No. 746,519. PATENTED DEC. 8, 1903.

S. J. JOHNSON.

DUMPING CAR.

APPLICATION FILED OCT. 28, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

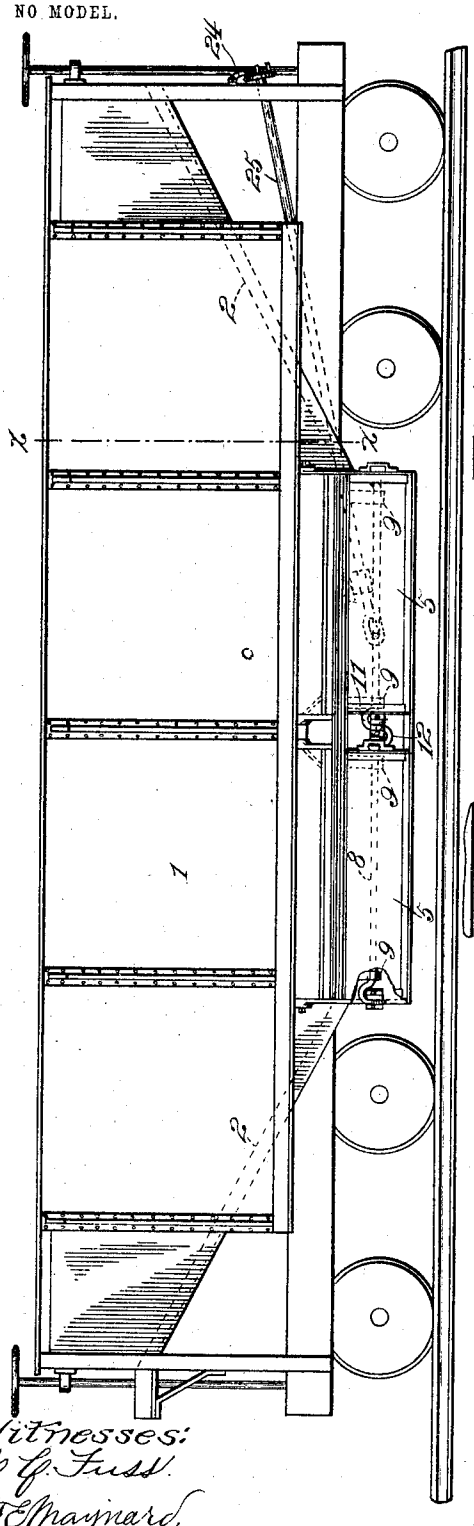


Fig. 1.

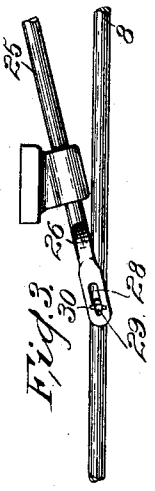


Fig. 3.

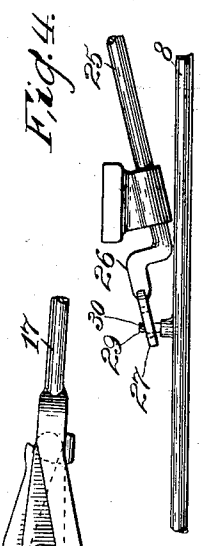


Fig. 4.

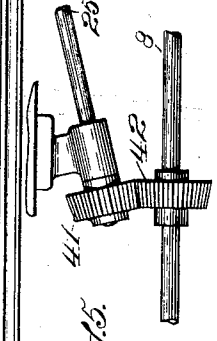


Fig. 5.

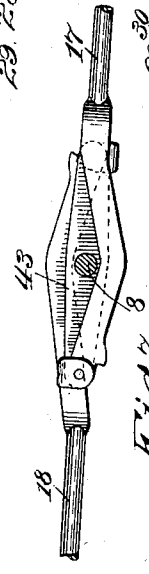


Fig. 7.

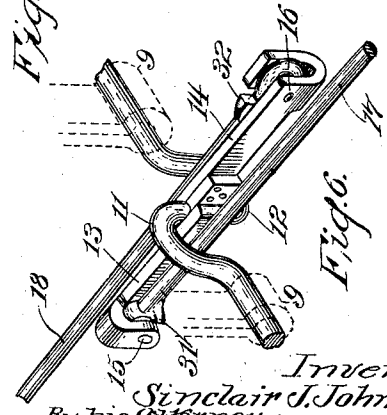


Fig. 6.

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THE NORRIS PETERS CO., PHOTO-LITHO. WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

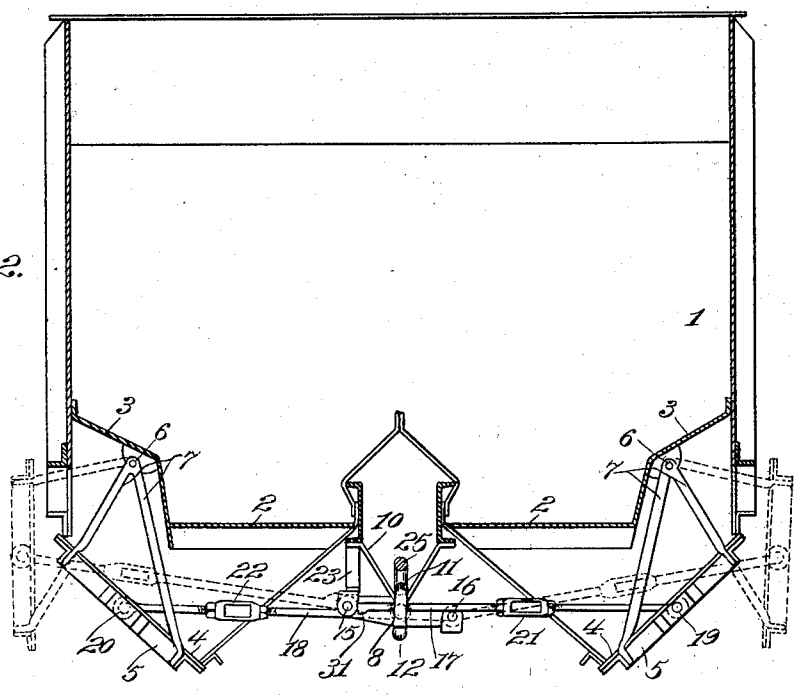
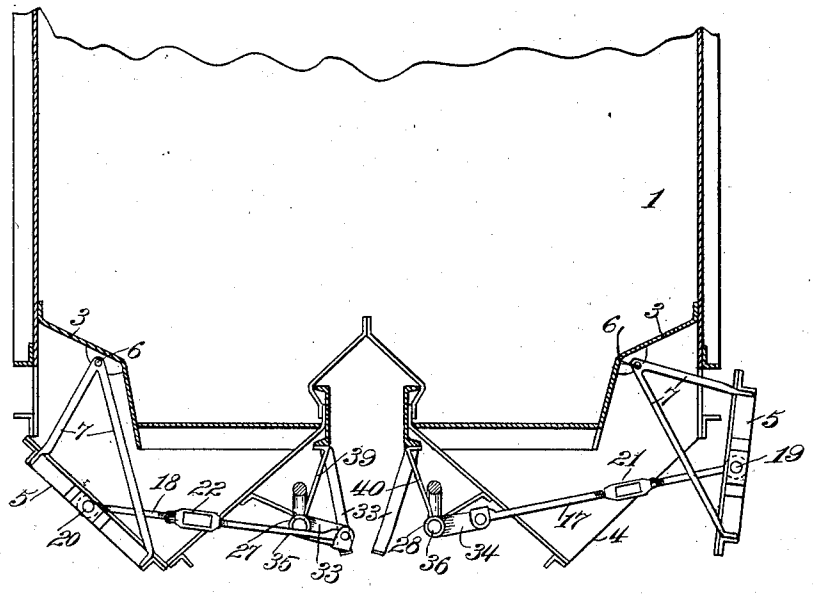



Fig. 8.




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No. 746,519. Patented December 8, 1903.

# UNITED STATES PATENT OFFICE.

SINCLAIR J. JOHNSON, OF MONTCLAIR, NEW JERSEY.

## DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 746,519, dated December 8, 1903.

Application filed October 28, 1903. Serial No. 178,330. (No model.)

*To all whom it may concern:*

Be it known that I, SINCLAIR J. JOHNSON, a citizen of the United States, residing in Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Dumping-Cars, of which the following is a specification.

This invention pertains to doors and door-operating mechanism for dumping-cars, and in its present form such doors and door-operating mechanism are designed for use in connection with such cars as deliver from the side.

An object of this invention is to provide doors and operating mechanism therefor, whereby such doors may be operated simultaneously and from a given point, preferably through the instrumentality of a single oscillating shaft, which may be suitably disposed, and to also provide an absolute lock for the doors when closed.

Other objects will become apparent from the following specification.

In such drawings as accompany this specification for the purpose of rendering the description more intelligible, Figure 1 is an elevational view of a dumping-car provided with the improved doors and operating mechanism therefor. Fig. 2 illustrates a transverse section on line $x\,x$ of Fig. 1 and show operating mechanism and doors both in their open and closed positions. Fig. 3 illustrates one form of connection employed in the train of mechanism, the same being illustrated in one position. Fig. 4 is a similar view illustrating the same in another position. Fig. 5 is a modified form of construction. Fig. 6 illustrates one form of crank mechanism used in conjunction with the operating mechanism. Fig. 7 shows a modified form thereof, and Fig. 8 illustrates an embodiment of the invention wherein each door may be operated independent of the other and from different points.

Similar characters of reference indicate like parts throughout the figures.

Shown for convenience of illustration is a car 1 of any ordinary type and of any suitable construction and which preferably may be provided with the usual inclined bottom 2, which may lead to central portions of the bottom of the car, from which portions may extend laterally and downwardly a plurality of side deliveries 3. In such present form of construction, as shown, the openings 4 of the deliveries may be disposed angularly with relation to the perpendicular axis of the car; but while this form of construction may be contemplated in practice such construction may be varied at will. As closures for the opening 4 there may be provided a plurality of doors, such as 5, which may be suitably mounted to swing against said openings and also therefrom at will, and in the present instance such mounting may be accomplished, as shown, by pivoting the doors to the body of the car, as at 6, in any suitable manner, and the doors proper may be attached to said body, as herein shown, by brackets 7 or may be attached in any other suitable manner. This point is placed above the plane of the door and in such a position that the door when open will not swing out too far beyond the side of the car and at the same time will not allow the door to swing down too far toward the track. The point from which the doors may be hung can be changed at will to regulate the swinging of the doors, whereby to permit their proper operation in connection with the door-openings. In such a door construction the load is supported more by the hinge-pivot and not so much by the operating mechanism, as is the case with doors which are hinged at one edge and in or below the plane of the door, and can therefore be more readily operated and controlled, so as to allow the doors to be stopped at will at any point.

Beneath the car 1 may be located a shaft 8, which may be disposed substantially centrally parallel to the longitudinal axis of the car and which may be carried in bearings 9, which may be borne by struts 10, and substantially midway of this shaft or at any point where it is desired to connect on that portion of the door-operating mechanism which is connected to the doors the shaft 8 may be suitably bent, as at 11 and 12, as shown, or otherwise suitably displaced, whereby to permit certain parts of the mechanism to pass beyond the central axis of the shaft 8.

From either side of the shaft 8, and preferably at those portions which are displaced, may proceed laterally-extended members or crank-arms 13 and 14, at or near the ends of

each of which may be pivots 15 and 16, whereon to mount shafts or rods 17 and 18. These rods may be pivotally connected to the doors 5, as at 19 and 20. Turnbuckles 21 and 22, as seen, for instance, in Figs. 2 and 8, may be employed, or any equivalent devices for adjusting the length of these rods 17 and 18, so that the respective doors 5 may properly close the openings. When the doors are in a closed position, as seen, for instance, in Figs. 1 and 8, it will be observed that the shaft 8 has been rotated, so that the pivot-points of the crank-arms 13 and 14 have passed to a position beyond the line running through the center of the pivots 19 and 20 and the center of the shaft 8, thus is secured an automatic locking function, for when the aforesaid pivot-point is beyond the aforesaid line the tendency is to rotate farther and not backward, and as it cannot rotate farther on account of a stop 23, suitably provided, the doors are securely locked. However, if desired, a drop-pawl 24 may be provided to prevent any rotation of the aforesaid shaft beyond a predetermined point. It will also be seen that in order that the pivot-points on the cranks can pass beyond the aforesaid lines of centers the shaft 8 may be bent, as seen in Fig. 6, or otherwise offset, or else the rods, as shown in Fig. 7, may be suitably bent. At any point in the length of this shaft 8 may be suitably coupled a second shaft 25, which may extend to or beyond the end of the car 1, from which point the shaft 8 and the shaft 25 may be operated, and for this purpose any suitable device may be located on the end of the shaft 25. This device in the present instance preferably comprises a wheel or arms with studs projecting therefrom, and a pawl 24, as shown, is provided to act in conjunction with said studs to hold the wheel or arm in any position at will. At or near the opposite end of the shaft 25 is formed an offset 26, from which proceeds a portion 27, provided with a slot 28, which is adapted to take over a member 29, which may be in the form of a stud proceeding from the shaft 8, and this shaft 25 is held to the member 29 by suitable means, such as a pin 30. By means of such connection the rotation or oscillation of the shaft 8 by a similar movement of the shaft 25 is conveniently effected, whereby to operate those portions of the train of mechanism which are directly connected to the main shaft 8 and the various doors for the openings. When the doors are thrown open, as seen in Fig. 2 in dotted lines, or in Fig. 8, and the position of the parts as shown in Figs. 6 and 7 are reversed, a set of stops or rests 31 and 32 are adapted to bear against the ends or pivot-bearings 15 and 16 of the crank-arms 13 and 14, and the rotation of the shaft 8 is thus automatically stopped when the door is fully opened.

In such form as is thus far described it will be observed that from a main shaft, preferably located substantially midway the width of the car and beneath the same, a plurality of doors for the openings which are located to deliver from the side may be operated and that such operation may be accomplished simultaneously both in closing and opening the doors, and, further, that when the doors are closed there is provided a stop or rest adapted to act upon the crank-arms of the mechanism for operating the doors, which stop or rest is so located or disposed as to be predeterminedly effective for positively maintaining the absolute contact of the doors against the openings.

While in practice it may be preferred to employ the form of mechanism hereinbefore described—that is, a single shaft centrally disposed for operating the plurality of doors simultaneously—it may also be desirable at will to employ a modified form—such, for instance, as shown in Fig. 8, wherein the use of an individual shaft for each door or each set of doors for the openings at one side of the car and another individual shaft for the doors for the openings at the other side is adopted. Especially will this be desirable in dumping the contents of a car from one side. For this purpose the arrangement of the openings 4, the doors 5, and the method of swinging said doors may, if found convenient, be the same or similar to that which has been hereinbefore described in connection with the single-shaft arrangement. The doors and the connection between said doors and the shaft may be the same or similar, and, as shown, comprises laterally-disposed members 33 and 34, respectively, each of which may be connected to individual shafts 35 and 36, respectively, which may be disposed on the side of the central portion of the car, preferably in bearings 27 and 28, which may be supported or carried by struts 39 and 40. Similar arrangements may be adopted for connecting these laterally-disposed members 33 and 34 with the doors 5, as has been before explained—that is to say, the connection may comprise rods 17 and 18.

It will be noted that when the shafts 35 and 36 are partially rotated the members 33 and 34 will operate in a manner similar to that hereinabove set forth and will likewise open and close the doors.

If desired, a substitute form of connection between the shafts 8 and 25—for instance, as shown in Figs. 3 and 4—may be employed, and, among others, that form which is shown in Fig. 5, which consists of a gear construction, may be used. In this arrangement a pinion 41 may be provided on the end of the shaft 25 and another pinion 42 on the shaft 8. These of course will be suitably located and will mesh with each other in any suitable manner.

For the crank mechanism shown in Fig. 6 may be substituted such a one as shown in Fig. 7, which may consist of bending the rods 17 and 18. These bent rods may be connected to a crank-arm 43 in this case, which surrounds the shaft 8, as seen in Fig. 7. This

arrangement does not necessitate displacing the shaft 8—for instance, as seen in Fig. 6—but nevertheless permits the knuckle-pivot point to pass beyond the aforesaid line of centers.

It will be seen that primarily this invention may consist of a single shaft operable from a single point and through the instrumentality of which, together with suitable trains of mechanism, a plurality of doors on each of the car sides for a plurality of openings of dumping-cars may be simultaneously and efficiently effected; that in combination with a single shaft and means employed the parts may be so related that when the doors are closed there will be an automatic lock, thus preventing the accidental operation of the parts or the opening of the doors.

Such constructions as have been shown in the drawings accompanying this specification are for purposes of illustration, and the special and precise arrangement of parts or precise elements as therein disclosed form only one embodiment of this invention, and the right is reserved to modify the construction, to substitute or omit parts, and to apply the principle of the invention to various types of cars in any manner at will which may most effectually carry out the ends of practicability.

Having thus described this invention, I claim—

1. In combination with a dumping-car having a plurality of openings on both sides of the car, a plurality of doors for said openings and which are pivoted to the body of the car at a point above said openings, a train of mechanism for operating said delivery-doors, a shaft operable from a given point and to which said mechanism is connected, portions of said shaft being so displaced as to permit certain elements of said mechanism to pass beyond the central line of said shaft to a position of rest.

2. The combination with a dumping-car provided with a plurality of lateral angularly-disposed deliveries, of a plurality of doors adapted to close the openings thereof, means for swinging said doors from a point above the delivery-openings, an operating-shaft for said doors, portions of which are suitably displaced, a pair of crank-arms connected to said shaft and adapted to pass the central line of said shaft and become locked, and a connection between said crank-arms and doors whereby to operate the latter when the shaft is operated.

3. The combination with a dumping-car having a plurality of laterally-disposed openings, a plurality of doors for closing said openings, and which are hung to swing from above said openings, a central shaft having portions thereof displaced, a plurality of crank-arms operated from said shaft and locatable in said displaced portions, a connection between said crank-arms and said doors, and means when said crank-arms are at or beyond the central line of the shaft to arrest the movement of the crank-arms.

4. The combination with a dumping-car having a plurality of side deliveries, the openings of which are angularly disposed with relation to the car, a plurality of doors for closing said openings, a single shaft for operating said doors and which is provided with displaced portions, a plurality of crank-arms carried by said shaft and locatable in the displaced portions and adapted when the doors are closed to locate above and below the central line of said shaft, connections between said crank-arms and doors, and a suitable rest for preventing excess movement of the crank-arms.

5. The combination with a dumping-car, of a plurality of side deliveries therefrom, the openings of which are angularly disposed with relation to the car, a plurality of doors for closing said openings, a single shaft for operating said doors and which is provided with displaced portions, a plurality of crank-arms carried by said shaft and adapted when the doors are closed to locate above and below the central line of the shaft, and in said displaced portions, connections between said crank-arms and doors, and a suitable stop for preventing excess movement of the crank-arms.

6. The combination with a dumping-car, of a plurality of side deliveries, a plurality of doors for said deliveries, a shaft beneath said car and between said doors and which is suitably displaced at suitable points, a pair of crank-arms proceeding from said shaft, a connection between said crank-arms and doors, and a rest for the crank-arms which will when the doors are closed prevent a movement thereof.

7. The combination with a dumping-car, of a plurality of deliveries therefor on each side, of a plurality of doors for said deliveries, a shaft running between said doors, mechanism between said doors and shaft, certain parts of said shaft being suitably offset to permit a disposition of certain other parts, when the doors are closed, beyond the central line of the shaft, and a secondary shaft for operating said shaft, and a connection between said shafts.

8. The combination with a dumping-car, of a plurality of side deliveries therefor, a plurality of doors for said deliveries, a shaft running between the doors, mechanism between the doors and shaft, certain of said mechanisms being suitably offset to permit the disposition of certain parts past center of the shaft, a secondary shaft for operating said shaft, a connection for rotating one shaft with respect to the other and which comprises slotted member adapted to move longitudinally with respect to the first-mentioned shaft and a member to guide said slotted member.

9. The combination with a dumping-car, of a plurality of side deliveries therefor, a plu-

rality of doors for said deliveries, a shaft running between the doors, mechanism between the doors and shaft, certain of said mechanism being offset to permit the disposition of certain parts past the center of the shaft and form a rest, a secondary shaft for operating said shaft, a connection for rotating one shaft with respect to the other and which comprises two members, each longitudinally movable with respect to each other, and means to operate the shafts.

10. The combination with a dumping-car, of a plurality of side deliveries having an angularly-disposed opening, of a plurality of doors for said openings, a shaft running between said doors and transverse thereto, crank-arms, proceeding from said shaft, connections between said doors and said crank-arms, and a rest for the crank-arms to prevent movement thereof beyond a predetermined point.

11. The combination with a dumping-car, a plurality of side deliveries therefor, a centrally-disposed shaft provided with displaced portions, a crank-arm proceeding on each side of said shaft, rods pivoted to said crank-arms, and connected to said doors, a secondary shaft, a slot-and-pin connection between said shafts, a drop-pawl connection at one end of said secondary shaft, and means when said shafts are partially rotated, to prevent the further movement thereof and thereby hold the doors locked.

12. The combination with a dumping-car, a plurality of side deliveries therefor, a centrally-disposed shaft provided with displaced portions, a crank-arm proceeding on each side of said shaft, rods pivoted to said crank-arm and connected to said doors, a secondary shaft, a slot-and-pin connection between said secondary shaft and said first-mentioned shaft, a pawl-and-ratchet connection at one end of said secondary shaft, and a rest when the shafts are partially rotated to prevent the further movement of the crank-arms and thereby hold the doors closed.

13. The combination with a dumping-car, a plurality of side deliveries therefor, a centrally-disposed shaft provided with displaced portions, a crank proceeding on each side of said shaft, rods pivoted to said cranks, and connected to said doors, a secondary shaft, a slot-and-pin connection between the shafts, a pawl-and-ratchet construction at one end of said secondary shaft, and a stop when the shafts are partially rotated to prevent the further movement thereof and thereby hold the doors closed.

14. The combination with a side-dumping car, a plurality of deliveries on each side therefor, a plurality of doors for said deliveries, a shaft for operating all of said doors, a secondary shaft for operating the first-mentioned shaft, a pair of crank-arms proceeding from said first-mentioned shaft, rods connected to said doors and said crank-arms, and a rest to prevent excess rotation of said shaft when the doors are either open or closed.

15. The combination with a side-dumping car, a plurality of deliveries on each side therefor, a plurality of doors for said side deliveries, a shaft for operating all of said doors, a secondary shaft operating said first-mentioned shaft, pairs of crank-arms proceeding from said shaft, rods connected to said arms and said doors, and stops for preventing excess movement of the shafts and doors when the latter are closed tight against the openings.

16. The combination with a side-dumping car, a plurality of deliveries on each side therefor, a plurality of doors for said deliveries, a shaft for operating all of said doors, a secondary shaft operating said first-mentioned shaft, a pair of crank-arms proceeding therefrom, rods connected to said doors and said crank-arms, and rests for preventing excess rotation of the shafts when the doors are either in an open or closed position.

17. In a car of the type described, the combination with deliveries on each side, of hinged doors therefor, of a shaft passing along beneath the deliveries, toggle-arms on said shaft, links coupled to said arms and doors, a secondary shaft connected to said first-mentioned shaft, and a rest for preventing the rotation too far in either direction of either shaft.

18. In a car of the type described, the combination with a plurality of deliveries on each side, a plurality of doors therefor and which are hinged at a point above the deliveries, of a system comprising a shaft, crank-arms proceeding therefrom, couplings for said arms and said doors, whereby all of the doors may be simultaneously opened and closed, and an operating-shaft running from the end of the car, connections between said operating-shaft and main shaft, whereby motion may be imparted thereto in either direction, and means whereby the rotation of said shafts may be suitably stopped in either direction at will.

19. In a car of the type described, the combination of deliveries on each side, a plurality of swinging doors therefor, and which may be mounted at a point above the deliveries, a system comprising a shaft with toggle-arms and links coupled to the doors, whereby all of the doors may be simultaneously operated at will, an operating-shaft running from the end of the car, connections between said shafts, whereby motion may be imparted from one shaft to the other in either direction, and a pawl and ratchet on the operating-shaft at the end of the car by which to turn said shafts.

20. In a car of the type described, the combination with deliveries on each side, of swinging doors therefor, a system comprising a toggle-shaft with arms, and links coupled to said doors, whereby the doors may be opened and closed simultaneously, an oper-

ating-shaft, connections between said shaft and the shaft with toggle-arms, whereby motion may be imparted to the shafts in either direction, and a pawl and ratchet applied to said shaft to control the opening and closing of the doors.

Signed at Nos. 9 to 15 Murray street, in the city, county, and State of New York, this 26th day of October, 1903.

SINCLAIR J. JOHNSON.

Witnesses:
FRED. W. BARNACLO,
FRED. J. DOLE.