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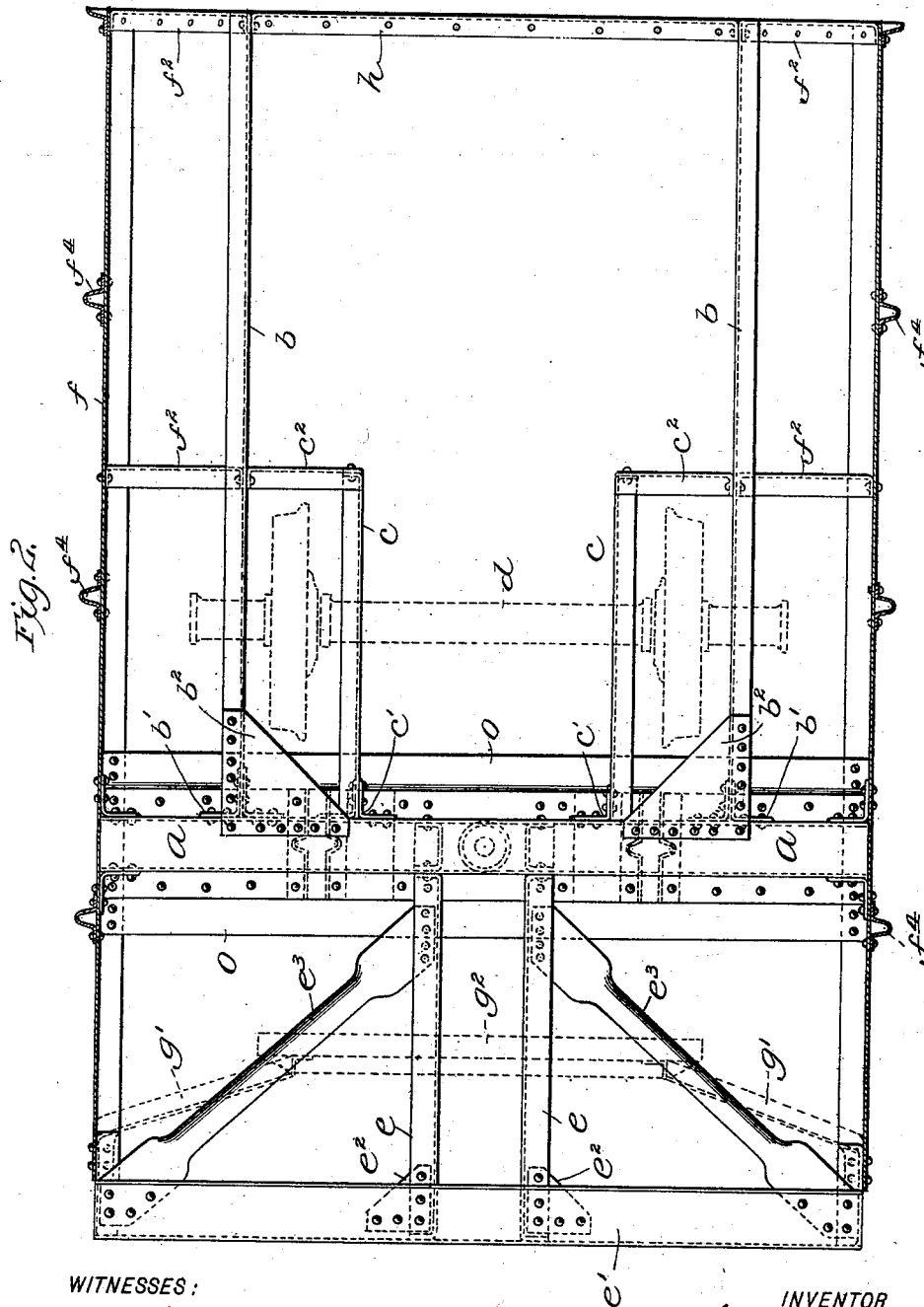
Patented Apr. 17, 1900.

C. T. SCHOEN.
HOPPER BOTTOM CAR.

(Application filed Aug. 10, 1899.)

(No Model.)

6 Sheets—Sheet 2.



WITNESSES:

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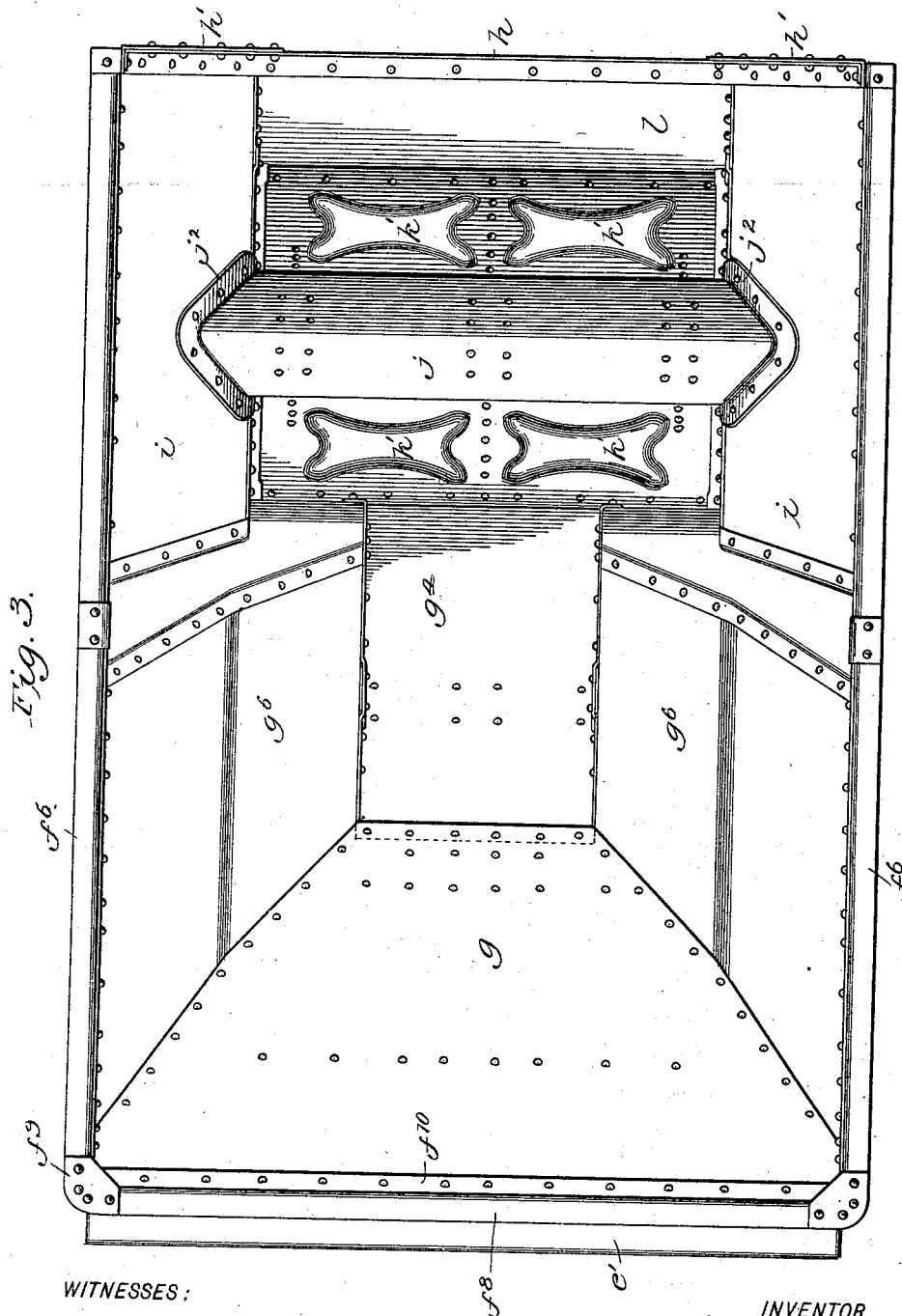
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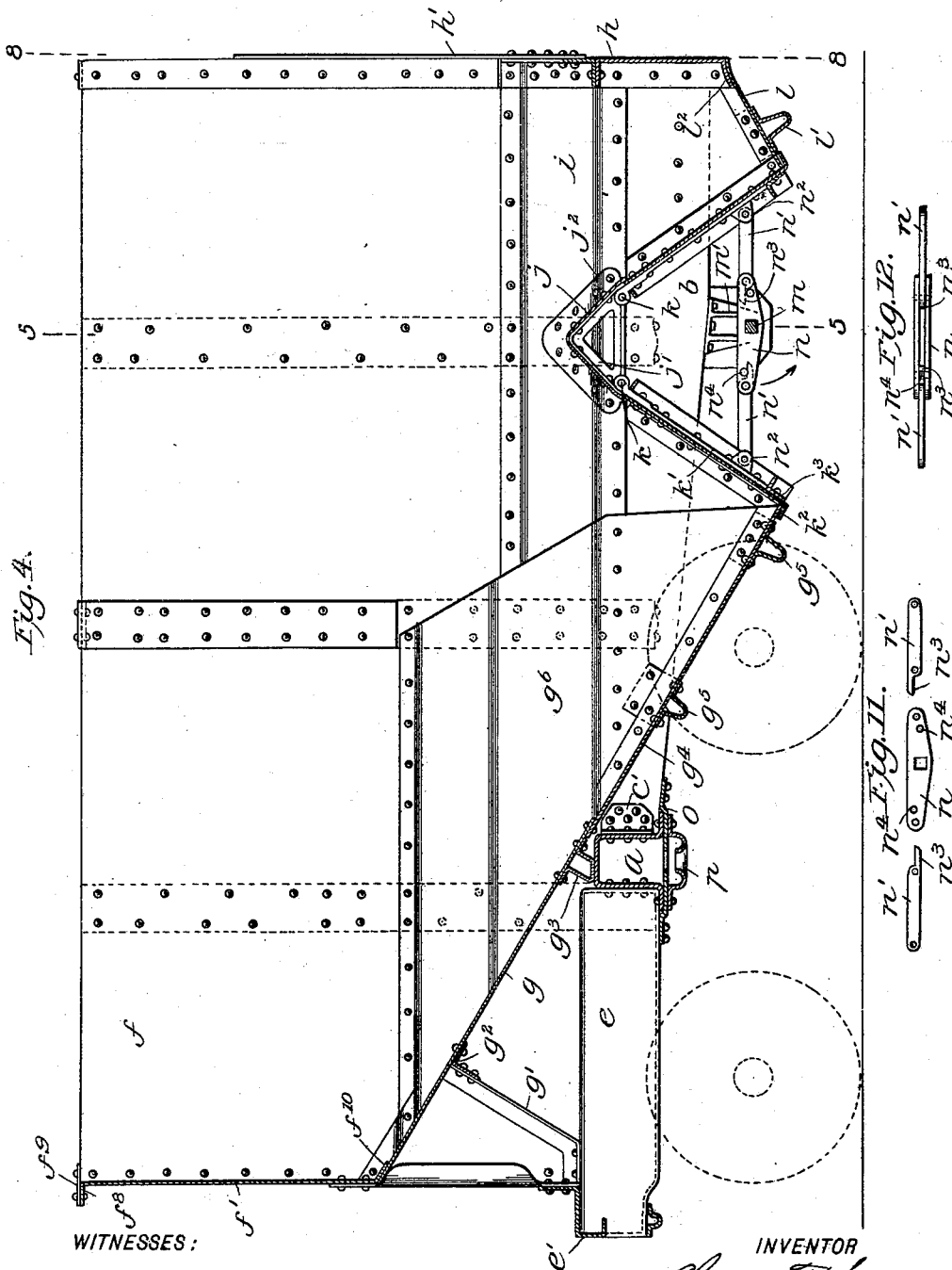
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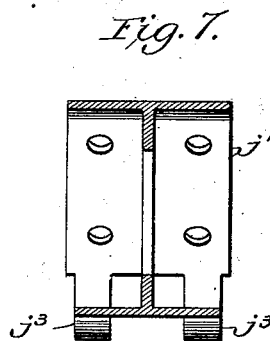
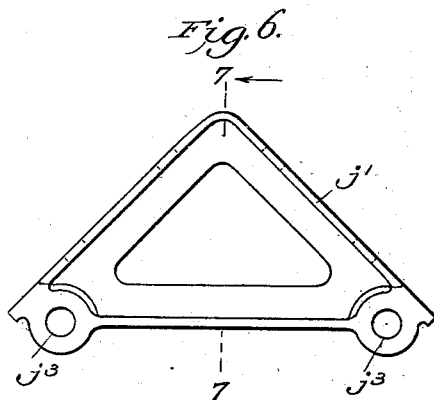
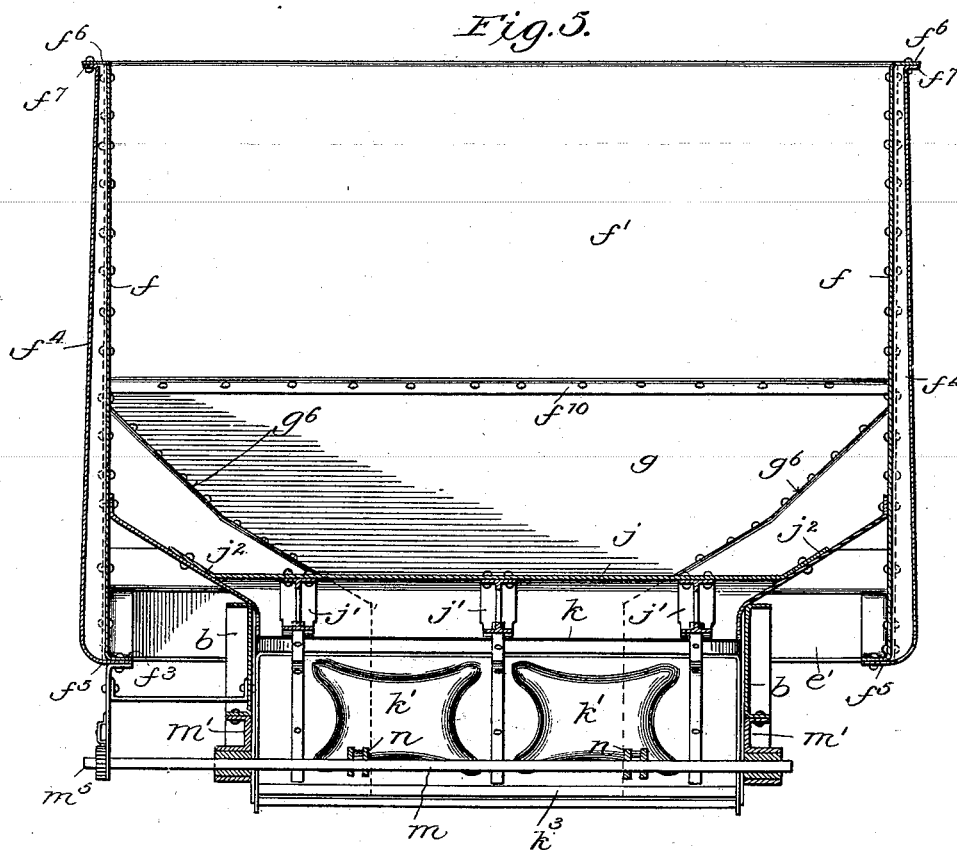
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(Application filed Aug. 10, 1899.)

(No Model.)

6 Sheets—Sheet 5.



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Patented Apr. 17, 1900.

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(No Model.)

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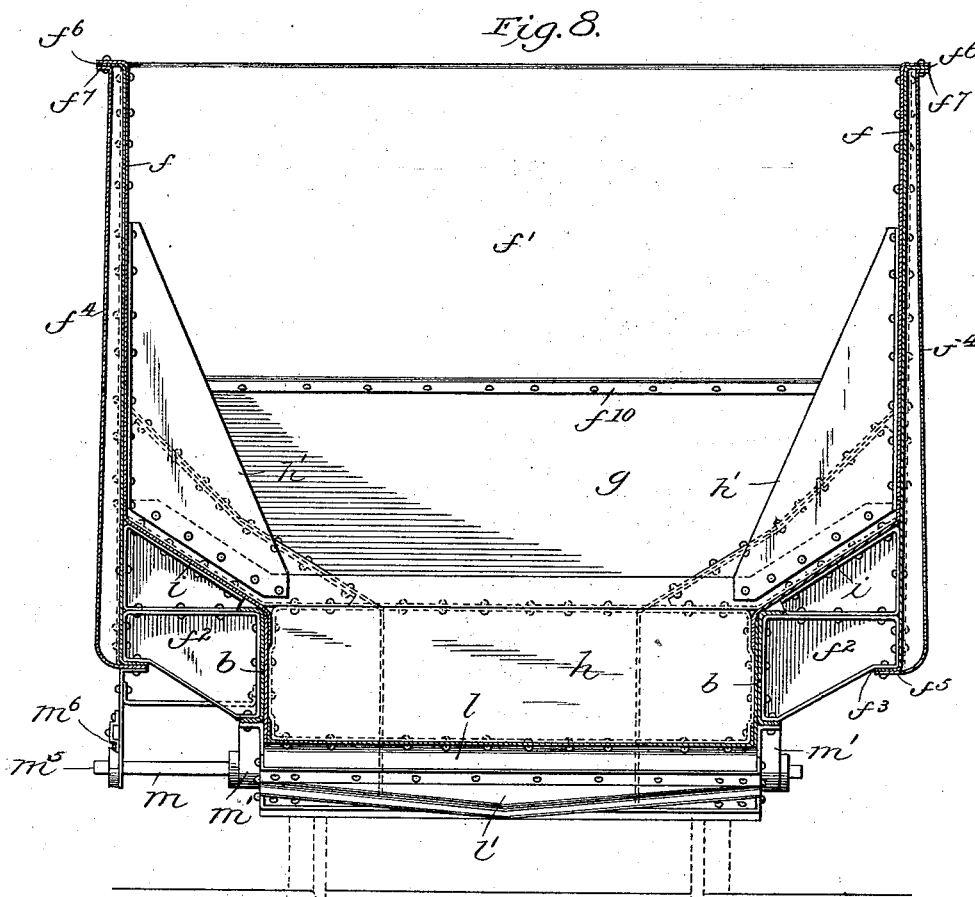
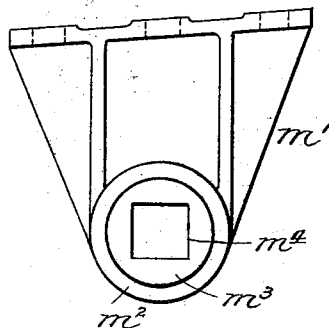


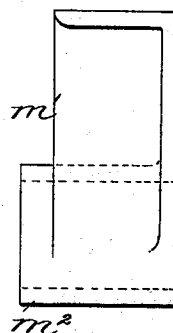
Fig. 9.



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Fig. 10.



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UNITED STATES PATENT OFFICE.

CHARLES T. SCHOEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
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HOPPER-BOTTOM CAR.

SPECIFICATION forming part of Letters Patent No. 647,907, dated April 17, 1900.

Application filed August 10, 1899. Serial No. 726,821. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. SCHOEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia, and State of Pennsylvania, have invented a certain new and useful Improvement in Hopper-Bottom Cars, of which the following is a full, clear, and exact description.

This invention relates to hopper-bottom metallic cars, and has for its objects, first, the adaptation of the underframe to double-hopper bottoms; second, the peculiar inclination of the bottom of the body, so as to divide the load and provide for its ready discharge, and thereby facilitate unloading, and, third, to provide means for simultaneously operating the doors of the double-hopper bottoms, and thus to expedite the unloading of the car and the subsequent closing of the doors. These objects I attain in and by the construction which I will now proceed to describe and then particularly point out and distinctly claim.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation of one half of a car constructed in accordance with my invention. Fig. 2 is a plan view taken substantially in the plane of line 2 2, Fig. 1, but outlining the underframe in full and dotted lines. Fig. 3 is a top plan view. Fig. 4 is a substantially-central longitudinal section. Fig. 5 is a vertical section taken substantially in the plane of line 5 5, Fig. 4. Fig. 6 is a side elevation of the door-hanging bracket, and Fig. 7 is a transverse section in the plane of line 7 7, Fig. 6. Fig. 8 is a vertical transverse section taken substantially in the plane of line 8 8, Fig. 4. Fig. 9 is a side elevation, and Fig. 10 a front elevation, of one of the hangers for the door-operating shaft. Fig. 11 is a detail side elevation of part of the door-operating mechanism, and Fig. 12 is a plan view of the same members of such mechanism.

In order to avoid repetition, I wish to say here that in the preferred construction all of the parts which are capable of being made of pressed steel are so made, and while I do not limit my invention to the use of pressed steel, excepting as hereinafter claimed, still I pre-

fer to construct my car of steel pressed to shape wherever that is possible.

The underframe comprises, essentially, a bolster *a* for each truck, and these bolsters are adapted to receive the center sills *b*, of which there are two and which are made as U-channels, having their ends secured to the bolster by resting upon its base-flange and riveted brackets *b'* *b'* and triangular foot-plates *b*². Flying sills *c* are similarly secured to the bolster by riveted brackets *c'* and are connected with the sills *b* by braces *c*². The arrangement of one pair of wheels is shown in Fig. 2 by dotted lines at *d*. Beams *e* project outwardly from the bolster at opposite ends to receive the draft-rigging, and these beams receive the end sills *e'* through the intervention of gusset-plates *e*² and oblique braces *e*³. The flooring, of metal plates, is laid under this underframe, as hereinafter more particularly described, and vertical sides *f* and ends *f'* are built up around the underframe and without the intervention of side sills are secured to the bolsters and to the center sills by means of the braces *f*² and parts of the flooring, as presently described.

As shown more especially in Figs. 5 and 8, the sides *f* have their lower ends continued below the bottom level of the underframe and flanged at *f*³, so as to be capable of being riveted to those portions of the underframe with which they may come in contact, such as the bolsters and braces *f*², and the said sides are reinforced by stakes *f*⁴, whose bottoms are also flanged at *f*⁵ and riveted to the said sides. The upper edges *f*⁶ of the sides and the upper edges *f*⁷ of the stakes are horizontally flanged and riveted together. The ends *f'* are provided with horizontal upper flanges *f*⁸, and these flanges are riveted to the sides through the intervention of corner-plates *f*⁹. (See Fig. 3.) The ends terminate short of the underframe and are provided with the flanges *f*¹⁰ and are connected with the inclined end portions *g* of the floor.

The floor is supported at its highest end from below by obliquely-arranged struts *g'*, which rise from opposite corners of the underframe and are united to a girder *g*², to which the floor is riveted, and a transverse girder *g*³

is erected above the bolster a and secured to the floor. The floor g is continued at g^4 , between the flying sills c , beneath the underframe and supported between these sills by girders g^5 , substantially as shown in Fig. 4. As shown in Fig. 3, the floor g and the floor g^4 are united with the inclined floor-plates g^6 , extending from opposite sides, so as to make a downwardly-converging cavity within the body of the car.

The car-body is divided midway of the underframe by a vertical wall h and by the wings h' , Fig. 8, and between these portions and the portions g^6 the sides are provided with shorter inclines i at opposite sides.

Transversely of the car and between the inclines i is arranged a cone j , and this cone is supported by a series of brackets j' , the details of which are shown more especially in Figs. 6 and 7, the said brackets and cone being riveted together, and the cone has flanged ends j^2 , which are riveted to the inclined plates i . The wall h , wings h' , and cone j divide the load in the body, and thus provide for facilitating its discharge. The brackets j' are provided with eyes j^3 , which form sockets to receive the pintles k of the gates or doors k' , which open and close the chutes formed by the inclined bottoms of the floor, as herein described. As shown in Fig. 4, these doors k' have the rim-flanges k^2 , which close about the edges of the chutes and overlap such edges, although they may be otherwise constructed, and the lower edges of the doors are reinforced by angle-pieces k^3 . The cone j , the doors, and their operating mechanisms are arranged within the spaces in the underframe formed by the center sills b and braces c^2 , as shown in Fig. 2.

What has been described constitutes one half of the car, as shown in Fig. 4, the other half being a duplicate construction, and the meeting ends of these halves between the wall h and the doors next adjacent have the inclined bottoms l , which may be supplied with supporting-girders l' , riveted thereto, the bottoms l being also riveted to the bottom flanges l^2 of the walls h .

The door-operating mechanism for each pair of doors comprises a shaft m , suitably supported in hangers m' , which are riveted to the sills b next the sides of the chutes. As shown in Figs. 9 and 10, these hangers may be castings, and they are provided with circular socket pieces or bearings m^2 , in which are fitted bushings m^3 , having the squared holes m^4 to receive the shaft m and turn with it. This shaft may extend from these bearings to either or both sides of the car and be provided with an end m^5 to receive a crank for closing the doors and a pawl-and-ratchet mechanism m^6 or other suitable means for holding the shaft against rotation. The shaft m is provided with one or more levers n , which turn with the shaft, and to opposite ends of each lever n are pivoted the links n' , which in turn are pivoted to the doors at n^2 , and

these links n' have projections n^3 on opposite sides, which cooperate with stop-pins n^4 on the levers n to arrest their movements in one direction. From this construction it is obvious that by rotation of the shaft m in the direction of the arrow, Fig. 4, the pins n^4 will act upon the projections n^3 of the links n' in such way as to tilt them out of the horizontal and permit the opening of the doors and the discharge of the load, the doors in such case swinging freely upon their pintles in the brackets j' toward one another. Upon a reverse movement of the shaft m the links will be moved so as to force the doors away from one another and close the chutes, as shown in said Fig. 4. Thus a positive movement of the doors in opening and closing the chutes or hoppers is obtained.

Rectangular or other shaped reinforcing-plates o are arranged beneath the bolsters and transversely of the car, to which also the sides are riveted, and these plates also receive the members p of the center bearings.

It will be observed that the metallic underframe is very economically adapted to the double-hopper bottom in each half of the car, that the interior of the car is constructed and arranged so as to receive the largest possible load with the easiest mode of discharging the same, and that the doors for the double-hopper bottom are operated simultaneously, so that in conjunction with the formation of the interior of the car the load may be discharged with great facility.

I reserve for my companion case of even date claims for the invention of an underframe without side sills and having the sides of the body supported upon braces projecting from the center sills, and I claim herein the adaptation of that construction to the peculiarities of the double-hopper-bottom car. I also reserve to the aforementioned case the claims for arrangement of the bolsters within the plane and as forming a part of the underframe.

One of the special advantages gained by the construction used in the present invention is that the car may be hung low without any interference whatever with the trucks and without interfering with the accessibility of the trucks at all times.

What I claim is—

1. In a double-hopper-bottom car, an underframe constructed without side sills and comprising bolsters, end sills, draft-rigging beams interposed between the bolsters and sills, and center sills arranged between the longitudinal center of the car and its sides and out of alinement with the draft-rigging beams and secured to the bolsters, thereby leaving a clear space in the middle of the car for the projection of the hopper-chutes through the underframe, substantially as described.

2. In a double-hopper-bottom car, an underframe comprising bolsters, end sills, draft-rigging beams interposed between the bol-

sters and sills, center sills arranged between the longitudinal center of the car and its sides and out of alinement with the draft-rigging beams, and secured to the bolsters, thereby
 5 leaving a clear space in the middle of the car for the projection of the hopper-chutes through the underframe, and flying sills projecting from the bolsters inwardly toward the center of the car and beyond the inner wheels
 10 and braced to the center sills, to accommodate the end inclines of the car-floor, substantially as described.

3. A pressed-steel underframe for cars, comprising bolsters, end sills, beams for the
 15 reception of the draft-rigging interposed between and secured to the bolsters and end sills, center sills secured to the bolsters and braced between their ends, the said center sills being arranged between the longitudinal
 20 center of the underframe and its side edges and out of alinement with the draft-rigging beams, and flying sills secured to the bolsters and braced to the center sills, substantially as described.

25 4. A metallic car, comprising an underframe constructed without side sills and having its central portion unobstructed by sills, a body portion erected upon said underframe and having a double inclined hopper-bottom,
 30 comprising inclined plates extending from the ends of the car downwardly through the underframe, inclined plates projecting from the sides of the car and meeting the end inclines, and a transverse cone interposed between
 35 inclines from the sides and supporting the doors of the hopper, substantially as described.

5. In a double-hopper-bottom metallic car, an underframe and a body mounted there-

upon and comprising inclined floor-plates extending from the ends through the under- 40
 frame, flooring-plates inclined from the sides of the car, discharge-chutes, a central division-wall separating the double-hopper bottoms, and lateral wings adjacent to said walls, substantially as described. 45

6. In a double-hopper-bottom car, the discharge-chutes provided with pivotal doors, combined with door-operating mechanism comprising a rotary shaft, a lever fast thereto and provided with stop-pins, and links con- 50
 necting said lever and doors and having end projections coöperating with the stop-pins on the lever for limiting the movement of the lever and links, substantially as described.

7. In a double-hopper-bottom car, the discharge-chutes provided with pivotal doors, combined with door-operating mechanism comprising a rotary shaft, a lever fast thereto and links connecting said lever and doors, and stops partly on the links and partly on 60
 the lever for controlling the coöperation of the links and lever in the movement of the doors, substantially as described.

8. In a double-hopper-bottom car, the combination with the discharge-chutes, of a trans- 65
 verse cone, triangular brackets attached to said cone, doors hinged to said brackets and means to actuate said doors, substantially as described.

In testimony whereof I have hereunto set 70
 my hand this 21st day of July, A. D. 1899.

CHARLES T. SCHOEN.

Witnesses:

CHAS. V. MCGLAUGHLIN,
 H. E. SWARTZ.