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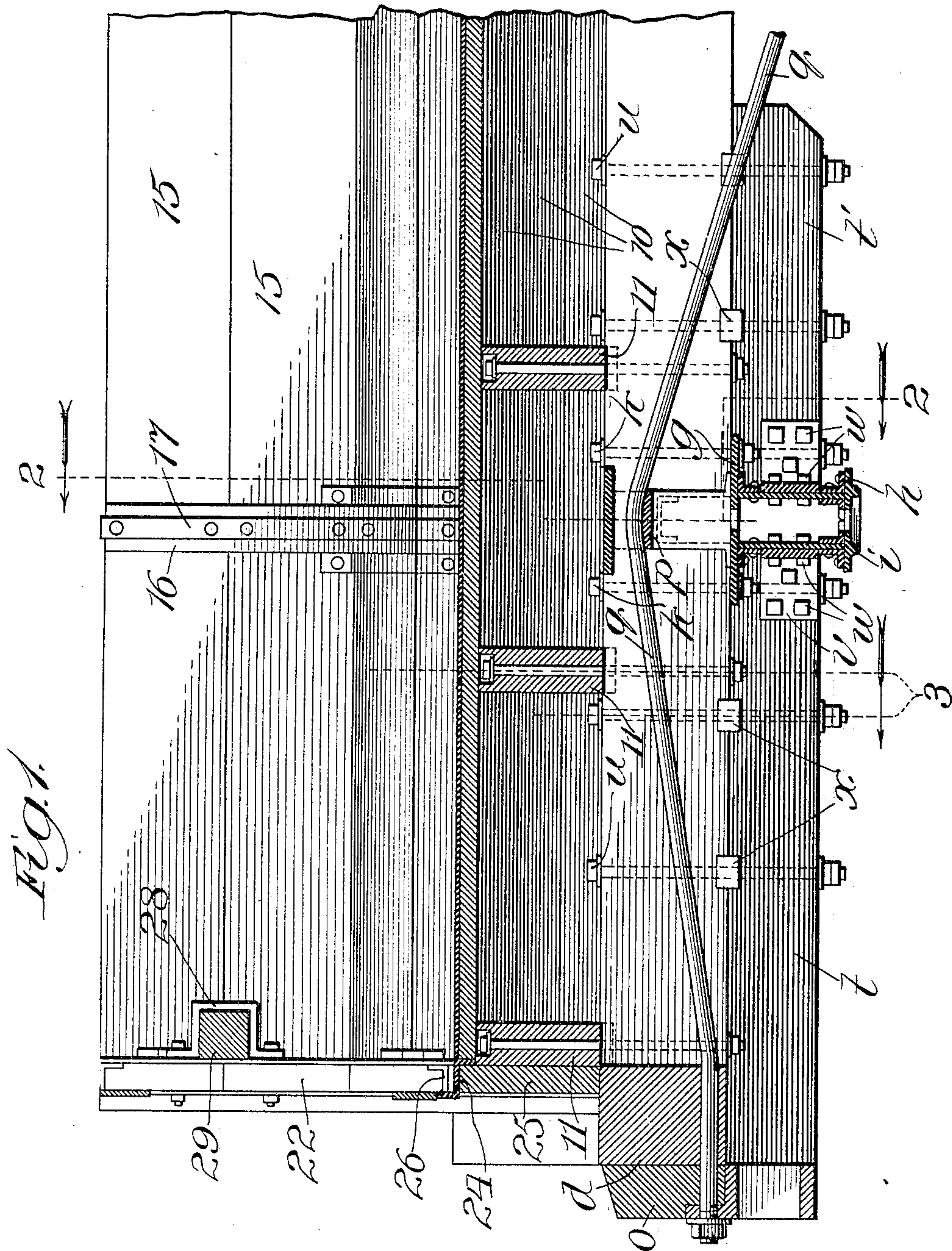
PATENTED JUNE 27, 1905.

S. OTIS & G. B. MALTBY.

DUMP CAR.

APPLICATION FILED AUG. 8, 1904.

4 SHEETS—SHEET 1.



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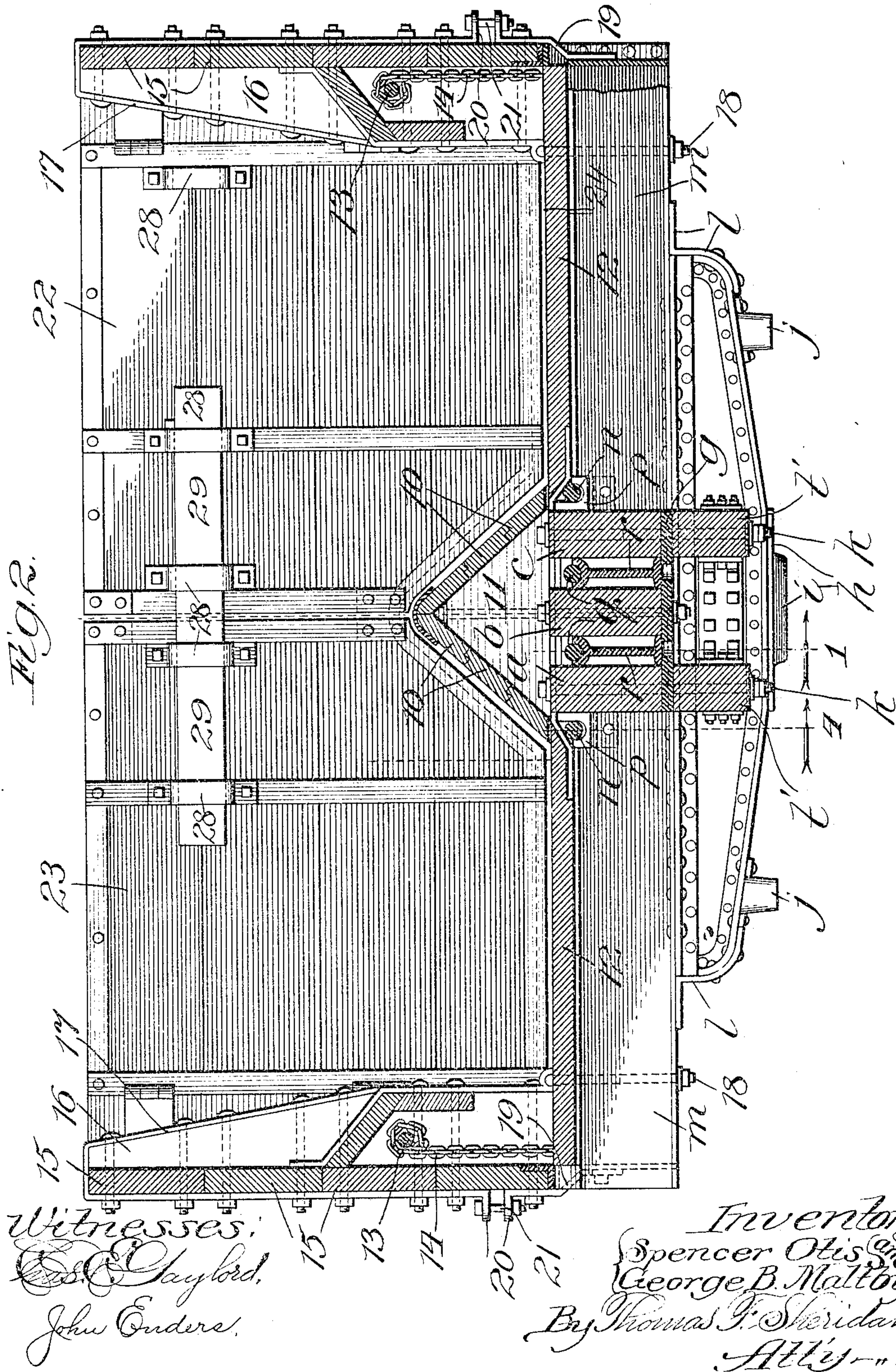
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4 SHEETS—SHEET 3.

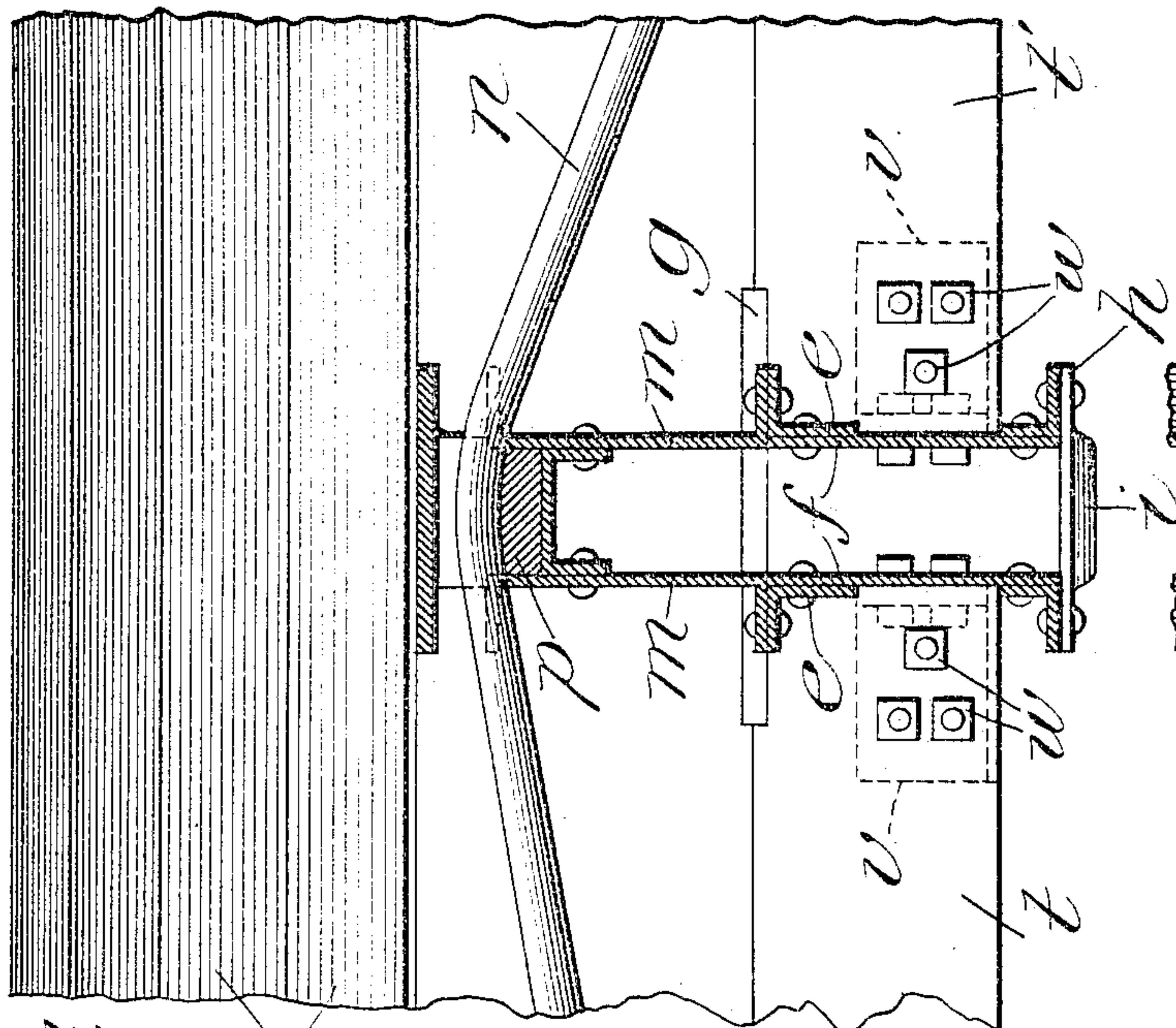


Fig. 4.

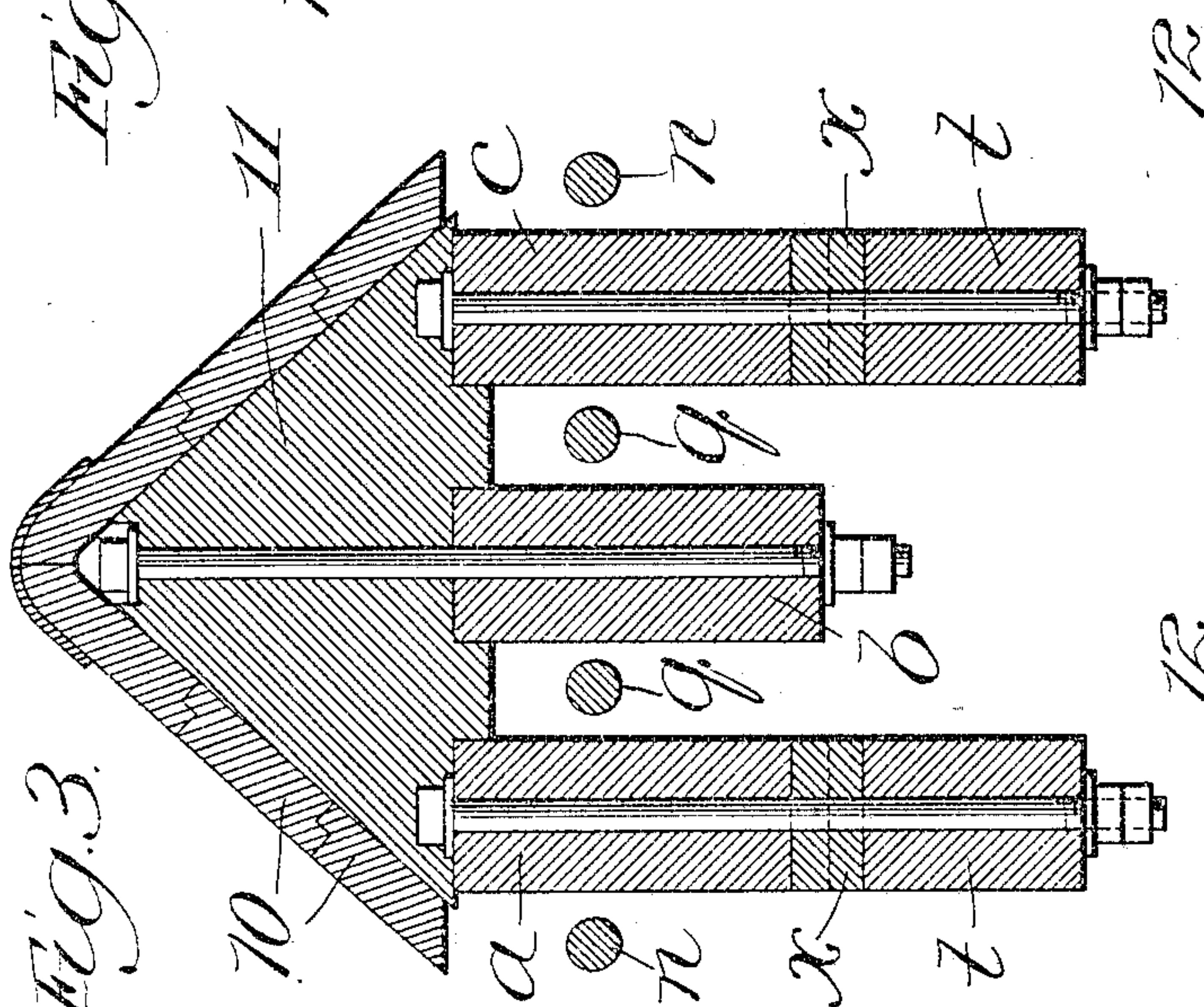


Fig. 3.

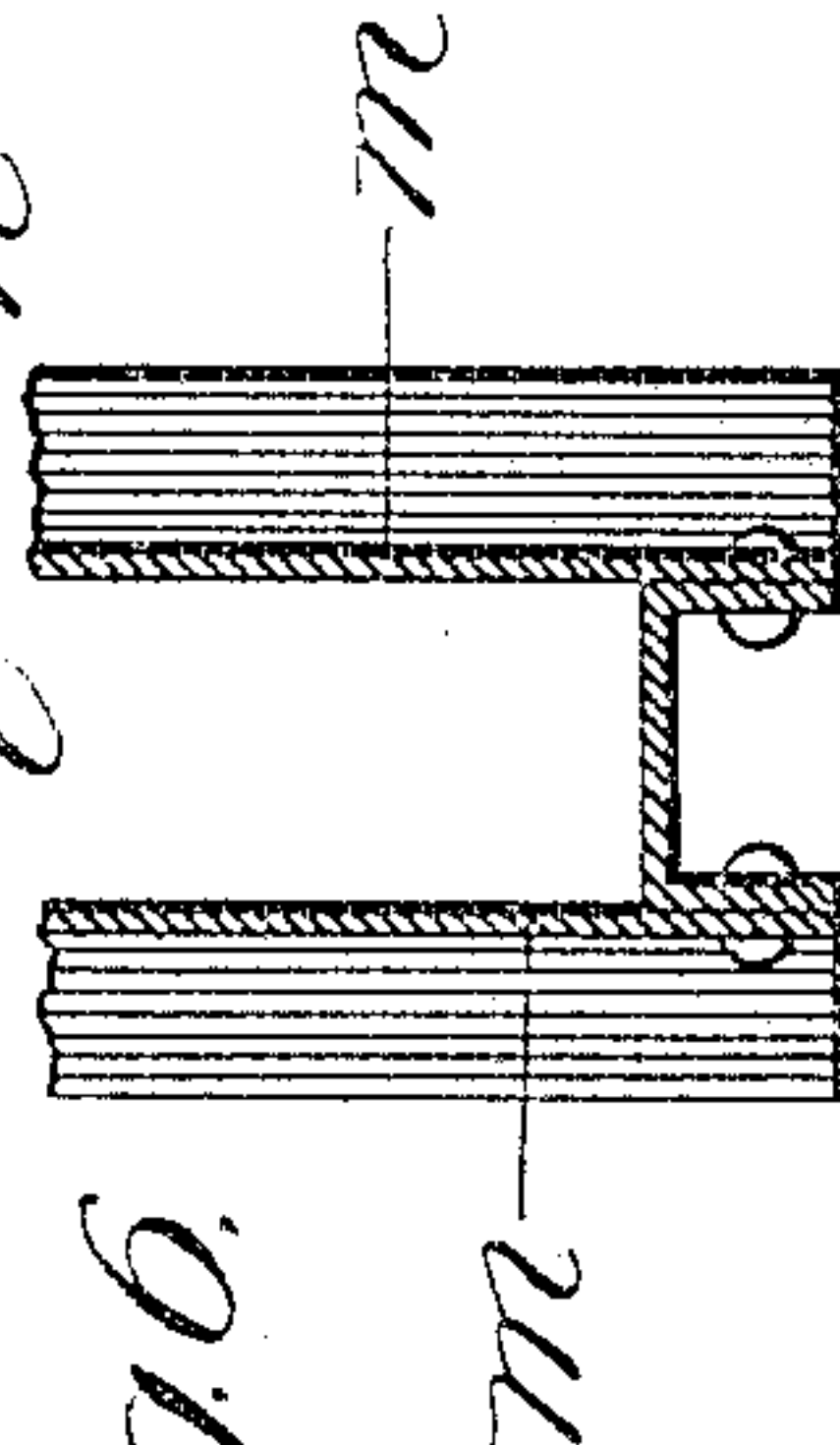


Fig. 6.

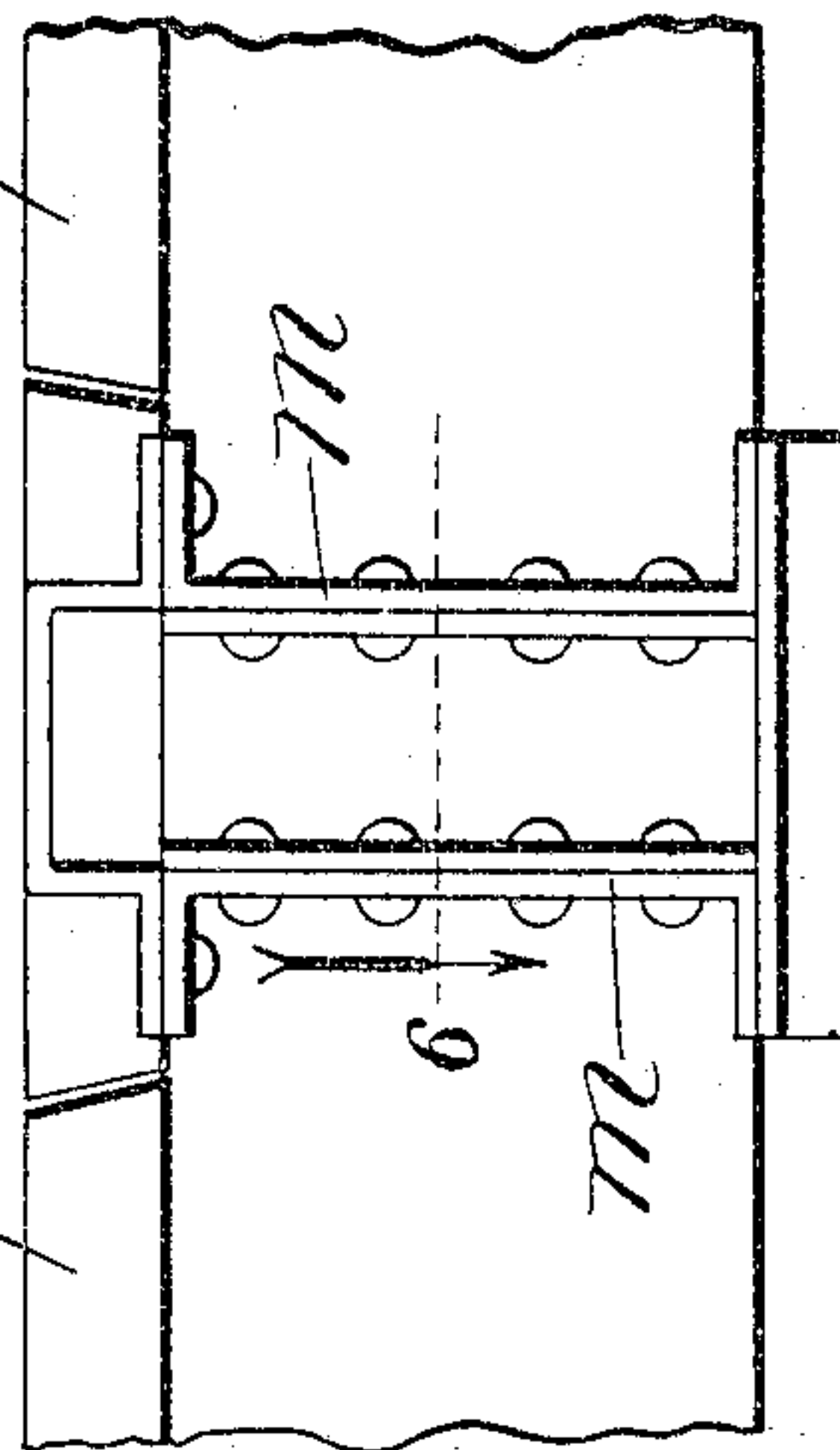


Fig. 5.

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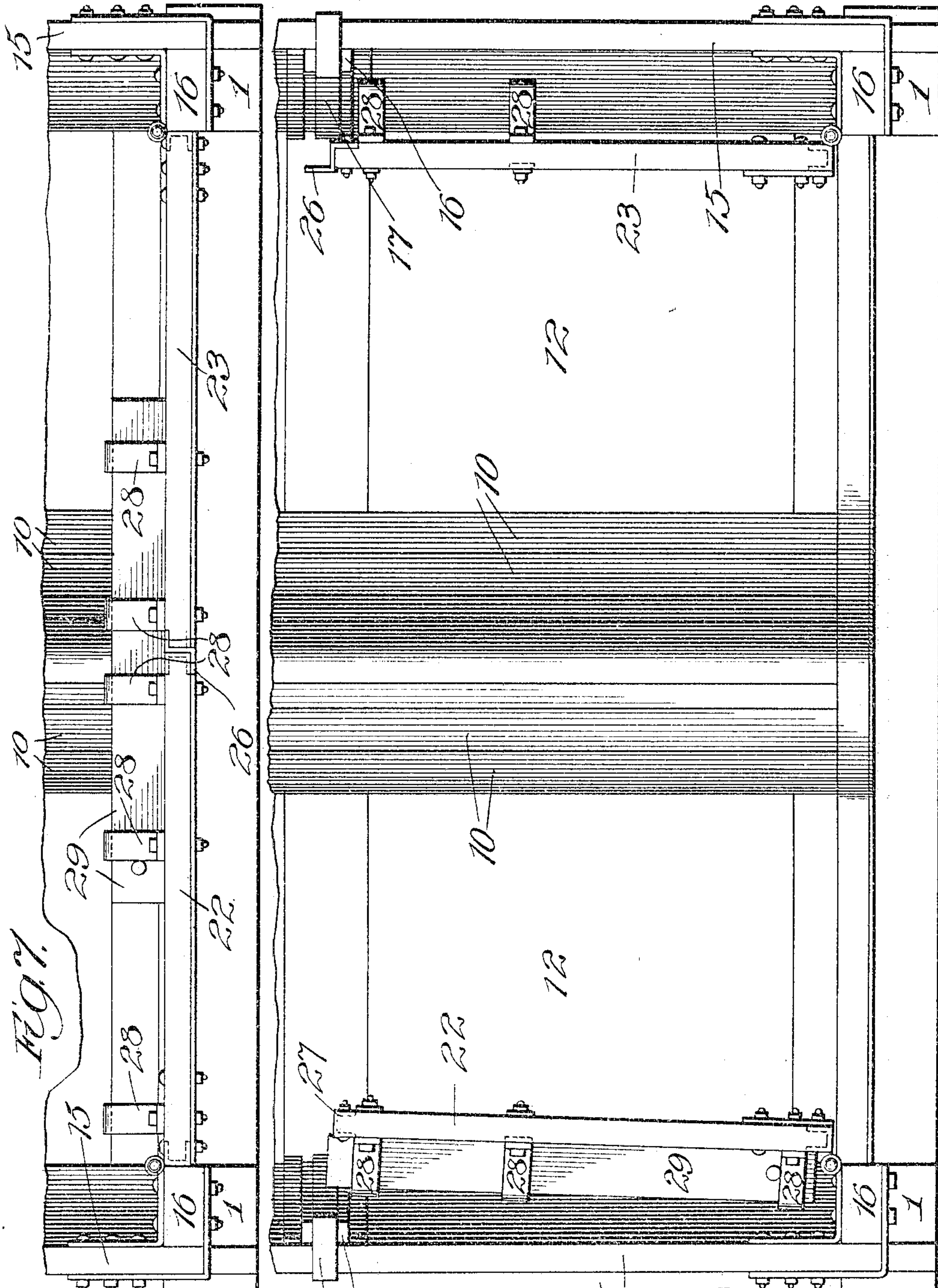
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4 SHEETS—SHEET 4.



Witnesses:  
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Fig. 8.

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# UNITED STATES PATENT OFFICE.

SPENCER OTIS, OF CHICAGO, ILLINOIS, AND GEORGE B. MALTBY, OF CLEVELAND, OHIO, ASSIGNORS TO NATIONAL COAL DUMP CAR COMPANY, OF RAPID CITY, SOUTH DAKOTA, A CORPORATION OF SOUTH DAKOTA.

## DUMP-CAR.

SPECIFICATION forming part of Letters Patent No. 793,150, dated June 27, 1905.

Application filed August 8, 1904. Serial No. 219,935.

*To all whom it may concern:*

Be it known that we, SPENCER OTIS, residing at Chicago, in the county of Cook and State of Illinois, and GEORGE B. MALTBY, residing at Cleveland, in the county of Cuyahoga and State of Ohio, citizens of the United States, have invented certain new and useful Improvements in Dump-Cars, of which the following is a specification.

10 This invention relates to improvements in dump-cars, and particularly to the construction and arrangement of the parts that go to form the body-bolster.

It relates, further, to other constructions and arrangements, which will be more fully hereinafter set forth. It will be understood, however, that while we have embodied our invention, as shown in the drawings, in the form of a bottom-dumping car such inventions are capable of use in connection with other types of freight-cars—such, for instance, as flat-bottom, gondola, and box cars—the parts illustrated and described herein, such as the bottom-dumping sections, 20 being merely illustrative as types of cars to which these inventions are particularly applicable.

The principal object of this invention is to provide a railway-car with a body-bolster constructed and arranged on the cantaliver principle, as will more fully hereinafter appear.

Further objects of the invention will appear from an examination of the drawings and from the following description and claims.

40 The invention consists principally in a car of this kind, in which there are combined a supporting-frame portion provided with center sills, a body-bolster for each end of the car arranged underneath the center sills and extending transversely of the same, discontinuous subbolsters arranged between the body-bolster and the floor-level of the car and extending out from each side of the center sills, and truss-rods extending from end to end of the car and passed over the inner ends

of the subbody-bolster, substantially as hereinafter set forth.

The invention consists, further, in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional elevation taken longitudinally of the car on line 1 of Fig. 2 and showing one end looking in the direction of the arrow; Fig. 2, a cross-sectional elevation of a portion of the car, taken on the irregular line 2 of Fig. 1 looking in the direction of the arrow; Fig. 3, an enlarged cross-sectional detail taken on line 3 of Fig. 1 looking in the direction of the arrow; Fig. 4, an enlarged sectional longitudinal elevation taken on line 4 of Fig. 2 looking in the direction of the arrow. Fig. 5, an enlarged detail of a portion of the mechanism; Fig. 6, a sectional detail taken on line 6 of Fig. 5; Fig. 7, a plan view of one end of the car looking at it from above and showing the foldable end doors in their closed position, and Fig. 8 a similar view showing 70 the foldable end boards in their open position.

In illustrating and describing these improvements we have only illustrated and described that which we consider to be new, taken in connection with so much that is old 75 as will properly disclose the invention to others and enable those skilled in the art to practice the same, leaving out of consideration other and well-known mechanisms, which if shown and described herein would only tend 80 to confusion, prolixity, and ambiguity.

In the art to which this invention relates it is well known that cars of this type have to be capable of withstanding the shocks incident to ordinary use and of distributing the strains and stress developed during such use to each and every part of the car, so that they may be absorbed and the danger from such strains thus minimized. The principal object of this invention, therefore, is to provide 90 a freight-car having the above-named advantages, all of which will more fully hereinafter appear.

In constructing a car in accordance with



these improvements a frame portion is provided having three center sills *a*, *b*, and *c*, longitudinally disposed of the car from end to end thereof, or, in other words, from one end sill *d* at one end of the car to a similar end sill at the other end. In this kind of a car all of the usual intermediate and side sills are thus dispensed with, as will more fully hereinafter appear.

In order to dispense with the usual intermediate and side sills, we provide a body-bolster made in two sections—a continuous main body section and discontinuous subsection—arranged one at each end of the car and transversely disposed. These body-bolsters are built and so connected each with the other and with the other mechanisms which go to form the car that they operate on the cantaliver principle, balancing the load upon the center bearings of the car. To construct such bolster mechanism, a main body-bolster is provided, arranged below the longitudinal center sills, attached to and transversely of the same, as shown particularly in Figs. 1 and 2, and formed of two substantial channel-sections *e* and *f*, (see Fig. 4,) composed of plates longitudinally disposed and upper and lower angle members tied together at their upper parts or portions by means of a plate *g* and at their lower portions by means of a plate *h*, which is provided with the usual center bearing *i*. This main body-bolster extends outwardly from the center of the car and slightly beyond the ordinary side bearings *j*. As above suggested, this main body-bolster is arranged below the longitudinal center sills and securely bolted thereto by means of the bolts *k*, which are passed down through the center sills and the tie-plate *g*, as shown particularly in Fig. 1. To complete the supporting of the structure upon the main body-bolster, a discontinuous sub body-bolster is provided, arranged above the main body-bolster in line therewith and secured to its upper portion by any desired means, preferably by means of rivets and straps *l* at or near each end and between the same and the ordinary floor-level of the car, as shown particularly in Fig. 1. This sub-bolster, as above suggested, is made discontinuous—that is, in two parts extending out radially from each side of the center sills—and is formed of two metal channel members *m*, riveted, as shown in Fig. 4, to the upper angle-irons of the main body-bolster, and fills the space or spaces between the main body-bolster and the ordinary floor-level of the car. The superstructure or body portion of the car is supported upon these body-bolsters, and ordinarily when the car is provided with a load the tendency would be to depress the outer ends of the subbody-bolsters and disrupt the connection between the inner ends of the same and the central portions of the main body-bolsters unless other mechan-

isms be provided. In order to overcome such objectionable feature, we provide a pair of truss-rods *n*, which extend from end to end of the car, as shown particularly in Fig. 4 and also in Fig. 1—that is, through each end sill, to which they are bolted outside the dead block *o* and then passed inwardly and over the grooved blocks *p*, arranged on the inner upper edges of the subbody-bolster, then downwardly and underneath the car-frame, as is usual. These truss-rods, as is well known, will assist in holding up a certain proportion of the load, so that when the car is loaded the proper proportion of the load will be placed on the inner ends of these subbolsters as well as on the outer ends, thus tending to preserve rather than destroy the connection between the different parts of the bolster. To further effect the cantaliver feature of this bolster mechanism, a second pair of truss-rods *q* is provided, arranged longitudinally of the car, exactly as shown in Fig. 1, and passed inwardly and through the dead block and end sills up and over the central portion of the main body-bolster in the spaces between the three center sills, then downward and underneath the car, as is usual where longitudinal truss-rods are employed. A pair of truss-rod saddles *r* is used, resting upon the main body-bolster at or near its central portion, upon which this second set of longitudinal truss-rods is supported, so that the part of the load which these truss-rods carries will also be placed upon this main body-bolster, thus dispensing with the usual side and intermediate sills.

To provide for economical and efficient draft-timbers, a pair of discontinuous draft-timbers, formed in two sections *t* and *t'*, is provided and extend from a point at or near each end of the car backwardly to the main body-bolster, which interrupts the same, and thence from the inner side of the main body-bolster to a point slightly in the rear thereof. These draft-timbers are secured to the undersills by means of a plurality of bolts *u* and to each other and the main body-bolster by a pair of U-shaped straps *v*. (Shown particularly in Figs. 1 and 2.) These U-shaped straps not only act to secure the different pairs of discontinuous draft-timbers to each other and to the main body-bolster by means of the bolts *w*, but also serve to distribute the shocks and strains incident to the pulling and buffing of the car to and through the main body-bolster to the different elements or members of the car. To prevent any shearing action on the bolts on account of any movement between the draft-timbers and longitudinal sills, key-and-groove mechanism *x* is provided and interposed between such draft-timbers and the lower portions of the longitudinal sills, as shown particularly in Fig. 1.



In order to complete a car of this class and provide for the carrying of the desired freights therein, the longitudinal center portions above the center sills is provided with a continuous **A**-shaped cap portion 10, extending substantially from end to end of the car—that is, substantially from one end board to the other and in substantially the same continuous angles or planes. This **A**-shaped cap portion is formed of a plurality of longitudinally-disposed boards or members as distinguished from the usual construction, which is formed of a plurality of radially or transversely arranged members, and is spaced the correct distance above the center sills and held in position by means of a plurality of **A**-shaped nailing-strips 11, which not only act as nailing-strips to hold the longitudinal members of the **A**-shaped cap in position, but also as stiffeners and spacing-pieces for the longitudinal center sills, as shown particularly in Fig. 3.

A dumping-bottom portion is formed of a plurality of swinging doors 12, arranged at each side of the longitudinal center sills and pivoted thereto in any desired manner with their free ends extending out to a point at or near the outer sides of the car, so that they may drop downwardly and inwardly from the same to an angle substantially coincident with the angle of the **A**-shaped cap, thereby dumping material which may be in the car to either or both sides of the railway-track. Rock-shaft and chain mechanism 13 and 14, respectively, are used and connected with the dumping-doors, as shown particularly in Fig. 2, for the purpose of closing and opening the same, as is usual in this type of cars.

In order to provide for a gondola car for the carrying of coal or similar freight or a car having side boards and open ends for the carrying of long timbers—such as telegraph-poles, railway-rails, and the like—vertical side boards 15 are provided and secured to the supporting-framework of the car by means of the posts 16, which are arranged on the inner side thereof and held in position by means of the straps 17, which are provided at one of their free inner ends with tie-bolts 18, as shown particularly in Fig. 2. These straps are passed upwardly and over the side posts, thence down on the outside of the side boards, where they are divided, the discontinuous section 19 being passed down and secured to the end of the body-bolster, as shown. The adjacent ends of the discontinuous sections of the strap are flanged, as shown at 20 in Fig. 2, and tied together by means of short tie-bolts 21. It will therefore be seen that these straps can be tightened whenever necessary or desirable to stiffen the side posts and boards.

To provide for the carrying of long articles, such as telegraph-poles and the like, the dumping-doors are swung upwardly to their

closed position, as shown in Figs. 2 and 7, so as to form a flat-bottom gondola car, and foldable end-boards made in two swinging sections 22 and 23 are provided, which swinging sections are hinged to the side posts arranged at or near each end of the car, so that they may be folded inwardly against the sides of the car to provide for an open-ended car or folded outwardly to engage with each other and form a gondola car. To provide stop mechanism for these foldable end-boards and prevent their being opened outwardly, as well as to assist in carrying any load therein, we make a **Z**-shaped bar 24 and arrange it transversely of the car, just inside the end sill, where it follows the contour of such end sill and **A**-shaped section, which is also the contour of the lower portion of the door. One flange of this metal **Z**-bar extends downwardly and inside of the end sill and downwardly and inside of the end piece 25, arranged to close the ends of the **A**-shaped caps. The web portion of such bar **Z** is laid on the upper surface of such end sills and parts 25, while the upwardly-extending flange is in position to be contacted by the lower edges of the foldable end-boards, which are provided with an angle-bar 26, arranged to contact the same, thereby providing an effectual stop, as well as a seal. The vertical meeting edges of the foldable boards are also provided with angle-bars preferably made **Z**-shaped in cross-section, as shown particularly in Figs. 7 and 8. One of the foldable boards, particularly 23, has its upper and lower portions provided with sections of this **Z**-shaped bar 26, while the other board is simply provided with wear-plates 27, adapted to contact the same. It will therefore be seen that the end-board 23 must be first closed before the door 22 can be closed. In order to hold and lock such doors in their closed position, they are provided with a plurality of straps 28, in which a sliding bar 29 is movably mounted, which may be passed through both of them, as in the figures mentioned, and thereby lock and hold the doors in position to carry the desired load.

We claim—

1. In a car of the class described, the combination of a supporting-frame portion provided with center sills, a body-bolster for each end of the car arranged underneath the center sills and extending transversely of the same, discontinuous subbolsters arranged between the body-bolster and the floor-level of the car and extending out from each side of the center sills, and truss-rods extending from end to end of the car and passed over the inner ends of the sub body-bolsters, substantially as described.

2. In a car of the class described, the combination of a supporting-frame provided with a plurality of center sills extending longitudinally of the car, a body-bolster for each end of the car arranged below such center sills and



extending transversely of the same, sub body-bolsters arranged between the body-bolster and the floor-level of the car and extending outwardly from each side of the center sills, a pair of truss-rods extending from end to end of the car and passed over the inner ends of the sub body-bolsters, second truss mechanism extending from end to end of the car and over the central portion of the main body-bolster, and truss-rod saddle or strut mechanism interposed between the secondary truss-rod mechanism and the body-bolster, substantially as described.

3. In a car of the class described, the combination of a supporting-framework having a plurality of longitudinal sills arranged only at or near the longitudinal center of the car, a main body-bolster arranged beneath the car secured thereto and transversely of the same and slightly beyond the usual side bearings, sub body-bolsters secured to and above the main body-bolster and between it and the ordinary floor-level and extending outwardly from each side of the longitudinal center sills to a point or points at or near the outer sides of the car, and truss-rod mechanism extending from end to end of the car over and on such bolster mechanism, substantially as described.

4. In a car of the class described, the combination of a supporting-framework having a plurality of longitudinally-arranged center sills extending substantially from end to end of the car, a main body-bolster arranged underneath secured to and transversely of the center sills, sub body-bolsters arranged above and secured to the main body-bolster filling the space between the same and the ordinary floor-level of the car and extending outwardly from each side of the center sills, truss-rod mechanism extending from end to end of the car and passing over the inner ends of the sub body-bolsters, discontinuous draft members extending from each end of the car to a point or points inside of the main body-bolster and secured to the lower sides of the center sills, bolt mechanism for securing such draft sills or timbers to the center sills, and U-shaped metal straps securing the different sections of the discontinuous draft members to each other and to the main body-bolster, substantially as described.

5. In a car of the class described, the combination of a supporting-frame having a plurality of longitudinally-arranged center sills extending substantially from end to end of the car, a body-bolster arranged at or near each end of the car underneath attached to and transversely of the center sills and extending to points slightly beyond the usual side bearings thereof, discontinuous sub body-bolsters arranged above and secured to the main body-bolster to fill the space between it and the ordinary floor-level and extending outwardly from each side of the center sills,

truss-rod mechanism extending from end to end of the car over and supported on the inner ends of the sub body-bolsters, secondary truss-rod mechanism extending from end to end of the car between the center sills over and supported on the main body-bolster, a pair of discontinuous draft members secured to the center sills extending from each end of the car inwardly to a point inside the main body-bolster, bolt mechanism for securing the draft members to the center sills, a pair of U-shaped straps for securing each pair of the discontinuous draft-timbers to each other and to the main body-bolsters, and key-and-groove mechanism interposed between the draft-timbers and the center sills to prevent shearing action on the securing-bolt mechanism, substantially as described.

6. In a car of the class described, the combination of a supporting-framework provided with end sills, a pair of side-boards extending upwardly and vertically therefrom, a continuous A-shaped central cap portion extending longitudinally of the car from the end sill at one end of the car to the end sill at the other end of the car and at the longitudinal center thereof, a drop-bottom dumping portion formed of a plurality of dumping-door sections arranged in a flat plane pivoted at their inner ends with their free edges at or near the outer side of the car and adapted to drop downwardly and inwardly, end-boards formed of a pair of swinging sections pivotally secured to the side-boards at each end of the car and adapted to fold inwardly against the side-boards of the car, and means for locking such swinging end-boards in position, substantially as described.

7. In a car of the class described, the combination of a supporting-frame portion provided with vertical side-boards, a plurality of side posts arranged inside of the vertical side-boards secured thereto and to the supporting-framework, a continuous A-shaped central cap portion extending longitudinally of the car from end to end and at or near the longitudinal center thereof, a stop for the end-boards formed of a Z-shaped metal bar arranged at or near the floor-level at each end of the car transversely of the same with one flange extending downwardly below such floor-level and the outer flange extending upwardly above the same, end-boards made in foldable sections pivotally secured to the end posts of the car and arranged when in their closed position to abut against the upwardly-extending flange of the Z-bar and adapted to be folded backwardly against the side posts of the car, and means for locking the foldable end-boards in closed position, substantially as described.

8. In a car of the class described, the combination of a supporting-framework provided with a plurality of center sills extending substantially from end to end of the car,



a main body-bolster arranged below attached to and transversely of the center sills and extending to points slightly beyond the usual side bearings, discontinuous sub body-bolsters secured to and filling the space above the main body-bolster and the ordinary floor-level and extending outwardly from each side of the center sills, truss-rod mechanism extending from end to end of the car passed above and supported on the inner ends of the sub body-bolsters and the central portion of the main body-bolsters to assist such parts in their operations, a central A-shaped cap portion arranged over the center sills and formed of a plurality of members longitudinally disposed, a plurality of interposed A-shaped spacing and stiffening pieces arranged between the longitudinally - disposed A-shaped portion and the center sills to which they are attached, vertical side-boards attached to the framework of the car and extending upwardly therefrom, side posts arranged inside the side-boards attached thereto and to the supporting-framework, foldable end-boards attached to the side posts at or near each end of the car and adapted to be folded backwardly and outwardly against the side posts, and means for locking and holding such foldable end-boards together in their closed position, substantially as described.

9. In a car of the class described, the combination of a supporting-frame portion provided with center sills, a body-bolster for each end of the car arranged underneath the center sills and extending transversely of the same, and subbolsters arranged between the body-bolster and the floor-level of the car and extending out from each side of the center sills.

10. In a car of the class described, the combination of a supporting-frame portion provided with center sills, a body-bolster for each end of the car having a lower main bolster member extending underneath the cen-

ter sills and upper subbolster members secured to such lower main bolster member and extending transversely of the car, side frames mounted upon the outer end portions of such subbolster members of the body-bolster, and end frames extending from side frame to side frame.

11. In a car of the class described, the combination of a supporting-frame portion provided with center sills, a body-bolster for each end of the car having a lower main bolster member extending underneath the center sills and upper bolster members secured to such lower main bolster member and extending upward to the floor and transversely of the car, and side frames provided with side sills mounted upon and entirely above the upper bolster members of such body-bolsters.

12. In a car of the class described, the combination of a supporting-frame portion provided with center sills, a body-bolster for each end of the car having a lower main bolster member extending underneath the center sills and upper bolster members secured to such lower main bolster member and extending upward to the floor and transversely of the car, side frames mounted upon such upper bolster members, end frames extending from side frame to side frame, a cap extending longitudinally of the car from end to end thereof having inclined side portions, and dumping-doors extending transversely of the car from the inclined side portions of such cap.

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