or boiler, and is not again admitted to the pipe until after the elevator-frame has been lowered and is to be again raised. The descent of the elevator-frame is effected by the disengagement of the outer part of clutch  $e^5$  from the part attached to pinion  $e^2$ , thereby permitting said pinion to revolve freely on its shafts. A suitable brake, as indicated at F', may be used to control the descent of the elevator, the same encircling and engaging the brake-drum E'. By applying the brake and moving the same laterally the drum E' will be moved on shaft  $e^3$ , thus disengaging the parts of the clutch. As the elevator-frame B reaches the upper limit of its movement, the pinions  $e$  are in engagement with the lower ends of the rack-bars  $b'$  and the upper ends of rack-bars  $a^2$ , while, when said elevator-frame is lowered, said pinions are at the lower ends of rack-bars  $a^3$  and the upper ends of rack-bars  $b'$ .

When the elevator-frame is at the upper limit of its movement, the platform C thereof is about on a line with the movable frame D, the tracks or rails  $b^2$  thereof projecting above the end cross-bar  $d'$ . To one end of this frame D is connected a board G, which serves as a platform on which one of the operators stands.

A platform  $g$ , consisting of a single board, is supported by hangers or loops  $g'$ , depending

from the projecting ends of shafts E. Upon this platform an operator can stand for turning the shaft  $e^3$  by crank-handle  $e^7$  and also for controlling the position of the clutch.

H is a swinging frame of approximately triangular form, the lower convergent ends of its sides being provided with shoes  $h$ , having rounded or ball-like ends  $h'$ , fitting in socket-plates  $h^2$ , rigidly secured to the stationary horizontal base  $h^3$  surrounding the stationary frame A. These socket-plates  $h^2$  have stops or shoulders  $h^4$ , which serve to limit the outward movement of the frame. Both the inward and outward movements of this frame are further controlled by chains  $h^5$ , secured thereto and also to two of the posts  $a$ . Upon this swinging frame H is a track-frame I, which is hinged or pivotally mounted at its center, as at  $i$ , to the outer upper end of frame H, so that said track-frame is free to move to occupy an inclined position, as shown in Fig. 2, its movement, however, being limited by a strap  $i'$ , secured at its ends to said track-frame and passing beneath the upper portion of frame H. The outer end of the rails  $i^2$  on this track-frame are bent or curved upwardly, as shown at  $i^3$ , and form stops for the transfer-car J. The swinging door  $j$  of this car has a cross-bar  $j'$ , the projecting ends of which are designed to be engaged by pivoted hooks  $j^2$  on the sides of said car. When the track-frame is tilted, as shown in Fig. 2, each hook  $j^2$  is disengaged from bar  $j'$  by an arm  $j^3$ , which is pivoted at its outer end to the track-frame I and at its other end to the free end of said hook, and is connected by a link or bar  $j^4$  to the frame H, said link serving to move said arm when the track-frame is tilted. Thus the contents of the transfer-car are allowed to dump into a car or tender W, located on the main track K.

I will now proceed to describe the means employed for storing the coal deposited adjacent to the elevator by dumping-cars, and ready to be conveyed to said elevator so as to be transferred to a car or tender on the main track.

L L designate hopper-like bins located beneath the main track K, any number of which bins may be employed. Over these bins are trap-doors  $l$ , through which coal deposited by suitable dumping-cars (not shown) passes into the bins. The bottoms of the latter are provided with openings which are normally closed by sliding doors  $l'$ , having rack-bars  $l^2$ , with which engage pinions  $l^3$  on a crank-shaft  $l^4$ . By turning this crank-shaft the doors can be moved beneath the hoppers or bins to allow the coal to pass therefrom into transfer-car J. Immediately above each of these openings in the bins is an agitator M, which consists of a cranked or bent shaft extending transversely across the bottom of the bins and journaled in the side of the latter. When the doors of the bins are moved from beneath the openings, the agitators are designed to be operated to effect the loosening and lowering of



the coal. Beneath the bins and parallel with the main track K is a track N, on which the transfer-car J is designed to be located when receiving the coal from the bins, and at right angles to this track is a transfer-track  $n$ , a turn-table  $n'$  being located at the point of conjunction of these two tracks. The rails of the track N align with the rails  $b^2$  of platform C of the elevator when the latter is lowered.

From what has been said it will be seen that upon the transfer-car J being supplied with coal from the bins beneath the main track the same is transferred by the turn-table to track  $n$  and then run onto the platform C of the elevator. The operator on platform G then raises the valved rod  $f^4$ , permitting the engines F to operate, (or if the latter are not in use the operator on platform  $g$  turns the crank-handle  $e^7$ ), effecting the revolution of pinion  $e^2$ , which travels with its shaft  $e^3$  by reason of the clutch connection, and the large gear-wheels  $e'$  being thus revolved the pinions  $e$  intermesh with the rack-bars of the stationary and movable frames, causing the rapid elevation of the latter until the car-carrying platform C is brought on a line with the top of the swinging frame H, when further movement of the elevator is automatically stopped by contact of the valve-rod  $f^4$  with cross-bar  $a^3$ . The rails  $b^2$  of platform C being then in alignment with the tracks  $n$ , the transfer-car is pushed forward on the latter, and its weight overcoming the center of gravity of track-frame I the latter is caused to tilt, and the door of said car being opened in the manner hereinbefore stated the coal is readily dumped into the tender located on the main track. After this is accomplished the track-frame is caused to assume its normal position by the operator on platform G bearing downwardly on the inner end of said track-frame, and the car is then again moved onto the platform C, and the operator on platform  $g$ , by disengaging the clutch  $e^5$  from pinion  $e^2$ , allows the elevator-frame to automatically lower. When the platform C reaches the lower limit of its movement, the transfer-car is removed therefrom onto the track N and then pushed into position for further use.

It will be observed that when the elevator is not in use the swinging frame H is swung inwardly between two of the posts or uprights of the stationary frame A, as shown in Fig. 1, so as not to be in the way of or form any obstruction to the passage of cars over the main track K.

The advantages of my invention are apparent to those skilled in the art, and it will be observed that I have provided simple, convenient, and inexpensive means whereby coal may be conveniently stored and can be quickly transferred to an elevated point and dumped into a car or tender.

It will be noticed that the elevator mechanism employed by me is strong and durable and highly efficient and rapid in operation.

I claim as my invention—

1. The herein described improved coal receptacle and elevator, comprising one or more bins or hoppers located beneath or adjacent to the main track, a lower subterranean track beneath said bins or hoppers, a transfer car designed to receive coal from said bins or hoppers, a transfer track, an elevator for receiving and raising said transfer car above said main track, and means for tilting said transfer car when so raised, whereby the contents thereof can be dumped into a car or tender on said main track, substantially as set forth.

2. The herein described improved coal receptacle and elevator, comprising a series of bins or hoppers located beneath the main track and having openings in their bottoms, sliding doors movable beneath said openings, a subterranean track beneath said bins or hoppers and parallel with said main track, a transfer car designed to receive coal from said bins or hoppers, a transfer track, a turn-table, an elevator for receiving and raising said transfer car above said main track, and means for moving said transfer car outwardly and tilting the same, whereby the contents of said transfer car can be dumped into the car or tender on said main track, substantially as set forth.

3. The combination with a railway track, of the series of subterranean bins or hoppers located thereunder and having upper trap doors, said bins or hoppers having openings in their bottoms, sliding doors for covering said openings, means for operating the same, and a subterranean track parallel with said former track located beneath said bins or hoppers, and a transfer car designed to move on said subterranean track, substantially as set forth.

4. An elevator of the class herein specified comprising a stationary frame, an inner movable frame carrying a platform, a horizontal frame having mechanism engaging said stationary and movable frames for effecting the raising and lowering of the latter frame, and means for operating said mechanism, substantially as set forth.

5. An elevator of the class herein described comprising a stationary frame having posts or uprights provided with rack bars, a movable frame also having posts or uprights provided with rack bars opposed to said former rack bars, a platform carried by said movable frame, a horizontal frame having shafts provided with pinions meshing with said opposed rack bars and means for rotating said shafts, substantially as set forth.

6. An elevator of the class herein described comprising a stationary frame having posts or uprights provided with rack bars, a movable frame also having posts or uprights provided with rack bars opposed to said former rack bars, and a platform carried by said movable frame, a horizontal frame having shafts mounted therein, pinions on said shafts engaging said opposed rack bars, intermeshing gear wheels on said shafts, and means for en-



gaging one of said gear wheels for rotating the latter, and causing pinions to revolve and effect the elevation of said movable frame, substantially as set forth.

- 5 7. An elevator of the class herein described comprising a stationary frame having posts or uprights provided with rack bars, a movable frame also having posts or uprights provided with rack bars opposed to said former rack  
10 bars, and a platform carried by said movable frame, a horizontal frame having shafts mounted therein, pinions on said shafts engaging said opposed rack bars, intermeshing gear wheels on said shafts, a pinion meshing  
15 with one of said gear wheels and having its shaft supported by said frame, and means for rotating said shaft, substantially as set forth.
8. An elevator of the class herein described comprising a stationary frame having posts  
20 or uprights provided with rack bars, a movable frame also having posts or uprights provided with rack bars opposed to said former rack bars, a platform carried by said movable frame, a horizontal frame having shafts  
25 mounted therein, pinions on said shafts engaging said opposed rack bars, intermeshing gear wheels on said shafts, a pinion meshing with one of said gear wheels and having its shaft supported by said frame, and engines,  
30 or the like, carried by said frame and having pitmen connected to said shaft, substantially as set forth.
9. An elevator of the class herein described comprising a stationary frame having posts  
35 or uprights provided with rack bars, a movable frame also having posts or uprights provided with rack bars opposed to said former rack bars, and a platform carried by said movable frame, a horizontal frame having  
40 shafts mounted therein, pinions on said shafts engaging said opposed rack bars, intermeshing gear wheels on said shafts, a pinion meshing with one of said gear wheels and having its shaft supported by said frame, engines  
45 carried by said frame and having pitmen connected to said shaft, and a fluid supply pipe opening into the chests of said engines, and designed to be connected to the source of pressure, substantially as set forth.
- 50 10. An elevator of the class herein described comprising a stationary frame having posts or uprights provided with rack bars, a movable frame also having posts or uprights provided with rack bars opposed to said former  
55 rack bars, and a platform carried by said movable frame, a horizontal frame having shafts mounted therein, pinions on said shafts engaging said opposed rack bars, intermeshing gear wheels on said shafts, a pinion meshing  
60 with one of said gear wheels and having its shaft supported by said frame, engine carried by said frame and having pitmen connected to said shaft, a fluid supply pipe opening into the chests of said engines, and de-  
65 signed to be connected to the source of pressure, and a valve in said pipe having an up-

wardly extending rod or stem designed to strike against a portion of said stationary frame and seat said valve when said movable frame reaches the limit of its upward move- 70 ment, substantially as set forth.

11. An elevator of the class herein described comprising a stationary frame having posts or uprights provided with inner rack bars, a movable frame having corresponding posts or 75 uprights and rack bars, a platform carried by said movable frame, a horizontal movable frame having mechanism for effecting the raising and lowering of said movable frame, the same comprising shafts having pinions en- 80 gaging said rack bars, engines for driving said shafts, a fluid-supply-pipe opening into the chests of said engines, a valve in said pipe, and means for closing or seating the same as said movable frame reaches the up- 85 per limit of its movement, substantially as set forth.

12. The combination with the stationary frame having posts or uprights provided with rack bars, and an upper cross bar connected 90 to said frame, of the movable frame having corresponding posts or uprights provided with rack bars, a horizontal movable frame having shafts provided with pinions engaging said opposed rack bars, intermeshing gear wheels 95 on said shafts, a driving pinion engaging one of said gear wheels and having its shaft provided with a crank arm, engines carried by said horizontal frame and having pitmen connected to said crank arm, a fluid-supply 100 pipe opening into the chests of said engines, the valve in said pipe having an upwardly extended spring-pressed rod or stem, and connections between said fluid-supply pipe and the source of supply, substantially as set forth. 105

13. The combination with the stationary frame having posts or uprights provided with rack bars, of the movable frame also having posts or uprights provided with rack bars, a platform at the lower end of said movable 110 frame secured to the posts or uprights thereof, the horizontal frame having longitudinal shafts provided with pinions engaging opposed rack bars of said posts or uprights of said frames, intermeshing gear wheels mount- 115 ed on said shafts, a driving pinion engaging one of said gear wheels, a shaft therefor on which said pinion is loosely mounted, a clutch fast on said shaft and designed to engage said pinion, and means for operating said shaft, 120 substantially as set forth.

14. The combination with the stationary frame having posts or uprights provided with rack bars on their inner opposed faces, of the movable frame having posts or uprights pro- 125 vided with rack bars on their outer faces opposite to said former rack bars, the horizontal movable frame carrying at its corners rollers bearing against the outer and inner longitudinal edges of the adjacent posts or uprights 130 and said stationary and movable frames, the shafts having pinions meshing with said op-



posed rack bars, intermeshing gear wheels mounted on said shafts, and means for driving said gear wheels, substantially as set forth.

15. The combination with the stationary frame having posts or uprights provided with rack bars, of the movable frame also having posts or uprights provided with rack bars, of the horizontal movable frame having cross bars, four inner short bars, rollers journaled in the latter and in said cross bars and bearing respectively against the outer and inner longitudinal edges of the said posts or uprights of said stationary and movable frames; shafts carried by said horizontal frame provided with pinions engaging said rack bars, intermeshing gear wheels mounted on said shafts, and means for rotating the same, substantially as set forth.

16. The combination with an elevator, of a swinging frame pivoted at its lower end and a tilting frame pivoted to said swinging frame, substantially as and for the purpose set forth.

17. The combination with an elevator, of a swinging frame pivoted at its lower end, means for limiting the inner and outward movement of said swinging frame, and a track-frame

pivotally connected to said swinging frame, and means for limiting the movement of said tilting frame and for opening the door of a transfer car located thereon when said track frame is tilted, substantially as set forth.

18. The combination with the bins or hoppers and the subterranean tracks, of the elevator having a platform provided with rails, the transfer car designed to fit thereon, having a pivoted door, means for elevating said platform, a swinging frame, a track-frame pivotally connected thereto and having rails thereon with which the rails of said platform are designed to coincide when said platform is elevated, means for limiting the movement of said track-frame, and a pivoted arm carried thereby for opening said door of said transfer car when the latter and said track-frame are tilted, substantially as set forth.

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

CHAUNCEY L. CHAPMAN.

Witnesses:

WASHINGTON H. GAUNT,  
CHARLES F. FIELD.