

C. H. WRIGHT & H. E. SCOTT.
CAR DUMPING APPARATUS.
APPLICATION FILED APR. 1, 1909.

932,529.

Patented Aug. 31, 1909.

5 SHEETS—SHEET 1.

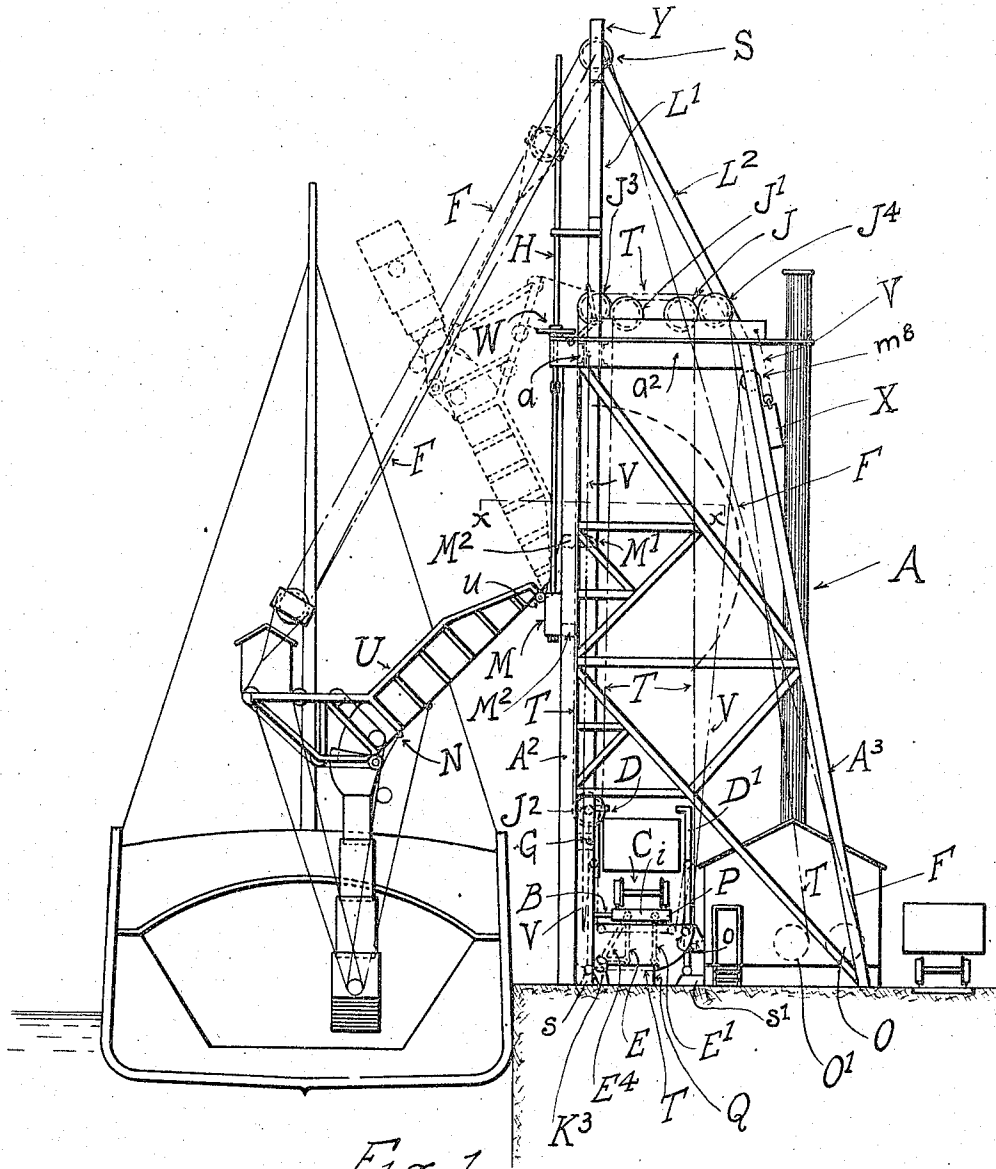


Fig. 1.

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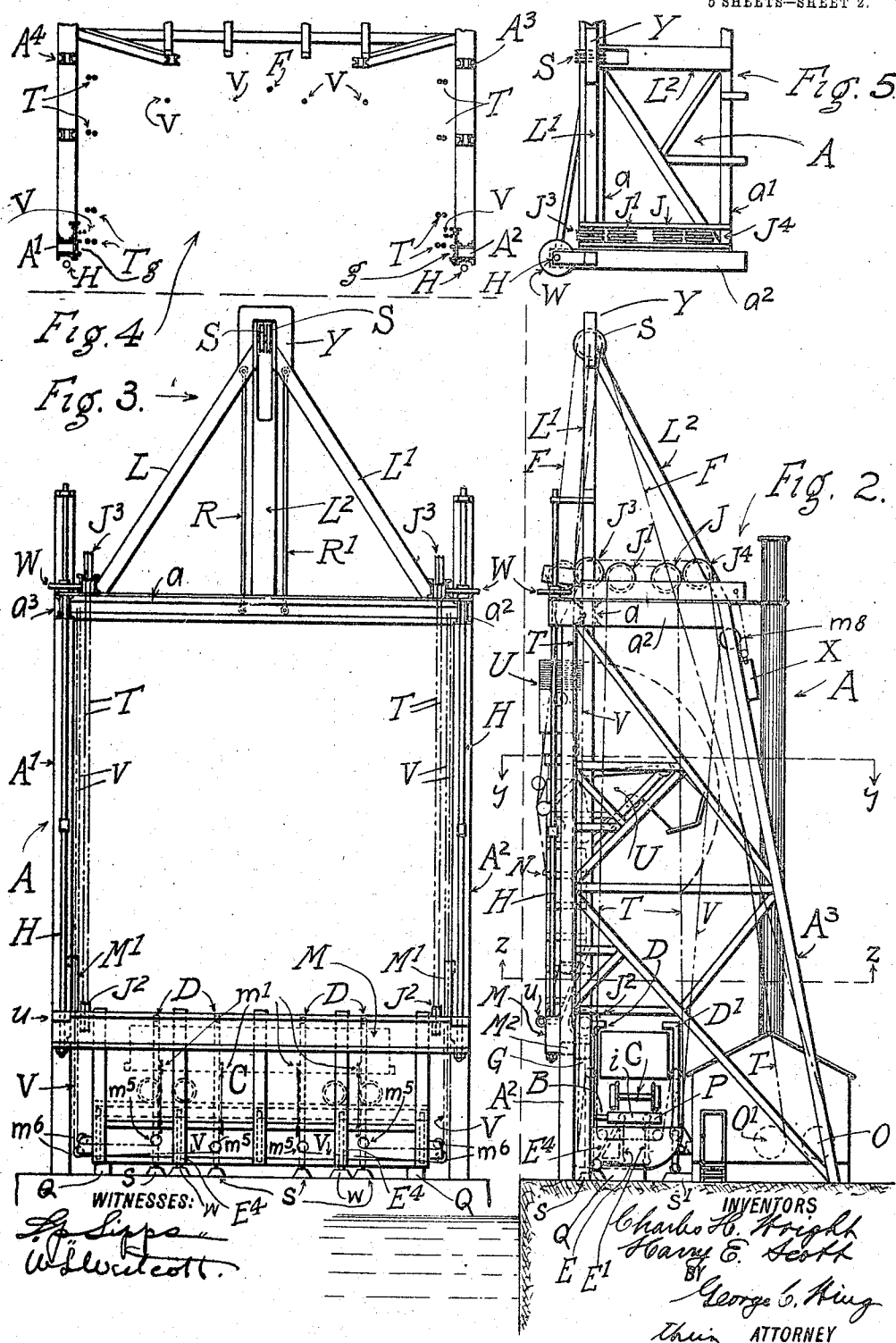
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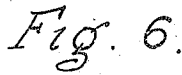
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5 SHEETS—SHEET 3.



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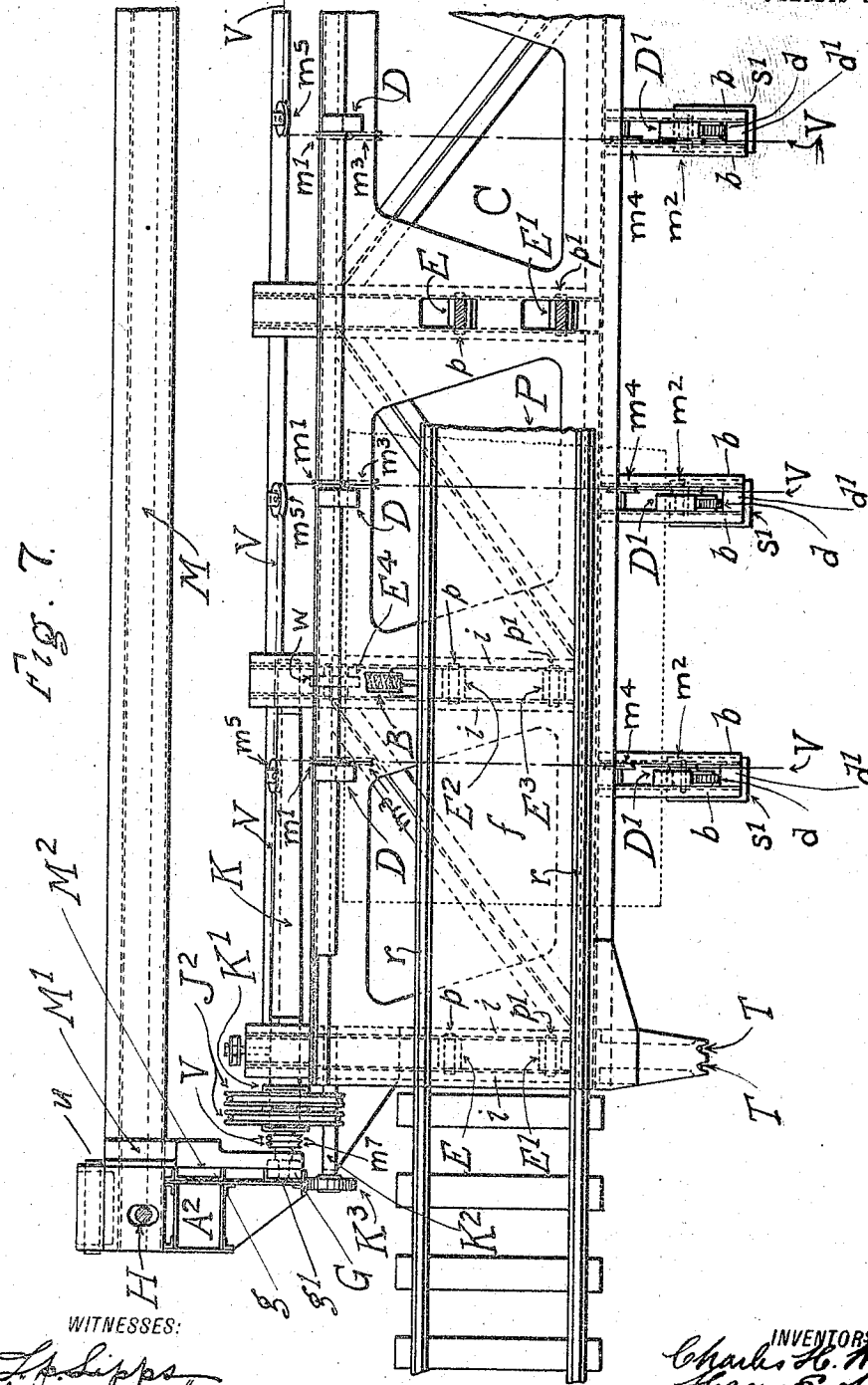
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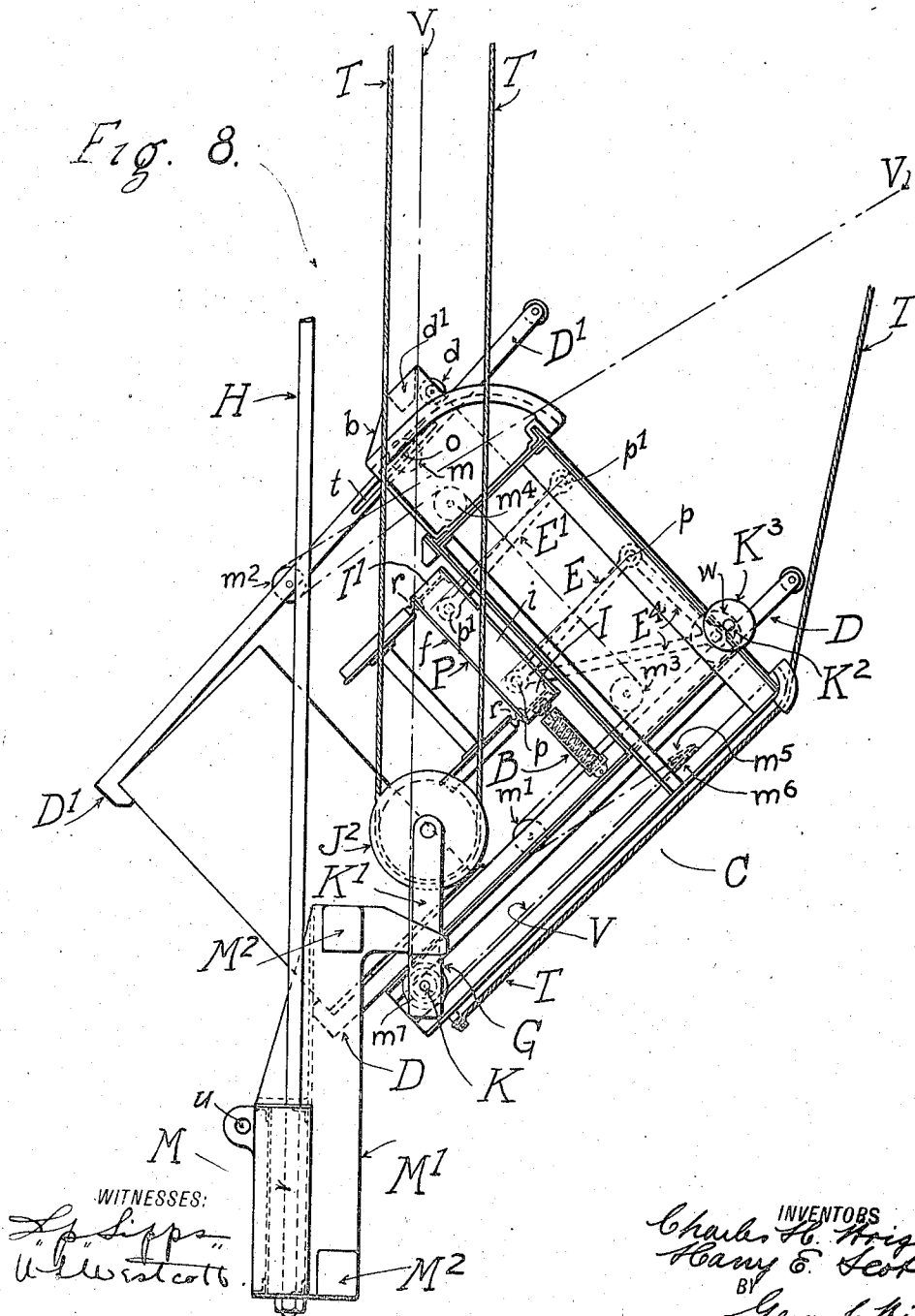
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6 SHEETS—SHEET 5.



UNITED STATES PATENT OFFICE.

CHARLES H. WRIGHT AND HARRY E. SCOTT, OF CLEVELAND, OHIO, ASSIGNORS TO THE BROWN
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CAR-DUMPING APPARATUS.

932,529.

Specification of Letters Patent. Patented Aug. 31, 1909.

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To all whom it may concern:

Be it known that we, CHARLES H. WRIGHT and HARRY E. SCOTT, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Car-Dumping Apparatus, of which we hereby declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings as a part of the specification, wherein the same parts are designated by the same letters in each instance.

Said improvement relates more especially to the class of mechanical instruments designed for the unloading of railway cars of gross cargoes, such as ore, coal, lime-stone, and similar bulky or granular matter, by overturning the car before and along the mouth of a chute, or apron, that leads to a vessel or other receptacle below.

As is well understood the class of apparatus in question is more generally employed upon docks and for the loading of vessels where it is desirable to utilize the entire dock-front, both because of the value of the land and space involved, and, because the weight of material, in a given apparatus, and the consequent primary cost, is, to an important degree dependent upon its proximity to such front. So, also, in order to be clear of the rigging of passing vessels, and conform to United States regulations on the subject, the extension apron usually employed must be so related to its supporting tower that, when the apparatus is idle, such apron may be retracted close to or entirely within the dock-line.

It is the purpose of the present invention to provide an unloading apparatus of the type above referred to, that, in addition to other new and advantageous features, by reason of the novel manner of its construction and mode of action, may be built and operated closer to a dock-line than existing devices of the sort, and without unduly projecting beyond such line at any time, or in any manner offending government requirements in the connection.

In the drawings Figure 1 is a side view of the apparatus in operative position. Fig. 2 is a similar view, when inoperative, and with the apron raised. Fig. 3 is a front view of the apparatus, the apron and lower frame-work not being shown. Fig. 4 is a

sectional plan view, between the lines *y y* and *z z* of Fig. 2 of the supporting framework of the apron or discharge chute, with the latter removed. Fig. 5 is a partial or semi-downward view of certain structural details at the top of said frame-work. Fig. 6 is an end view of a special cradle arrangement with a car within the same in position for clamping. Fig. 7 is a plan view on the line *x, x*, of Fig. 1 of a portion of the apron-girder as connected with its supporting post, and of a corresponding portion of the cradle related thereto, in operative position, and, Fig. 8, is an end view of said apron-girder, a cradle-stop and the cradle, itself, in position for dumping the car-load.

The apparatus, as a whole, is characterized by the usual frame work tower A, made up of the four corner-posts A^1 A^2 A^3 A^4 , and the requisite braces to render the same stable, the rear corner posts A^3 , and A^4 , being inclined inwardly from their bases toward the front of the structure. The front posts A^1 and A^2 are vertical, and carry upright grooves *g' g'* on their inner opposite faces, and all four posts are held together at the top by suitable cross-girders, *a* and *a'* that connect, respectively, the front and rear pairs of posts, and a^2 and a^3 that connect the two side pairs. Said girders, except *a*, are fastened directly to their posts, but, the connection of *a* to its pair of posts is made, indirectly, by fastening its ends to the cross-girders a^2 and a^3 , at a point thereon to the rear of the front posts A^1 and A^2 so that said girder *a* shall be set back from the front of the tower A, for the special purpose that will hereinafter appear. Said posts are rigidly affixed, at their lower ends, to any suitable foundation provided for the purpose. The structural arrangement of the tower A, as a whole, is such that the entire front of said tower below the cross-girder *a*, and its interior are free from any parts or pieces, so as to be clear to receive therein the cradle and apron, hereinafter described, and their operative connections. Located upon the cross-girder *a*, is an elevated A-frame arrangement made up of the two legs L and L' fastened, at their lower ends, respectively, to said cross-girder near its ends, and joined together at their upper ends, by an intermediate yoke or casting Y. Parallel girder-supporting rods R and R' extend vertically from points near the apex of said

A-frame, to said girder *a*, to which they are there connected. A back-stay *L*² extends downwardly at the rear of said A frame between the apex and the cross-girder *a'*.
 5 Sheaves *S*, *S'*, for the hoisting ropes of the apron or chute are located in said yoke. Within said tower is the usual L-shaped cradle *C*, provided, upon its horizontal portion with a platform *P* for the reception of
 10 the car to be unloaded. Said platform *P* is a rectangular frame-work, composed of side-beams *I* and *I'* and a series of cross-beams *i*, *i'*, arranged, in the figures in five pairs therethrough with a suitable floor *f*, above
 15 and upon the same. Parallel *T*-rails, for the car, extend lengthwise of the platform. Between the parallel members of the first, third and fifth of said pairs of cross-beams *i*, arranged, in sets of two, are shown upright
 20 eye-bars *E*, *E'*, pivotally connected, by the pins *p*, *p'*, through their eyes, to the cradle below, and at their upper ends, to said platform, at points thereon slightly off the vertical and toward the side of the cradle. In
 25 a like manner, between the parallel members of the second and fourth of said pairs of cross-beams *i*, pivotally connected to said cradle and platform, are shown similar sets of eye-bars *E*² and *E*³, the inner eye-bars
 30 *E*², of each set, being provided with bell-crank arms or extensions *E*⁴ toward the side of the cradle, which are preferably connected at their inner ends, to rollers *w*. As
 35 will be evident said sets of eye-bars, thus located, serve to support said platform upon the cradle. At suitable points between said platform and the side of the cradle—(see
 40 Figs. 6, 7 and 8) are preferably, located retarding springs or bumpers *B*, *B*, to check lateral motion of the car and platform when the latter is free to move upon said
 45 supporting bars. Clamping-bars *D* and *D'* are located at intervals, on each side of the cradle, to engage the car and hold it firmly in position on the rails *r*, during the over-
 50 turning movement. In the drawings, these clamping-bars are at different intervals. In this instance the clamps *D* are in the form of upright hooks movably located in and
 55 through apertures in the horizontal portion of the cradle. They are of suitable length to project below the cradle, and to come into bearing against foundation stops *s* beneath the same when the cradle is lowered, and, by
 60 the further descent of the cradle, to become thereby disengaged from the car. The clamps *D'* are suitably related to the cradle to become disengaged therefrom, in a like
 65 manner, when, on lowering the cradle, said clamps encounter their stops *s'*, but by reason of the special sheave relation and attachments, of *D'*, their mode of action is somewhat different from that of the clamps *D*. The clamps *D'*, instead of being loosely
 65 fitted in and through the cradle, like the

clamps *D*, are connected thereto by the forked brackets *bb* which extend laterally from the cradle toward the rear of the tower A. Said forks straddle the clamps *D'* and carry pins and axles *o*, which pass through
 70 longitudinal slots *t* in the clamps *D'*, and a sheave *m*, located between said forks.

As will appear more clearly, when the operative system of which the sheave *m* is a part is considered, this arrangement results
 75 in a downward vertical movement of the clamp *D'* during which *D'* also pivots around *O*, inwardly toward the cradle and reversely, of course, when the cradle is lowered. This inward movement and tendency
 80 of the clamps *D'*, by reason of the horizontal or side component in such direction due to its rope and sheave-system, referred to, is controlled and regulated by providing on the exterior edge or back of *D'* below said slot
 85 *t*, a roller *d*, between the forked brackets *b*, in bearing against a block *d'* provided for the purpose. Said block is given a bearing surface for said roller that is vertical against
 90 the same, when the clamp *D'* is upright, and resting on the stop *s'*, but which recedes or inclines outwardly and downwardly therefrom, at a suitable angle and contour to allow said clamp *D'* to yield to said horizontal
 95 component tendency, and pivot inwardly around *O*, toward and above a car, upon said platform, when the cradle ascends, but to depress the lower end, or shorter arm of
 100 said pivoted clamp-bar *D'*, and withdraw its upper or clamping end away from such car when said bar is lowered to a bearing engagement with the stop *s'*.

To serve in actuating the clamps *D* and *D'*, in their clamping functions, we locate
 105 sheaves, *m'*, *m'*, on the clamps *D*, at a point somewhat above the horizontal portion of the cradle *C*, and, sheaves *m*² at like points on the clamps *D'*, above the pivotal points of the latter. In the same vertical plane
 110 with each opposite pair of these sheaves, *m'*, *m'*, below and between the same, upon said portion of the cradle, are also located opposite sheaves *m*³ and *m*⁴. On the front of the
 115 cradle, at about the same elevation thereon, as *m*⁴, are diagonally located sheaves *m*⁵, and at either side thereof near the posts *A'* and *A*², respectively, and, in the same plane, one with the other, are sheaves *m*⁶ *m*⁶. These
 120 sheaves should correspond in number with the number of pairs of clamps *D* and *D'* used at intervals along the cradle's side.

Near the upper portion of the cradle *C* are located upon shafts *K* that project laterally from the ends of the cradle for the purpose, a number of sheaves *m*⁷, corresponding
 125 with the sheaves *m*⁶, in such position that a vertical line from their scores will be tangential to the scores of the sheaves *m*⁶ *m*⁶ below. In the same plane as the sheaves *m*, near the top of the tower A, and at the rear
 130

thereof, are a similar number of sheaves m^8 m^8 thereby completing the sheave system for clamping the several pairs of clamps D and D'. The shafts K project a suitable distance laterally from said cradle—and beyond the sheaves m^7 , to engage the grooves $g' g'$, by the trunnion-blocks G, G, on the ends of said shafts. Shafts K² similarly project from said cradle and carry guiding rollers K³ that bear against said posts at the rear.

M is a vertically adjustable transverse beam, which, through the castings M', slidably engages the front corner posts A' and A² within the up and down grooves g, g , on the inner sides of said posts. The beam is controlled in its vertical movements, by the hanger-rods H, H, that support the beam from the cross-girder a^2, a^2 , and, the worm-wheel arrangements W, for the purpose. Said parts M', are hook-like castings, attached in upright positions to each end of the beam. At the top and bottom of the same are block-like projections M², of suitable dimensions to enter said grooves $g g$ at a working fit. An apron or discharging chute U, is hinged to said beam at u . It is of the usual form, in such connections, having a broad open mouth that extends across the front of the tower A, and gradually tapers toward its discharging or outer end. In the drawings said apron is shown as hoisted and lowered, around its hinged connection to the beam M, and supported at given angles with respect to the same, by the rope F, that pulls around and from a point N beneath the outer end of the chute, and, which, after the multiplication indicated, is reeved over a sheave S in the A-frame arrangement at the top of the tower A, and is thence carried downward to a source of power O.

For accomplishing the several intended movements of the cradle, ropes T T (here preferably indicated as double) are attached at each end of said cradle near the top, and thence are led downwardly around the same, up and through the tower A, around sheaves J and J', at the top, and thence down and around a pair of sheaves J², which are connected to the shafts K by the links K'. Said ropes are then led up and around sheaves J³ and J⁴ and downwardly to a source of power O'.

From points at the top and in each end of the tower, in planes, respectively, of the sheaves $m^7 m^7$, ropes V V pass downwardly at the front and through the score of said sheaves, and each passing under and around a sheave m^6 , extends inwardly to the sheaves m^7 , in each case, upwardly around the sheaves m^7 , in the several sheave-systems, under and around the sheaves m , and up and around sheaves m^8 through the pulley-blocks of counterweights X, upward to a fixed anchorage at the top. Said counterweights must be sufficient, in the relation

described, to resist the tendency of the car to leave the rails r , while being overturned in the process of unloading.

A loaded car being brought upon the platform P, within the tower, the ropes T, T, are now wound in toward the source of power at O', which will raise the cradle upwardly along the grooves $g' g'$ until the trunnion-blocks G G, encounter the hook-like castings M' M', which then serve as pivots to the cradle C, and the latter under the continued pull of the ropes T T, is thereupon overturned, and its load dumped into the adjacent apron or chute. It will be seen that, in the meantime, inasmuch as the platform supporting eye-bars E² and E³ are off the vertical, as soon as the cradle is lifted, the platform P and the car will be carried by the parallel motion of said bars toward the side of the cradle with the car in a firm position for overturning against the side, and, also, that the car, in its progress upward, will have engaged the clamps D and D' and raised them from their foundation stops s and s' , whereby the counterweights X X, through their rope and sheave-systems explained, will at once firmly secure them to such engagements.

Upon an unloading being effected, as just stated, the ropes T T are unwound, whereupon the cradle will right itself around said pivotal points and descend through the tower until the cradle rests upon the foundations Q, Q, at the base of the same. Before this point is reached by the cradle the lower ends of the clamps D and D' will meet the stops s and s' , and as the cradle descends along their lengths the car will be withdrawn from beneath their hooks, and the clamps themselves will assume upright positions at the platform's sides. After the clamps D and D' are thus released, the rollers w , will encounter their special foundations $s^3 s^3$, and by reversing said parallel motion through the bell-crank arms E⁴ the platform P will be forced back to its normal position.

In order to withdraw the apron or chute U within the tower and behind the front of the same it is only necessary to lower the hanger-rods H H, by means of the worm-wheel arrangement W, until the beam M, and the mouth of the apron or chute hinged thereto, are at a sufficient distance from the top of the tower to allow the chute to be withdrawn into an upright position, around its hinges, and retracted through the open front of the tower.

While the drawings show a customary telescopic extension of the chute, such extension is not an essential part of our apparatus, but it must of course be itself collapsed to a proper extent, before the chute is withdrawn within the tower as just described.

Having now described our invention as

applied in concrete apparatus or arrangement, what we claim and wish to secure by Letters Patent is:—

1. In a car-dumping apparatus, the combination of a frame-work or tower, a cradle therein, a car-receiving platform thereon, supported by upright bars pivoted to said cradle and platform, respectively, in transverse pairs, suitable means for holding a car on said platform, and for raising the cradle, within the tower, to an engagement with suitable stops therein, that also serve as pivotal bearings for the cradle when rotated, in such engagement, outwardly from said tower, together with suitable means of rotating said car when in said position, outwardly from said car, substantially as shown and described.

2. In a car-dumping apparatus, the combination of a frame-work or tower, a cradle therein, a car-receiving platform thereon, supported by upright bars pivoted to said cradle and platform, in transverse pairs, at points on the same that are off the vertical, suitable means for holding a car on said platform, and for raising the cradle within the tower, to an engagement with suitable stops therein, that also serve as pivotal bearings for the cradle when rotated, in such engagement outwardly from said tower, together with suitable means of rotating said car when in said position, outwardly from said car, substantially as shown and described.

3. In a car-dumping apparatus, the combination of a frame-work or tower, a cradle therein, a car-receiving platform thereon, supported by upright bars pivoted to said cradle and platform, in transverse pairs, at points on the same that are off the vertical, suitable means for holding a car on said platform, and for raising the cradle, within the tower, to an engagement with suitable stops therein, that also serve as pivotal bearings for the cradle when rotated, in such engagement outwardly from said tower, together with suitable means of respectively rotating said car when in said position, outwardly from said car, and of holding said platform against lateral motion on its supporting bars, when said cradle is at its normal position at the base of the tower, substantially as shown and described.

4. In a car-dumping apparatus, the combination of a tower, having an open or clear space at the front side of the same, a horizontal beam vertically movable at said side, a chute or apron hinged to said beam, a cradle within said tower, suitable means for, respectively, holding a car thereon, raising and lowering the cradle within the tower and rotating the same outwardly toward said side, holding said car on said platform during said operation, raising and lowering said beam vertically of said side and for raising and lowering said chute or

apron around its hinged connection to said beam, substantially as shown and described.

5. In a car-dumping apparatus, the combination of a tower having an open or clear space at the front side of the same, a horizontal beam vertically movable at said side, a chute or apron hinged to said beam, a cradle within said tower, suitable means for, respectively, holding a car thereon, raising and lowering the cradle within the tower and rotating the same outwardly toward said side, holding said car on said platform during said operation, raising and lowering said beam vertically of said side and for raising and lowering said chute or apron around its hinged connection to said beam to within said open space, substantially as shown and described.

6. In a car-dumping apparatus having a tower with an open or clear space at one side thereof, and a vertically movable apron or chute transversely of said side and pivotally connected thereto, the combination of an elevated sheave-supporting frame-work or structure, on the top of said tower, set back of the vertical plane of the points of said pivotal connection of the apron or chute, so as to afford a clear space above said connections into which said apron or chute, or a portion thereof, may be retracted or withdrawn, when said beam has been lowered across said side, substantially as shown and described.

7. In a car-dumping apparatus having a tower, with an open or clear space at one side thereof, and a vertically movable apron or chute transversely of said side and pivotally connected thereto, the combination of an elevated A-frame arrangement or structure to support sheaves for the hoisting rope of the apron or chute, on the top of said tower, set back of the vertical plane of the points of said pivotal connections of the apron or chute so as to afford a clear space above said connections into which said apron or chute, or a portion thereof, may be retracted or withdrawn, when said beam has been lowered across said side, substantially as shown and described.

8. In a car-dumping apparatus having a tower with an open or clear space at one side thereof, and a vertically movable apron or chute transversely of said side and pivotally connected thereto, the combination of a forward transverse girder, above said space, set back of the vertical plane of the points of said pivotal connections, so as to afford a clear space above said connections into which a portion of the apron or chute may be drawn, and an elevated A-frame arrangement or structure on said girder, provided—near its top—with sheaves for the hoisting rope of said apron or chute, substantially as shown and described.

9. In a car-dumping apparatus having a

frame-work or tower, a cradle therein for the car to be unloaded, and suitable means for raising and lowering the same, the combination of a series of vertically movable
5 clamps for such car, extending through and below said cradle, at one side thereof, and a second series of similar clamps pivotally connected to said cradle at its other side through longitudinal slots in the same, rope
10 and sheave-systems, suitably connected to said tower, cradle, and clamps, to, severally, tend to pull said clamps downwardly, and said second series inwardly around their

pivots, when actuated by counterweights operatively connected to said systems for the purpose, together with downwardly receding bearing pieces for the members of said second series of clamps connected to said cradle below said pivotal connections in each case, substantially as shown and described. 15 20

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