

No. 763,265.

PATENTED JUNE 21, 1904.

D. C. COURTNEY.

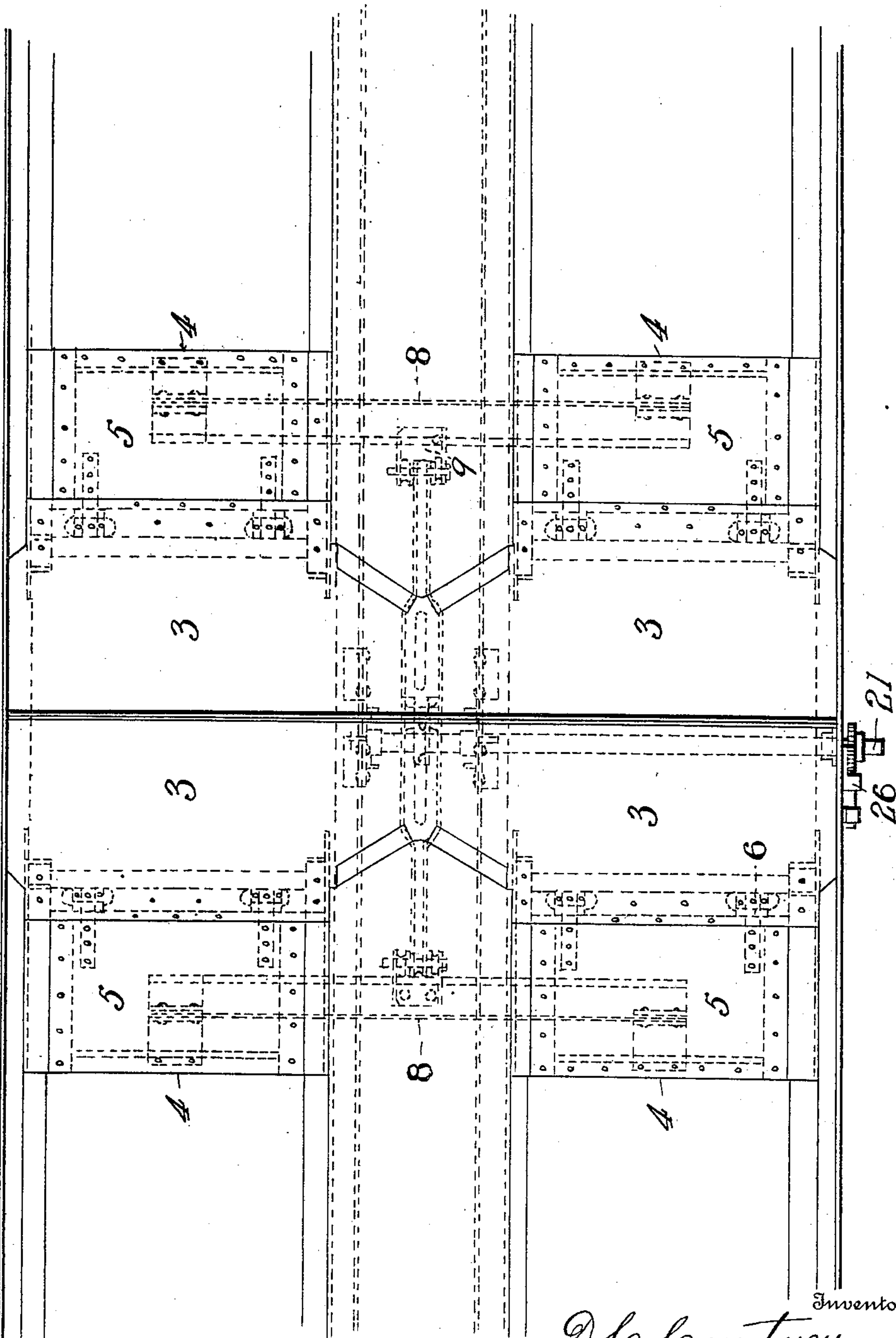
DROP DOOR AND OPERATING MECHANISM FOR CARS.

APPLICATION FILED SEPT. 17, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 1.



Witnesses

Chas. K. Davis.
Chas. S. Mason.

By

D. C. Courtney
J. E. Stebbins.

Inventor

Attorney

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APPLICATION FILED SEPT. 17, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

FIG. 2.

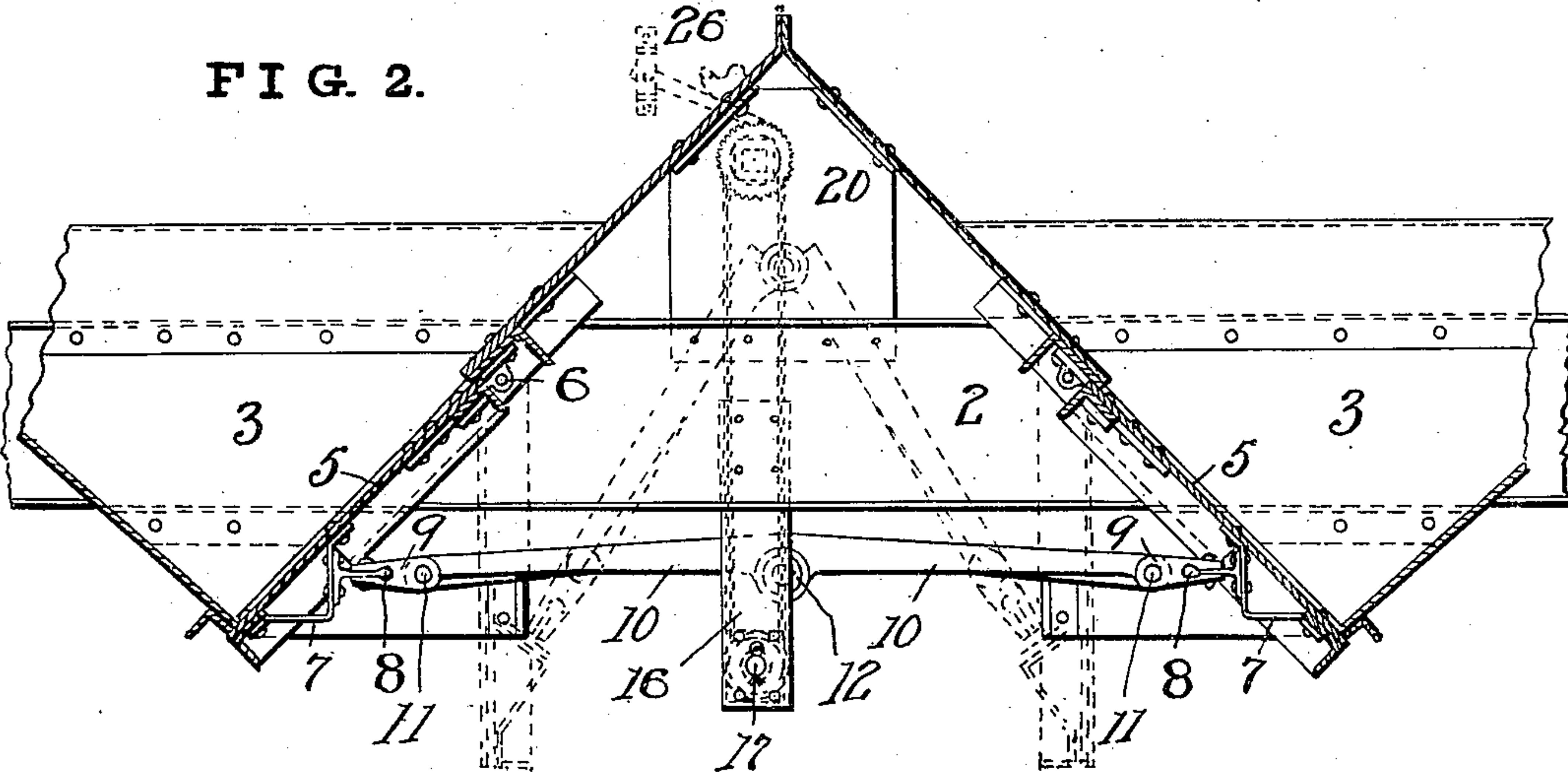


FIG. 4.

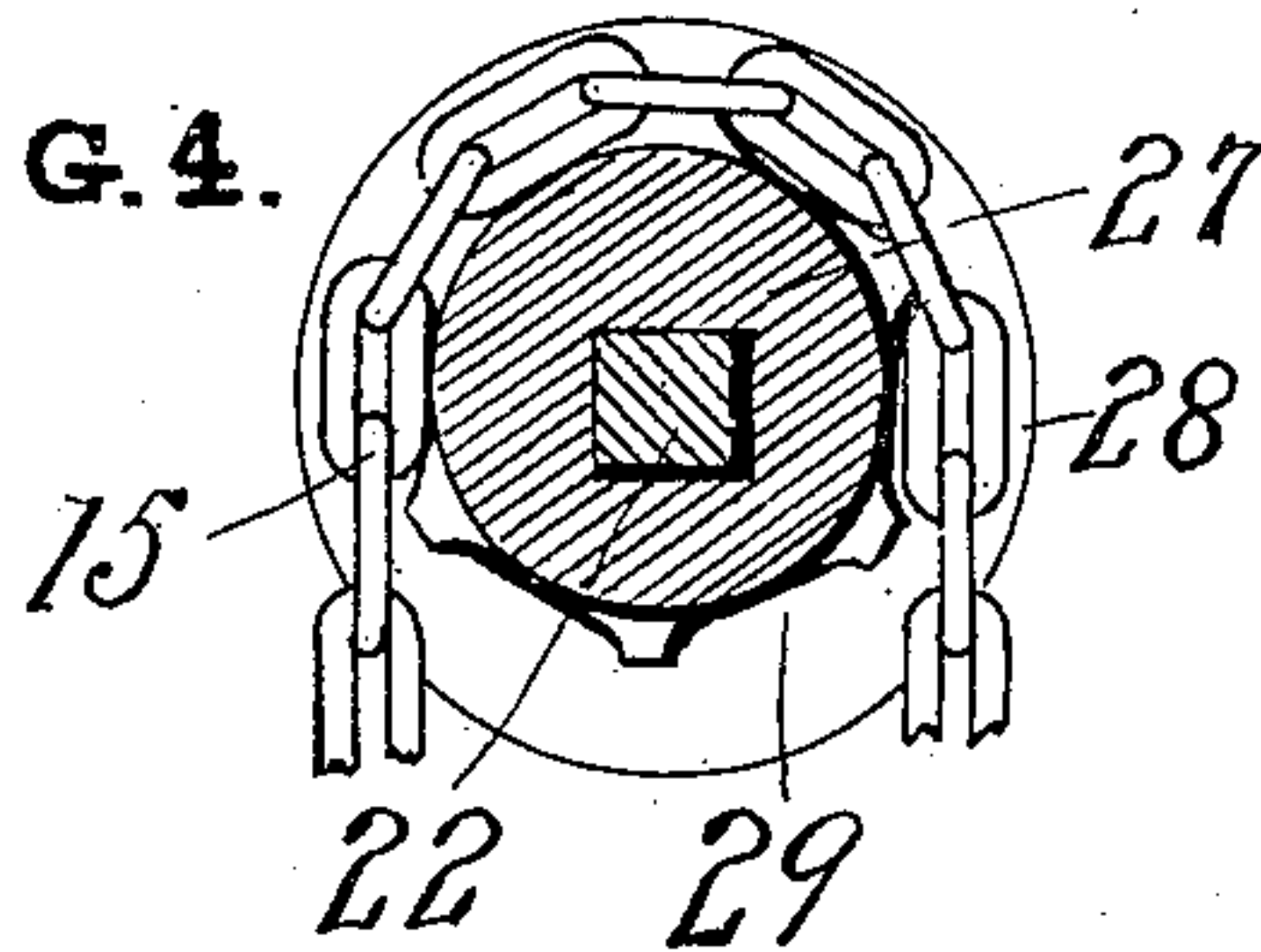
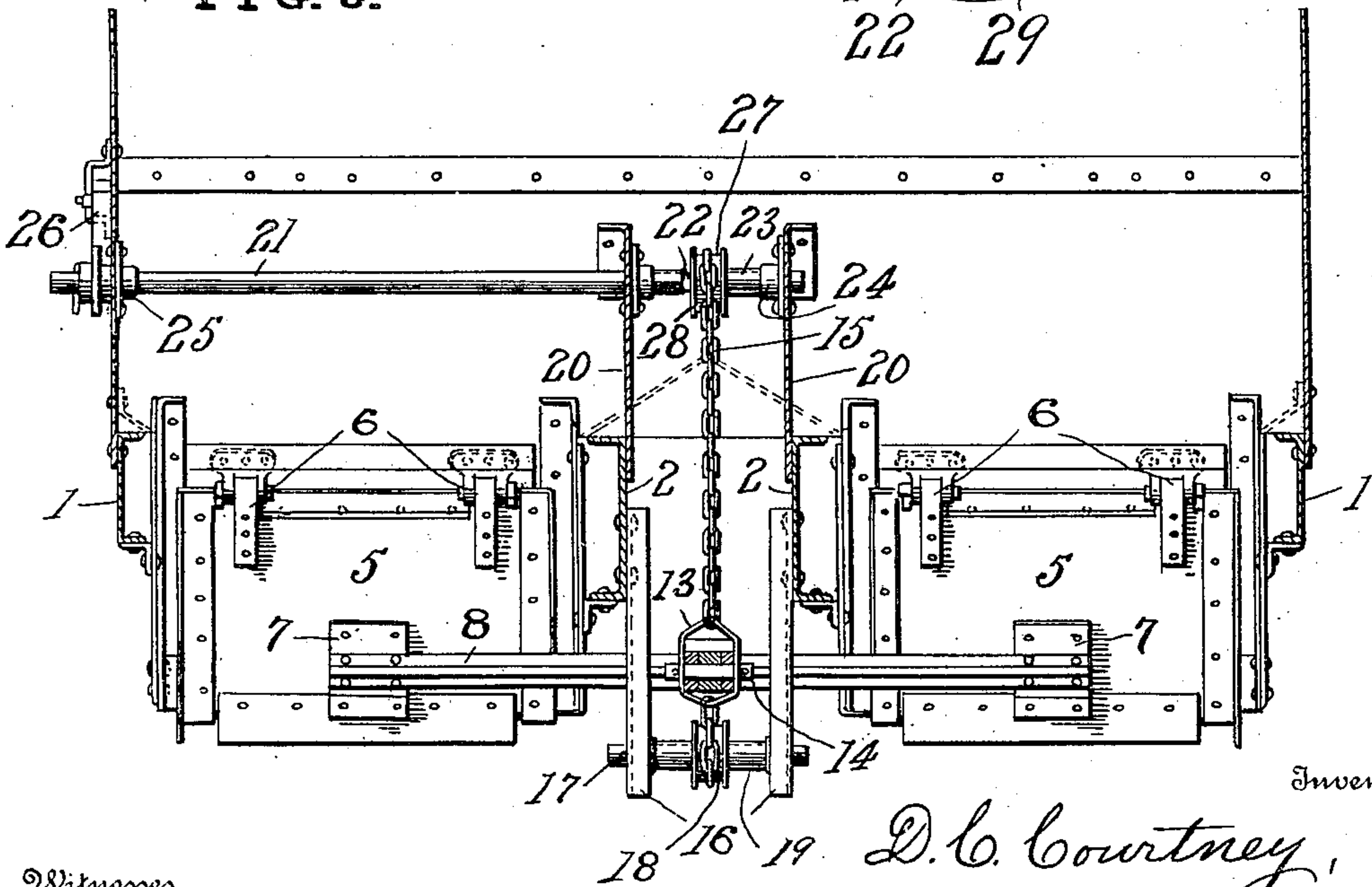


FIG. 3.



Witnesses

Chas. K. Davis.

Chas. S. Mason

By

D. C. Courtney,

J. E. Stebbins.

Inventor

Attorney

UNITED STATES PATENT OFFICE.

DANIEL CHARLES COURTNEY, OF ALLEGHENY, PENNSYLVANIA.

DROP-DOOR AND OPERATING MECHANISM FOR CARS.

SPECIFICATION forming part of Letters Patent No. 763,265, dated June 21, 1904.

Application filed September 17, 1903. Serial No. 173,573. (No model.)

To all whom it may concern:

Be it known that I, DANIEL CHARLES COURTNEY, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Drop-Doors and Operating Mechanism for Cars, of which the following is a specification.

The object of my invention is the provision of improved drop-doors and operating mechanism for cars which shall be more simple than the constructions and arrangements now in use and consequently be less liable to become deranged and allow the doors to open when the car is in transit or to become inoperative when it is desired to discharge the load.

A further and specific purpose is the provision of operating means which shall be positive in action, opening and closing the doors independent of gravity and when closed locking them in position.

My invention consists in certain novelties of construction and combinations of parts hereinafter set forth and claimed.

The accompanying drawings illustrate an example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principle.

Figure 1 is a top plan view of a hopper-bottom car, showing the central portion thereof only, the ends being removed. Fig. 2 is a longitudinal section of Fig. 1. Fig. 3 is a cross-section. Fig. 4 shows a detailed view of a sheave of a form especially adapted for use with the common link chain.

Referring to the several figures, the numeral 1 designates the outside sills of the car, consisting of steel channel-beams; 2, the center sills or stringers, also of channel-steel, but of greater depth than the side sills; 3, the four hoppers extending below the horizontal plane of the sills; 4, the four openings through the bottoms—two on each side of the central stringers; 5, the four doors which normally close the openings; 6, the hinges by which the doors are secured to the walls of the hoppers; 7, four brackets—one upon each door and riveted thereto; 8, two bulb-steel beams, each

riveted at its ends to a bracket; 9, two clips, each secured to a steel beam midway of its ends and forming part of a hinge; 10, two lever-arms; 11, pivots at the junction of the clips 9 and the lever-arms; 12, a knuckle-joint at the meeting ends of the lever-arms; 13, a yoke which encircles the knuckle-joint; 14, a pivot-pin uniting the ends of the lever-arms and also passing through the yoke; 15, a link chain secured to opposite ends of the yoke; 16, two channel-iron hangers riveted to the webs of the stringers; 17, a shaft located in holes made in the lower ends of the hangers; 18, a sheave on the shaft; 19, sleeves upon the shaft each side of the sheave; 20, braces or supports riveted to the stringers at their lower ends and to the walls of the hopper at their upper ends; 21, an operating-shaft having an angular end to receive an operating lever or crank; 22, an angular portion of the shaft; 23, a sleeve; 24, bearings for the shaft secured to the braces; 25, a bearing for the shaft located at the side of the car; 26, a suitable pawl-and-ratchet mechanism; 27, a sheave fixed upon the angular portion 22 of the shaft or held by a key or spline, so it will revolve with the shaft; 28, the flanges of the sheave, and 29 represents recesses in the sheave between the flanges, which receive the edges of alternate links of the chain when the sheave is revolved.

The method of constructing the car and assembling the several parts is obvious from the illustrations and need not be set forth in detail.

The *modus operandi* of the door is as follows: A lever or crank is applied to the end of shaft 17, the pawl raised, and the shaft, with the sheave, revolved toward the left. This action raises the yoke 13, which, with the lever-arms, takes the position shown by dotted lines in Fig. 2, the doors at the same time being swung upon their hinges away from the respective openings. To close the doors, the shaft is revolved in the opposite direction, bringing the lever-arms into a straight line one with the other. As thus disposed it will be seen that the doors are held firmly and securely in position, inasmuch as the pressure of the load upon the doors is transmitted to the lever-arms directly and the

thrust of one lever-arm is counterbalanced by the thrust upon the other. The ratchet and pawl by holding the shaft against revolution prevent any movement of the knuckle-joint, and hence the doors are positively held closed.

From the foregoing description it becomes clear that I have devised improved drop-doors and operating mechanism therefor which fulfill all the conditions set forth as the purpose and object of my invention. Two lever-arms and two sheaves only are required, and an ordinary link chain may be used in connection with the yoke. The bulb-steel beams are amply stiff enough to hold the doors in closed position, and the doors themselves are positively moved in both directions.

In practice changes may of course be introduced and substitutions of parts or elements be made for those shown and for performing the same functions without constituting substantial departures.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a car, having openings through the bottom, of doors; lever-arms pivoted to the doors and united to form a knuckle-joint; two sheaves arranged in a ver-

tical plane and one of the sheaves being recessed and located upon an operating-shaft; a chain passed over the sheaves and secured to a yoke which encircles the knuckle-joint; and means for locking the operating-shaft.

2. The combination with a car having openings through the bottom, of doors; two lever-arms united to form a knuckle-joint and pivoted at their extreme ends to beams secured to the doors; two sheaves; a chain passed over the sheaves and also secured to the lever-arms; and an operating-shaft.

3. The combination with a car having openings through the bottom, of doors on opposite sides of the stringers; beams uniting the doors; lever-arms pivoted to the beams and to each other; sheaves; a chain passed over the sheaves and having its ends secured to the lever-arms; means for revolving one of the sheaves; and means for locking said sheave so it cannot rotate.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL CHARLES COURTNEY.

Witnesses:

DAVID ELPHINSTONE,
J. L. BROWN.