

No. 840,757.

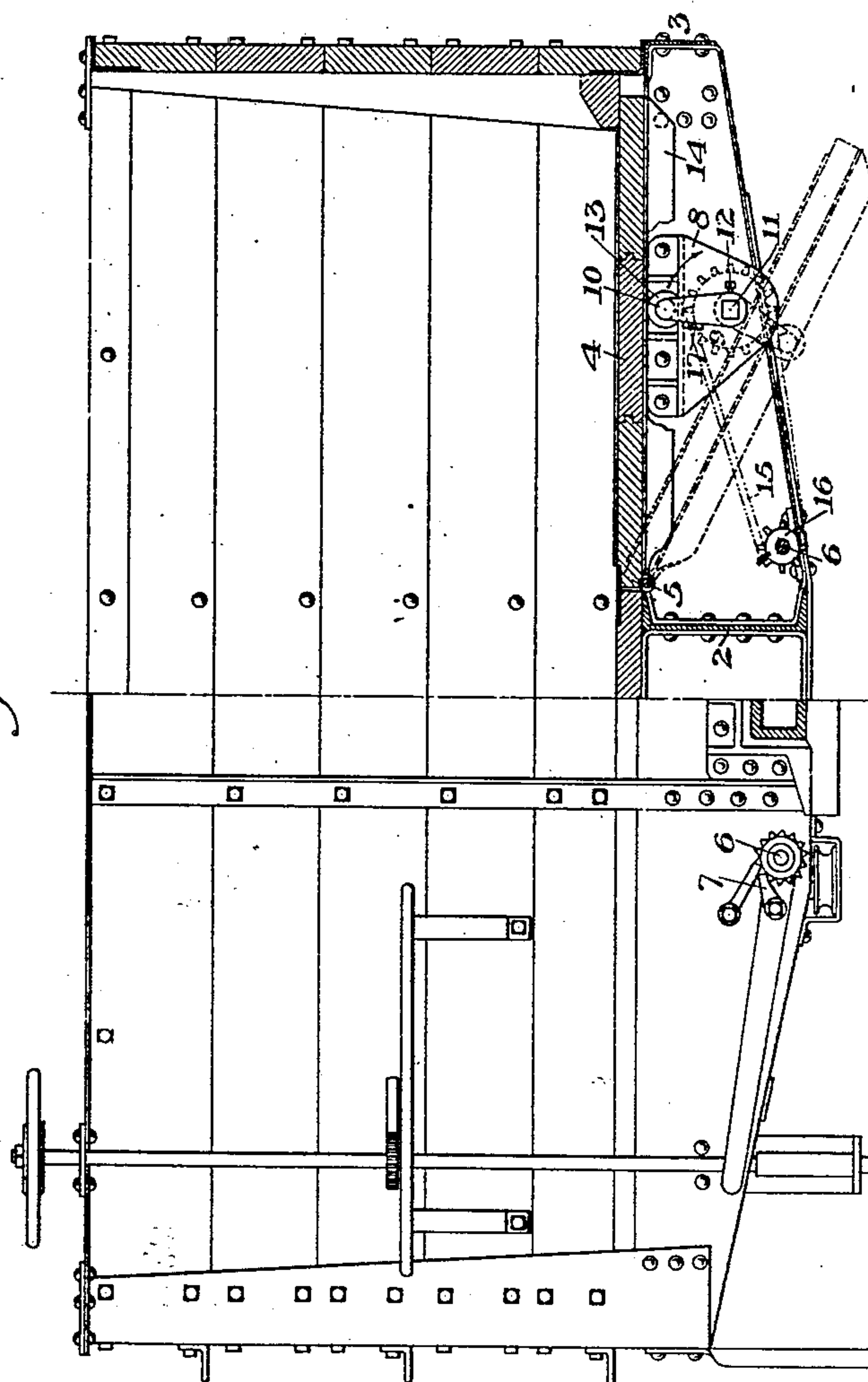
PATENTED JAN. 8, 1907.

F. DITCHFIELD.
DOOR OPERATING MECHANISM.

APPLICATION FILED MAR. 21, 1905.

3 SHEETS—SHEET 1

Fig. 1.



WITNESSES

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INVENTOR

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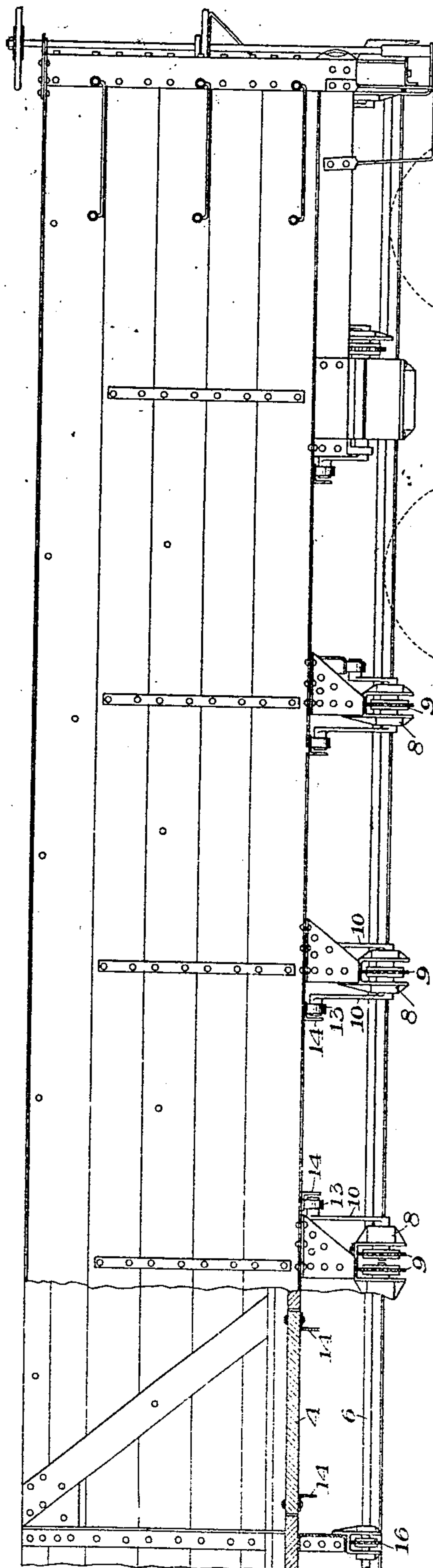
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

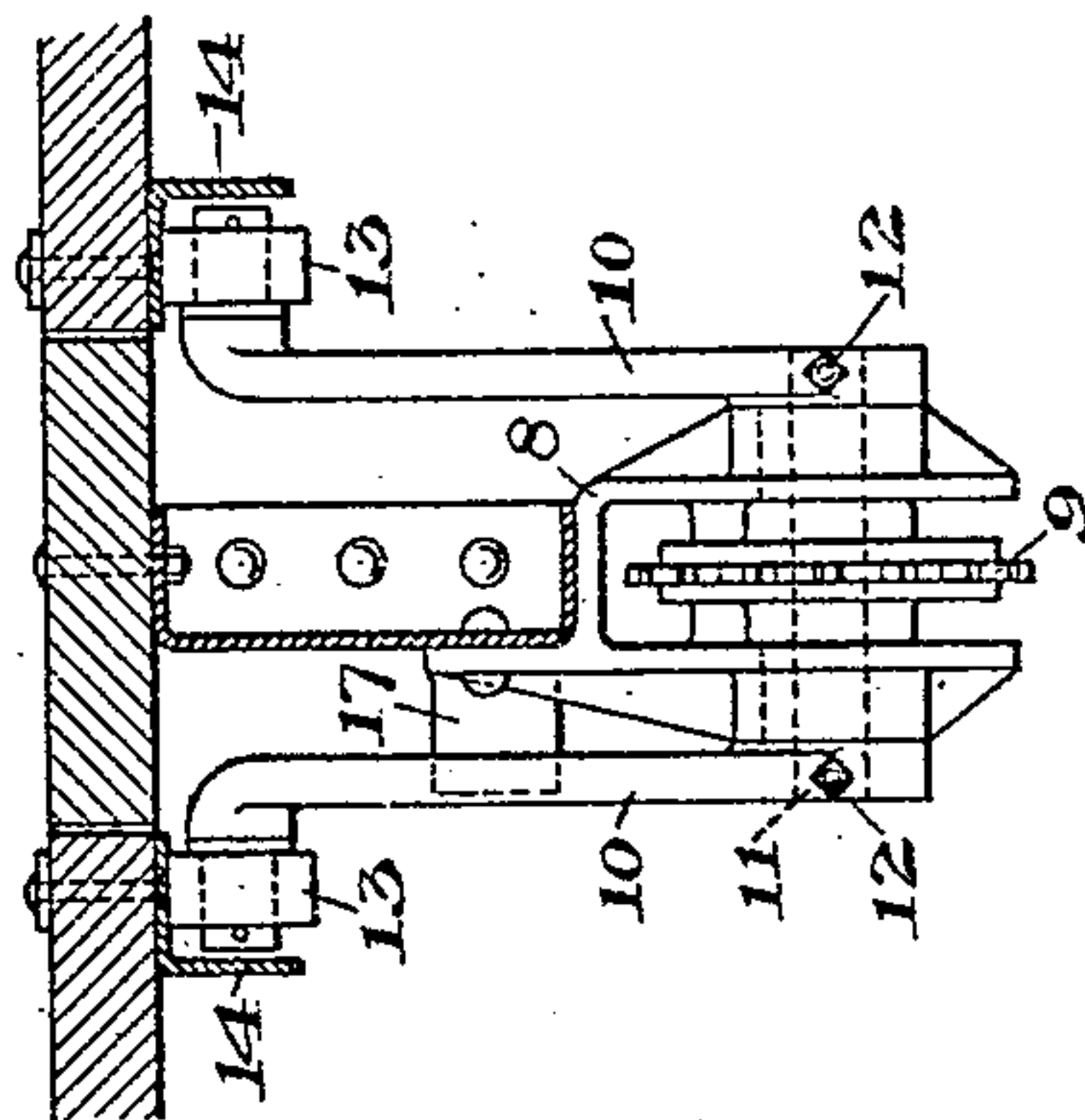
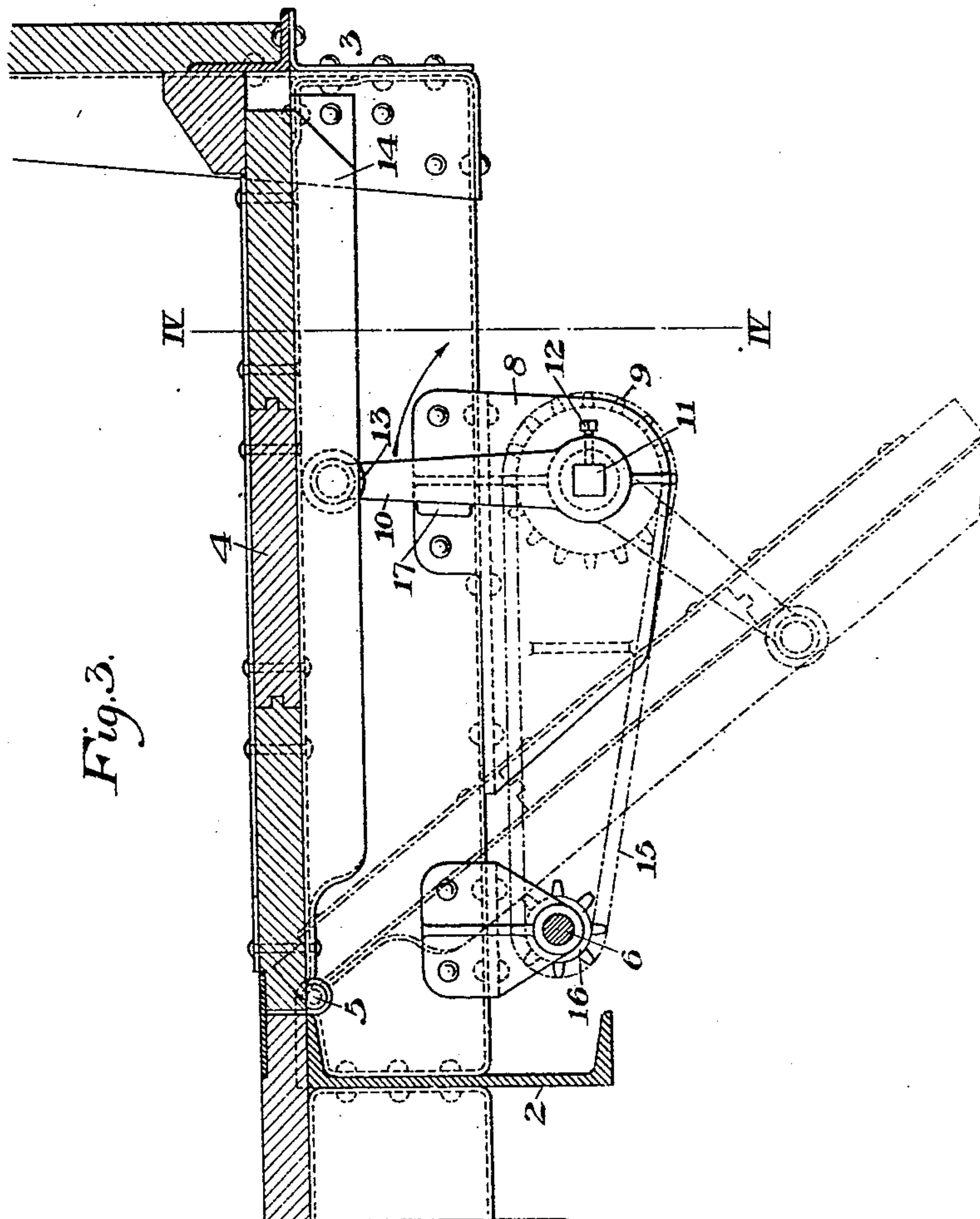


Fig. 3.



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

FRANK DITCHFIELD, OF BELLEVUE, PENNSYLVANIA, ASSIGNOR TO
PRESSED STEEL CAR COMPANY, OF PITTSBURG, PENNSYLVANIA,
A CORPORATION OF NEW JERSEY.

DOOR-OPERATING MECHANISM.

No. 840,757.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed March 21, 1905. Serial No. 251,220.

To all whom it may concern:

Be it known that I, FRANK DITCHFIELD, of Bellevue, Allegheny county, Pennsylvania, have invented a new and useful Door-Operating Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view, part of which is in end elevation and part in vertical section, showing my door-operating mechanism, one of the doors being shown in open position by dotted lines. Fig. 2 is a side elevation of the car. Fig. 3 is a sectional view, on a larger scale, showing the detail of construction. Fig. 4 is a vertical cross-section on the line IV-IV of Fig. 3.

In the drawings, 2 represents the center sill of a car, 3 is the side sill, and 4 4 are doors in the bottom of the car, which are hinged at suitable points 5 and are adapted to swing vertically into open and closed positions. The car is usually provided with a number of these doors arranged in line at both sides of the center sill. For the purpose of operating them I employ main operating-shafts 6 6 on each side of the center sill. Each shaft is preferably made in halves, each half extending, preferably, half the length of the car and being provided at one or both end sills with squared portions for attachment of crank-handles and with holding-pawls 7 or other suitable locking mechanism.

At each door and preferably journaled in brackets 8 on the several bolsters and transoms are sprocket-wheels 9, the axes of which are journaled in bearings in downwardly-projecting forked portions of the brackets. On each side of the brackets a crank-arm 10 is fixed to the axis of the sprocket-wheel, being held thereto by squared shafts 11, which extend through the axes of the sprockets and are held to the arms by bolts 12. These arms are preferably provided at their ends with rollers 13, which engage with the doors, plates or shapes 14 being preferably applied to the doors to constitute wearing-surfaces. As the doors are on opposite sides of the bracket, each of the crank-arms engages a separate door.

All the sprockets are connected by sprocket-chains 15 with sprocket-wheels 16 on the main operating-shafts 6, so that by turning this shaft all the sprocket-wheels 16 and the sprockets 9 with which they are in gear are operated simultaneously, and the crank-arms are thus rotated, the extent of the rotation being approximately about a one-half revolution. When the crank-arms are in their downwardly-projecting positions, as shown by dotted lines in Fig. 3, the doors which rest on the rollers 13 are open; but if the main shaft be rotated so as to turn the crank-arms in the direction of the arrow the engagement of the rollers with the doors will raise the doors into the closed position, (shown by full lines,) in which position the crank-arms are preferably inclined slightly inside the vertical. Stops 17 are provided to limit the motion of the crank-arms, and the load on the door will force the crank-arm against its stop and thus prevent accidental opening.

The mechanism is very simple and durable and constitutes an effective means for operating the car-doors. As the sprocket-wheels are driven from a main shaft each sprocket may be of a suitable length to correspond to the depth of the bolster or transom to which it is applied, and, if desired, the main operating-shafts may be extended from end to end of the car and they may be located along the sides of the car instead of being near the center sill.

Within the scope of my invention as defined in the claims the parts may be modified in many ways, since

What I claim is—

1. Door-operating mechanism comprising a main operating-shaft, another rock-shaft having a crank-arm, a swinging door actuated by the crank-arm, said door and arm swinging in the same or parallel planes, and an actuating connection between the main operating-shaft and the crank-arm shaft; substantially as described.

2. Door-operating mechanism comprising a longitudinal power-shaft, a series of separated shafts parallel therewith, each having a crank-arm, swinging doors actuated by said crank-arms, said doors and arms swinging in the same or parallel planes, and actuating

connections between the main operating-shafts and the separate crank-arm shafts; substantially as described.

3. Door-operating mechanism comprising
5 a power-shaft extending longitudinally of the car at one side of its center, a series of doors arranged to swing in paths transverse of the car, shafts having crank-arms swinging parallel to the planes of the paths of the doors,
10 and sprocket connections between the main operating-shaft and the crank-arm shafts; substantially as described.

4. Door-operating mechanism comprising
15 crank-arms engaging the door, said crank-arms moving slightly inside the vertical when in closed position, and stops for the arms in such position; substantially as described.

5. In door-operating mechanism, a swing-
20 ing crank-arm, flexible connections arranged to turn the arm, and a stop for the arm in closed position, said stop being stationary relatively to the crank-arm shaft; substantially as described.

25 6. In door-operating mechanism, a short shaft having an intermediate sprocket-wheel, crank-arms secured to the shaft on opposite sides of the sprocket-wheel, and separate doors engaged by the crank-arms; substantially as described.
30

7. Door-operating mechanism comprising two crank-arms on the same rotary support, a sprocket-wheel on the support between the crank-arms, and a chain arranged to turn the
35 sprocket; substantially as described.

8. A car having two doors, a bearing supported on the frame between said doors, a shaft carried in the bearing and having crank-

arms engaging both doors, and a separate power-shaft having actuating connection with
40 the said crank-arm shaft; substantially as described.

9. A car having a series of doors in its floor arranged to swing downwardly and inwardly toward the longitudinal axis of the
45 car, a longitudinal operating-shaft near the longitudinal axis of the car, rocking crank-arms beneath the series of doors and swinging in parallel planes with the paths of said doors, and actuating connections from the
50 power-shaft arranged to rock said crank-arms; substantially as described.

10. A car having downwardly and inwardly swinging doors in its floor, a longitudinal power-shaft extending below the floor
55 near the hinged ends of the doors, a series of stub-shafts outside of and parallel with the power-shaft, crank-arms on the stub-shafts, and flexible connections from the power-shaft arranged to simultaneously rock the se-
60 ries of stub-shafts; substantially as described.

11. A car having a series of doors in its floor arranged to swing in parallel planes, crank-arms arranged to operate the doors and swinging in parallel planes therewith, separated stub-shafts for the crank-arms, and a
65 power-shaft having actuating connections with several of said stub-shafts; substantially as described.

In testimony whereof I have hereunto set
70 my hand.

FRANK DITCHFIELD.

Witnesses:

K. L. ROBINSON,
H. B. FISHER.