My invention relates to mechanism for operating the doors of dump cars, being especially adapted to the doors of dump cars of the side dump type; the invention having for its object the provision of mechanism whereby the doors of a dump car can be operated by one man, due to the construction whereby an increased leverage is provided as the door moves toward closed position with the result that a complete closing of the door is assured.

Another object of the invention is to provide mechanism of the character mentioned whereby the free end of the door and its superposed load will be carried by a non-movable portion of the mechanism fixedly secured to a car underframe member, the mechanism at the same time being so designed as to require comparatively small space between the operating plane of the doors and the transverse members or cross bearers of the car underframe, thus adapting the mechanism to the standard types of dump cars with maximum sized doors.

A further object of the invention is to provide a construction wherein the relation between the doors and the operating mechanism is such that in the event the doors encounter undue impacts from a clam-shell or scoop, that such impacts will not deflect the operating shafts thereof, as will appear from the specific description hereinafter set forth.

The invention also has for its object the provision of operating mechanism of comparatively simple character and which is not apt to become inoperative.

The aforementioned objects and the advantages inherent in my invention will be more readily comprehended from the detailed description of the construction shown in the accompanying drawings, wherein:

Figure 1 is a plan view of a portion of a dump car, with parts broken away to more clearly illustrate my operating mechanism.

Figure 2 is a side elevation of a car door section and the operating mechanism, with portions broken away and in section.

Figure 3 is a detailed sectional view of the operating shaft and lever mounting on the bottom of the door; the view being taken substantially on the line 3-3 of Figure 1 looking in the direction of the arrows.

Figure 4 is a detail perspective view of the shaft and hand lever supporting bracket secured on the doors.

Figure 5 is a cross sectional view taken substantially along the line 5-5 of Figure 1 and looking in the direction of the arrows, with the open position of the door and the released condition of the operating mechanism shown in dotted lines.

Figure 6 is a cross sectional view taken substantially along the line 6-6 of Figure 1, with the door dropped down into full open position.

Figure 7 is a detail sectional elevation of the supporting bracket and the ends of the door controlling links, illustrating the initial position of the mechanism when the door has practically reached closed position; the view being taken from the rear of the bracket as indicated by line 7-7 of Figure 1.

Figure 8 is a detail sectional view taken on the line 8-8 of Figure 5 and looking in the direction of the arrows.

Figure 9 is a side elevation of the portions of the mechanism shown in Figure 8, with the operating shaft and portions of the door and floor shown in section.

Figure 10 is a sectional view of the locking pawl bracket taken substantially on the line 10-10 of Figure 9 with the latch pin or pawl omitted.

Figure 11 is a side elevation of the bracket.

Figure 12 is a detail sectional view taken on the line 12-12 of Figure 10.

Figure 13 is a sectional view taken on the off-set line 13-13 of Figure 10 as viewed in the direction of the arrows.

Figure 14 is a perspective view of the locking pawl.

Figure 15 is a perspective view of a portion of the car floor and underframe and illustrating the supporting bracket.

Figure 16 is a perspective view of a portion of a door and the rod-end supporting bracket secured adjacent the side of the door.

My invention relates more especially to the bottom door type of dump car and as an exemplification the invention has been shown applied to the side dumping type wherein the doors are hinged adjacent the longitudinal center of the car as shown in Figure 1, where the doors 20 are shown in closed position, with the ends and sides of the doors being lapped by the side sill portion 21 and floor plates 32 of the car. These cars are also usually provided with a plurality of cross bearers or crossbeams 23, spaced apart longitudinally of the car to enable the desired number and desired size of door openings to be arranged in the car floor on each side of the longitudinal median line of the car.

The doors 20 are hingedly supported by the 55
brackets 24 (see Figures 5 and 6) secured to the longitudinal center sill member 25, allowing the door to swing vertically downward to open position as shown in full lines in Figure 6.

The door 20, on its lower face and adjacent to the opposite sides and at the free or swinging end thereof, is provided with suitable depending brackets 26, each of which is provided with an elongated straight opening or slot 27 disposed transversely of the door toward the free end thereof as clearly shown in Figures 6 and 16. The slot 27 in each bracket 26 is intended to extend in a substantially horizontal direction when the door is closed; that is to say, slot 27 is disposed substantially parallel with the door and is of length sufficient to permit a predetermined degree of movement of the operating rod 28 which extends transversely of the door 20 with the opposite end mounted in a similar bracket 26 at the opposite side of the door.

The rod 28, at its ends—or preferably throughout its length as shown, is square or of non-circular cross-section—see Figure 16—and extends entirely through the slots 27 in the brackets 26.

The extended ends of the rod at the outer sides of the brackets are each provided with a link 29 which is secured to the rod 28 so as to oscillate when the rod 28 is given rotary movement. The end of the link connected to the rod, on its outer side, is provided with an annular boss or enlargement as at 30, see Figure 16, to provide a door supporting member as will hereinafter appear. The enlargement or boss 30 is arranged to extend beyond the side of the door 20 as shown in Figures 2 and 16.

Secured to the cross bearers or beams 23 on opposite sides of the door openings, at points coincident with the brackets 26 (when the doors are closed) are brackets 51; these brackets being firmly secured in place and each provided at the rear side with an extension or lobe 32 to which a link 33 is pivotally secured. The side of the bracket is enlarged laterally to provide an upwardly sloping open-sided pocket or socket 34 which has an opening or entrance at the lower forward end thereof, as seen in Figures 6 and 15; the walls of the socket at the open end being somewhat flared and arched as shown at 35 and 36 to act as guides for the enlargement or boss 33 and to direct the latter into the pocket or socket 34. The socket 34 in bracket 26 is adapted to be laterally disposed adjacent the socket or pocket 34 in bracket 31 when the door is brought to closed position, as seen in Figures 5 and 7, with the result that the enlargement or boss 33 at the end of link 23 will engage the flared guide walls 35 and 36 and be caused to move into the pocket or socket 34 while the operating rod 28 on the door is at the forward end of the slot 27, which laterally aligns up with the open end of the pocket or socket 34.

The lower end of link 33 is preferably curved slightly forward and pivotally secured at 37 to the lower end of link 23; either the lower end of the latter or lower end of the former being bifurcated so as to permit the links to extend substantially parallel and in the same transverse plane so as not to interfere with the dropping door.

The rod 28, which extends transversely of the door, also extends through a bracket 38 which is secured to the bottom of the door 20 intermediate of the sides. The bracket 38 is provided with a pair of parallelly spaced portions 39, 39 which extend in a direction transverse of the car; the portions 39, 39 are slotted at 40, and the opposing or inner sides of these portions 39 are provided with the laterally disposed ribs 41 which extend about the perimeters of the slots 40 except at the inner or rear ends of the slots, see Figure 4.

The operating rod 28 extends through the slots 48, as shown in Figures 2, 3 and 8.

The rod 28, in its passage through bracket 38, is also made pass through the enlarged end 42 of an operating handle or lever 43 on the end 42 being provided with an angular opening to match the cross-sectional configuration of the rod 28 and hence prevent rotation of the lever 43 on the rod 28.

The sides of the enlargement 42 of the lever 43 are formed to support the lever in the pocket provided by the arcuate ribs 41 which terminate adjacent the rear ends of slots 40 and thus provide a pocket open toward the rear end of the bracket 38 and enables the trunnion forming sides 42a on the enlarged end of the lever 43 to be slid into place while the end of rod 28 is being passed through the slots of bracket 38 during installation.

The lever 43 is preferably arranged so as to extend to the side of the car beyond the opening when the door is closed, as shown in Figure 5. It is apparent that when the handle or lever 43 is grasped and an outwardly and upwardly pulling force exerted while in the dotted line position shown in Figure 5 (namely with the door in full open position), the handle or lever is caused to swing through the arc of a circle on its trunnions which are rotatably mounted on the pocket forming ribs 41.

By pulling upwardly toward the side of the car, the rod 28 will be brought toward the forward ends of slots 48 in bracket 38 and also toward the forward end of the slot 27 in each bracket 26 at opposite sides of the door. As a result the hubs 30 on the upper ends of the links 29 at opposite sides of the door will be positioned for entrance through the lower end of the socket 34 in the bracket 26, as shown in Figure 7 where the hub 30 has just entered the socket 34.

When the hubs 30 on the upper ends of the links 29 at opposite sides of the door have entered the socket 34 as shown in Figure 7, the door 20 is practically closed but is in snug lapping relation with the floor members of the car.

In order to induce the snug relation, the socket 34 in each bracket 26 is at a slight upward inclination toward the rear as shown in Figure 6; while the relation between the straight slots 27 in door bracket 26 and the inclining socket 34 in the stationary bracket 31 is shown in Figure 7.

It is apparent that by forcing the hub 30 of the link 29 to ride rearwardly upward in the socket 34, the door 20 will be forced correspondingly upward into snug lapping relation at its end and sides with the floor members or portions of the car and prevent material settling through the door opening.

In order to induce this rearward riding movement of the hubs 30 of links 29 (and similar movement of the rod 28), I prefer to provide the forward edge or side of link 29 at its upper end with an arcuate toe or cam portion 44 (more clearly shown in Figures 7 and 16) which is adapted to engage the arcuate wall portion 35 of the socket in the stationary bracket 31.

It is evident that continued upward pull on handle or lever 43 exerts an oscillatory force on
link 29 toward the right in Figure 7, causing toe 5 toward the rear or closed end of the socket 34 where the rod 28 on the door will be disposed at the rear ends of slots 27 in the brackets 26 at each side of the door, as shown in Figure 5.

When the elements are in the position just described, the pivot 37 at the floating ends of links 29 and 32 will be disposed slightly to one side of the vertical plane of the fixed pivotal point of link 32 as shown in Figure 5 and thus transmit the load to the cross bearers or cross beam members 23 of the car through the medium of brackets 31.

In order that there may be a slight yielding relation between the bottom of the door and the rod 28, I prefer to provide a slight clearance between the trunnion forming sides 42 of the pocket forming ribs 41, as shown at 45, in Figure 9. With this clearance, in the event the door is subjected to too great an impact by a clam-shell or loading scoop, the lower edges of the sides 42 of the key-holes 44 of the bracket 3 and the tops of the pocket forming ribs 41 will be deflected and not affect the door operation as the defection of the door will be taken care of by the clearance between the trunnions 42 of the lever 43 and the tops of the pocket forming ribs 41.

The position of the controlling lever 43 and of the door operating elements is maintained by means of a locking pin 46, whose one end is provided with a radially disposed lug 47, while the other end is provided with an operating handle 43, as seen in Figure 14. Secured on the bottom of the side sill portion 21, and substantially in alignment with the operating lever 43, is a bracket 49 provided with a bifurcated depending portion as shown in Figure 10; with the lower ends of the bifurcations preferably enlarged laterally and apertured to receive the shank of pin 46 and provide sufficient bearing therefor. The apertures through the bifurcations are somewhat in the nature of key-hole slots as shown at 50, see Figures 11 and 13, for passage of the cylindrical shank of pin 46 and the lug 47, thus enabling the locking pin 48 to slide lengthwise through the bracket 49 and through a suitable opening in the lever or handle 43.

The bifurcations of bracket 49 are spaced apart sufficiently to receive a portion of operating handle or lever 43 therebetween; lever 43 being preferably provided with a slotted rib portion at 43a which fits between the bifurcations with the slot in rib portion 43a arranged to register with the key-hole slot 50 in the bifurcations of bracket 49; the slot in handle portion 43b being large enough for passage of the lug 47 and pin 46 therethrough. The key-hole slot 50 extends from one side and through a major portion of the bracket 49 with the elongated portion 50 disposed substantially in a horizontal direction as shown in Figures 10 and 11; the slot 50 with the portion 50a disposed as just defined extends from the side of the bracket 49 which is disposed toward the door, namely the side of the bracket shown in Figure 11, the left hand side of Figure 10. At a short distance from the opposite end of the aperture 50, the elongated slot portion of the aperture is disposed in a different direction, namely at a slightly upward inclination as shown at 50b in Figure 12 and as shown at the right side of the bracket as viewed in Figure 10. It is evident that the locking pin 46 must be given different directions of rotation in order to permit the pin 46 to slide through the bifurcations of the bracket 49, and hence the off-set created by the end 50b of the key-hole slot 50 prevents the too far withdrawal rearwardly of the locking pin 46 although permitting sufficient movement to withdrawing the lug end of the pin from the left hand bifurcation of bracket 49, as viewed in Figure 10, and into the right hand bifurcation, thus also withdrawing the pin from the slot in the rib 43a of handle 43.

This permits the latter to be swung downwardly, thereby rolling the hub 30 toward the open end of socket 34 which will allow the hub 30 to drop out of socket 34 and the door to also drop downwardly into the open position shown in Figure 6, where the door will be supported by a suitable stop plate or member 51 secured to the cross-beam 23; the lower end of plate 51 being bent laterally into the path of the door.

The locking pin 46 is inserted into the key-hole slot 49 of the right hand side thereof, as viewed in Figure 10, by holding handle 48 vertically as shown in Figure 14 at which time lug 47 is positioned to pass through the slot 50b. This must be done before the bracket is secured in place. With the handle 48 extending radially from one side of the pin as shown in Figure 14, it is evident that the handle 48 will swing downwardly through the action of gravity as shown in Figure 9, and thus cause the lug 47 to point toward the right in Figure 14 and hence in a direction opposite to the elongated portion 50b of the key-hole slot. As a result, withdrawal movement of the pin 46 is impossible until the handle is lifted so as to rotate the pin 46 sufficiently where the lug 47 will register with the key-hole slot as shown in Figures 11 and 13. After the bracket 49 is secured in place beneath the side sill member 21, the handle 48 will be limited in its upward movement by the side sill member as shown in dotted lines in Figure 9 and hence the bringing of lug 47 into register with slot 50 and the complete withdrawal of pin 46 from the bracket 49 will be impossible.

With this construction and arrangement the unlocking position can only be accomplished by swinging the handle 48 toward the side of the car instead of toward the door where the hand of the operator might be injured by the dropping door.

In order to induce the slot in the rib 43a of handle 43 to quickly register with the key-hole slot in bracket 49 when the handle is swung upwardly into place, I provide the handle with a longitudinal rib at 43c which will contact the lower end of bracket 49 and prevent further upward movement of the handle; the rib 43c at the same time reinforcing the handle. The bracket 49 on its side wall and at the upper perimeter of the key-hole slot therein is provided with a lateral projection or overhanging lip 48c with which lug 47 on locking pin 46 will engage if the handle 48 is turned too far or in the wrong direction.

I have illustrated my invention applied to a door of a side dump type of dump car, but it will be understood that it may be applied to other types of drop doors and that certain modifications may be made without departing from the spirit of my invention which has been defined in terms employed for purposes of description and not as terms of limitation.
What I claim is:

1. A dump car door operating mechanism comprising, in combination with a downwardly swinging door, a link oscillatally and movably secured to the bottom of the door and provided with a lateral projection disposed beyond the side of the door; a link pivotally secured at the side of the door opening to a transverse floor beam; the lower ends of both links being pivotally secured thereto; a socket arranged on the transverse floor beam and open at one end, and means whereby the laterally disposed portion of the first mentioned link is caused to move into said socket when the door is closed.

2. A dump car door operating mechanism comprising, in combination with a downwardly swinging door, a link oscillatally and movably secured to the bottom of the door and provided with a lateral projection disposed beyond the side of the door; a link pivotally secured at the side of the door opening with its lower end pivotally connected with the first mentioned link; and means secured adjacent the door opening and adapted to cooperate with said lateral projection and to force the door into complete closed position.

3. A dump car door operating mechanism comprising, in combination with a downwardly swinging door, a link oscillatally and slidably secured at its upper end to the door and provided at its upper end with a portion adapted to project beyond the side of the door; a link pivotally secured to a cross-member of the car adjacent the door opening, the lower ends of the two links being pivotally secured together; a socket member secured to the car cross member adjacent the door opening adapted to receive the extension on the first mentioned link and to support the door in closed position; cooperating surfaces on the first mentioned link and on said socket member whereby said extension is forced toward the closed end of the socket; and operating means whereby the links will be oscillated and said extension moved into said socket member.

4. A dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured at its upper end to a transverse floor beam adjacent the door opening; a rod rotatably and slidably mounted in said slot; the lower end of said link being pivotally secured at one end to the rod, while its other end is pivotally secured to the first mentioned link; the end of the link connected to said rod being laterally extended beyond the door; a socket member secured to the transverse floor beam adjacent the door opening and adapted to receive the lateral extension of said link and support the door, said member having an upwardly inclined socket open at the lower end; and means secured to said rod whereby the door may be lifted from open position, said rod rotated, the pivotal connection between the two links moved rearwardly and thence forwardly and the lateral extension at the upper end of the second mentioned link moved upwardly to the closed end of the socket.

5. A dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured at the upper end to a transverse floor beam at each side of the door opening; slotted brackets secured on the lower side of the door; a rod slidably mounted in the slots of the brackets and having its ends disposed to the outer sides of the brackets; a link fixedly secured to each end of the rod, with the other ends pivotally secured to the lower ends of the first mentioned links; the upper ends of the second mentioned links having enlarged boss portions disposed beyond the sides of the door; socket providing brackets secured to the transverse floor beam at each side of the door opening, said brackets having rearwardly inclining sockets open at the lower forward ends and adapted to receive said boss portions at the ends of the second mentioned links and thereby support the door; the open ends of the sockets and the upper ends of the second mentioned links having cooperating surfaces adapted to guide the boss portions into place; and a lever secured to said rod whereby the door may be lifted, said rod rotatably and slidably secured to a rod pivotally connected to the first and second mentioned links moved rearwardly and thence forwardly and the boss portions of the second mentioned links moved upwardly into the sockets.

6. A dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured at its upper end to a stationary member of the car adjacent the door opening; a rod rotatably and slidably mounted on the bottom of the door; a link fixedly secured at one end to the rod and having an extension disposed beyond the side of the door, while the other end of the link is pivotally secured to the first mentioned link; a socket member secured to the car cross member adjacent the door opening and adapted to receive said link extension when the door is moved into closed position; a slotted bracket on the bottom of the door through which said rod extends; a lever secured to said rod and fulcrumed in said bracket; and gravity controlled means for locking said lever in door closing position.

7. A dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured at its upper end to a stationary member of the car adjacent each side of the door opening; slotted brackets secured on the bottom of the door; a rod rotatably and slidably mounted in the slots of said brackets; a link fixedly secured to each end of the rod, the upper ends of said links being enlarged laterally to extend beyond the sides of the door, the lower ends of the first and second mentioned links being pivotally secured together; socket members secured to the car cross members at each side of the door opening and having sockets open at one of the ends to receive said lateral enlargements of the second mentioned links when the door is moved to closing position; a lever secured to said rod intermediate of its ends and journaling in one of said slotted brackets; and means secured to the car side sill adapted to receive the lever and to hold the latter in raised position.

8. A dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured at its upper end to a stationary member of the car adjacent each side of the door opening; a rod rotatably and slidably mounted in the slots of said brackets; a link fixedly secured to each end of the rod, the upper ends of said links being enlarged laterally to extend beyond the sides of the door, the lower ends of the first and second mentioned links being pivotally secured together; socket members secured to the car cross members at each side of the door opening and having sockets open at one of the ends to receive said lateral enlargements of the second mentioned links when the door is moved to closing position; a lever secured to said rod intermediate of its ends and journaling in one of said slotted brackets; and means secured to the car side sill adapted to receive the lever and to hold the latter in raised position.

9. A dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured at its upper end to a stationary member of the car adjacent each side of the door opening; a rod rotatably and slidably mounted in the slots of said brackets; a link fixedly secured to each end of the rod, the upper ends of said links being enlarged laterally to extend beyond the sides of the door, the lower ends of the first and second mentioned links being pivotally secured together; socket members secured to the car cross members at each side of the door opening and having sockets open at one of the ends to receive said lateral enlargements of the second mentioned links when the door is moved to closing position; a lever secured to said rod intermediate of its ends and journaling in one of said slotted brackets; and means secured to the car side sill adapted to receive the lever and to hold the latter in raised position.
prising, in combination with a downwardly swinging door; a pair of links movably secured to the bottom of the door with their upper ends enlarged laterally to extend beyond the planes of the door sides; socket members secured to the car frame on opposite sides of the door opening adapted to receive the laterally disposed enlargements of said links to support the door in closed position; a pair of links pivotally secured at one of their ends to the car frame while the other ends of said links are pivotally connected with the lower ends of the first mentioned links; and a hand lever operatively connected with the upper ends of the first pair of links so as to oscillate the latter when an upward pull on said lever is exerted and the enlargements on said links moved into the sockets of said members.

10. Dump car door operating mechanism comprising, in combination with a downwardly swinging door; a pair of links arranged at each side of the door, one link of each pair having a fixed pivotal point on a cross beam of the car while the other link of each pair has a shifting pivotal connection with the door, the lower ends of the links of each pair being pivotally secured together, the shifting pivotal points of the links secured to the door being arranged to move adjacent to the fixed pivotal points of the other links when the door is moved to closing position; and means carried by the door and operatively connected with the links connected with the door whereby the door may be lifted and said links controlled.

11. Dump car door operating mechanism comprising, in combination with a downwardly swinging door; a pair of links arranged at each side of the door, one link of each pair having a fixed pivotal connection with a cross beam of the car while the other link of each pair has a shifting pivotal connection with the door and is provided at said pivotal connection with an extension disposed laterally beyond the side of the door, the lower ends of the links of each pair being pivotally secured together; means, secured to the cross beam of the car, provided with an upwardly sloping socket open at the forward end of the means and adapted to receive the extension on said link when the door is raised to closing position; and means carried by the door and operatively connected with the links connected with the door whereby the door may be lifted, the direction of oscillation of the links controlled and the extension at the shiftable ends of the door links moved into said sloping sockets.

12. Dump car door operating mechanism comprising, in combination with a downwardly swinging door; a pair of links arranged at each side of the door with one of the ends of the links of each pair pivotally secured together; one link of each pair being pivotally secured to a cross beam of the car; slotted brackets secured on the bottom of the door; a rod slidably mounted in said brackets; one link of each pair being fixedly secured to the ends of said rod and having an enlargement extending beyond the side of the door; a lever fixedly secured to said rod and fullcrumed in one of said brackets; and a socket member secured to the cross-beam at each side of the door opening, the sockets of said members being open toward the side of the car and adapted to receive the enlargements on said door carrying links when the door is moved to closed position and the door load transferred to the car cross-beams.

13. Dump car door operating mechanism comprising, in combination with a downwardly swinging door; slotted brackets secured to the bottom of the door; socketed brackets secured to the cross members of the car on opposite sides of the door opening, with the sockets being inclined and open at the upper end disposed toward the car side and provided with guide walls, a rod slidably and rotatably mounted in the slots of the first mentioned brackets; a pair of links pivotally together and arranged at each side of the door, one link of each pair pivotally secured to said cross members while the other link of each pair is fixedly secured to one end of the rod and the point of connection between the rod and link enlarged laterally to extend beyond the door opening and to enter the sockets of the second mentioned brackets when the door is closed; a lever secured to said rod and fullcrumed in one of the first mentioned brackets; and cam surfaces adjacent the ends of the links secured to said rod and adapted to cooperate with said guide walls of the second mentioned socketed brackets whereby said enlarged portions of the links are forced into the inclined sockets through upward movement of the lever.

14. In a dump car door operating mechanism involving a downwardly swinging door; a pair of links operatively arranged at opposite sides of the door, one link at each side being pivotally connected to cross members of the car at opposite sides of the door opening, while the other link of each pair is operatively connected with the door, the lower ends of the links of each pair being pivotally secured together; a rod movably mounted on the bottom of the door and operatively connected with the upper ends of the last mentioned links of each pair and adapted to control the links; lateral extensions at the point of connection between the rod and the last mentioned links and extending beyond the door sides; socketed brackets secured to the car cross members on opposite sides of the door opening with the sockets open at the lower forward ends of the brackets and adapted to receive said lateral extensions when the door is moved to closing position and thereby transfer the door load to said car cross members; and means whereby said rod is controlled and said lateral extensions made to ride into said sockets.

15. In a dump car door operating mechanism involving a downwardly swinging door; a pair of links operatively arranged at opposite sides of the door, one link of each pair being pivotally secured to the car cross members, while the lower ends of both links of each pair are pivotally secured together; a rod movably mounted on the bottom of the door and operatively connected with the upper end of the second mentioned link of each pair and adapted to control the second mentioned links and the pivotal connection between the adjacent ends of the links of each pair; a lateral extension at the point of connection between the rod and the second mentioned links made to extend beyond the door sides; socketed brackets secured to the car cross members on opposite sides of the door opening with the sockets open at the lower forward ends of the brackets and adapted to receive said lateral extensions when the door is moved to closed position and thereby transfer the door load to said cross members; arcuate cooperating surfaces between the socketed brackets and the upper ends of the second mentioned links whereby said lateral extensions are caused to move toward the closed ends of the sockets;
and a hand lever secured to said rod and fulcrummed on the bottom of the door.

16. A dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured to a car cross member; a second link pivotally secured on the door, the lower ends of the two links being pivotally secured together, while the upper end of the second link is provided with an enlargement extending laterally beyond the side of the door; means secured to the car cross member and adapted to receive said enlargement when the door moves to closing position whereby the door load is transferred to the car cross member; and means secured to the door whereby the latter is brought to and locked in closed position.

17. A dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured at its upper end to the car body adjacent the door opening so as to swing vertically; a rod rotatably and slidably mounted on the lower side of the door; a link secured to said rod so as to rotate therewith, while the opposite end of the link is pivotally secured to the lower end of the first mentioned link, an enlargement at the point of connection between the rod and the second mentioned link extending beyond the side of the door; an open-sided bracket secured to the car body adjacent the door-opening, said bracket providing a socket disposed transversely toward the side of the car and having an opening at one end, said opening to the socket in the bracket being adapted to receive said enlargement when the door and links are moving toward closed position and thereby support the door in closed position; and means whereby said connection is guided through the opening and into the socket.

18. Dump car door operating mechanism comprising, in combination with a downwardly swinging door; a link pivotally secured at each side of the door-opening to a cross member of the car so as to swing vertically; brackets secured to the lower side of the door and provided with elongated slots; a rod disposed through the slots in the brackets; a link secured at each end of the rod and pivotally secured to the lower ends of the first mentioned links; lateral enlargements at the connections between the ends of the rod and the second mentioned links and disposed beyond the sides of the door; a bracket secured adjacent each side of the door-opening to a car cross member and provided with a socket open at one end and adapted to receive said lateral enlargements; and an operating handle secured to the rod whereby the door may be lifted, the rod rotated and the enlargements moved into the sockets of the second mentioned brackets.

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