

No. 843,132.

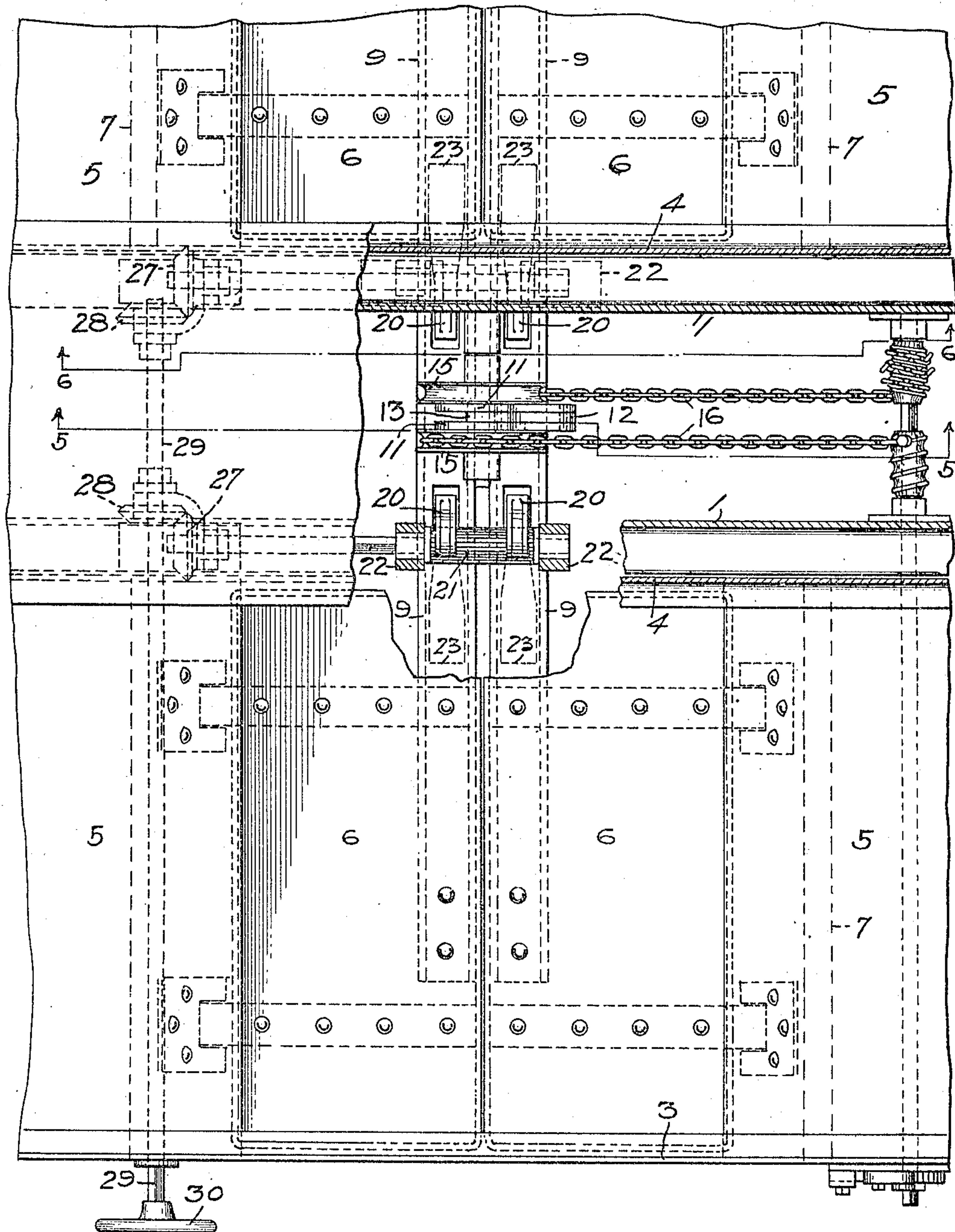
PATENTED FEB. 5, 1907.

A. CHRISTIANSON.  
SAFETY DEVICE FOR HOPPER CAR DOORS.

APPLICATION FILED NOV. 10, 1906.

3 SHEETS—SHEET 1.

**FIG. 1**



**WITNESSES.**

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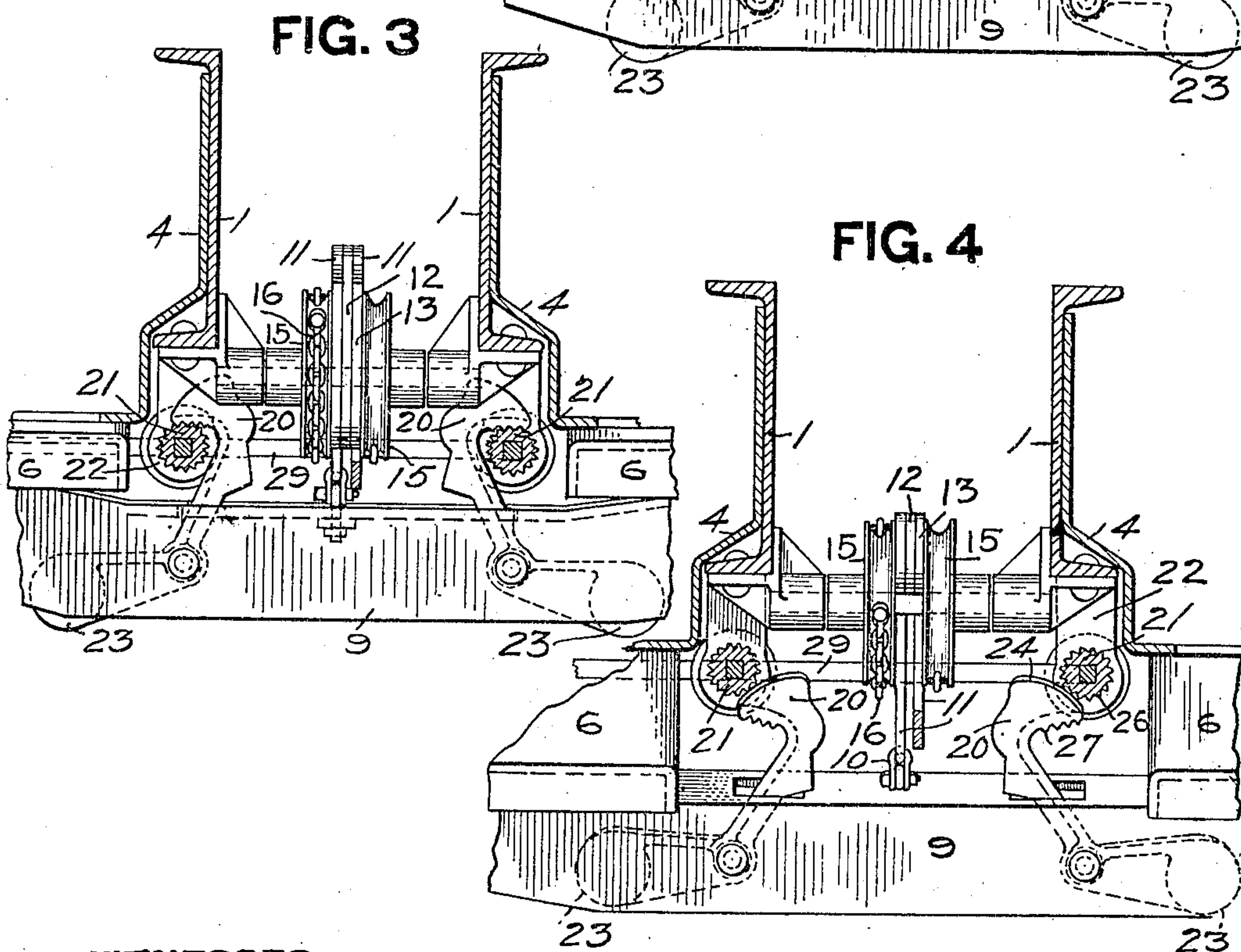
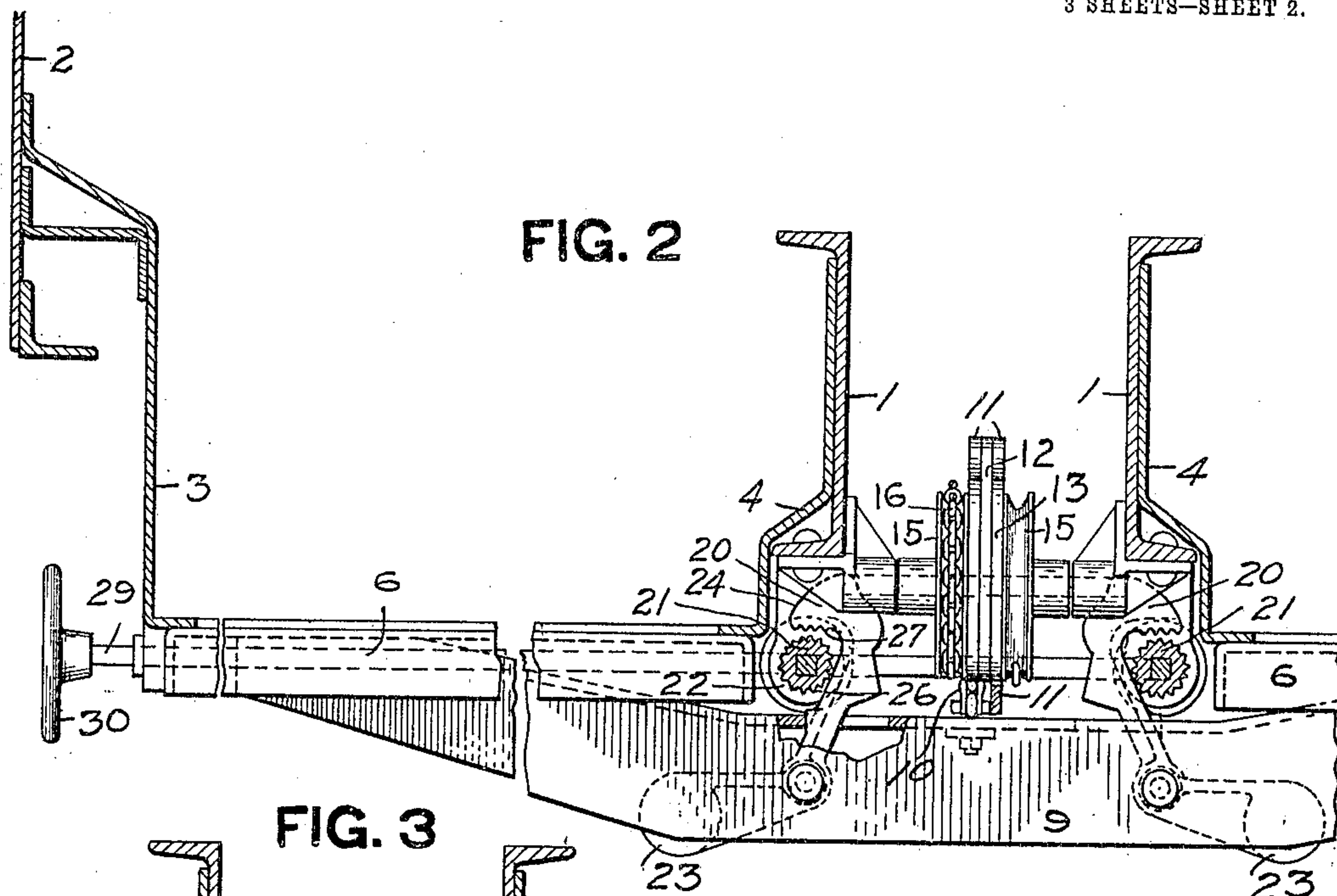
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

FIG. 5

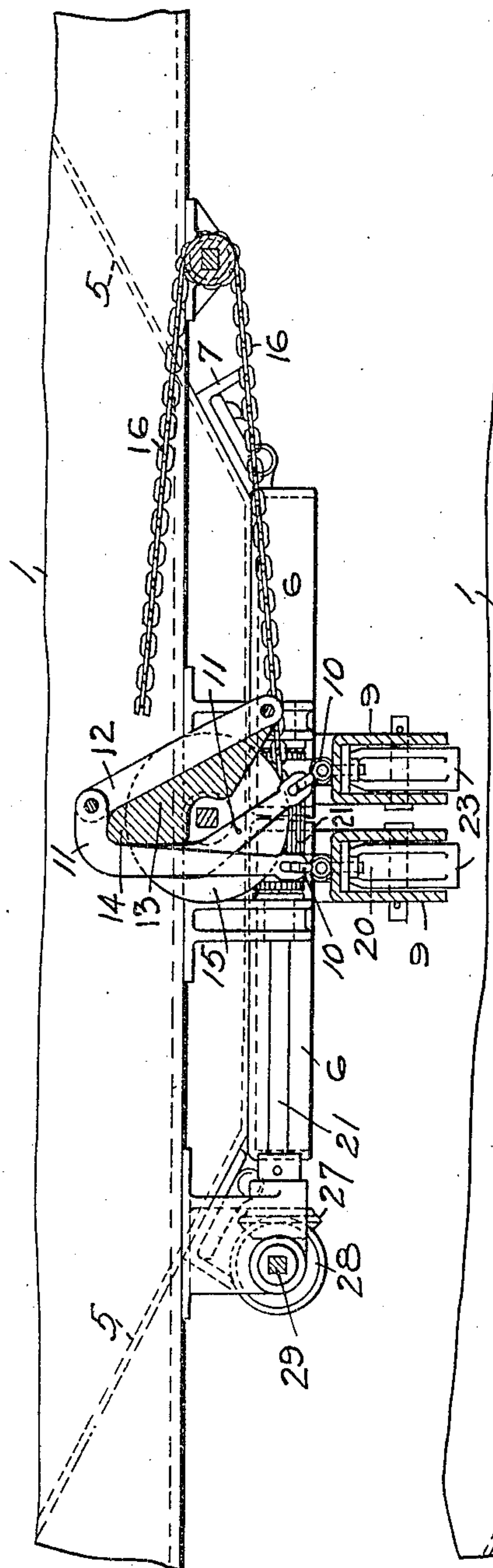
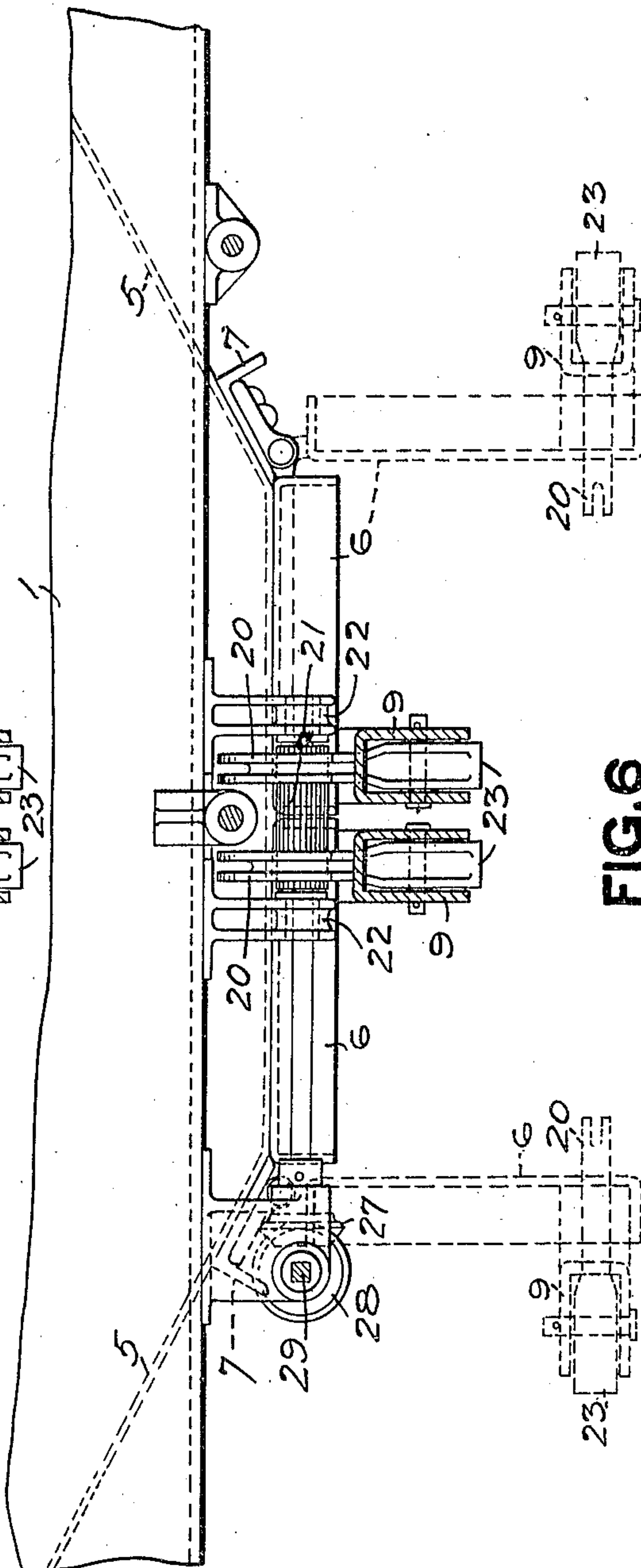


FIG. 6



WITNESSES.

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# UNITED STATES PATENT OFFICE.

ANDREW CHRISTIANSON, OF BUTLER, PENNSYLVANIA, ASSIGNOR TO  
STANDARD STEEL CAR COMPANY, OF PITTSBURG, PENNSYLVANIA,  
A CORPORATION OF PENNSYLVANIA.

## SAFETY DEVICE FOR HOPPER-CAR DOORS.

No. 843,132.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed November 10, 1906. Serial No. 342,841.

*To all whom it may concern:*

Be it known that I, ANDREW CHRISTIANSON, a resident of Butler, in the county of Butler and State of Pennsylvania, have invented a new and useful Improvement in Safety Devices for Hopper-Car Doors; and I do hereby declare the following to be a full, clear, and exact description thereof.

This invention relates to safety devices for the doors of hopper-cars or hopper-bottom gondola cars.

The object of the invention is to provide a device which is simple of construction, easy of operation, which does not interfere with the ordinary door-operating mechanism, and which effectively holds the door closed in case the usual door-closing mechanism fails.

In all railway-cars provided with swinging drop-doors, whether arranged horizontally or on an incline, there is always danger of the door-closing means failing. Usually these doors are closed by means of some rotating shaft connected to the doors either by means of chains, links, or other flexible connectors, and the doors are usually held in closed position by locking the shaft against rotation. This locking means is liable to become displaced or the flexible connectors sometimes break, in either event permitting the doors to swing open and discharge the lading.

This invention is intended to provide additional safety devices which prevent the doors from swinging open in case any of the foregoing contingencies arise.

The invention comprises the arrangement of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view of a portion of the bottom of a gondola car provided with hoppers and showing my invention applied thereto, a portion of the car being in horizontal section. Fig. 2 is a transverse section showing the lower portion of the car. Figs. 3 and 4 are similar views of a portion of the car, showing the door mechanism in different positions. Fig. 5 is a longitudinal vertical section taken on the line 5 5, Fig. 1; and Fig. 6 is a similar view on the line 6 6, Fig. 1.

In the drawings the invention is shown applied to a gondola car provided with hoppers, although it is evident that it can be applied to any form of hopper-bottom car having

horizontal doors extending either transversely or longitudinally of the car.

In the drawings the center sills are shown at 1 and are standard rolled channel-beams placed with their flanges projecting outwardly. The car sides are indicated at 2, the outer hopper-sheets at 3, the inner hopper-sheets at 4, and the inclined floor or hopper sheets at 5. The doors 6 are hinged at their outer edges to angles 7, secured to the lower edges of the inclined floor-plates 5. These doors when closed are horizontal, as shown, and extend transversely of the car, being arranged in pairs, the individuals of which are connected by a transverse beam 9, (shown as of general U shape in cross-section) and having its ends secured to the doors and middle portion depressed and extending underneath the center sills.

The door closing and operating mechanism may be of any usual or desired form, such as chains connected to a winding-shaft, but preferably comprise short chain members, one connected to each of the beams 9 and each having connected thereto a hook-shaped link 11, connected by another link 12 to a drum 13, provided with cam projections 14, over which the hooks take when the doors are closed. This drum is rotatably mounted between the center sills, as shown, directly over the center line of the oppositely-swinging doors. It may be rotated by any suitable means, such as providing the same with a sheave or sheaves 15, over which runs a belt, chain, or the like 16, extending to a transversely-arranged winding-shaft 17. This is one form of the Simonton door-operating mechanism, but is not essential to my invention.

The arrangement and construction of the doors and the door-closing mechanism described are of well-known types, and this specific form has been selected largely for purposes of illustration, as any other construction of doors or door-closing mechanism will answer the purposes of this invention equally as well.

My invention is intended as an additional locking or safety device to prevent the doors from falling open in case the door-closing mechanism fails. This is accomplished by means of a safety latch or latches shown in



the form of hooks 20, mounted on the doors and engaging a suitable stop or stops on the body of the car. As shown, two hooks 20 are provided for each double door, these hooks being pivoted in the beam 9 and adapted to engage stops in the form of a shaft or drum 21, mounted in suitable bearings 22, secured to the center sills. The hooks are so arranged that they automatically engage the shafts or drums 21 when the doors swing closed. To this end said hooks are counterweighted, as at 23, and the upper outer face is rounded, as at 24.

In order to permit the ready disengagement of the hooks from the stops, the latter are made movable, such as being rotatable, as shown, and preferably the drums 21 and hooks 20 have interengaging or serrated faces, as shown at 26 and 27, so that when the shafts are rotated the hooks are pushed off the same, as will be readily understood.

The shafts 21 may be rotated in any suitable way, such as providing them with beveled gears 27, meshing with similar gears 28 on a transverse shaft 29, which extends out to the side of the car, where it is provided with suitable rotating means, such as a hand-wheel 30.

The doors will be closed in the usual way by operating the winding-shaft. As the doors approach the limit of their closing movement the inclined noses 24 of the hooks guide the latter so they pass the drums 21, as shown in Fig. 4, and in the final closed position of the doors the counterweights 23 swing the hooks, so that the serrated faces thereof lie above the drums 21, as seen in Fig. 2. As long as the door-closing mechanism is intact these hooks perform no function, but are preferably slightly out of contact with the drums, as shown. In case the door-closing mechanism fails, the doors drop until the hooks rest upon the serrated drums and are held by said hooks in this position, (shown in Fig. 3,) so that the lading cannot be discharged. In opening the doors the door-closing mechanism is first released, which permits the doors to drop until arrested by the hooks 20, after which the hand-wheel 30 is operated to rotate the shafts 21, and this through the interengaging faces of the drums and hooks pushes the latter off of the former and permits the doors to swing open by gravity. The shafts 21, however, need not be rotated when the doors are being closed, as the hooks engage the drums automatically.

The mechanism described is simple of construction and can be applied to various types of cars without interfering with the usual door-operating mechanisms employed. It is so constructed that it acts automatically in closing the doors, thus not adding to this operation, and it effectually holds the doors in closed position when the ordinary door-closing mechanism fails.

What I claim is—

1. A railway-car provided with a swinging bottom door, closing mechanism for said door, a safety device comprising a latch mounted on the door and arranged to automatically engage the car-body when the door is closed, and means independent of the door-closing mechanism for releasing said latch. 75
2. A railway-car provided with a swinging bottom door, closing mechanism for said door, a safety device comprising a latch mounted on the door, and a movable member mounted on the car-body and arranged to be engaged by the latch and when moved to release said latch. 80
3. A railway-car provided with a swinging bottom door, closing mechanism for said door, a safety device comprising a latch mounted on the door, and a movable member mounted on the body in position to be engaged by the latch and arranged when moved to release said latch, said latch and movable member being provided with interengaging connections. 85
4. A railway-car provided with a swinging bottom door, closing mechanism for said door, a safety device comprising a latch mounted on the door, and a movable member mounted on the body in position to be engaged by the latch and arranged when moved to release said latch, said movable member and latch being provided with toothed or serrated engaging faces. 90
5. A railway-car provided with swinging bottom door, closing mechanism for said door, a safety device comprising a swinging hook mounted on the door, and a movable member on the body arranged to be automatically engaged by the hook and when moved to release the same. 95
6. A railway-car provided with a swinging bottom door, closing mechanism for said door, a safety device comprising a hook pivoted to the door, and a rotatable member on the body having a toothed engagement with said hook. 100
7. A railway-car provided with a swinging bottom door, closing mechanism for said door, a safety device comprising a hook pivoted to the door, and a rotatable shaft mounted on the body in position to be engaged by the hook. 105
8. A railway-car provided with a center sill, a door on either side of the same, a beam connecting said door, door-closing mechanism, a safety device comprising a hook pivotally mounted on the beam, and a rotatable member mounted on the body in position to be engaged by the hook. 110
9. A railway-car provided with a swinging bottom door, closing mechanism therefor, a safety device comprising a counterweighted hook pivoted to the door, and a rotatable member mounted in the body in position to be engaged by the hook and arranged when rotated to release said hook. 115



10. A railway-car comprising a center sill,  
connected doors on either side thereof, a  
hook mounted on said doors, a longitudinal  
shaft mounted on the center sill in position  
5 to be engaged by the hook, and a transverse  
actuating-shaft geared to said longitudinal  
shaft.

In testimony whereof I, the said ANDREW  
CHRISTIANSON, have hereunto set my hand.

A. CHRISTIANSON.

Witnesses:

ROBERT C. TOTTEN,  
J. R. KELLER.