To all whom it may concern:

Be it known that I, Argyle Campbell, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Car-Door-Locking Mechanisms, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in car door locking mechanisms.

Objects of the invention are to provide a relatively inexpensive, durable and efficient door locking mechanism, especially adapted for use on railway dump cars.

In the drawing forming a part of this specification, Figure 1 is a side elevational view of a portion of a dump car showing my improvements in connection therewith, unnecessary parts of the car being broken away to avoid crowding on the sheet. And Fig. 2 is an elevational view taken at right angles to the view in Fig. 1 and looking from the left toward the right of Fig. 1.

In said drawing, the car shown is of that type commonly known as a W-type of hopper car, wherein there are four discharge hopper openings, two on each side of the center sill of the car and with the bottom hopper sheet of each hopper sloping upwardly to the end of the car and the doors pivoted along their upper edges beneath a small bridge or arch adjacent the longitudinal center of the car.

In such type of cars, each hopper is defined by an inner side hopper sheet (not shown) an outer side hopper sheet 10 and a bottom inclined hopper sheet 11. Each opening is adapted to be closed by a hopper door of suitable construction as indicated at 12, the same being pivoted along their upper edges to swing about an axis extending transverse of the car, as indicated conventionally at 13. When in closed position, the doors are at approximately right angles to the hopper bottom sheets 11, as clearly indicated in Figure 1. It is customary to have the two transversely aligned sets of doors operated simultaneously and for this purpose a connecting cross-brace is secured to the doors near their free edges, such cross-brace, in the instance shown, consisting of a channel as indicated at 14.

In carrying out my invention, the locking mechanisms are duplicated on each side of the car for each transverse set of doors. Only one such device is shown in the drawing, it being understood that the others are similar. Each locking mechanism, as shown, comprises a suitable bracket A, rigidly secured to the outside hopper sheet 10, a latching element proper indicated at B; a cooperating casting C secured to the door, and a locking lever D.

The bracket A is in the form of a casting having a journal bearing therein, indicated at 15 which extends horizontally and in a plane perpendicular to the pivotal axis of the corresponding set of swinging doors. At the bottom corner, the bracket A is laterally extended outwardly as indicated at 16 and pivotally attached thereto on a suitable bolt or rivet 17 is the lock lever D which preferably consists of a straight bar as best indicated in Fig. 1, the position of the lock lever D being such that it may swing up without interfering with the journal bearing 15.

The latching element B preferably consists of a section of rod of suitable strength, the same having a main horizontally extending shaft portion 18 rotatably mounted in the journal bearing 15. At its righthand end, as viewed in Fig. 1, the latching element B is provided with a depending arm 19 extending at right angles to the main shaft portion 18, said arm 19 having a lateral outwardly extended flange 20 on which the lock lever D is adapted to rest and thereby prevent the latching element B from turning accidentally when the locking mechanism is in operative position. At its other end the latching element B is formed with another right-angled extension 21 offset 90° with respect to the arm 19, as best shown in Fig. 2. As will be apparent from an inspection of Figure 2, the arms 19 and 21 are so related that arm 19 is adapted to serve as a counterbalance or counter-weight for arm 21, tending to hold the latter in operative position.

The arm or extension 21 is adapted to be swung up behind the casting C which is rigidly secured by suitable flanges to the main part of the door 12 and the cross-brace 14. The casting C is provided with a flange 22 extending perpendicular to the main plane of the door on the outer side thereof, said flange having a rounded depression 23 in its edge and a cam edge 24 leading to and merging with the depression 23.

The locking mechanism is shown in closed
or operative position in the drawing. To re-
lease the doors, the lever is first swung up-
wardly in a counter-clockwise direction, thereby freeing the depending arm 19. The
latching element B is then rotated in a coun-
terclockwise direction as viewed in Fig. 2, by
striking the arm 19 with either a claw-bar or
other suitable tool, thereby swinging the arm
or extension 21 downwardly and disengag-
ing it from behind the casting C. It will be
understood that the operation of the locking
mechanism in both closing and opening the
doors is carried out on both sides of the
car. In closing the mechanism, the doors
are swung to closed position and the latching
element B rotated in the reverse direc-
tion to that above described, it being appar-
ent that the arm or extension 21 will gradu-
ally cam up along the edge 24 into the de-
pression 23 and thereby hold the door in
closed position. Suitable means are provided
to prevent the latching element B from slid-
ing in its bearing when in inoperative po-
sition, as for instance, a lug 25 bearing
against the lefthand end of the journal bear-
ing 15 as viewed in Fig. 1.

The arrangement which I have shown and
described is exceedingly simple, can be manu-
factured and applied at very small expense
and affords a suitable locking arrangement
for those railroads which desire to avoid
the expense of more complicated door op-
erating mechanisms.

I have herein shown and described what I
now consider the preferred manner of carry-
ing out the invention, but the same is merely
illustrative and I contemplate all changes
and modifications that come within the scope
of the claims appended hereto.

I claim:

1. In a door locking mechanism for dump
cars having a discharge hopper defined by
a sloping bottom sheet and side sheets and a
hopper door hinged to swing about its up-
per edge, the combination with a latching
element pivotally supported from a side
outer sheet to rotate about an axis trans-
verse to the pivotal axis of the door, said
element projecting beyond the closed posi-
tion of the door and provided with an arm
extending laterally therefrom, said ele-
ment having also an operating section; of a
shouldered element secured to the outside
of the door adjacent its edge nearest said
side hopper sheet and behind which shoul-
dered element said arm is adapted to engage
to lock the door in closed position when said
latching element is rotated; and means for
holding said latching element in operative
position.

2. In a door locking mechanism for dump
cars having a discharge hopper and a hopper
door adapted to swing about its upper edge,
the combination with a bracket secured to
the hopper, said bracket having a journal
bearing with the axis thereof extending in
a plane perpendicular to the pivotal axis of
the door; of a latching element rotatably
mounted in said journal bearing and having
one end thereof extended beyond the door
when the latter is in closed position, said ex-
tended end of the latching element having an
arm projecting at right angles therefrom
and adapted to swing in position behind the
adjacent edge of the door; a shouldered ele-
ment secured to said door in alinement with
said latching element when the door is in
closed position, said shouldered element co-
operating with said arm of the latching ele-
ment when the parts are in locked position;
and means for holding said latching element
in operative position including another arm
at the opposite end of said element extend-
ing at right angles thereto and angularly
offset approximately 90° with respect to said
first named arm.

3. In a door locking mechanism for dump
cars, having a discharge hopper defined by
fixed hopper sheets and a swinging door piv-
oted along its upper edge, the combination
with a latching element pivotally mounted
on one of the parts of the hopper, said latching
element having a right-angled arm at one
end thereof projecting beyond the adja-
cent edge of said part; of a cooperating
shouldered element secured to another part
of the hopper, said right-angled arm of the
latching element engaging with said should-
ered element when the door is in closed
position, one of said parts of said hopper be-
ing movable, and the other fixed; and means
for holding said latching element in opera-
tive position including, another arm at the
opposite end of said element extending at
right angles thereto and angularly offset ap-
proximately 90° with respect to said first
named arm.

4. In a door locking mechanism for dump
cars and the like having a discharge hopper
defined by a sloping bottom sheet and side
sheets and a hopper door hinged to swing
about its upper edge, the combination with
a bracket secured to one of said hopper
sheets, said bracket having a journal bearing
therein extending horizontally and in a plane
perpendicular to the pivotal axis of the door;
of a latching element journaled in said bear-
ing, said latching element having a right an-
gled extension at one end adapted to swing
behind the outer side of the door when the
latter is in closed position, said latching ele-
ment being provided also with another right-
angled extension at its opposite end; a co-
operand shouldered element secured to the
outside of the door and with which said
first mentioned right-angled extension is
adapted to cooperate in locking the door;
and a lock lever pivotally mounted on said
bracket and adapted to engage said second
mentioned right-angled extension of the
latching element to hold the latter in operative position.

5. In a door locking mechanism for dump cars having a discharge hopper defined by a sloping bottom sheet and side sheets and a hopper door hinged to swing about its upper edge, the combination with a bracket secured to a hopper side sheet adjacent the door opening, said bracket being provided with a horizontally extending journal bearing in a plane perpendicular to the pivotal axis of the door; of a casting secured to the door on the outer side thereof adjacent its edge aligned with said hopper side sheet, said casting having a cam edge with a depression therein; a latching element rotatably mounted in said journal bearing of the bracket, said latching element having one end thereof extended beyond the door when the latter is in closed position, such extended end having an arm extending at right angles therefrom adapted to swing into engagement with said cam edge of the casting and into the depression thereof, the opposite end of said latching element having another arm extending at right angles therefrom, offset 90° with respect to the first-named arm; and a locking lever pivotally mounted on said bracket and adapted to engage with said second named arm of the latching element to hold the latter against accidental rotation when in locked position.

6. In a door locking mechanism for dump cars having a discharge hopper and a swinging hopper door disposed approximately at right angles to the bottom sheet of the hopper when the door is in closed position, a member pivotally mounted on said hopper, said member having angular projections at each end thereof, the projection at one end being arranged to engage behind the door when in closed position to lock it and the projection at the opposite end of said member extending in a direction to counterbalance the first named projection and tending to hold the latter in operative position.

7. In a door locking mechanism for dump cars having a discharge hopper and a door for closing the discharge opening thereof, a latch member rotatably mounted on said hopper, said latch member having projections at each end thereof extending approximately at right angles to the main part of said member, the right angled projection at one end being rotatable to a position behind the door to hold it in closed position, the right angled projection at the opposite end of said member serving as a counterweight and lever for effecting rotation of said member.

8. As an article of manufacture, a door locking device comprising: a bracket adapted to be rigidly secured to another member, said bracket having a journal bearing provided therein; a latch element rotatably mounted in said bearing and provided at each end thereof with an arm extending at right angles, the arms being angularly offset; and a lock member pivotally mounted on said bracket and adapted to engage with one of said arms to hold said element in its operative position.

In witness that I claim the foregoing I have hereunto subscribed my name this 2nd day of September, 1921.

ARGYLE CAMPBELL.

Witnesses:
PAULINE M. MERRICK,
ANN BAKER.