

1,059,422.

2 SHEETS—SHEET 1.



Wm. Geiger
A. W. Munday

Albert E. Zimmer

BY
Munday, Ervins, Adcock & Clarke.

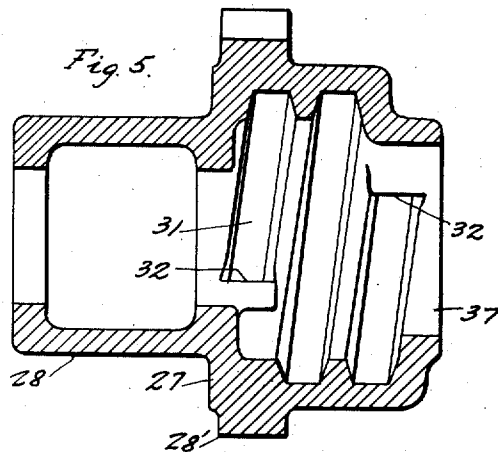
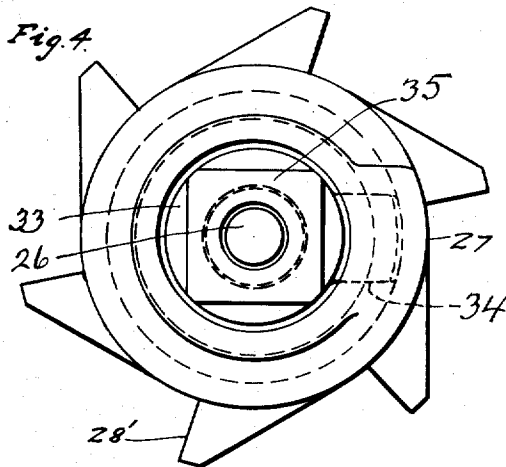
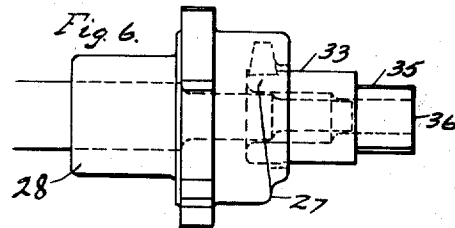
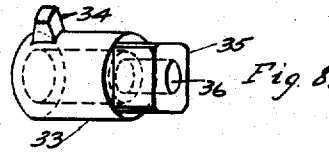
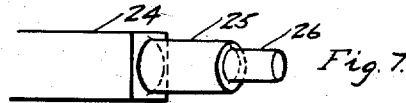
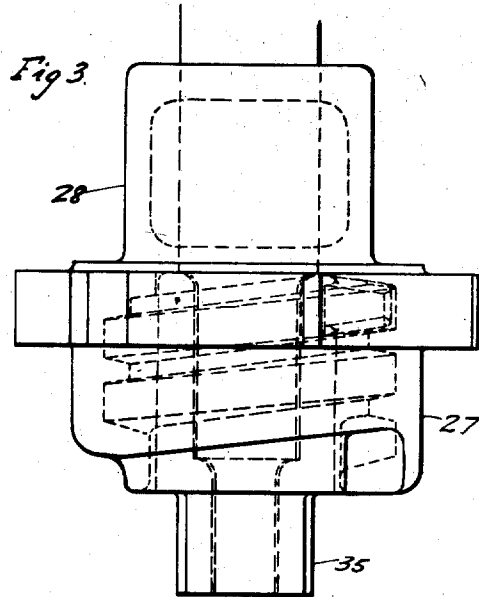
ATTORNEYS.

A. E. ZIMMER.
CAR DOOR OPERATING MECHANISM.
APPLICATION FILED APR. 27, 1912.

1,059,422.

Patented Apr. 22, 1913.

2 SHEETS—SHEET 2.



WITNESSES:

Wm. Geiger
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INVENTOR.

Albert E. Zimmer

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Munday, Evans, Adcock & Clarke.

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UNITED STATES PATENT OFFICE.

ALBERT E. ZIMMER, OF CHICAGO, ILLINOIS, ASSIGNOR TO ENTERPRISE RAILWAY EQUIPMENT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CAR-DOOR-OPERATING MECHANISM.

1,059,422.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed April 27, 1912. Serial No. 693,756.

To all whom it may concern:

Be it known that I, ALBERT E. ZIMMER, a citizen of Norway, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Car-Door-Operating Mechanism, of which the following is a specification.

This invention relates to improvements in safety clutch car door operating mechanism. The object of the invention is to provide means for unwinding the operating shaft of a car door mechanism, when unloading, with perfect safety to the operator.

Formerly, in car door mechanisms in many cases, it has not been customary to provide any sort of clutch mechanism between the operating shaft and the door, so that when the operating shaft is unwound, the load on the door tends to speed up the rotation of the operating shaft and thereby take with it the wrench or claw-bar used by the operator in starting the unwinding operation, and this often results in severe injury to the operator. In other cases, it has been customary to place a clutch or loose connection in the car door operating mechanism, but so far as I am aware, these clutches or loose connections are provided so as to allow less than a complete independent rotation between the member immediately operated upon by the wrench or claw-bar and the operating or winding shaft proper so that in cases where it is necessary to have a complete or more than a single rotation of the operating shaft in unwinding, it is found that the load will turn the operating shaft near the final open position of the car door and hence will twist the wrench or claw-bar from the hands of the operator and injure the latter.

The improvements which I have shown and herein describe are so arranged that the same may be adapted for operating shafts which require either less than a complete rotation or a plurality of rotations in unwinding and may be operated without injury to the operator.

My invention furthermore consists in the improvements in the parts and devices and in the novel combinations of parts and devices herein shown, described or claimed.

In the drawing forming a part of this specification, Figure 1 is a partial plan view of a car body underframe, showing my improvements in connection therewith, the

parts being broken away to more clearly show the construction. Fig. 2 is a partial, vertical, sectional view, taken substantially on the line 2—2 of Fig. 1, and also showing in elevation a portion of the side of the car and the end of the operating shaft and immediate parts connected therewith. Fig. 3 is a plan view of the clutch operating mechanism proper. Fig. 4 is an end view of the structure shown in Fig. 3. Fig. 5 is a longitudinal, sectional view of one of the clutch members. Fig. 6 is a side elevation showing my improvements applied to the end of an actuating shaft, and Figs. 7 and 8 are detail, perspective views of the end of the actuating shaft and one of the clutch members, respectively.

In the drawings, 10, 10 denote the center sills of a dump car to which my improvements are adapted to be applied, and mounted on these center sills and extending laterally of the car is the operating shaft 11, the same being provided with a drum 12 having an extension 13 to which is pivoted a link 14, the latter having pivoted thereto at its opposite end a link 15, to which is pivotally secured hook shaped links 16, the latter being pivotally connected at their lower end to eye-bolts 17 secured in the free ends of hinged drop bottom doors 18. The mechanism which I have just described for lifting and closing the hinged doors may be of any suitable or well known form other than that which I have described, and it is immaterial to my invention what sort of winding connections are used. On each side of the winding drum 12 and keyed to the shaft 11 are chain winding drums 19, over which run winding and unwinding chains 20 and 21 between the actuating shaft being secured at their outer ends to a winding drum 22, keyed to a transversely arranged actuating shaft 23. Other means than that which I have described may be substituted for the winding and unwinding chains 20 and 21 between the actuating shaft 23 and the operating shaft 11, or in some instances, the operating shaft 11 may itself be extended to either the side of the car, or, when arranged longitudinally of the car, may have its ends extended to the ends of the car, and have the clutch device, about to be described, applied thereto, and thereby omitting the actuating shaft 23 entirely. The actuating shaft 23 is extended to the

side of the car, and as shown more clearly in Fig. 7, is provided with a square portion 24 and outer cylindrical portions 25 and 26, respectively, the latter being somewhat

5 smaller in diameter than the portion 25.
Non-rotatably mounted on the squared portion 24 of the actuating shaft 23 is a hollow clutch member 27, the latter being formed with a bearing portion 28 adapted
10 to be mounted in a journal bearing member 29 (see Fig. 1) secured to one of the car frame members. The clutch member 27 has preferably integrally formed therewith a ratchet 28', of the usual construction, and
15 with which coöperates a pivoted pawl or dog 29 adapted to be locked by the usual form of locking cam 30, as shown in Fig. 2. The interior of the hollow clutch member 27 is provided with a spiral groove 31; which
20 may have one or more complete convolutions, always slightly in excess of and depending upon the number of rotations necessary to wind and unwind the operating shaft, said groove 31 being provided at each
25 end thereof with a limiting stop 32. The second member of the clutch device, as more clearly shown in Fig. 8, comprises a hollow, cylindrical member 33, adapted to fit on the cylindrical portion 25 of the end of the actuating shaft, said member 33 being provided also with an integrally formed lug or projection 34 which moves in the spiral
30 groove 31 and which limits the amount of rotation of the member 33 relatively to the member 27 when the same engages the limiting stops 32 at the ends of the groove 31. The outer end of the clutch member 33 is provided with a squared head 35, the latter being provided with a cylindrical bore 36
40 adapted to fit the reduced cylindrical end 26 of the actuating shaft 23. The squared end or head 35 is adapted to receive and be rotated by a wrench, claw-bar or other suitable device for winding and unwinding the
45 operating shaft.

In assembling the mechanism, the clutch member 33 has its lug 34 first inserted through the circular opening 37 at the outer end of the other clutch member 27, and the
50 member 33 with the lug 34 moving in the groove 31 is then rotated until the member 33 is within the member 27. Thereupon, the shaft 23 has its cylindrical ends 25 and 26 and the squared portion 24 inserted through the member 27 and member 33, and as will
55 be obvious, these members are self locked in position. By forming the ratchet wheel integral with one of the clutch members, it will be seen that the entire device is exceedingly compact and one which can be
60 cheaply manufactured.

I have shown and described one form of my invention, but it will be apparent that many changes and variations may be made
65 in the details of construction thereof with-

out departing from the spirit of the invention, and all such changes and modifications are contemplated as fall within the scope of the appended claims.

I claim:—

1. In a car door operating mechanism, in combination, a shaft and a clutch device connected therewith, said device comprising a member non-rotatably mounted on the shaft, and another member rotatably mounted and adapted to move longitudinally along the shaft, one of said members having a spiral groove, and the other a lug working in said groove, whereby the two members are rotatable independently of each other.

2. In a car door operating mechanism, in combination, a shaft and a clutch device connected therewith, said device comprising a member non-rotatably mounted on the shaft, and a second member rotatably mounted on the shaft and adapted to move longitudinally therealong, one of said members being provided with a spiral groove, the number of convolutions of which exceed the number of rotations required of the shaft in closing the car doors, and being provided with a limiting stop at each end thereof, and the other of said clutch members being provided with a lug working in said groove and limited in its rotations relative to the first named clutch member by said stops.

3. In a car door operating mechanism, in combination, a shaft and a clutch device connected therewith, said device comprising a member non-rotatably mounted on the shaft, said member having a spiral groove therein, and a second member rotatably mounted on the shaft and adapted to move longitudinally therealong, and provided with an integral lug coöperating with said spiral groove.

4. In a car door operating mechanism, in combination, a shaft and a clutch device connected therewith, said device comprising a hollow member non-rotatably mounted on the shaft and provided with a spiral groove on the interior thereof, said spiral groove being provided with limiting stops at each end thereof, and a second member rotatably mounted on the shaft and provided with an integral lug on the exterior thereof adapted to work in and coöperate with said spiral groove.

5. In a car door operating mechanism, in combination, a shaft and a clutch device connected therewith, said device comprising a member non-rotatably mounted on the shaft and having formed integrally therewith a ratchet wheel, and a second member rotatably mounted, one of said members being provided with a spiral groove and the other with a lug movable in said groove.

6. In a car door operating mechanism, in combination, a shaft and a clutch device connected therewith, said clutch device compris-

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ing a member non-rotatably mounted on said shaft, a second member rotatable independently of said first named member and movable longitudinally relatively thereto, one of said members being provided with a spiral groove, and having limiting stops at each end thereof, and the other member being provided with a lug working in said groove and having a head adapted to receive a claw bar and be rotated thereby, one of said members having formed integrally therewith a bearing hub and a ratchet wheel.

7. In a car door operating mechanism, in combination, a shaft having a squared portion and a clutch device connected therewith, said clutch device comprising a hollow member secured to said shaft on the squared portion, and being provided also with a spiral groove on its interior, said spiral groove having stops at each end thereof, and said member being furthermore provided with an integrally formed ratchet wheel, and a second clutch member adapted to fit within the first named clutch member and rotatable relatively thereto, and having also a lug formed integrally therewith, said lug being adapted to move in the spiral groove, said second named clutch member having a squared end by which the same may be rotated by a wrench or other suitable means.

8. In combination, hinged car doors, an operating shaft and connections between

said shaft and the free ends of the car doors, an actuating shaft and connections between said operating shaft and the actuating shaft, a clutch device on the actuating shaft comprising a hollow member non-rotatably mounted on the shaft and provided with a spiral groove on the interior thereof, and having also formed integrally therewith a ratchet wheel, and a second clutch member rotatably mounted on the shaft having formed integrally therewith a lug adapted to move in the spiral groove, said second named clutch member being provided also with a squared end by which the latter may be rotated and a pivoted pawl and pawl locking member cooperating with the ratchet wheel.

9. In a car door operating mechanism, in combination, an actuating shaft, and a clutch device connected therewith, said clutch device comprising a hollow member having a ratchet wheel formed integrally therewith and non-rotatably mounted on the shaft, and a second hollow member rotatably mounted within the first named hollow member and rotatable on the shaft, each of said members being mounted on the shaft and thereby self locked in assembled position.

ALBERT E. ZIMMER.

Witnesses:

PEARL ABRAMS,
H. M. MUNDAY.

Corrections in Letters Patent No. 1,059,422.

It is hereby certified that in Letters Patent No. 1,059,422, granted April 22, 1913, upon the application of Albert E. Zimmer, of Chicago, Illinois, for an improvement in "Car-Door-Operating Mechanism," errors appear in the printed specification requiring correction as follows: Page 1, line 95, strike out the words "between the actuating shaft" and insert the commas and words, *respectively, the latter*; same page, line 101, for the word "betwen" read *between*; page 3, line 6, strike out the word "and"; and that the said Letters Patent should be read with these corrections therein, that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of May, A. D., 1913.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

ing a member non-rotatably mounted on said shaft, a second member rotatable independently of said first named member and movable longitudinally relatively thereto, one of said members being provided with a spiral groove, and having limiting stops at each end thereof, and the other member being provided with a lug working in said groove and having a head adapted to receive a claw bar and be rotated thereby, one of said members having formed integrally therewith a bearing hub and a ratchet wheel.

7. In a car door operating mechanism, in combination, a shaft having a squared portion and a clutch device connected therewith, said clutch device comprising a hollow member secured to said shaft on the squared portion, and being provided also with a spiral groove on its interior, said spiral groove having stops at each end thereof, and said member being furthermore provided with an integrally formed ratchet wheel, and a second clutch member adapted to fit within the first named clutch member and rotatable relatively thereto, and having also a lug formed integrally therewith, said lug being adapted to move in the spiral groove, said second named clutch member having a squared end by which the same may be rotated by a wrench or other suitable means.

8. In combination, hinged car doors, an operating shaft and connections between

said shaft and the free ends of the car doors, an actuating shaft and connections between said operating shaft and the actuating shaft, a clutch device on the actuating shaft comprising a hollow member non-rotatably mounted on the shaft and provided with a spiral groove on the interior thereof, and having also formed integrally therewith a ratchet wheel, and a second clutch member rotatably mounted on the shaft having formed integrally therewith a lug adapted to move in the spiral groove, said second named clutch member being provided also with a squared end by which the latter may be rotated and a pivoted pawl and pawl locking member cooperating with the ratchet wheel.

9. In a car door operating mechanism, in combination, an actuating shaft, and a clutch device connected therewith, said clutch device comprising a hollow member having a ratchet wheel formed integrally therewith and non-rotatably mounted on the shaft, and a second hollow member rotatably mounted within the first named hollow member and rotatable on the shaft, each of said members being mounted on the shaft and thereby self locked in assembled position.

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