

No. 721,089.

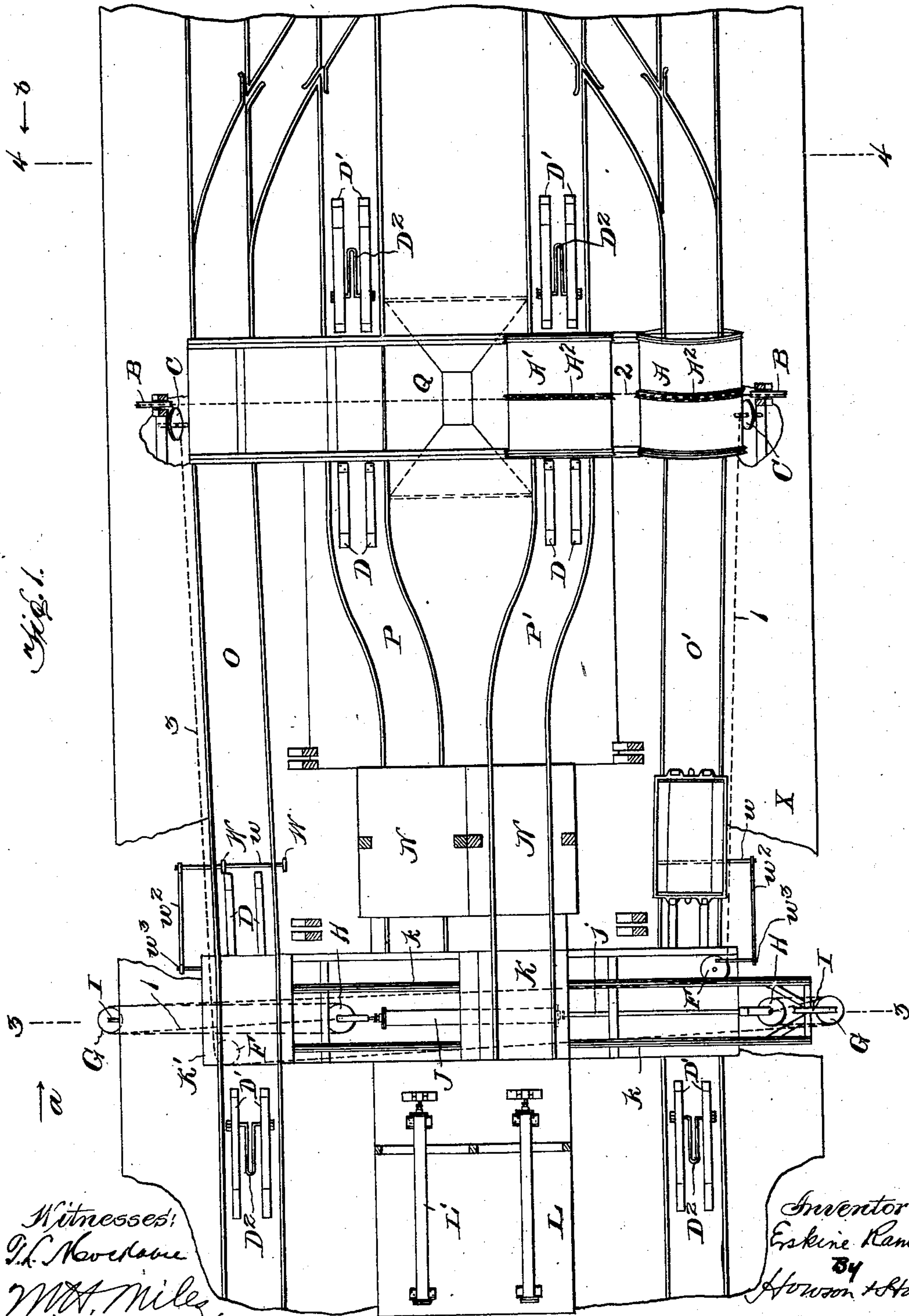
PATENTED FEB. 17, 1903.

E. RAMSAY.
CAR HANDLING AND DUMPING DEVICE.

APPLICATION FILED DEC. 16, 1902.

NO MODEL.

9 SHEETS—SHEET 1.



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9 SHEETS—SHEET 2.

Fig. 5.

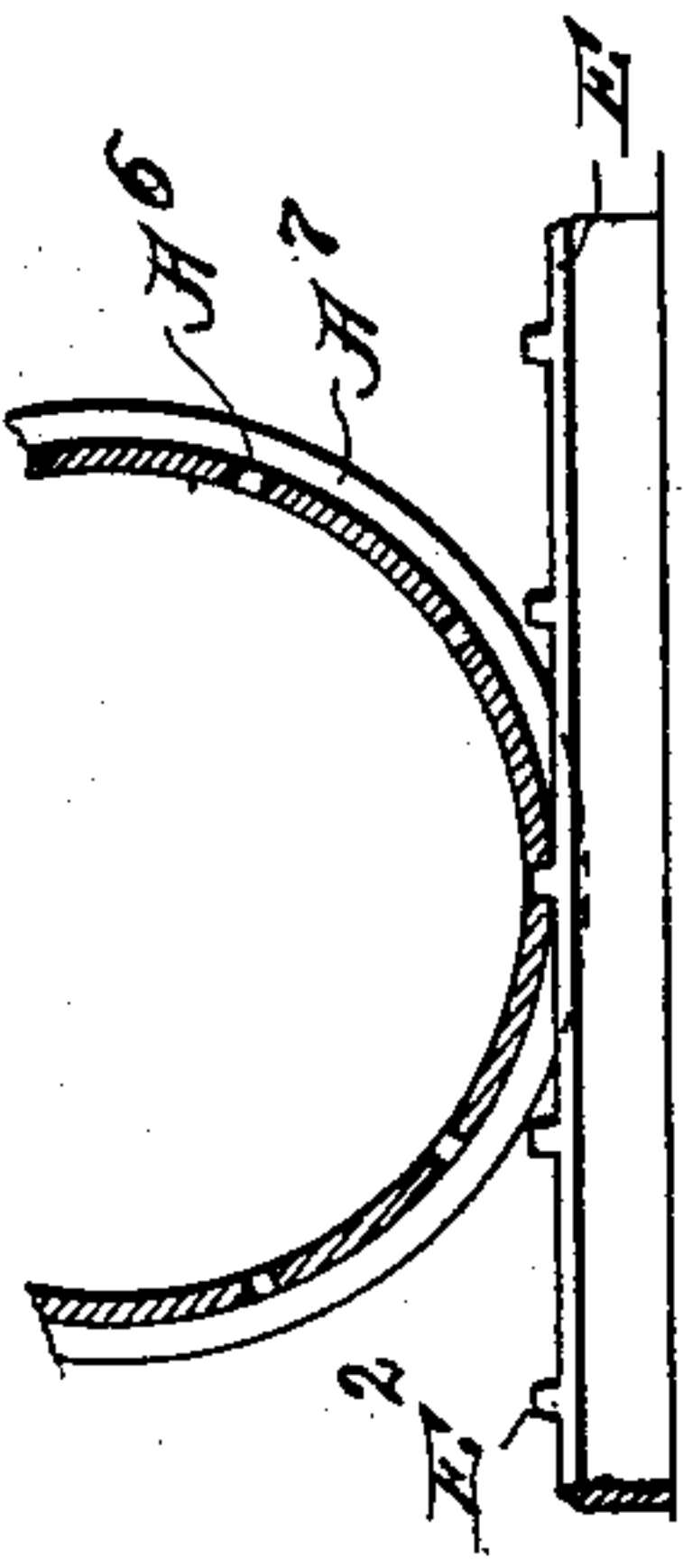
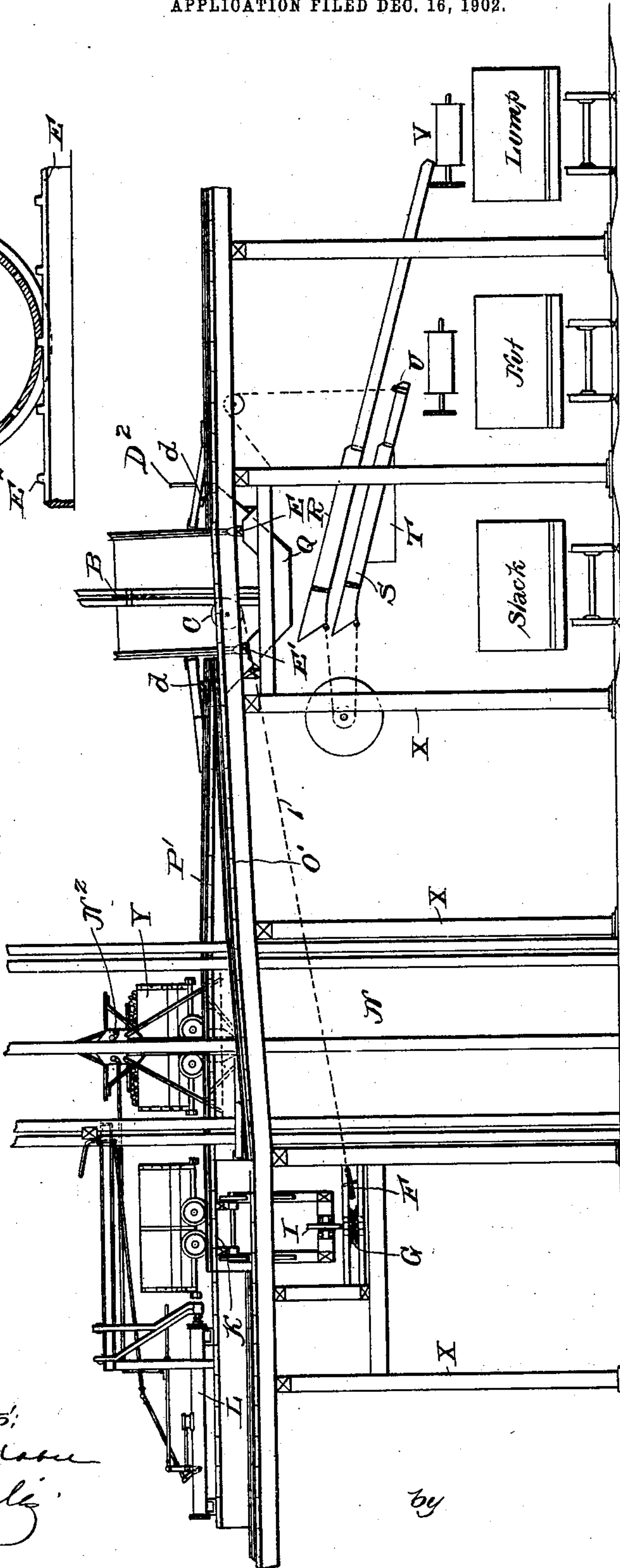


Fig. 2.



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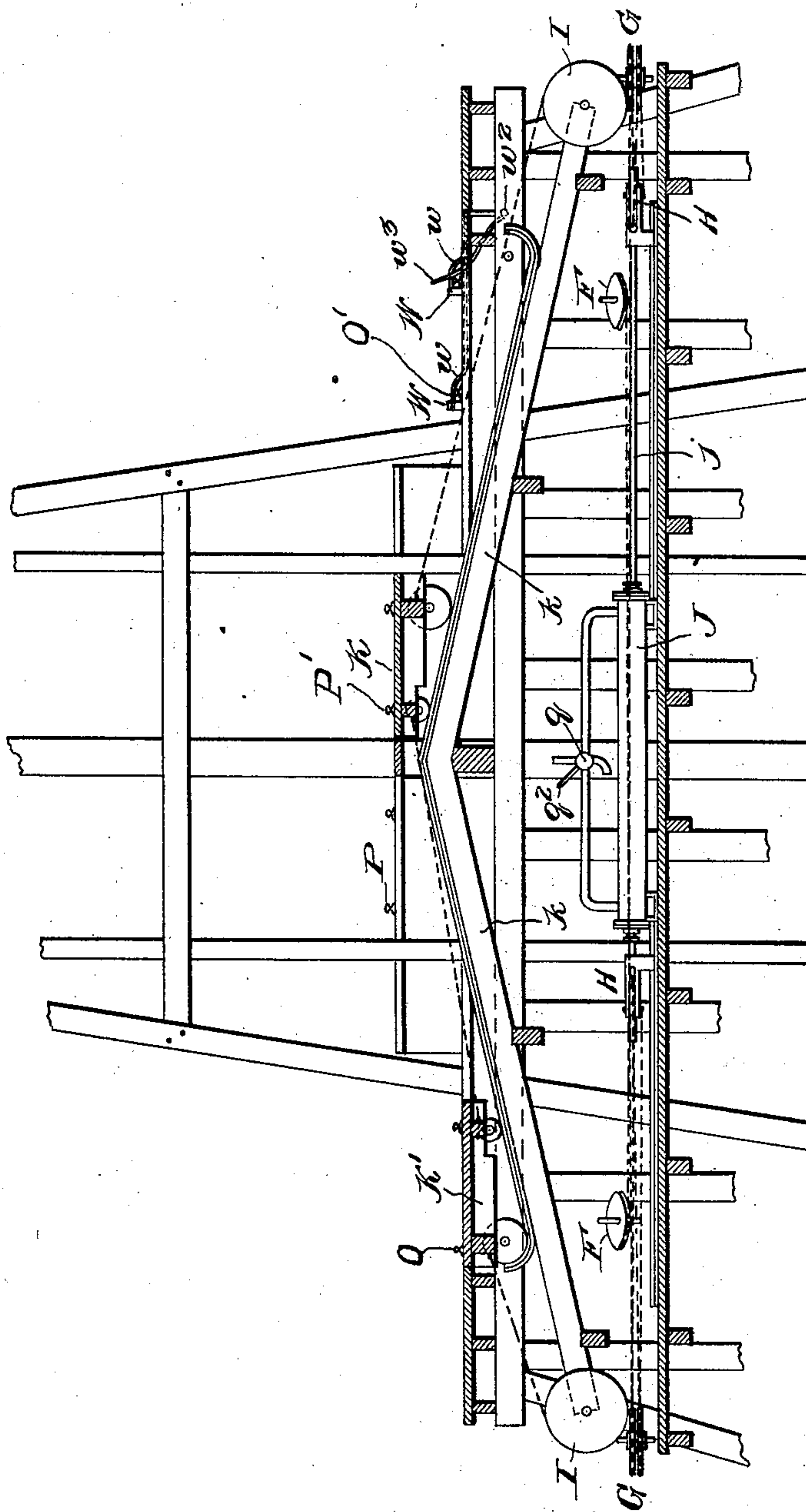
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9 SHEETS—SHEET 3.

Fig. 3.



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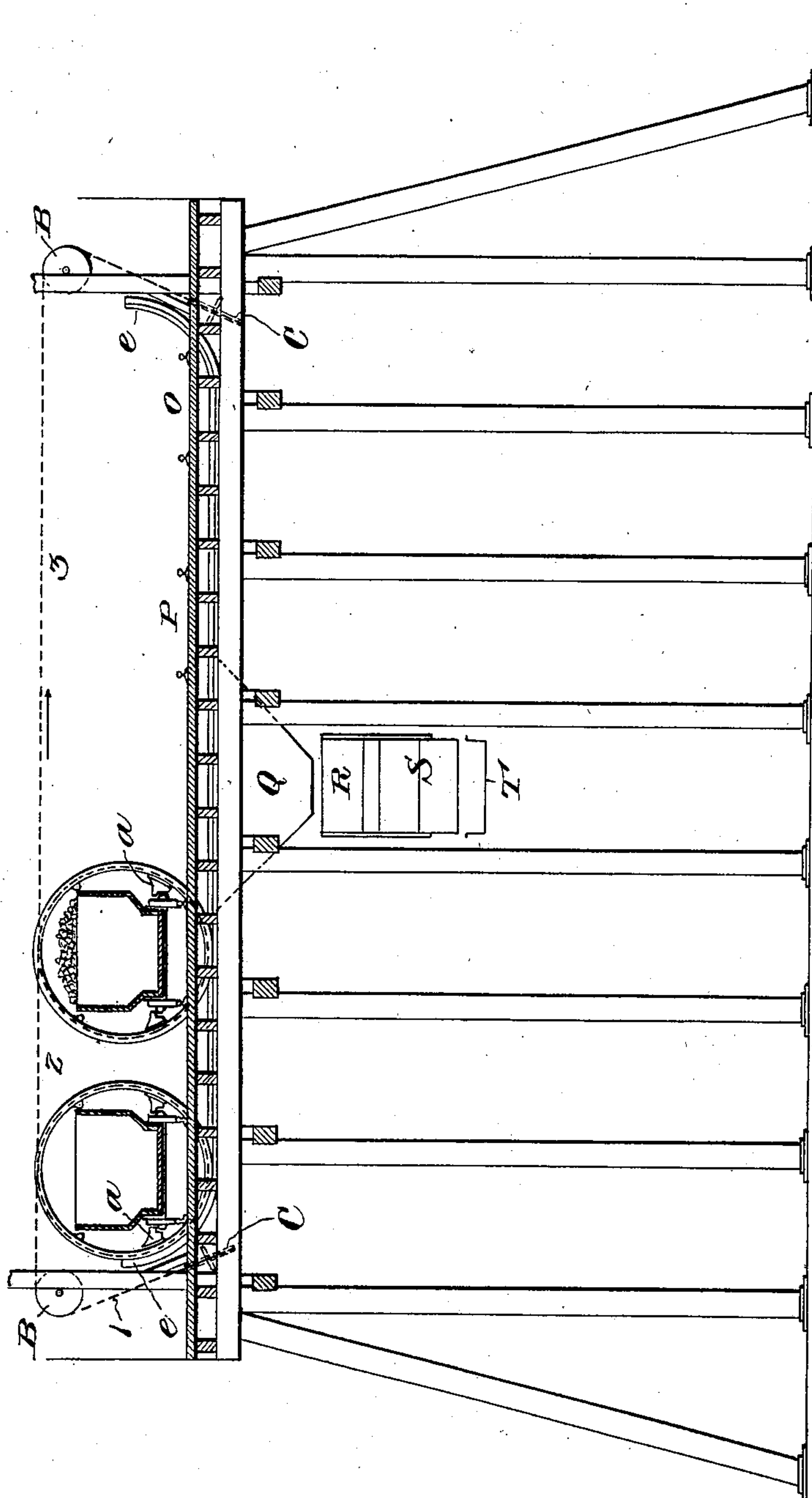
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9 SHEETS—SHEET 4.

Fig. 4.



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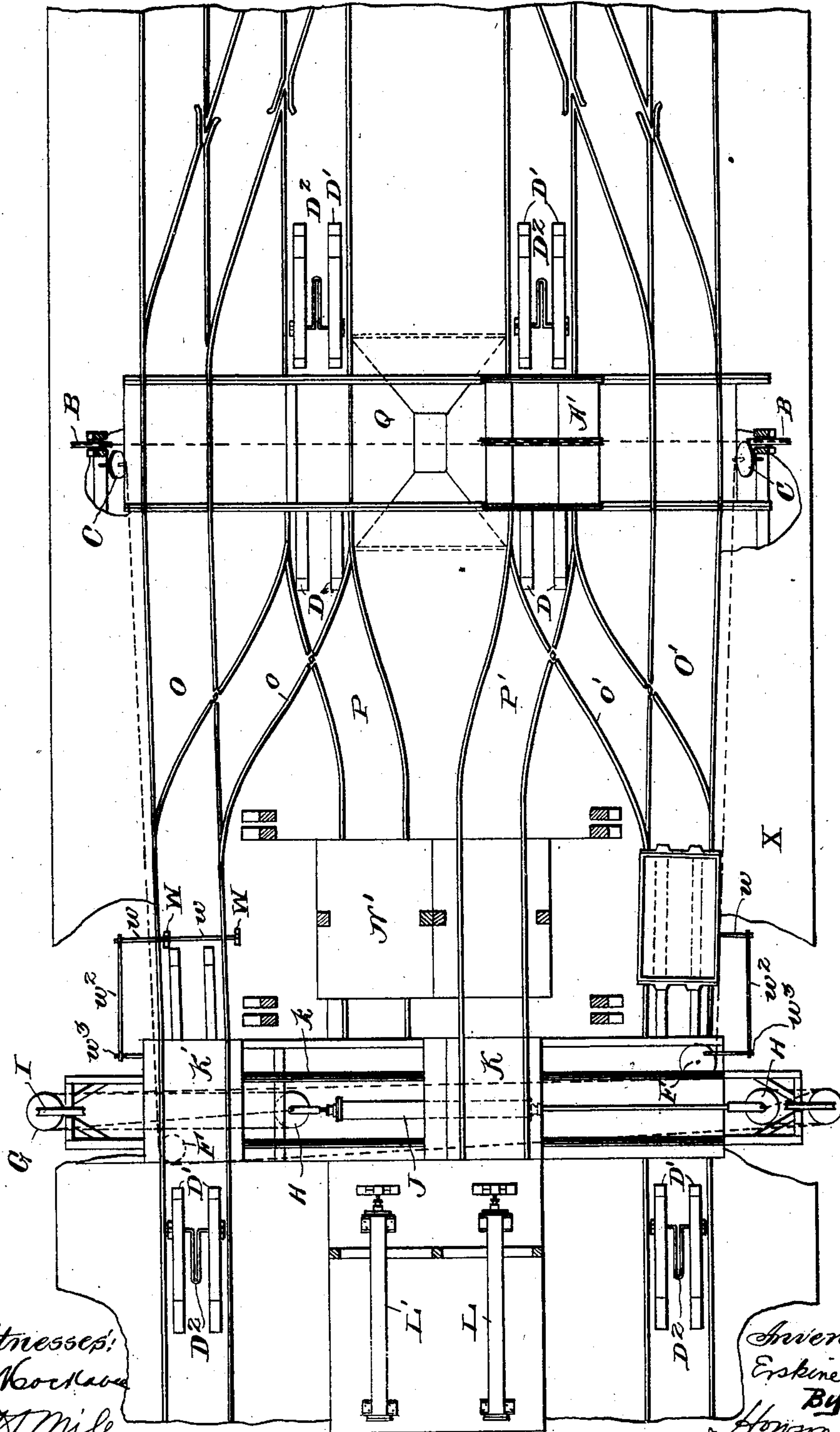
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9 SHEETS—SHEET 5.



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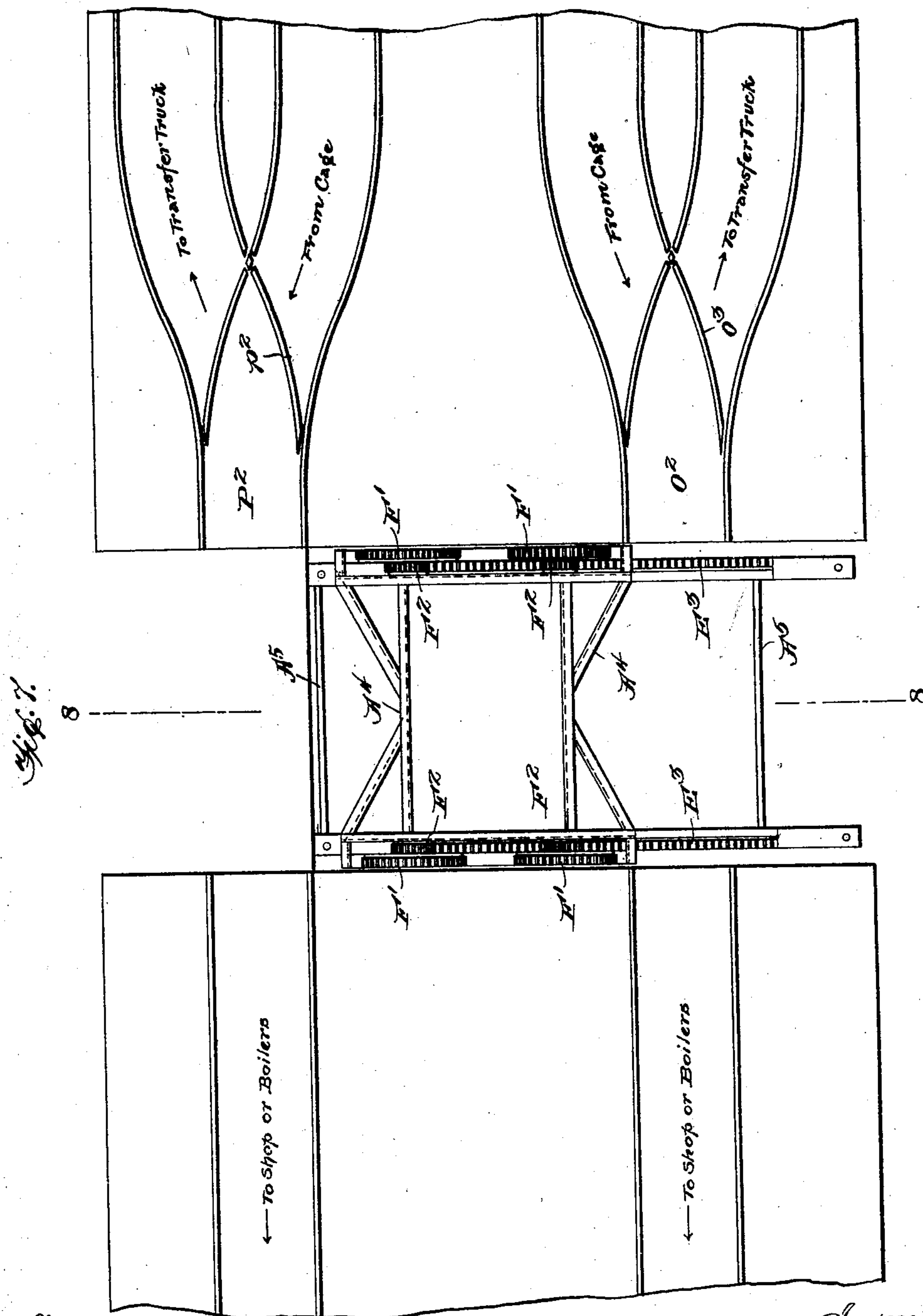
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9 SHEETS—SHEET 6.



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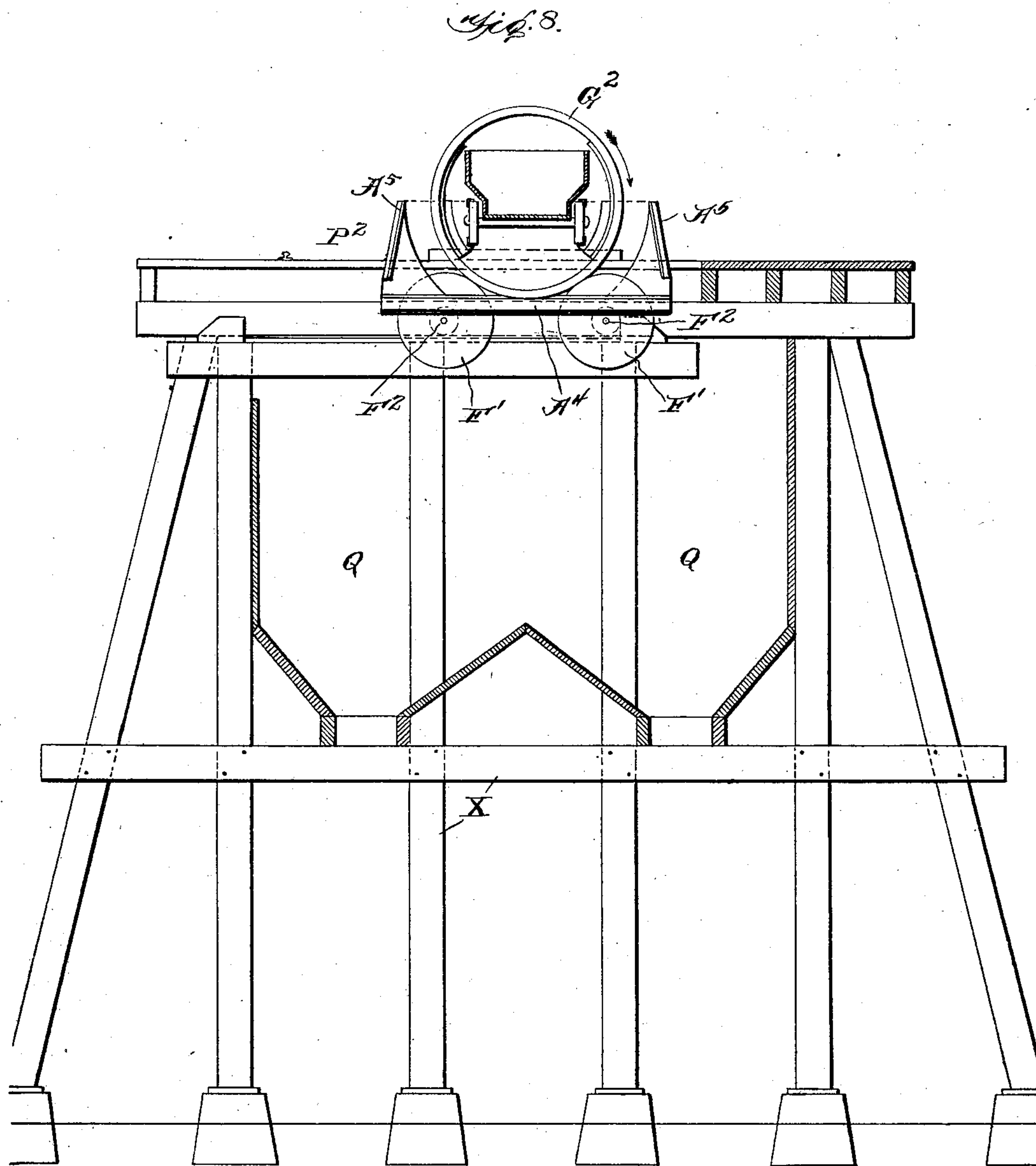
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9 SHEETS—SHEET 7.



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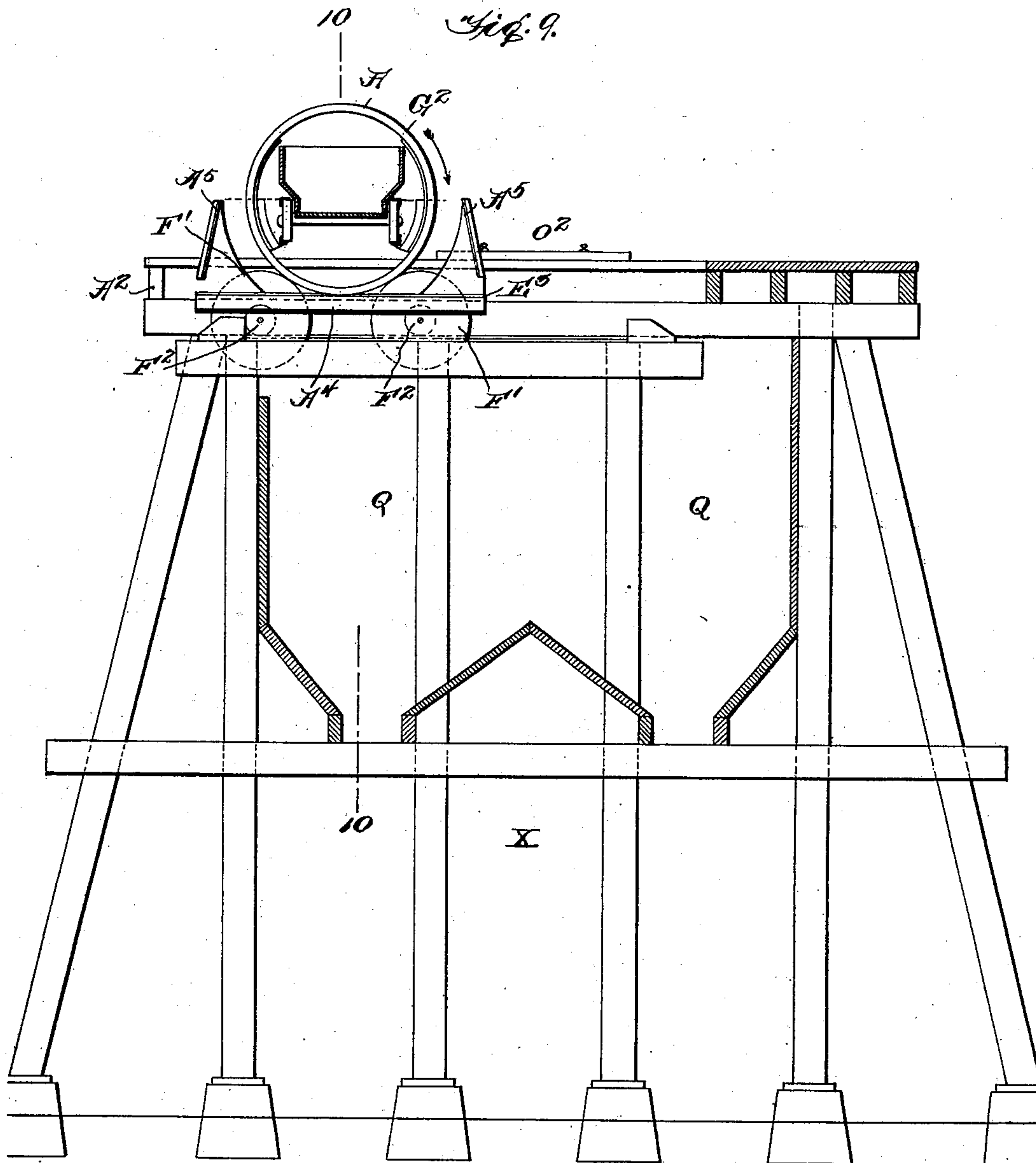
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APPLICATION FILED DEC. 16, 1902.

NO MODEL.

9 SHEETS—SHEET 8.



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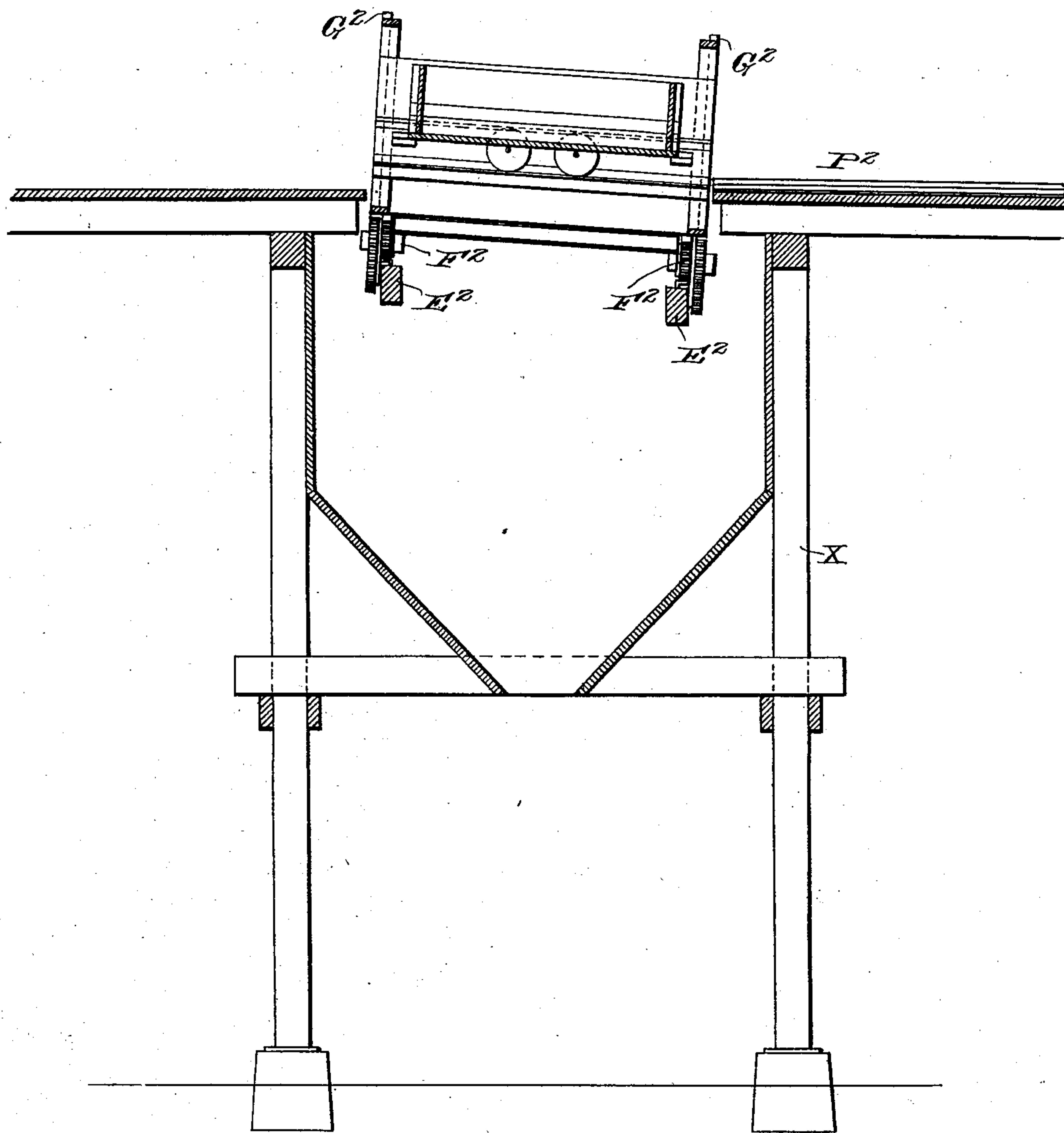
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CAR HANDLING AND DUMPING DEVICE.

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9 SHEETS—SHEET 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

ERSKINE RAMSAY, OF BIRMINGHAM, ALABAMA.

CAR HANDLING AND DUMPING DEVICE.

SPECIFICATION forming part of Letters Patent No. 721,089, dated February 17, 1903.

Application filed December 16, 1902. Serial No. 135,427. (No model.)

To all whom it may concern:

Be it known that I, ERSKINE RAMSAY, a citizen of the United States, and a resident of Birmingham, Jefferson county, State of Alabama, have invented certain new and useful Improvements in Car Handling and Dumping Devices, of which the following is a specification.

My invention relates to devices for handling cars containing coal and other minerals, &c., and dumping the same; and my objects are to provide a device of this character which will receive a loaded car or cars of coal, ore, and other substance from the point of supply, such as a mine-shaft or slope-mine, and transfer the same to a tipping or dumping structure and thence dump the said cars into a hopper or other receptacle for distribution to shaking screens, cars, or bins, and to so construct such a device that the operations may be automatic and under the control of a single operator from the time the loaded car is received from the mine, as from a cage in a shaft or a slope, the empty cars being automatically returned and transferred to said cage or slope for transportation to the mines for reloading; and my further object is to provide such a handling and dumping structure as will permit the performance of the operations designated in practically a continuous manner and will likewise admit of the switching of the empty cars or loaded cars either through or from the rotary tippie structure for transfer to the repair-shops or boilers of the plant; and my object is, finally, to construct a car handling and dumping structure of the character indicated which will insure the transportation of the loaded car or cars from the mines in the most expeditious and safe manner and will embody the simplest and most durable construction of parts for effecting the purpose desired, and which, moreover, will be susceptible of application either to the slope-mine or to a shaft-mine or to any suitable source of supply from which the material is to be transported in cars, then dumped and returned for reloading.

In the drawings I have shown my car handling and dumping device in connection with a well-known type of transfer and discharge apparatus—such, for example, as the Robert

Ramsay transfer-rams disclosed in Patent No. 404,656, granted to Robert Ramsay June 4, 1880; but it is to be understood that my invention is applicable to mines or other source of supply where such transfer apparatus is not employed or needed, as well as in connection with other transfer apparatus.

With these objects in view my invention consists in the combination of means for transporting a loaded car from the mines or other source of supply, means for transferring said car to a rotary or dumping tippie, means for causing the latter to invert the car and to discharge its contents into a suitable place, and means for returning the empty car so discharged to the point of supply; and it further consists in the combination, with such means, of mechanism for effecting the automatic operation of the several functions specified; and it further consists in the novel construction of car handling and dumping apparatus as hereinafter described with reference to the accompanying drawings and in the details thereof, as more particularly pointed out in the claims.

In the drawings, Figure 1 is a plan view of a structure embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a transverse vertical section on the line 3 3, Fig. 1, looking in the direction of the arrow *a*. Fig. 4 is a similar view on the line 4 4, Fig. 1, looking in the direction of the arrow *b*. Fig. 5 is a sectional detail hereinafter referred to. Fig. 6 is a top plan view of a modification of the structure shown in Figs. 1 to 4. Fig. 7 is a top plan view of a further modification. Figs. 8 and 9 are transverse vertical sections thereof on the lines 8 8, Fig. 7, showing the rotary tippie in different positions; and Fig. 10 is a longitudinal section on the line 10 10, Fig. 9.

Referring to the drawings, in which the same reference characters relate to the same or corresponding parts in all the views, the letter X indicates throughout the structure a suitable supporting-framework consisting of beams, girders, &c., properly arranged for supporting the various tracks for the cars in running from the cage of the mine or other place to the tippie and for the transfer of the tippie from a transporting-track to a return-track in dumping and for the transfer of

loaded or empty cars to the repair-shops, boilers of the plant, &c.

Referring particularly to Figs. 1 to 5, which show the invention in connection with a shaft-mine, N indicates an ordinary mine-shaft, in which a cage N² is hoisted in position by the usual hoisting means for elevating a loaded car Y to the level of the transporting-tracks P P', the latter being in juxtaposition, and such cage in Fig. 2 being in position to bring the tracks thereon in alinement with the transporting-tracks P', over which the car passes toward the rotary tippie A'. Located on opposite sides of the shaft or point of supply, in the present instance the shaft of a mine having the vertically-moving cages N², are the transfer structure and the rotary-tippie dumping structure, the latter preferably consisting of rotary tipples similarly constructed to the rotary car-dumping structure, such as that disclosed and claimed in my patent dated June 3, 1902, No. 701,764; but any suitable rotary tippie may be used where the conditions warrant or require with means for moving it along a track or way as it rotates, as hereinafter described.

In order to expedite the handling of the material, I have preferably used two sets of transfer-trucks K and K' in connection with two rotary tipples A and A', the latter being mounted on a way transversely intersecting the tracks. These transfer-trucks are mounted upon tracks k, extending transversely with respect to the tracks O, P, P', and O', and inclined downwardly from the central axis of the structure, as shown in Fig. 3, so that the depressed ends of said track or way may aline with the downgrade return-tracks O and O'. These transfer-trucks bear suitable rails for holding the cars and are fixed at such distance apart that when the truck K' alines with the track O the truck K is in alinement with the track P' and when moved from the position shown to the extreme position in the other direction the truck K' will aline with the track P and the truck K with the track O'. The truck K is designed to receive the empty car from the track O' and transport it to a point opposite the track P', in which position it is utilized to push the loaded car Y from the cage onto the track P', leading to the rotary tippie A', down which track P', on account of the sloping grade toward the tippie, said car will run by gravity into the tippie, while the empty car, under the action of the ram L, pushes the loaded car, as stated, and takes its place on the cage ready for lowering or for return to the mines or other place, and, similarly, the transfer-truck K' receives the empty car from the track O and transfers it to a point opposite the cage whose tracks aline with the track P, and is similarly used in connection with the ram L' to push the loaded car onto the track P, down which the car travels by gravity into the rotary tippie A when the latter has been transferred to that point.

In order to effect the transfer of the trucks K and K' from one set of tracks to the other for the purpose above indicated, a motive-power cylinder J, fixedly mounted on the supporting structure below the transfer-trucks, is provided with a piston-rod j, extending through opposite ends thereof, and to the ends of which are attached ropes 1 and 3. These ropes pass around the sheaves I, mounted at the outer edge of the supporting structure upon suitable fixed bearings, and are attached to the trucks K and K', (see Fig. 3,) so that a stroke of the piston-rod causes the trucks to move to the other set of tracks. On the ends of the piston-rod j are mounted suitable pulleys H. The rope 1 is also fastened to the end of the piston-rod j, from which it passes around the fixed pulley G, then around the pulley H, back around the pulley G, then to the opposite side of the structure around the deflecting-pulley F, and thence to the pulleys C and B and around and secured to the rotary tippie A, the rope 3 being similarly rove with respect to the tippie A', see Figs. 1 and 3. The movement of the piston-rod in one direction will cause the transfer-trucks to traverse its tracks from one point of the set of transporting-tracks to the return-tracks. At the same time that this movement occurs the rotary tipples A and A' are caused to move in the opposite direction thereto, and in so moving they make one complete revolution in order to first reverse the car for discharge of its contents and then right the empty car into position for delivery from said tippie, and as a convenient and preferable mode of accomplishing this result and in arranging the same so as to occur not only simultaneously with, but in opposite direction to, the movement of the transfer-trucks I wind the rope 1, after passing from the guide-pulley F, around the fixed pulley C, secured to the fixed structure near the rotary tippie, thence around the guide-pulley B, and thence around the grooved rings A² on the rotary tippie A from one side of the structure, the other rope 3 leading around the grooved rings A² on the tippie A' from the other side of the structure, by which means it will be observed that, assuming the tipples to be capable of movement across the structure as they are rotated, movement of the piston-rod of the motor power device J in one direction will cause the transfer-trucks K and K' to move in the opposite direction thereto and through the medium of rope-gearing 1 and various guide-pulleys to impart a motion of translation to the rotary tipples in the opposite direction. In order to provide for this translation of the rotary tipples and at the same time to preserve a fixed distance between the same equal to the distance between the centers of the tracks O' and P' and between the centers of the tracks O and P, I mount the said tipples upon suitable rails E E', which are preferably of the form shown in Fig. 5, where the rail E, provided with projecting

teeth E^2 , and supporting-rings A^7 on the tipples have corresponding holes A^6 , thus constituting a rack and pinion, the teeth meshing with the holes A^6 on the said rings as the tipples are revolved. As a further means of causing the tipples to rotate and preserve their fixed distance apart I wind a rope 2 around a grooved ring A^2 of the tipples, so that when either the rope 1 or the rope 3 pulls the tipples said rope 2 will cause the tipples to rotate with the one in advance.

It will be observed that with the piston in the cylinder J as shown and the ropes 1 and 3 rove in the manner described and shown the movement of the rotary tipples will be twice the length of a piston-stroke, and as they move this distance one pays off as the other winds up the rope with reference to a fixed point an amount equal to twice the distance of travel of the said tipples. Hence the tracks P and P' must be laterally disposed at a distance twice the length of the piston-stroke, and it is absolutely necessary that the tracks and tipples upon which the cars are supported shall aline with the loading and discharging or return tracks when the tipples are transferred from one to the other, which result is insured by the rack-and-pinion engagement between the rotary tipples and its transferring-track. In order to prevent the loaded car from passing through or partly through the tipples as it travels by gravity into the same over the tracks P and P', I provide automatically-actuated bumpers D and D' on opposite sides of the tipples, such bumpers being normally in the position shown, so as to engage a fixed part of the car—as, for example, by means of a suitable spring d , as shown in Fig. 2—so that as the car travels down the track it will depress the bumper D, and the latter immediately after the car enters the tipples will automatically resume its position and prevent backward movement of the car, while the bumper D', oppositely disposed to the bumpers D, will prevent the car from passing through the tipples. When it is desired to permit the car to pass through the tipples, either loaded or empty, to the repair-shops or boilers, such transportation will be effected by means of the depressing-lever D^2 , which is arranged to depress the bumpers D' in order to permit the car to travel over the same, the tracks O O' and P and P' being continued and provided with suitable switches shown in the proper direction for switching at the point desired. A similar arrangement for preventing the movement of the empty car beyond the transfer-truck is utilized on opposite sides of said truck, as shown in Fig. 1, where similar reference characters relate to similar automatically-operating bumpers above described. The bumpers D, however, are preferably not provided on the tracks O and O', as it is desirable that the empty car shall pass out of the tipples immediately after the latter reaches the tracks O or O', and to prevent the empty car from passing beyond

the track opposite the transfer-truck unless and until the said truck is in alinement with said tracks to receive the car automatically-operating dogs W are located in advance of the bumpers, and the said dogs W are carried by crank-arms w on a shaft w^2 , which is normally held in such position by the weight of the dogs as to throw the dogs across the track in line with the car, (see Fig. 3,) and thus stop the same as it descends the tracks toward the transfer-truck, such tracks being on a slight downward grade in order to allow the car to run by gravity from the tipples toward the said trucks; but when the transfer-trucks are brought into proper position a fixed part on the truck engages an arm w^3 of the crank-shaft, elevates the same, and swings the dogs away from the track out of possible engagement with the traveling car.

Between the two tracks P and P' a suitable hopper Q is located, into which the rotary tipples are discharged as they traverse back and forth across the tracks, such hopper being shown as adapted to discharge into a screening device, that shown, for example, being adapted for screening coal, and assuming coal the material being handled such coal will be discharged into the upper screen R, which separates the lump from the nut and slack, the former passing into the conveyer V, whereby it is carried to cars or to bins or other places, while the latter mixture falls through the meshes of the screen R onto the screen S, which separates the nut from the slack, the latter falling into the chute T, after which it is directed into cars on tracks beneath the same or to other points, the former passing down the chute over the end of the screen S onto a conveyer U and discharged likewise into cars or other places.

In order to provide for the tilting or inclination of the tipples A and A' to correspond with the grade of the tracks with which they are in alinement for receiving loaded cars and discharging empty cars, the rail E' is depressed from the center of the track P and across the track O and from the center of the track P' to and across the track O', thereby causing the tipples to incline toward the transfer structure, as shown in Fig. 2.

From the foregoing description the mode of operation will be clearly understood, and, briefly stated, it will be noted that when the tipples are in the position shown in Fig. 1 an empty car is on the transfer-truck K and is pushed therefrom by the ram L, thereby moving the loaded car Y from the cage onto the track P' into the tipples A', the empty car taking the place of said loaded car on the cage. The operator, who may be stationed between tracks P and P' and between the cages and the transfer-trucks, now moves a lever connected to the stem q^2 of the valve q of the cylinder J, Fig. 3, admitting motive fluid thereto and causing the piston to travel in the opposite direction to that shown, which pulls the rope 3, thereby transmitting motion

to the tippie A', causing the same to move to the opposite side of the structure and in its motion to revolve on the tracks E and E', discharging the contents of the car into the hopper Q as it passes over the same, the rope 1 being paid out to the same extent as the rope 3 is pulled in by the traveling piston-rod. At the same time the transfer-trucks K and K' are moved in the opposite direction, so as to bring the truck K' opposite the track P and the truck K opposite the track O', and the empty tippie A is now brought into position opposite the track P, and as the tippie A' moves from the center of track P' to the center of the track O the depression causes the forward end to tilt in the direction shown in Fig. 2, thereby automatically starting the car from the tippie onto the track O, down which it runs toward the transfer-truck, and at the same time the ram L' may be operated to push the empty car from the truck K' onto the cage, which has now arrived in position through the shaft N, thus forcing the loaded car thereon to the track P and into the tippie A, and movement in the opposite direction will effect the same sequence of operations.

To prevent the tippie from moving too far in either direction, the tracks E and E' are preferably curved at the end to form bumpers e, as shown in Fig. 4, and the cars while in the rotary tipples are preferably maintained in fixed relation thereto by means of brackets a, such as that disclosed and claimed in my prior patent, already referred to.

In the foregoing construction the parts are designed with reference to the use of one or more, preferably two, rotary tipples; but in some cases it may be desirable to employ one, in which event a suitable arrangement of switches for switching cars from one track to the other, such as that shown in Fig. 6, may be employed, wherein it will be noted that the tracks O' and P' and O and P, respectively, are connected by switches o and o' and a single rotary tippie A' is used instead of two, the ropes 1 and 3 passing around the grooves A² and fastened to the ring A⁷ of the tippie A', and leading to the fixed guide-pulleys B, C, F, and G to the pulleys H on the piston-rod j, and then fastened to a fixed position, as shown. In this arrangement the travel of the rope would be two times the stroke of the piston, while the travel of the tippie would be the same as that of the piston. Such an arrangement may, in some cases, be preferable, as it is possible to dispense with the use of one of the tipples as well as the connecting-rope usually employed between the two tipples. The operation of this structure is otherwise the same as that hereinbefore described, and the parts indicated are of the same form and construction and mode of operation, the same letters indicating such parts.

In some cases it may be advisable to modify the construction for special adaptation to

other mines, in which cases the particular form of tippie shown in connection with the previously-described construction is not needed, and consequently the tracks leading to the rotary-tippie structure are modified, as shown in Figs. 7 to 10, by reference to which it will be seen that the tracks P² and O² are so located as to return the empty car at opposite ends of the extreme limit of movement of the rotary-tippie structure A. These tracks are provided with switches o³ and p², leading to the transfer-truck, if the latter is used, or the slope, if not used. The movement of the tippie structure from one side to the other of this track in order to effect the discharge of the loaded car is accomplished in a similar manner by means of the cylinder J, from the piston-rod of which extends a rope attached to the tippie A, the latter of which is mounted upon a truck A⁴, which travels upon tracks E² and E³, as before, a shield A⁵ extending from both ends of the truck to deflect the contents of the car as it is dumped into the hopper Q. In this construction it will be noticed that the transfer-trucks K and K' and the cages N² N² are located the same as in Fig. 1, the loaded tracks leading from the cages to the tippie and the empty tracks leading from the tippie to the transfer-trucks. A loaded car is received from the cage over the track O² and dumped in going to the track P², where the empty car passes out of the dump to the transfer-truck. The same, but opposite, movement takes place when the loaded car is received from the cage over the track P². Where this form of dump or, indeed, the other is used at a slope-mine, the transfer-trucks are dispensed with, the loads being received from the loaded track, here shown as the cage-track, and returned on the empty track, here shown as the transfer-track. In this form the rotary tippie A is mounted on spur gear-wheels F', carried on a common axle with smaller gears F², the latter meshing with the tracks E², while the former mesh with the ring G² on the tippie. A complete revolution of the tippie can therefore be effected in any desired travel of the tippie by properly proportioning the diameters of the spur-wheels F² and F'. The dump should have its track on which the mine-car runs on an upgrade, as shown in Fig. 10, and one of the tracks E² should be depressed, as shown in said figure, so that the loaded car, having sufficient momentum, will run into the tippie, and when the contents are discharged by the rotary movement of the tippie the said car, now empty, will automatically run out of the dump and down the grade to the transfer-truck or other place. With this construction it is obvious that if the travel of the tippie is the same as that of the transfer-trucks when such are used a single direct connection from the piston-rod of the cylinder J is sufficient, thereby dispensing with the sheaves or pulleys G and H.

I claim as my invention—

1. In a device for handling and dumping cars, the combination with a set of tracks along which the cars are conveyed from and returned to a source of supply, of a rotary tippable movably transversely of said tracks, means for traversing said rotary tippable from alinement with one track to another, and mechanism for causing said rotary tippable to invert as it is traversed from one track to another, substantially as described.

2. In a device for handling and dumping cars, the combination with a set of tracks along which cars are conveyed from and returned to a source of supply, of rails extending transversely of said tracks, a rotary tippable mounted on said rails, means for moving said tippable over the rails and for causing the tippable to rotate as it traverses the rails from one track to another, whereby a loaded car is dumped as it passes along the rails and the empty car righted for discharge from the tippable as the latter is traversed from one track to another, substantially as described.

3. In a device for handling and dumping cars, the combination with a set of tracks along which cars are conveyed from and returned to a source of supply, of rails extending transversely of said tracks, a rotary tippable mounted on said rails, means for moving said tippable over the rails and for causing the tippable to rotate as it traverses the rails from one track to another, whereby a loaded car is dumped as it passes along the rails and the empty car righted for discharge from the tippable as the latter is traversed from one track to another, and means for tilting the tippable as it is rotated so as to cause the empty car to run out of the tippable by gravity, substantially as described.

4. In a device for handling and dumping cars, the combination with a set of tracks along which cars are conveyed from and returned to a source of supply, of rails extending transversely of said tracks, a rotary tippable mounted on said rails, means for moving said tippable over the rails and for causing the tippable to rotate as it traverses the rails from one track to another, whereby a loaded car is dumped as it passes along the rails and the empty car righted for discharge from the tippable as the latter is traversed from one transporting-track to another, one of the said rails being depressed to cause the tippable to incline toward one of the tracks down which the empty car is caused to run from the tippable by gravity, substantially as described.

5. In a device for handling and dumping cars, the combination with tracks for transporting cars from a source of supply, of rails extending transversely of said tracks at the place where the material is to be discharged from the cars, a rotary tippable on the rails, means for traversing the tippable over the rails from alinement with one track into alinement with another, means for causing the tippable to rotate and dump the car held therein and

operating in conjunction with the traversing means so as to bring the tippable in alinement with a track for return of the empty car when the tippable has made a complete revolution, one of the tracks having a downgrade from the tippable to cause the empty car to return by gravity from said tippable, means for conveying the car along the transporting-track to the tippable, and automatically-acting bumpers located in line with the moving loaded car for preventing the car from running back after it has entered the tippable, substantially as described.

6. In a car handling and dumping device, the combination with transporting-tracks leading from a mine-shaft or other source of supply, rails extending transversely of said tracks, a discharge-opening located between the rails and between the transporting-tracks, mine-cages in the shaft adapted to aline with the transporting-tracks, rails for transfer-tracks extending transversely of the tracks, return-tracks leading from opposite ends of the rotary-tippable rails to the transfer-track rails, transfer-trucks on said latter rails, and mechanism for traversing the rotary tippables and the transfer-trucks in opposite directions over their respective ways or rails, so timed that one rotary tippable is brought into position for receiving a loaded car from a transporting-track as the other is carried to a return-track, and one of the transfer-trucks is brought to a position to receive an empty car from a rotary tippable, while the other conveys an empty car to one of the mine-cages, substantially as described.

7. In a car handling and dumping device, the combination with a mine-shaft, of a cage therein, a track for transporting a car from the cage, a rotary-tippable way extending transversely of said tracks, a return-track extending from said way, a way extending transversely of said tracks, a transfer-truck on said way adapted to be moved into alinement with the transporting and the return track to bring an empty car in alinement with a loaded car on the cage and to receive an empty car from the tippable, and means for simultaneously moving the transfer-truck and the rotary tippable in opposite directions, substantially as described.

8. In a car handling and dumping device, the combination with a mine-shaft, of a cage therein, a track for transporting a car from the cage, a rotary-tippable way extending transversely of said tracks, a return-track having a downgrade extending from said way, a way extending transversely of said tracks, a transfer-truck on said way adapted to be moved into alinement with the transporting and the return track to bring an empty car in alinement with a loaded car on the cage and to receive an empty car from the tippable, means for simultaneously moving the transfer-truck and the rotary tippable in opposite directions, and dogs normally extending over the return-

track to prevent a car from passing from said return-track until the transfer-truck is in place to receive it, substantially as described.

9. In a car handling and dumping device, the combination with a mine-shaft, of a cage therein, a track for transporting a car from the cage, a rotary-tipple way extending transversely of said tracks, a return-track having a downgrade extending from said way, a way extending transversely of said tracks, a transfer-truck on said way adapted to be moved into alinement with the transporting and the return-track to bring an empty car in alinement with a loaded car on the cage and to receive an empty car from the tipple, means for simultaneously moving the transfer-truck and the rotary tipple in opposite directions, dogs normally extending over the return-track to prevent the passage of a car, and connections between said dogs and the transfer-truck adapted to be operated by the truck as the latter moves into place to receive a car and permit said car to pass onto the truck, substantially as described.

10. In a car handling and dumping device, the combination with one or more transporting-tracks and one or more return-tracks, of a way for one or more rotary tipples transversely intersecting said tracks, a mine-shaft or other source of supply having one or more cages or hoists therein for elevating cars into alinement with the transporting-tracks, a way for one or more transfer-trucks extending transversely of the tracks, one or more trucks on said way adapted to be moved into alinement alternately with a cage and a tipple and a return-track and a tipple, a transfer-ram device arranged to push an empty car from a transfer-truck onto a cage and thereby move a loaded car from the cage into a tipple, and means for causing the tipple with loaded car to dump the contents of the car as the said tipple traverses its way, substantially as described.

11. In a car handling and dumping device, the combination with one or more transporting-tracks and one or more return-tracks, of a way transversely intersecting said tracks, one or more rotary tipples movable over said way, a mine-shaft having one or more cages therein for elevating a car into alinement with the transporting-tracks, a way extending transversely of said tracks adjacent to the mine-shaft, one or more transfer-tracks on said way, a motive-power device connected to said transfer-trucks for traversing the same over the way, connections between the transfer-trucks and the rotary tipples adapted to cause the tipples to move simultaneously with and in opposite directions to the transfer-trucks, whereby a transfer-truck is alternately alined with a cage and a tipple and with a return-track and a tipple, substantially as described.

12. In a car handling and dumping device, the combination with one or more transporting-tracks and one or more return-tracks, of

a way transversely intersecting said tracks, one or more rotary tipples movable over said way, a mine-shaft having one or more cages therein for elevating a car into alinement with the transporting-tracks, a way extending transversely of said tracks on the opposite side of the shaft to the tipples, one or more transfer-trucks on said way, a motive-power device connected to said transfer-trucks for traversing the same over the way, connections between the transfer-trucks and the rotary tipples adapted to cause the tipples to move simultaneously with and in opposite directions to the transfer-trucks, whereby a transfer-truck is alternately alined with a cage and a tipple and with a return-track and a tipple, substantially as described.

13. In a car handling and dumping device, the combination with one or more transporting-tracks and one or more downgrade return-tracks, of a way transversely intersecting said tracks, one or more rotary tipples on said way, a mine-shaft having one or more cages therein for elevating cars to the level of the transporting-tracks, an inclined way extending transversely of the tracks, one or more transfer-trucks on said way adapted to be moved into alinement with a return-track at the lowest point of the way and with a transporting-track and cage at its highest point and with a rotary tipple on a transporting-track and a return-track, mechanism for moving the transfer-truck, connections between the transfer-truck and the rotary tipple for causing the two to move in opposite directions, and means for pushing an empty car from its transfer-truck against a loaded car on a cage, substantially as described.

14. In a car handling and dumping device, the combination with one or more transporting-tracks and one or more downgrade return-tracks, of a way transversely intersecting said tracks, one or more rotary tipples on said way, a mine-shaft having one or more cages therein for elevating cars to the level of the transporting-tracks, an inclined way extending transversely of the tracks, one or more transfer-trucks on said way adapted to be moved into alinement with a return-track at the lowest point of the way and with a transporting-track and cage at its highest point and with a rotary tipple on a transporting-track and a return-track, mechanism for moving the transfer-truck, connections between the transfer-truck and the rotary tipple for causing the two to move in opposite directions, means for pushing an empty car from its transfer-truck against a loaded car on a cage, and automatically-acting bumpers on the transporting-tracks near the rotary tipples to prevent a car from running out of the same, substantially as described.

15. In a car handling and dumping device, the combination with one or more transporting-tracks and one or more downgrade return-tracks, of a way transversely intersecting said tracks, one or more rotary tipples on said

way, a mine-shaft having one or more cages therein for elevating cars to the level of the transporting-tracks, an inclined way extending transversely of the tracks, one or more transfer-trucks on said way adapted to be moved into alinement with a return-track at the lowest point of the way and with a transporting-track and cage at its highest point and with a rotary tippie on a transporting-track and a return-track, mechanism for moving the transfer-truck, connections between the transfer-truck and the rotary tippie for causing the two to move in opposite directions, means for pushing an empty car from its transfer-truck against a loaded car on a cage, and automatically-acting bumpers on the transporting-tracks near the rotary tippies and on the return-tracks near the transfer-trucks to prevent a car from running from the same, substantially as described.

16. In a car handling and dumping device, the combination with one or more transporting-tracks and one or more downgrade return-tracks, of a way transversely intersecting said tracks, one or more rotary tippies on said way, a mine-shaft having one or more cages therein for elevating cars to the level of the transporting-tracks, an inclined way extending transversely of the tracks, one or more transfer-trucks on said way adapted to be moved into alinement with a return-track at the lowest point of the way and with a transporting-track and cage at its highest point and with a rotary tippie on a transporting-track and a return-track, mechanism for moving the transfer-truck, connections between the transfer-truck and the rotary tippie for causing the two to move in opposite directions, means for pushing an empty car from its transfer-truck against a loaded car on a cage, and dogs normally blocking the return-tracks near the transfer-truck adapted to be moved clear of the said tracks by the transfer-truck when the latter moves into place to receive an empty car, substantially as described.

17. In a car handling and dumping device, the combination with one or more transporting-tracks and one or more downgrade return-tracks, of a way transversely intersecting said tracks, one or more rotary tippies on said way, a mine-shaft having one or more cages therein adapted to elevate cars into line with the transporting-tracks, a transverse way on the opposite side of said mine-shaft depressed at the end to aline with the end of a return-track, one or more transfer-trucks on said way, a motive-power device for moving the transfer-trucks, connections between the transfer-trucks and the rotary tippies for causing the same to move in opposite directions to and simultaneously with the transfer-trucks, means for pushing an empty car from a transfer-truck against a loaded car on a cage thereby transferring the latter to a rotary tippie, bumpers on the transporting-tracks at opposite sides of a rotary tippie and on the return-tracks at opposite sides of a

transfer-truck, dogs on the return-track adjacent to a transfer-truck, and means operated by a transfer-truck for moving said dogs away from the track, substantially as described.

18. In a car handling and dumping device, the combination with two transporting-tracks in juxtaposition and two return-tracks outside of said transporting-tracks, of a way transversely intersecting said tracks, two rotary tippies on said way, one adapted to aline with a transporting-track while the other alines with an adjacent return-track, a mine-shaft having two cages therein for elevating cars into alinement with the transporting-tracks, a way for transfer-trucks extending transversely of said tracks, two transfer-trucks thereon, one adapted to aline with a return-track while the other alines with a transporting-track, connections between the transfer-trucks and the rotary tippies adapted to cause them to move in opposite directions, and a motive-power device under the control of an operator for moving the transfer-trucks in either direction, substantially as described.

19. In a car handling and dumping device, the combination with two transporting-tracks in juxtaposition and two downgrade return-tracks outside of said transporting-tracks, of a way transversely intersecting said tracks, two rotary tippies on said way, one adapted to aline with a transporting-track while the other alines with an adjacent return-track, a mine-shaft having two cages therein for elevating cars into alinement with the transporting-tracks, a way for transfer-trucks extending transversely of said tracks having its ends depressed to aline with the return-tracks, two transfer-trucks thereon, one adapted to aline with a return-track while the other alines with a transporting-track, connections between the transfer-trucks and the rotary tippies adapted to cause them to move in opposite directions, and a motive-power device under the control of an operator for moving the transfer-trucks in either direction, substantially as described.

20. In a car handling and dumping device, the combination with two transporting-tracks in juxtaposition and two return downgrade tracks outside of said transporting-tracks, of a way transversely intersecting said tracks, two rotary tippies on said way, one adapted to aline with a transporting-track while the other alines with an adjacent return-track, means for tilting the rotary tippies in the direction of the downgrade tracks, a mine-shaft having two cages therein for elevating cars into alinement with the transporting-tracks, a way for transfer-trucks extending transversely of said tracks, two transfer-trucks thereon, one adapted to aline with a return-track while the other alines with a transporting-track, connections between the transfer-trucks and the rotary tippies adapted to cause them to move in opposite directions, and a

motive-power device under the control of an operator for moving the transfer-trucks in either direction, substantially as described.

21. In a car handling and dumping device, 5 the combination with two transporting-tracks in juxtaposition and two return-tracks outside of said transporting-tracks, of a way transversely intersecting said tracks, one side of the rotary-tipple way being depressed from 10 the transporting to the return track to cause the tipple to tilt toward the track, two rotary tipples on said way, one adapted to aline with a transporting-track while the other alines with an adjacent return-track, a mine-shaft 15 having two cages therein for elevating cars in alinement with the transporting-tracks, a way for transfer-trucks extending transversely of said tracks, two transfer-trucks thereon, one adapted to aline with a return-track while the other alines with a transporting-track, connections between the transfer-trucks and the rotary tipples adapted to cause 20 them to move in opposite directions, and a motive-power device under the control of an operator for moving the transfer-trucks in either direction, substantially as described.

22. In a car handling and dumping device, the combination with two transporting-tracks and two return-tracks, of a source of supply 30 from which the tracks lead, a way extending transversely of said tracks, two rotary tipples thereon, a way extending transversely of said tracks, two transfer-trucks thereon, a motive-power device for moving the transfer-trucks simultaneously in either direction, a 35 rope gearing connected to the power device and connecting the transfer-trucks with the rotary tipples on opposite sides of the struc-

ture, and means for causing the rotary tipples to rotate as the transfer-trucks and the 40 tipples are moved transversely of the tracks in opposite directions by said rope gearing, substantially as described.

23. In a car handling and dumping device, the combination with one or more transport- 45 ing-tracks and one or more return-tracks, both of which have a slight grade, of a way transversely intersecting said tracks, one or more rotary tipples on said way, a source of supply from which the tracks lead to the rotary- 50 tipple ways, means for traversing the tipple over the way and for rotating the same as it is traversed, and means for tilting the tipple toward each track as it alines therewith, substantially as described. 55

24. In a car handling and dumping device, the combination with one or more transport- ing-tracks and one or more return-tracks, both of which have a slight grade, of a way trans- 60 versely intersecting said tracks, one or more rotary tipples on said way, a source of supply from which the tracks lead to the rotary-tipple ways, means for traversing the tipple over the way and for rotating the same as it 65 is traversed, one side of said way being depressed at the centers of said tracks so as to cause the tipple to incline toward the tracks, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of 70 two subscribing witnesses.

ERSKINE RAMSAY.

Witnesses:

J. WEIDMAN MURRAY,
JOHN ARMSTRONG.