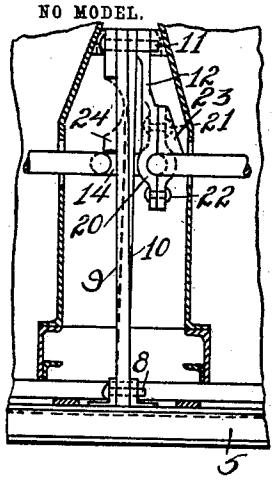
No. 763,185. PATENTED JUNE 21, 1904.

S. J. JOHNSON.

OPERATING MECHANISM FOR DUMPING CARS.

APPLICATION FILED APR. 14, 1904.

NO MODEL.



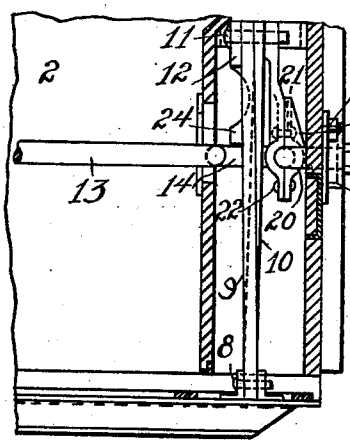


Fig. 1.

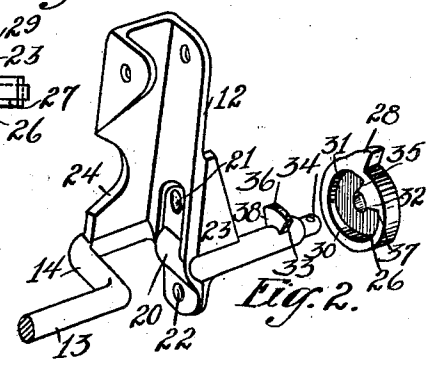


Fig. 2.

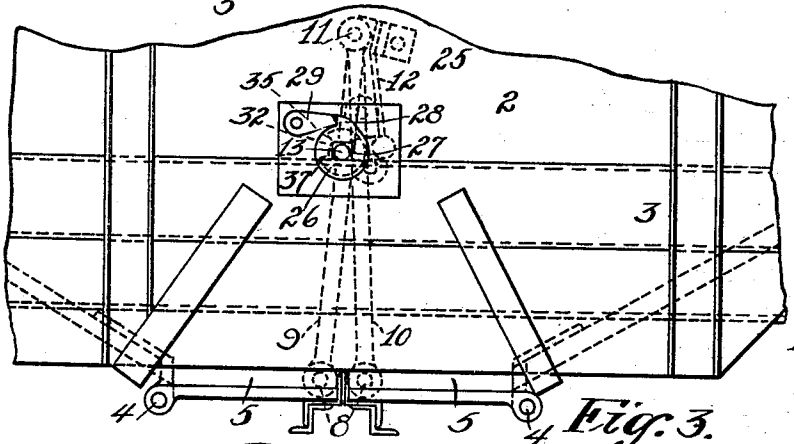


Fig. 3.

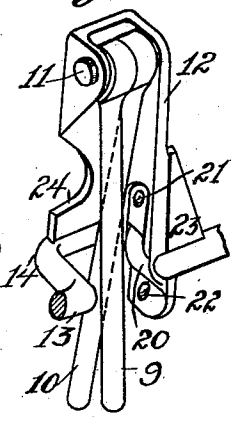


Fig. 7.

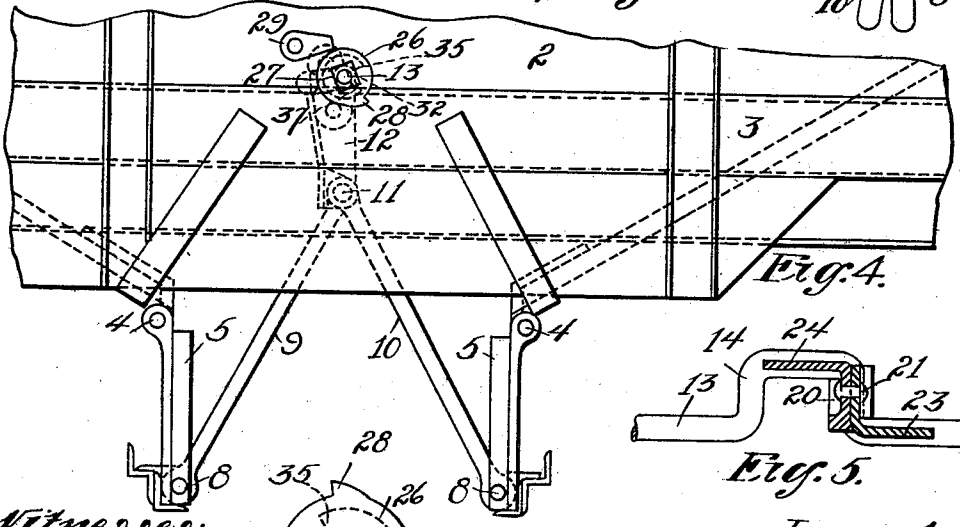


Fig. 4.

Fig. 5.

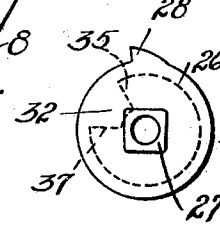


Fig. 6.

Witnesses:
Robert Ait-
F. E. Maynard.

Inventor:
Sinclair J. Johnson
By his attorney
F. A. Richards.

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

No. 763,185. Patented June 21, 1904.

UNITED STATES PATENT OFFICE.

SINCLAIR J. JOHNSON, OF MONTCLAIR, NEW JERSEY.

OPERATING MECHANISM FOR DUMPING-CARS.

SPECIFICATION forming part of Letters Patent No. 763,185, dated June 21, 1904.

Application filed April 14, 1904. Serial No. 203,072. (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 Operating Mechanism for Dumping-Cars, of which the following is a specification.

This invention pertains to an operating mechanism for opening and closing the doors of dumping-cars, particularly of that type having openings in the bottom thereof which are adapted to be closed by doors, which may consist of swinging leaves for the openings.

It is an object of the invention to provide a door-operating mechanism whereby the doors may be operated from a given point and simultaneously and preferably through the instrumentality of a single operating-shaft suitably disposed and offset or displaced to receive certain elements connected to all of the doors and permit them to pass to a position where they will cause the door to be automatically held against reverse movement when the doors are closed.

Another object of the invention is to provide means for initiating the movement of the operating-shaft from its locked position, so that the weight of the doors or the load thereupon will automatically complete the opening operation of the doors without likewise urging the means through the complete path of movement of said shaft, and I also employ said initiating means to close the doors. This and other objects, apparent from the following description, I attain by providing the doors with substantially straight links, which are pivoted to the swinging edges of said doors and also to the free end of a suitable crank-arm to which the opposite ends of said links are pivotally connected, and for the purpose of permitting said links to be carried through beyond the central line of the said shaft when the doors are closed I suitably offset or displace the operating-shaft at a point in the plane of the links, so that the latter will pass into said offset when the doors are closed. In this way the resultant of the links passes through a little beyond the center line of the oscillating shaft, and as the tendency after passing the center is to continue the rotation I provide a stop to arrest the further travel of the cranks, and in this way the doors are automatically locked.

The unlocking of the shaft is accomplished, preferably, through an idle actuator carried upon the shaft and which coöperates with means upon said shaft for moving the same from its locked position to a position where the weight of the doors will automatically complete the path of movement of the operating mechanism to open the doors, and in this instance this idle actuator is provided with means to receive a wrench or lever.

In the drawings accompanying the present specification, Figure 1 illustrates a cross-section of a car with the mechanism attached. Fig. 2 is a detail perspective of the displaced shaft, together with the initiating mechanism. Fig. 3 is a side elevation of the portion of the car showing the door-operating mechanism with the doors closed. Fig. 4 is a similar view showing the doors open. Fig. 5 is a plan view of the displaced shaft, partly in section; and Fig. 6 is a detail view of the idle actuator; and Fig. 7 is a view similar to Fig. 2, showing the links connected to the arm.

Similar characters of reference indicate like parts throughout the figures.

Referring in detail to the drawings, the car-body is designated in Figs. 1, 3, and 4 by 2, the same having a hopper-shaped bottom 3, to which may be suitably hinged by pivots 4 the half-leaves 5 of the doors, which in the present application of this invention when closed preferably are horizontally located. Suitably pivoted to the doors 5 by pivots 8 are links 9 and 10, which in the present instance comprise substantially straight bars whose upper ends are suitably connected by a pin 11 to a crank-arm 12, which is mounted upon and fixed to an oscillating shaft 13. This oscillating shaft 13 is, as shown, (see Fig. 2,) suitably displaced or offset at 14, and at this displaced portion of the shaft the crank-arm 12 is located. This crank 12 in the present instance is a single crank-arm and is so formed at its pivot-point as to embrace the links as a clevis. This crank-arm, as before pointed out, is situated at the displaced portion

of the oscillating shaft 13 and is suitably connected therewith by a clamp 20, which is bolted to the crank-arm at 21 and 22 and which clamps the arm to a portion of the shaft 13, and the structure thus mounted upon the shaft 13 is preferably braced by webs 23 and 24, as seen, for instance, in Fig. 2.

While I have described the crank as shown, which in this case obviates machine-work and forging, it is obvious that the crank can be otherwise suitably formed to embrace and carry the links.

At a suitable point in the car-body I provide a stop 25, against which may rest, when the doors are closed, the crank-arm 12.

When the doors are in their full closed position, the crank-arm 12 will bear against the stop 25 and the links 9 and 10, connected therewith, will so locate into the displaced portion 14 of the oscillating shaft that the lines connecting the pivoted point of both of the links 9 and 10 will pass beyond the line of center of the shaft 13, as will also the point where the links are connected to the clevis, the result being that the parts will then occupy a complete position of rest, and thereby hold the doors locked in their closed position, the stop 25 on the car-body serving as a rest to prevent a rotation too far of the arm 12.

For the purpose of unlocking the shaft 13 I provide an idle actuator 26, which is provided on its outer face with means, such as a squared hub 27, (see Fig. 6,) adapted to receive a wrench or lever and which is provided with a tooth 28, adapted to take a pawl 29, pivoted to the car for purposes hereinafter to be explained. The wall of the member 26 may be depressed, as at 30, so as to form a rim 31, and within such depression may be a tooth or lug 32, as shown in Fig. 2. A corresponding lug 33 is mounted upon the shaft 13, which shaft in this instance is provided with a spindle 34, upon which is mounted the idle actuator 26. The contour of the faces of the lug 33 upon the shaft 13 is preferably the same as the contour of the faces of the tooth or lug 21 within the depressed portion of the actuator 25, each comprising slanting side walls which when in abutment are also in registry. When the doors are in their closed position, it is designed that the wall 35 of the lug within the depression of the actuator 26 shall register with the wall 36 of the lug 33 on the shaft, and, as will be observed, when a sufficient movement of the idle actuator through the instrumentality of a wrench applied to the nut 27 thereon turns or rotates the shaft 13 and carries the pivoted point of the arm 13 from its locked position to an unlocked position the doors 5 by their weight and through the instrumentality of the links 9 and 10 will cause the shaft to automatically complete its movement, when the lug 33 will travel uninterrupted in the depression 30 of the actuator 25. While the latter is permitted to remain in this position, it is held by the operator manipulating the crank, and when it is desired to again close the doors the face 37 of the lug within the depression will contact with the face 38 of the lug 33 on the shaft, when the latter through the instrumentality of said actuator and wrench attached thereto may be urged in a reverse direction, at the same time lifting the crank-arm, links, and doors until the latter are in a full closed and locked position, as aforementioned.

For the purpose of insuring against the accidental movement of the shaft from sudden jar of the car to again swing open the doors the tooth 28 on the idle actuator may be engaged with the pawl 29, as seen, for instance, in Fig. 3.

It will be noted that by permitting or causing the upper pivoted ends of said links to locate just a little beyond the central line of effort that while the links are in such position it is impossible to unlock the doors.

It will be further observed that I have provided novel and efficient means for inducing the initiatory movement of the parts and thereafter to permit such movement to be automatically completed without manual assistance or without compelling the person operating the mechanism to be subjected to violent or sudden jerks as the mechanism swiftly proceeds in its path of travel.

I do not confine myself to any particular details of construction of the various parts so long as I provide for the locking of the doors in their closed position through the means of causing the links connecting the doors with the operating mechanism to locate at a point substantially dead-center, which in this instance effects the complete locking of the doors.

Having thus described my invention, I claim—

1. In a hopper-door-operating mechanism, the combination with door, of an operating-shaft therefor and which is located above the door and having a displaced portion, actuating means carried by said shaft at said displaced portion and links connecting said door and means, which links pass into said displaced portion and beyond the center line of the shaft when the doors are closed.

2. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor and which is located above the doors and suitably displaced, actuating means carried by said shaft at said displaced portion, and links connecting said doors and means, which link connections pass into the displacement and beyond the center line of the shaft to a position of rest when the doors are closed.

3. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor and which is located above said doors and suitably displaced, actuating means carried by said shaft and straight links con-

necting said doors and means and which pass into the displacement and beyond the center line of the shaft to a position of rest automatically when the doors are closed and a stop for insuring such position of rest.

4. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor and which is located above said doors and suitably displaced, a crank-arm carried by said shaft, and links connecting said doors and crank-arm and which pass into the displacement and beyond the center line of the shaft to a position of rest when the doors are closed.

5. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor and which is located above said doors and suitably displaced, means connected to said doors and which pass into said displacement and beyond the center line of the shaft to a position of rest when the doors are closed, means connecting said door-connecting means with the shaft, and a stop against which said connecting means will rest to maintain the doors in their closed positions.

6. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor which is located above the doors and having a displaced portion, actuating means carried by the shaft, straight links pivoted to said means and connected to the doors, and which links pass into said displaced portion and beyond the center line of the shaft to a position of rest when the doors are closed.

7. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor which is located above the doors and having a displaced portion, actuating means carried by the shaft, straight links pivoted to said means and connected to the doors, and which links pass into said displaced portion and beyond the center line of the shaft to a position of rest when the doors are closed, and a stop for said means carried by the shaft to prevent its rotation too far beyond the center line of the shaft, whereby to maintain said doors in a closed position.

8. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor and which is located above said doors and having a displaced portion, a crank-arm carried by said shaft, links pivoted to said crank-arm and connected with the doors and which pass into the displaced portion and beyond the center line of the shaft to a position of rest, whereby they lock the doors when closed, and a stop against which said crank-arm bears to hold the doors in their locked position, and also prevent the links from bearing against the shaft.

9. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor and which is located above said doors and having a displaced portion, a crank-arm carried at the displaced portion of the shaft, links pivoted to said crank-arm and connected with the doors and which pass into the displaced portion and beyond the center line of the shaft to a position of rest whereby the doors are locked when closed, and a stop against which said crank-arm bears to hold the doors in their locked position, and also to prevent the links from bearing against the shaft.

10. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor and which is located above the doors, and means for initiating the movement of the shaft so that the latter may be automatically rotated from its locked to its unlocked position, such means after such initiating movement operating as an idler.

11. In a hopper-door-operating mechanism, the combination with door-operating mechanisms, and an operating-shaft therefor, of means for initiating the movement of said shaft, which means after the shaft is initially moved remain inoperative.

12. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor and which is located above said doors and suitably displaced, links connecting said doors with the shaft and which pass into the displacement and beyond the center line of the shaft to a position of rest when the doors are closed, and means for initiating the movement of the part to unlock them from said position of rest, said means thereafter being adapted to remain idle.

13. In a hopper-door-operating mechanism, the combination with swinging doors, of an operating-shaft therefor and which is located above said doors and having a displaced portion, links connecting said doors with said shaft and which pass into said displaced portion beyond the center line of the shaft when the doors are closed, and an actuator for starting the rotation of said shaft to unlock the parts, said means after unlocking the parts may remain idle on said shaft.

14. In a hopper-door-operating mechanism, the combination with swinging doors, of an operating-shaft for said doors, connection between said shaft and said doors, and means for initially turning the shaft, said means to unlock the part adapted to remain idle during any remaining movement of said shaft.

15. In a hopper-door-operating mechanism, the combination with doors, of an operating-shaft therefor, means for initiating the movement of the shaft, and which means constitute an idler after said movement has been initiated.

16. In combination with an operating mechanism for dumping-cars, of an actuator therefor said actuator comprising a member suitably connected with said mechanism, and adapted to initiate the movement of said mechanism from a locked to an unlocked position, said actuator therefor remaining idle.

17. In a hopper-door-operating mechanism, the combination with door-operating mechanisms, an operating-shaft therefor, of an actuator for said shaft, said actuator comprising a member rotatably mounted upon said shaft adapted to grasp said shaft to initially move the same, said rotatably-mounted member adapted thereafter to remain idle on said shaft.

18. In a hopper-door-operating mechanism, the combination with door-operating mechanisms, an operating-shaft therefor, of an actuator for said shaft, said actuator comprising a member rotatably mounted upon said shaft adapted to grasp said shaft to initially move the same, said rotatably-mounted member adapted thereafter to remain idle on said shaft, and means to operate the rotatably-mounted member.

19. In a hopper-door-operating mechanism, the combination with doors, of connecting-links for said doors, an operating-shaft located above said doors, and a crank-arm located on said shaft and which comprises an element so formed at its pivotal point as to embrace the links as a clevis.

20. In a hopper-door-operating mechanism, the combination with doors, of connecting-links for said doors, an operating-shaft suitably located and having a displaced portion, and a crank-arm located on said shaft, and which comprises an element so formed at its pivotal point as to embrace the links as a clevis, said links when said doors are closed passing into said displaced portion and beyond the center line of the shaft to a position of rest.

21. In a hopper-door-operating mechanism, the combination with doors, of straight connecting-links for said doors, an operating-shaft suitably located and having a displaced portion, and a crank-arm located on said shaft, and which comprises an element so formed at its pivotal point as to embrace the links as a clevis, said links when said doors are closed passing into said displaced portion and beyond the center line of the shaft to a position of rest, and a stop for said crank-arm to insure such position of rest.

22. In a hopper-door-operating mechanism, the combination with doors and suitable connections therefor, of an operating-shaft for said doors and located thereabove and having a displaced portion, a crank-arm located on said shaft and so formed at its pivotal end as to embrace the connections as a clevis and which is suitably clamped to said shaft, said connections passing into said displaced portion and beyond the center line of the shaft to a position of rest when the doors are closed.

23. In a hopper-door-operating mechanism, the combination with doors and suitable connections therefor, of an operating-shaft for said doors and located thereabove having a displaced portion, a crank-arm located on said shaft at said displaced portion and so formed at its pivotal end as to embrace the connections and which is suitably clamped to said shaft, said connections passing into said displaced portion and beyond the center line of the shaft to a position of rest when the doors are closed.

24. In a hopper-door-operating mechanism, the combination with doors and suitable connections therefor, of an operating-shaft suitably displaced, a crank-arm clamped to said shaft, said connections pivotally engaging said crank-arm and which pass into the displaced portion beyond the center line of the shaft to a position of rest when the doors are closed, and a brace between said crank-arm and shaft.

25. In a hopper-door-operating mechanism, the combination with doors and suitable connections therefor, of an operating-shaft suitably displaced, a crank-arm clamped to said shaft, said connections pivotally engaging said crank-arm and which pass into the displaced portion beyond the center line of the shaft to a position of rest when the doors are closed, and braces between said crank-arm and shaft.

26. In a hopper-door-operating mechanism, the combination with doors and suitable connections therefor, of an operating-shaft suitably displaced, a crank-arm clamped to said shaft, said connections pivotally engaging said crank-arm and which pass into the displaced portion beyond the center line of the shaft to a position of rest when the doors are closed, and a brace carried by the crank-arm and bearing on the shaft.

27. In a hopper-door-operating mechanism, the combination with doors and suitable connections therefor, of an operating-shaft suitably displaced, a crank-arm clamped to said shaft, said connections pivotally engaging said crank-arm and which pass into the displaced portion beyond the center line of the shaft to a position of rest when the doors are closed, and braces between said crank-arm and shaft.

28. In a hopper-door-operating mechanism, the combination with an operating-shaft, of an idly-mounted actuator thereon, means on said shaft engaging said actuator, said means being adapted to travel in an opening in said actuator and independently thereof after the movement of the shaft is initiated.

29. In a door-operating mechanism, the combination of an operating-shaft adapted to be moved from a locked to an unlocked position, of means for unlocking said shaft, said means comprising an actuator idly mounted on said shaft and adapted to remain idle after the unlocking of said shaft has been effected.

30. The combination with a door-operating mechanism of an operating-shaft, an idly-mounted actuator on said shaft and comprising an annular member provided with a hollowed-out portion, a tooth in said hollowed-

out portion, a lug on said shaft adapted to engage with said tooth to initiate the movement of the shaft, said lug after such initiating movement being adapted to travel in said hollowed-out portion while the actuator remains idle.

31. The combination with a door-operating mechanism, of an operating-shaft, an idly-mounted actuator on said shaft and comprising an annular member provided with a hollowed-out portion, a tooth in said hollowed-out portion, a lug on said shaft adapted to engage with said tooth to initiate the movement of the shaft, said lug after such initiating movement being adapted to travel in said hollowed-out portion while the actuator remains idle on the shaft, and means for holding said actuator in place when the shaft is locked.

32. The combination with a door-operating mechanism, of an operating-shaft, an idly-mounted actuator on said shaft and comprising an annular member provided with a hollowed-out portion, a tooth in said hollowed-out portion, a lug on said shaft adapted to engage with said tooth to initiate the movement of the shaft, said lug after such initiating movement being adapted to travel in said hollowed-out portion while the actuator remains idle, and a lug on said actuator adapted to engage a pawl for holding said actuator in place when the shaft is locked.

33. In a hopper-door-operating mechanism, the combination with a door, of an operating-shaft therefor, means for initiating the movement of the shaft, and which means constitute an idler after such movement has been initiated.

34. In a hopper-door-operating mechanism, the combination with a door, of an operating-shaft therefor, means for initiating the movement of the shaft, and which means constitute an idler after such movement has been initiated, said means also operating to close the door.

35. In a hopper-door-operating mechanism, the combination with a door, of straight connected links for said door, an operating-shaft suitably located and having a displaced portion, and a crank-arm located on said shaft and which comprises an element so formed at its pivotal point as to embrace the links as a clevis, said links when said door is closed passing in said displaced portion and beyond the center line of the shaft to a position of rest, and a stop for said crank-arm to insure such position of rest.

36. In a hopper-door-operating mechanism, the combination with a door, of straight connected links for said door, an operating-shaft suitably located and having a displaced portion, and a crank-arm located on said shaft and which comprises an element so formed at its pivotal point as to embrace the links as a clevis, said links when said door is closed passing in said displaced portion and beyond the center line of the shaft to a position of rest, and a stop for said crank-arm to insure such position of rest, means for initiating the movement of the shaft and which means constitute an idler after said movement has been initiated.

37. In a hopper-door-operating mechanism, the combination with a door, of straight connected links for said door, an operating-shaft suitably located and having a displaced portion, and a crank-arm located on said shaft and which comprises an element so formed at its pivotal point as to embrace the links as a clevis, said links when said door is closed passing in said displaced portion and beyond the center line of the shaft to a position of rest, and a stop for said crank-arm to insure such position of rest, means for initiating the movement of the shaft and which means constitute an idler after said movement has been initiated, and which means also operates to close the doors.

38. The combination with a door-operating mechanism, of an operating-shaft, an idly-mounted actuator mounted on said shaft for opening and closing the doors and comprising an annular member provided with a hollowed-out portion, a tooth in said hollowed-out portion, a lug in said shaft adapted to engage with a tooth to initiate the movement of said shaft, said lug after such initiating movement being adapted to travel in said hollowed-out portion, while the actuator remains idle and opening the doors.

39. The combination with a door-operating mechanism, of an operating-shaft, an idly-mounted actuator on said shaft for opening and closing the doors and comprising an annular member provided with a hollowed-out portion, a tooth in said hollowed-out portion, a lug in said shaft adapted to engage with said tooth during the closing of the doors, both lugs and tooth operating to close the door in its locked position.

40. The combination with a door-operating mechanism, of an operating-shaft, an idly-mounted actuator on said shaft for opening and closing the doors and comprising a member provided with a tooth, a lug on said shaft adapted to engage with said tooth to initiate the movement of the shaft, said lug after such initiating movement being adapted to travel with the shaft while the actuator remains idle.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 13th day of April, 1904.

SINCLAIR J. JOHNSON.

Witnesses:

FRED. W. BARNACLO,

JOHN O. SEIFERT.