Sept. 17, 1946. A. E. ZIMMER 2,407,912

SAFETY OPERATING HANDLE FOR CAR DOOR MECHANISM

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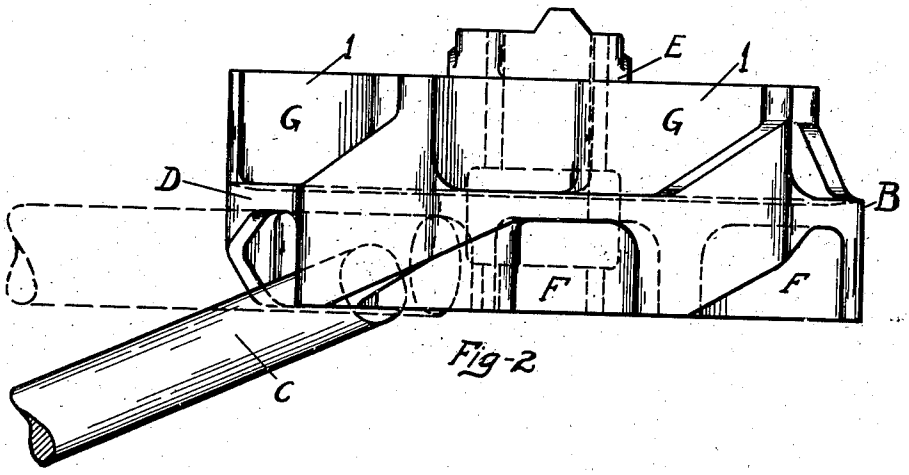

Fig-2

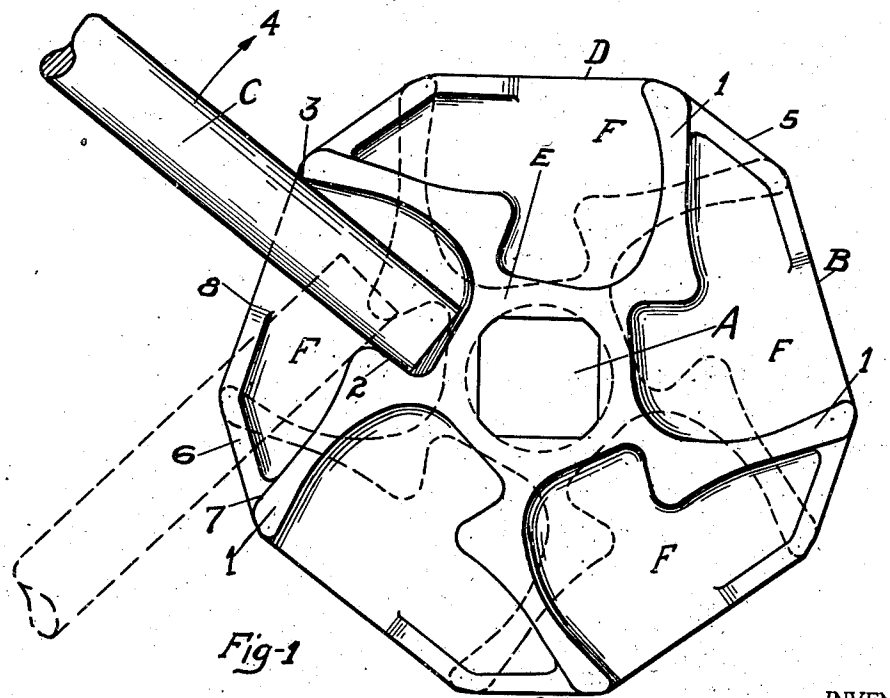

Fig-1

Albert. E. Zimmer INVENTOR.

BY George S. Knight

Atty.

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SAFETY OPERATING HANDLE FOR CAR DOOR MECHANISM

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3 Claims. (Cl. 74—552)

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My invention relates to improvements in railway car door operating mechanism of the type shown in Patent No. 1,705,952, issued March 19, 1929, to Albert E. Zimmer.

My object is to provide a safety device for the manual operating mechanism for the door mechanism operating shaft in order to prevent the possibility of injury to the operator.

I accomplish this object by the provision of means for automatically disconnecting and ejecting the manual operating bar from its socket member on the shaft when the shaft overruns or is rotated at high speed by the door when opening under discharging load.

My invention further consists in the combination and arrangement of parts hereinafter described and set forth in the appended claims, in connection with the accompanying drawing which illustrates one embodiment of the invention.

In the drawing,

Fig. 1 is a front elevational view of the socket or pocket member and the removable bar inserted therein for rotating the shaft of the door operating mechanism; and

Fig. 2 is a plan view of the parts shown in Fig. 1 and illustrating the ejection of the handle bar from the socket member.

In door operating mechanism of the type shown in said patent hereinbefore mentioned, the drop bottom doors are hinged at one side and at their other side are supported by chain or linkage which is wound upon a shaft to swing the door upward to closed position and unwound from the shaft when the doors are swung downwardly to open position. The shaft is mounted in slotted bearings to shift bodily to a position beneath the edge of the door to support the door in closed position. This occurs when the shaft is rotated in a direction to wind up the chains and bring the doors to closed position. A continued rotation of the shaft in the same direction forces the shaft bodily beneath the edge of the doors. Conversely when the doors are to be opened the shaft is rotated in an unwinding direction. The initial rotation of the shaft bodily shifts the shaft from beneath and clear of the edge of the doors, whereupon the rotation of the shaft is continued but at great speed and force by the doors dropping under the weight of the load.

The shaft A is rotated manually by means of a handle bar mechanism on the shaft located at the end of the car in a place convenient for the operator. This mechanism comprises a disc-like member B having a plurality of sockets for the

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reception of a removable lever or handle bar C by which the operator can apply sufficient power to rotate the shaft. The socket member B consists of a central disc portion D having an elongated hub portion E extending each way from the disc and mounted on and keyed to the outer end of the shaft, the shaft and the bore of the hub being squared in section for this purpose.

Series of pockets F and G are formed on opposite sides of the disc by means of walls 1 which project outwardly at substantially right angles from the faces of the central disc and which extend from the hub to the outer margin of the disc. The sockets on both sides of the disc are identical in form, except that they are arranged in reverse for the proper engagement of the handle bar to rotate the shaft in opposite directions. In other words, in the present structure, the sockets on the outer side of the disc are arranged for the rotation of the member B and the shaft in a clockwise direction, while those on the inner face of the disc are arranged for rotation in a counter-clockwise direction.

The sockets formed in the manner described have inner walls formed by the faces of the disc and side walls formed by the projections 1. They are open, however, in an axial direction and in a radial direction at the peripheral margin of the disc. Each projection 1, at its inner end, is formed to provide a shoulder 2 which serves as a bearing for the end of the handle bar C, and the outer end of each next adjacent projection 1 provides a bearing 3 for the side of the handle bar C and these two bearings provide a rigid connection of the handle bar with the socket member B whereby pressure applied by the operator to the bar C in the direction in which the shaft is to be rotated will rotate the shaft. In Fig. 1, the sockets are arranged so that the member B will be rotated in a clockwise direction. Thus the operator, by inserting the bar in the socket F in engagement with the shoulder 2 and the bearing 3, and applying pressure in the direction of the arrow 4, rotates the member B and the shaft in a clockwise direction, which in the present case is the unwinding direction of the door operating mechanism. If this pressure is released, as is the case when the falling doors suddenly and rapidly rotate the member B in the same direction, the handle bar C being still held in the hands of the operator leaves the bearing 3 and its inner end rotates against the shoulder to a position more or less indicated by the dotted lines.

In accordance with my invention, I provide means for positively ejecting the handle bar C

from the socket under the conditions of overrunning of the mechanism, as hereinbefore described. In the present structure, the specific means for this purpose is in the form of cams 5 positioned at the radial mouths or entrances of the sockets. These cams are preferably formed integrally with the disc D at the edge thereof, and at one end they merge with the outer ends of the projections 1. These cams have inclined edges 6 which are disposed at an angle to the plane of the disc member D so that their ends 7 are flush with the projections 1 and their ends 8 intersect and merge with the face of the disc D.

When the shaft and socket member B are rotated at high speed by the falling doors, the cam associated with the particular socket in which the handle bar C is positioned acts to positively engage the handle bar C and forcefully eject the bar from the socket in an axial direction with respect to the shaft and member B, thus making it impossible for the bar C to be caught in any manner by the spinning socket member B. Thus there is no danger of injury to the operator even though he may retain a hold on the bar.

I claim:

1. In a safety operating mechanism for the dump door operating mechanism of railway cars, the combination of an operating shaft for said door operating mechanism, manually operated means for rotating said shaft in either direction comprising a disc-like socket member secured to the shaft and having a plurality of sockets for the reception of a removable operating handle bar each of said sockets opening both on the periphery and on a side of the disc-like socket member, and a cam member associated with each socket and having an inclined surface adapted to engage the handle bar when the socket member is rotated in the same direction faster than it is rotated by the handle bar and eject said handle bar from said socket in a direction axially of the shaft.

2. In a safety operating mechanism for closing and opening railway car doors and including a shaft rotatable in one direction for closing the door and in the opposite direction for opening the door, said shaft being subject to overrunning when the door is opened, means for rotating said shaft comprising a disc-like member secured to the shaft and having opposed shoulders for the reception of the end portion of a handle bar so formed that the bar may be retained therein when the bar is actuated in the overrunning direction and the bar may be removed therefrom in the direction of the axis of rotation of the disc, and a cam having an inclined surface for engaging the bar to positively force the bar clear of the shoulders in the direction of the axis of rotation of the disc when the shaft and said disc-like member overruns.

3. In a safety operating mechanism for the car door operating mechanism, the combination with a rotatable shaft, subject to induced rapid rotation in one direction when free of restraint and while under load; of means for rotating said shaft comprising a disc-like member having a plurality of open-sided sockets formed by projections outstanding from the face of said disc, said projections forming opposed shoulders in said sockets for engagement by a removable actuating handle bar to rotate the shaft in the direction in which it is subject to rapid rotation, and a cam comprising a projection having an inclined surface disposed angularly with respect to the plane of the disc and positioned to engage the handle bar and force the handle bar from engagement with said shoulders and out of the open side of the socket when the shaft is rapidly rotated.

ALBERT E. ZIMMER.