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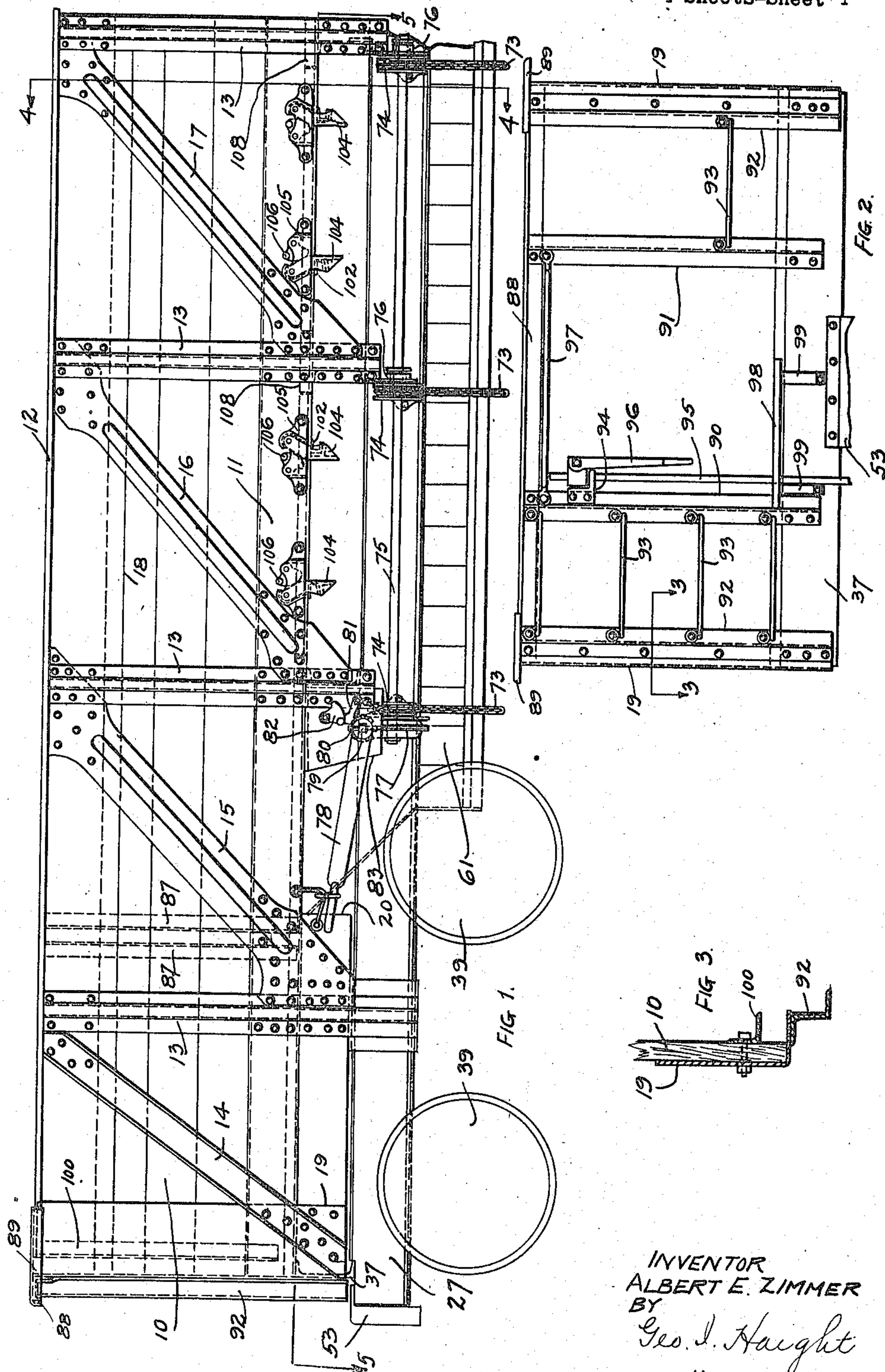
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A. E. ZIMMER

DUMP CAR OF THE CONVERTIBLE TYPE

Filed Dec 1, 1922

4 Sheets-Sheet 1



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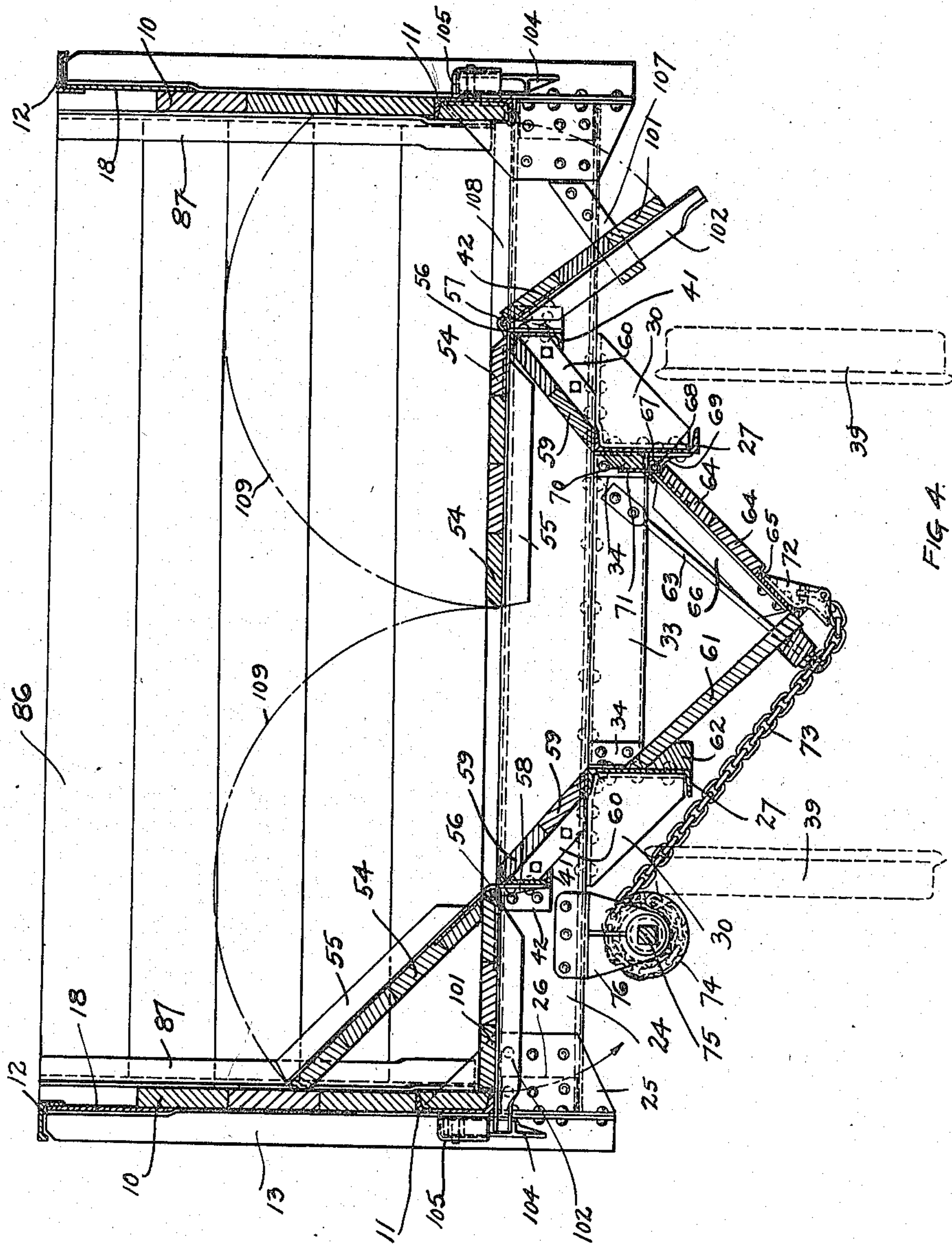
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BUMP CAR OF THE CONVERTIBLE TYPE

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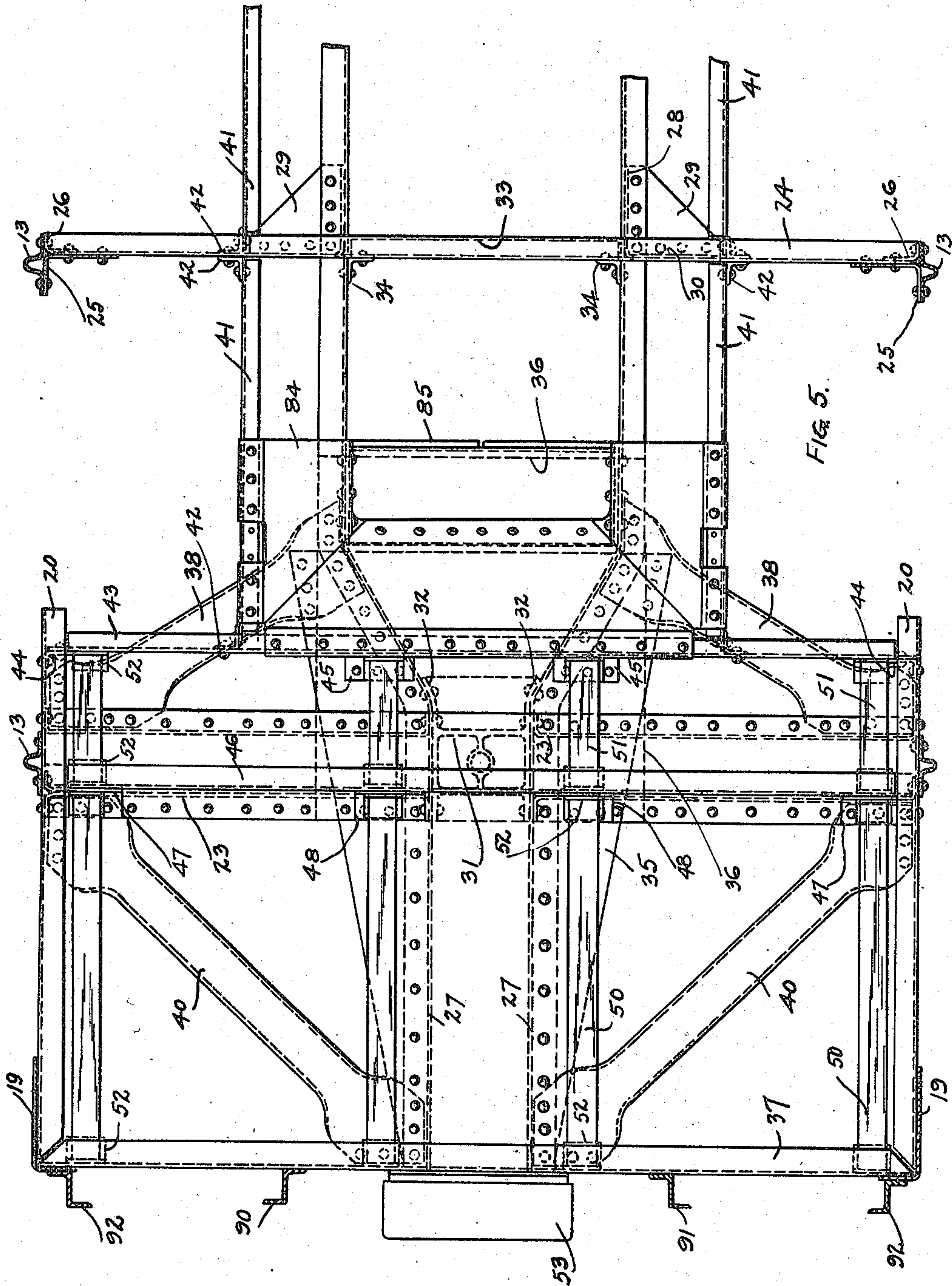
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DUMP CAR OF THE CONVERTIBLE TYPE

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4 Sheets-Sheet 3



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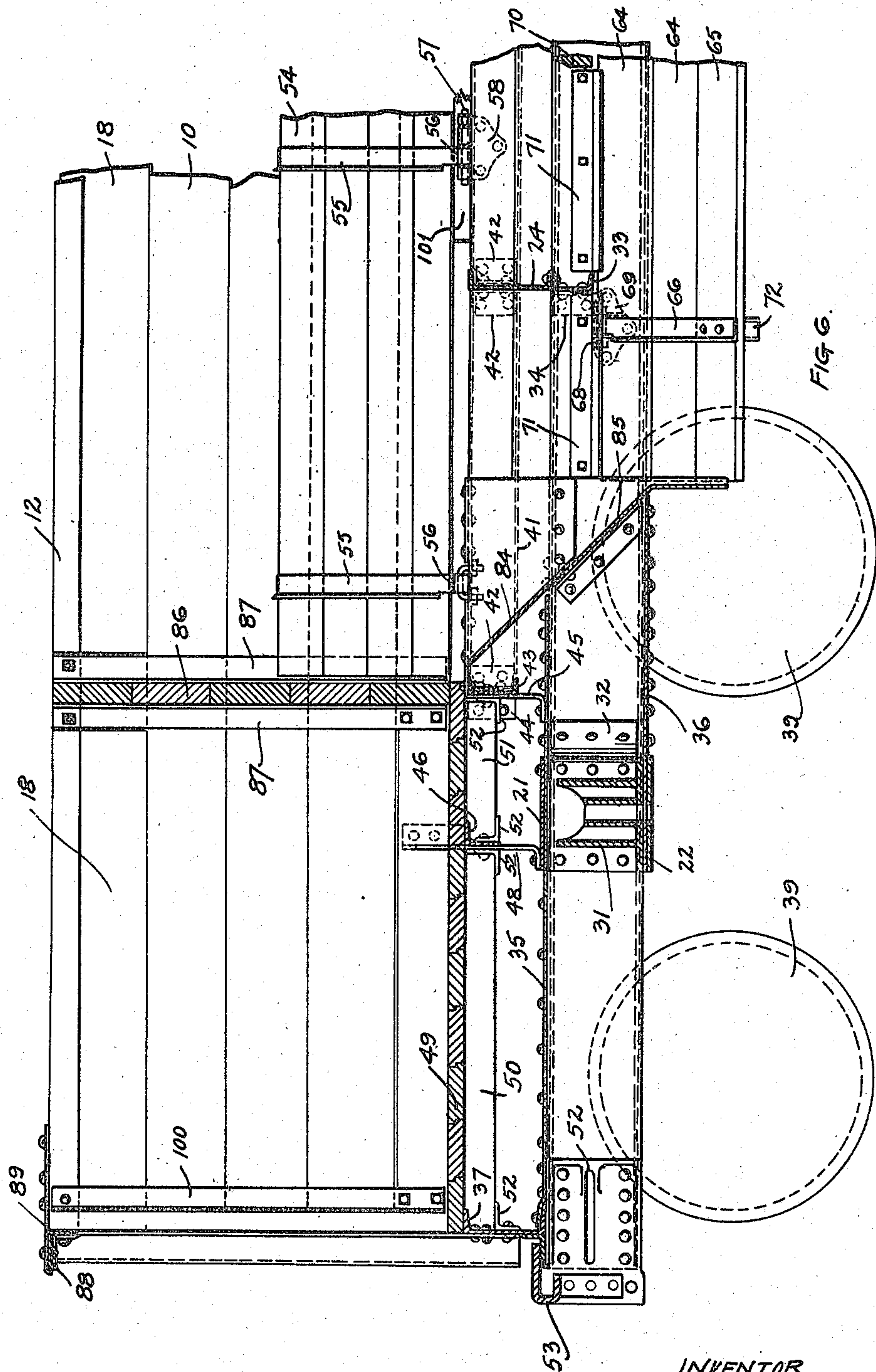
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DUMP CAR OF THE CONVERTIBLE TYPE

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

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DUMP CAR OF THE CONVERTIBLE TYPE.

Application filed December 1, 1922. Serial No. 604,160.

To all whom it may concern:

Be it known that I, ALBERT E. ZIMMER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Dump Cars of the Convertible Type, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in dump cars of the convertible type.

An object of this invention is to provide a car which may be used either as a flat bottom gondola, side dump or center dump car.

Another object of this invention is to provide a car of the type above indicated wherein the center sills are so formed as to provide a transversely widened space for a distance intermediate the bolsters for the purpose of accommodating a longitudinally extending hopper.

Another object of this invention is to provide draft sills extending continuously between end sills for the purpose of effectively withstanding buffing and draft strains and in the novel combination of the same with a dumping hopper construction.

A further object of this invention is to greatly cheapen the construction of cars of the identified type by utilizing the sides of the car as load-carrying members and connecting the same with transverse beams beneath which longitudinal sills are disposed.

Further, the invention resides in certain novelties of construction and novel combinations of parts, such as will be more fully pointed out hereinafter and claimed.

In the drawings forming a part of this specification, Figure 1 is a side elevation showing substantially half a car embodying the improvements. Figure 2 is a view of the upper portion of one of the ends of the car showing the skeleton framework employed to brace the sides. Figure 3 is an enlarged fragmentary sectional view taken substantially on line 3—3 of Figure 2. Figure 4 is a sectional view taken substantially on line 4—4 of Figure 1 with a portion of the side trussing omitted for purpose of clearness, the left hand portion of Figure 4 showing the position of the parts when the car is arranged as a center dump car and the right hand portion showing the position

of the parts when the car is adapted for service as a gondola or for side dumping. Figure 5 is a horizontal sectional view of the underframe and hopper framework corresponding substantially to 5—5 of Figure 1, the end flooring, doors and other parts being omitted. And Figure 6 is a longitudinal vertical section of a portion of the car taken substantially through the longitudinal center of the car.

In said drawings, 10 denotes the planks of the vertical side walls of the car, 11 the lower member of each side truss, 12 the upper member of each side truss, 13 vertical side stakes, 14, 15, 16, 17 diagonal braces of the side truss each directly secured to the corresponding member 12 and also to a longitudinally extending plate 18; 19 corner bands or posts and 20 extension side sills which complete the side truss at each end of the car. The two side trusses are both preferably of the same construction and rest on the bolsters, each formed of top plate 21, bottom plate 22 and diaphragms 23. A series of transverse beams 24, preferably channels located between the bolsters, extend transversely of the side trusses and are secured thereto by means of plates 25 and 26. Extending longitudinally and below the said transverse beams are longitudinal or center sills 27—27, preferably channels, and secured to the transverse beams by means of gussets, each preferably formed with a wall 28 extending in parallelism with the web of the sills, and secured thereto, a horizontal wall 29 secured to the lower flange of the transverse beam 24 and a transverse vertically extending wall 30 uniting the aforesaid walls 28 and 29. In this manner a connection is secured which effectively withstands twisting strains in any direction inasmuch as the walls 28, 29 and 30 are disposed in different planes and substantially at right angles to each other.

Said center sills 27—27 at each end of the car are preferably formed with the normal A. R. A. standard spacing of $12\frac{7}{8}$ inches for the purpose of accommodating the draft gear and pass through the bolsters at this standard spacing and thereafter diverge for a limited distance and thereafter extend in parallelism to present a transversely widened space for the accommodation of a longitudinally disposed V-shaped hopper as clearly shown in Figure 5. At the bolster,

the center sills are spaced from each other by means of a block 31 formed with diverging side walls 32 conforming to the divergence of the sills and secured thereto. At each transverse beam (see Figure 4) a spacing member 33, preferably formed of channel shape, is secured to the lower flange of the transverse beam 24 and extends transversely of the hopper between the sills 27—27 and is secured thereto by means of angle-shaped connections 34—34.

Reference to Figure 5 will show that the transition from the standard A. R. R. spacing of the sills to the wider spacing is accomplished by bending the center sill members 27—27 and in order to counteract the spreading tendency of the sills under buffing shocks due to such bends, I employ a novel form of construction and system of bracing for the underframe structure whereby outward spreading of the sills under buffing shocks is prevented. Broadly, this construction consists of uniting at each end of the hopper the diverging portion of the adjacent sills into a box-shaped structure by means of top cover plate 35 and bottom cover plate 36 (see Figure 6). Each top cover plate 35 preferably extends from the end of the hopper past the bolster to the end sill 37 and is there suitably secured to the lower flange thereof. Each of the bottom cover plates 36 extends across the longitudinal sills 27—27 and is secured to the lower flanges thereof and extended to the body bolster and is there secured to the bolster bottom cover plate 22. Such a construction provides for a box-shaped trapezoidal structure of great strength to which the sides of the car are braced by means of horizontal braces 38—38 preferably disposed substantially in alignment with the top of the center sills and above the wheels which are designated herein as 39. Opposed to braces 38 and preferably disposed on substantially the same level are braces 40—40 extending from the junction of the end sill and center sills to the junction of the bolster and the side sill of the car, thereby bracing the underframe structure in a very rigid manner.

Intermediate the transverse beams 24, are short longitudinally extending beam members 41, preferably channels, and secured to the transverse beams by means of plates 42—42. At each end of the longitudinal hopper, transverse beams 43, formed of restricted depth, are secured to the side walls of the car by means of angle connections 44 and are further supported intermediate their ends by means of brackets 45 resting on the center sill structure. The sides of the car are further tied transversely by means of an additional beam member 46 preferably at an angle, and disposed at the bolster (see Figures 5 and 6). This member is connected at its ends to the sides of the

car by means of connections 47 and supported intermediately thereof by means of brackets 48 supported by the center sill structure. The permanent end floor 49 is preferably carried by and secured to wooden beams 50 and 51 resting on brackets 52 secured to the underframe structure. The sills 27 are adapted to receive the usual draft castings 52 and striking plate 53.

Intermediate the permanent end floor portions 49 and over what is commonly designated the hopper section of the car between the trucks, the floor of the car comprises sets of hinged convertible floor sections which, broadly, consist of planks 54 bolted together on angle beams 55 which are bent over to form hinges 56 adapted to receive pins 57 and by means of which the sections are swingingly mounted on hinge brackets 58 carried by the short beams 41. The swinging sections as shown in the left hand portion of Figure 4 are adapted to form the upper sloping walls of a longitudinally extending V-shaped center dumping hopper. A continuation of the said inclined walls in a downward direction consists of planks 59 secured to blocks 60 and bridging the space on each side of the hopper between the upper beams 41 and sills 27.

Between the sills 27 and extending longitudinally of the car is the stationary floor 61, secured at its upper part by means of blocks 62 to the adjacent sill 27, and which is inclined downwardly and supported at the free edge thereof from the underframe structure by means of straps 63 secured to beams 33. A downwardly inclined dumping door having its surface formed of planks 64 and a channel 65 is disposed opposite to the inclined floor 61 in such a manner that its free edge will be adjacent thereto when the door is in the closed position. Door braces 66 for the hopper door are disposed within the hopper itself and each preferably consists of an angle member bent in the form of an eye to present a hinge 67 adapted to receive pivot 68 whereby the door is pivotally mounted on hinge brackets 69 carried by one of the sills 27. The disposition of the door braces within the hopper itself and the location of the hinge proper, as best shown in Fig. 4, is particularly advantageous in securing a greater degree of door opening than would otherwise be possible. The aperture presented between the door and sill 27 to which it is hinged, is closed by disposing above the hinge brackets 69, longitudinally extending blocks 70 and door shields 71.

For the purpose of operating the said hopper door, I provide brackets 72 adapted to extend beyond the free edge of the door and secured to the channel 65. A series of chains 73 or other flexible elements each having one end thereof connected to a

bracket 72 and the other end connected to a sheave 74. Said sheaves 74 are rigidly mounted on a longitudinally extending shaft 75 by means of which the doors are operated. The shaft 75, which is rotatably mounted in bearing brackets 76, may be actuated by any suitable mechanism and in this instance the preferred arrangement consists of worm and gear mechanism enclosed in a housing 77. Rotation of the worm is effected by lever 78 acting through transverse shaft 79 which is fitted at the outer end thereof with locking mechanism consisting of ratchet 80, locking pawl 81 and locking dog 82; the locking mechanism being preferably disposed on the side of the car and mounted thereon by a plate 83.

At each end of the hopper, plates 84 and 85 form the end walls and a portion of the side walls of the stationary hopper below the horizontal floor level of the car. The end walls of the hopper above the floor line of the car, consist of end planks 86 removably mounted between guides 87, preferably angles, secured to the car side walls, these planks being movable to a position adjacent the end framework of the car to complete the end walls of a gondola car when in such position.

The ends of the car in this particular invention are each formed with horizontal top member 88 secured to the sides of the car by means of gussets 89, intermediate vertical posts 90 and 91, and corner end posts 92 secured to top member 88 and to the end sill. The corner end posts 92 are secured to the corner bands 19 and posts 90 and 91 are spaced therefrom a sufficient distance to permit the use of these members as stiles for vertical end ladders, the rungs thereof being provided by grab-irons 93 extending therebetween. Furthermore, the post 90 forms a rigid support for securing a brake mast bracket 94 thereto adapted to receive brake mast 95 and the actuating means therefor 96. A grab handle 97 extends between the posts 90 and 91. A brake platform 98 is supported on brackets 99. Within the car, angles 100 are secured to the interior side walls thereof presenting in conjunction with the inner walls of the corner bands 19, guide recesses within which the planks 86 may be moved to complete the end walls of the car as a gondola type. In this manner the skeleton framework forming the end of the car forms a supporting frame for the ladders and brake mast and effectively maintains the side trusses from bending inwardly or outwardly, thereby enabling the side trusses to advantageously fulfill their functions as load-carrying members.

Extending outwardly from the convertible swinging floor sections are laterally discharging side dump doors 101, each pro-

vided with supporting beams 102, the latter each preferably bent to form a hinge eye whereby the doors may be mounted on the hinge brackets 58 by means of hinge pivots 57, the latter forming common pivots for the said side dump doors and convertible floor sections. Any suitable means may be utilized for holding the side dump doors in closed position. A preferred construction is that shown herein which consists in extending the hinge beams 102 beyond the side of the car and engaging the same by means of door hooks 104 pivotally mounted on brackets 105 and adapted to be maintained in locked position by locking dogs 106. Suitable means for limiting the downward swing of the doors 101 may consist of straps 107 securely riveted to the transverse beams.

Intermediate the doors 101, I have disposed narrow filler planks 108 resting on the transverse beams 24 thereby forming a level floor car when the said doors 101 are in closed position and the swinging convertible floor sections have been swung inwardly to a level position as shown on the right hand half of Figure 4. In this position, it will be noted that the planks 54 forming the convertible floor sections rest directly on the transverse beams 24 and the free edges of said sections meet substantially at the longitudinal center of the car thereby forming a car having the floor thereof in one plane and therefore of much advantage when it is desired to unload a car by means of a clam shell type of bucket or shovelling by hand. When the car is converted in this manner for use as a gondola car, it will be obvious that the central hopper door will be inoperative and dumping of the load is then effected at the side of the track by means of side dumping doors 101.

The swinging floor sections are each arranged to swing in a single arc as shown by the dotted line 109 with the free edge thereof resting directly against the side wall of the car and supported thereby and therefore the angles 55 of the floor sections constitute beams supported by the side wall of the car and at the hinges 56. With this construction of a unitary floor section thus braced, I am enabled to dispense with the supporting brackets usually disposed on the side wall of the car for the purpose of sustaining the floor sections in the inclined position and which impede the unloading of coal or similar lading by means of a clam shell bucket.

The convertible floor sections are formed in such manner that when swung to the upwardly inclined position as shown in the left hand portion of Figure 4, the side dumping doors 101 are covered and rendered inoperative and discharge of the lading is effected by opening the hopper dumping door through the actuation of shaft 75.

It will be noted that the improved freight car construction provides for an unobstructed central hopper between cross-bearers and furthermore I obtain a car of very strong construction and strongly fortified to sustain draft and buffing shocks, and a car wherein the side walls are utilized to carry the vertical load.

As will be understood by those skilled in the art, various changes may be made in the details of construction and arrangement of parts. The form which I have shown and described I consider the preferable one but contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a dump car, the combination with bolsters and end sills; of center sills extending substantially in parallelism from the end sills inwardly through the bolsters, said sills diverging for a limited distance after passing through the bolsters and thence extending in parallelism thereby presenting a wide space between the sills; and a longitudinal V-shaped hopper disposed in said wide space.

2. In a dump car, the combination with bolsters; of continuous center sills extending from end to end of the car and extending through the bolsters at the normal A. R. A. spacing, said sills having a wider spacing than normal for a distance intermediate the bolsters; and a longitudinally disposed V-shaped hopper interposed therebetween.

3. In a dump car, a longitudinally extending hopper including end floors inclined inwardly and downwardly and a pivoted discharge door; and sills extending longitudinally of the hopper and converging inwardly at each end of the hopper and extending under the inclined hopper end floors.

4. In a dump car, a longitudinally extending hopper; sills disposed at each side of the hopper and extending longitudinally thereof; and stationary sloping side and end floors disposed entirely above the sills, the aforesaid sills converging at each end of the hopper and passing beneath said stationary end floors.

5. In a dump car, a longitudinally extending hopper having side walls and end walls; sills disposed at each side of the hopper and extending longitudinally thereof, the aforesaid sills converging at each end of the hopper; and tying plates extending from one sill to the other at the top and bottom of the converging portions of said sills and thereby uniting the same and forming a box-like section.

6. In a dump car, the combination with a bolster; of center sills extending through the bolster substantially in parallelism and diverging inwardly thereof; a filler form-

ing a portion of the bolster interposed between the said sills, said filler having diverging flanges secured to the diverging sills.

7. In a dump car, the combination of longitudinally extending sills; of a longitudinally extending hopper, including a pivoted discharge door, extending therebetween, said sills converging inwardly at the ends of the hopper; and a horizontally extending plate disposed at each end of the hopper and extending from one to the other of the said sills and secured thereto.

8. In a dump car, the combination of end sills; body bolsters; longitudinal sills; a longitudinally extending hopper disposed between the sills, said sills converging inwardly at the ends of the hopper and extending in parallelism through the bolsters; top cover plates secured to both of said sills at each end of the car and each extending to both sides of the corresponding bolster and transversely tying the divergent portion of the sills together inwardly of the bolster.

9. In a dump car, the combination with bolsters and end sills; of center sills extending from the end sills inwardly through the bolster and diverging outwardly thereafter to present a transversely widened space between said sills intermediate the bolsters; a longitudinally extending hopper, including a discharge door interposed between said sills; and means for tying the said sills together at the ends of the said hopper comprising top and bottom cover plates, each extending from one sill to the other and secured thereto to thereby provide box-like sections beyond the ends of the hopper.

10. In a dump car, the combination with the sides of the car; of body bolsters; sills extending longitudinally between the bolsters and diverging outwardly therefrom for a limited distance and extending thence in parallelism thereby presenting a transversely widened space; a longitudinally extending hopper disposed between the said sills; and diagonal braces extending outwardly from the sills adjacent the ends of the hopper towards the junctions of the body bolsters and sides of the car and connected thereto.

11. In a dump car, the combination of load-carrying members disposed at the sides of the car; transversely disposed beams united at their ends to said sides; longitudinal sills disposed entirely below the said transverse beams and secured at their tops thereto; and a longitudinally extending V-shaped hopper properly disposed between the said sills and below said beams.

12. In a dump car, the combination of load-carrying members disposed at the sides of the car; transversely disposed beams carried thereby; longitudinally disposed sills extending continuously below the said transverse beams and secured thereto, the

lower portion of a longitudinally extending hopper being disposed between the said sills; beams disposed in parallelism with the said sills and above the same and spaced outwardly therefrom; and floor sections sloping inwardly and downwardly and connecting the said beams and sills and forming walls of the hopper.

13. In a dump car, the combination of load-carrying sides; transversely disposed beams carried thereby; longitudinal sills disposed below the said transverse beams; a longitudinally extending hopper disposed between the said sills; and connections uniting the said sills and transverse beams each including a transversely and vertically extending gusset portion and transversely and horizontally extending gusset portion.

14. In a dump car, the combination of load-carrying sides; transversely disposed beams carried thereby; longitudinal sills disposed below the said transverse beams; a longitudinally extending hopper disposed between the said sills; connections between the said transverse and longitudinal beams, each of said connections being formed of a member presenting walls disposed in three different planes and substantially at right angles to each other.

15. In a dump car, the combination of load-carrying sides and transversely extending beams carried thereby; longitudinal sills disposed below the said transverse beams and secured thereto; a longitudinally extending V-shaped hopper disposed between the sills; longitudinal beams disposed above the said sills and spaced outwardly therefrom; side dumping doors and swinging floor sections carried by the said beams, the said swinging floor sections being adapt-

ed to assume an inclined position forming a portion of the inclined walls of a central hopper and covering the said dumping doors thereby rendering the latter inoperative for side dumping.

16. In a car of the character described, an underframe construction at each end of the car comprising: a bolster; an end sill; draft sills extending parallelly between the end sill and the bolster; longitudinal sills inwardly of the bolster and spaced wider apart than the draft sills; sill-sections diverging inwardly from the bolster and rigid with said longitudinal sills; an inclined hopper end floor extending between said longitudinal sills; and a horizontally disposed tie-plate located between the bolster and said inclined hopper end floor and united to said diverging sill sections.

17. In a convertible dump car, the combination with longitudinally extending sills between the bolster; of a longitudinally arranged hopper between said sills; transversely extending beams extending across the tops of said longitudinal sills; side walls; longitudinally extending beams located in a plane above the tops of said longitudinal sills; and pivotally mounted sets of floor sections supported from said longitudinal beams and adapting the car to be converted either into a flat floor gondola or a longitudinal hopper center dump car.

In witness that I claim the foregoing I have hereunto subscribed my name this 22nd day of November 1922.

ALBERT E. ZIMMER.

Witnesses:

FRANCES SAVAGE,
H. M. DEAMER.