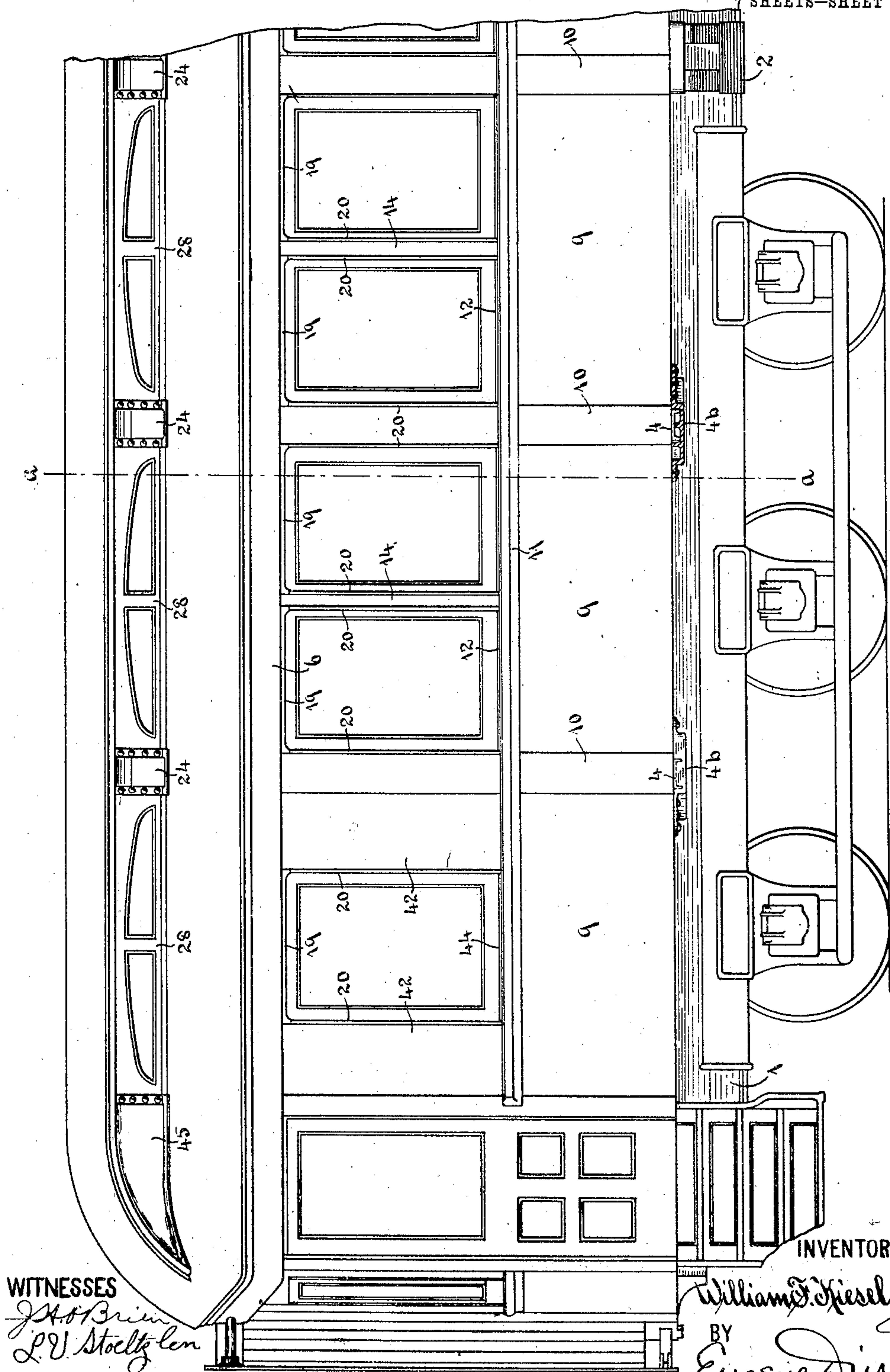


No. 842,889.

PATENTED FEB. 5, 1907.

W. F. KIESEL, JR.  
RAILWAY CAR FRAME.  
APPLICATION FILED MAR. 6, 1906.

7 SHEETS—SHEET 1.



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7 SHEETS—SHEET 2.

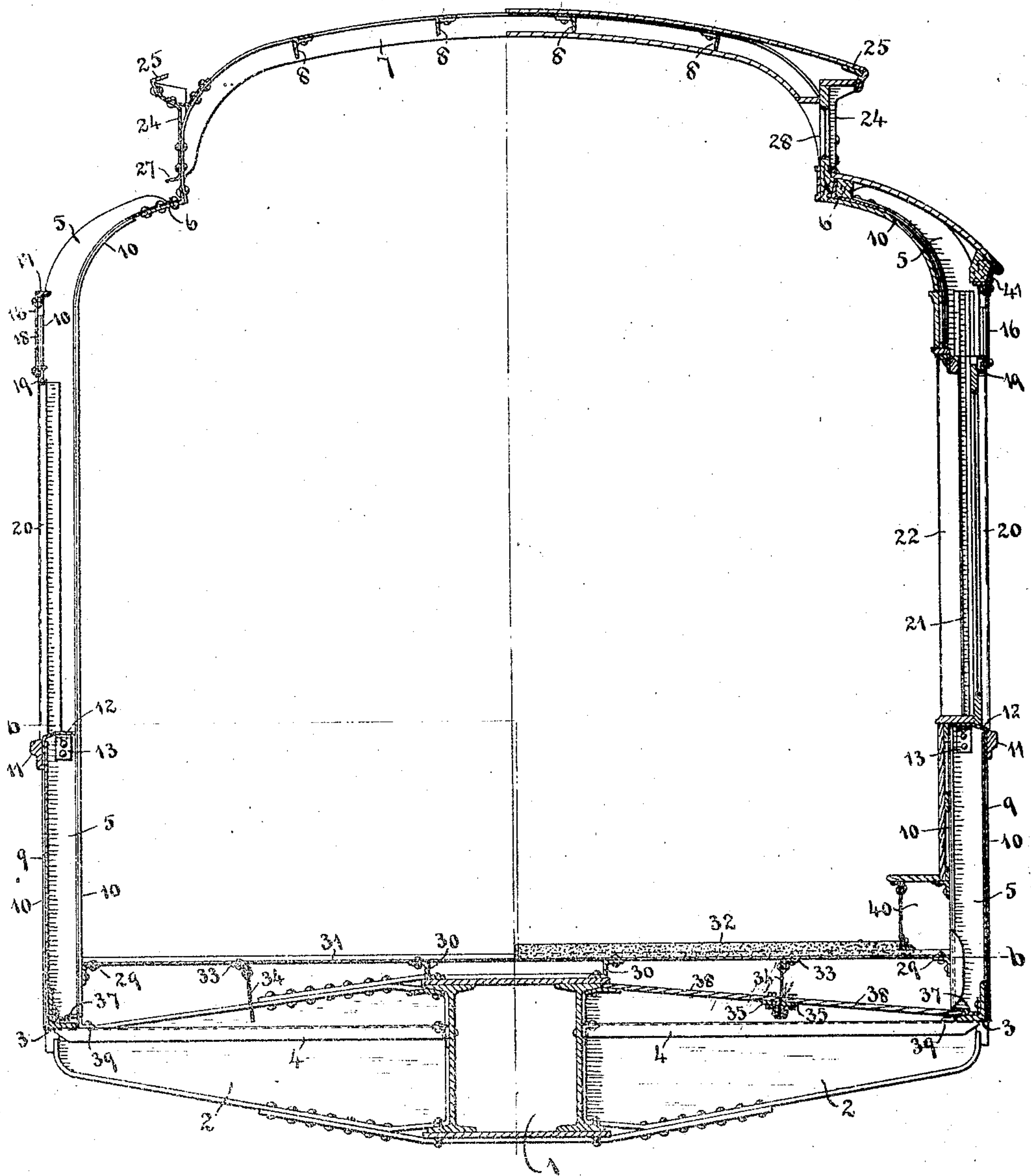


Fig. 2.

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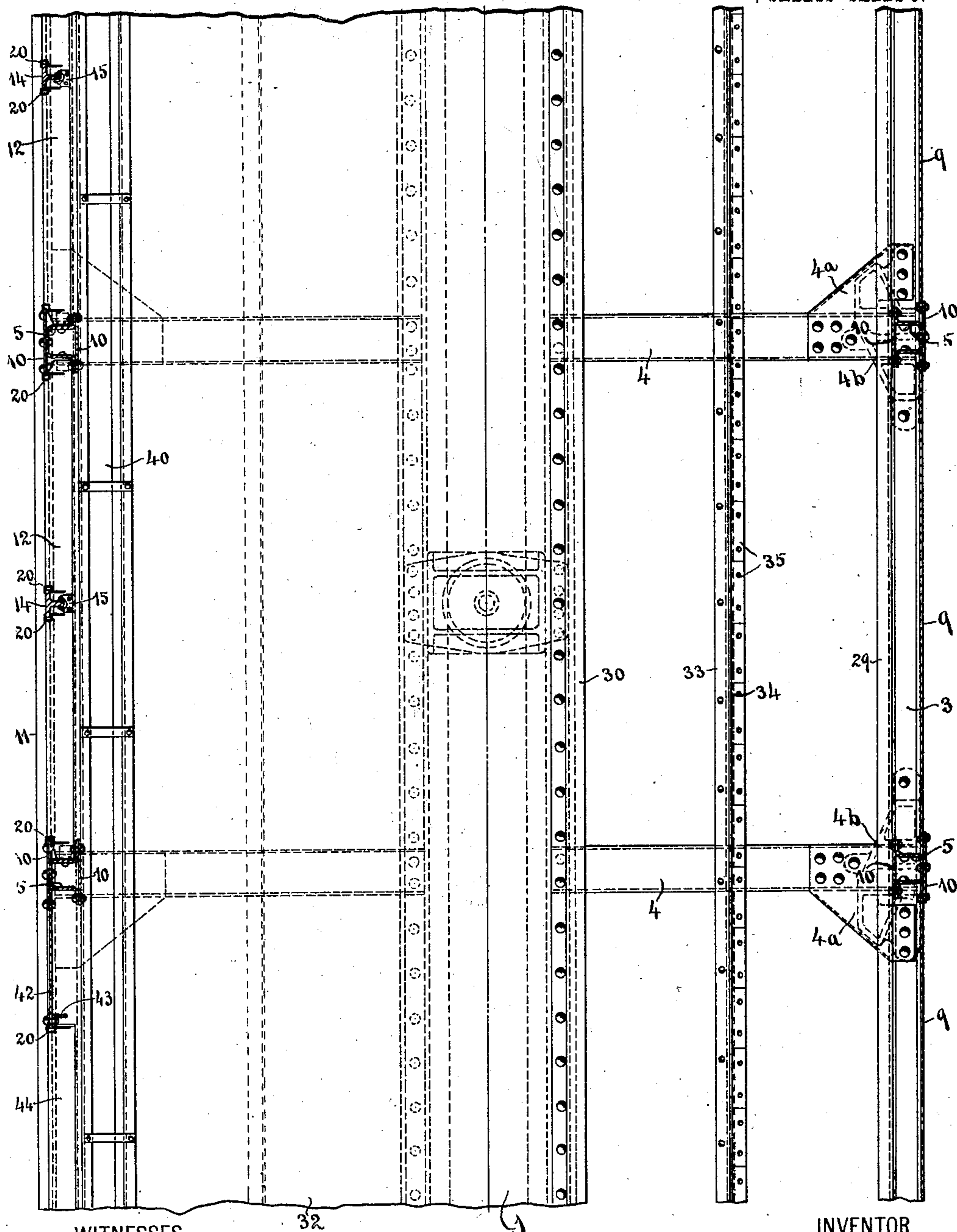
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7 SHEETS—SHEET 3.



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7 SHEETS—SHEET 4.

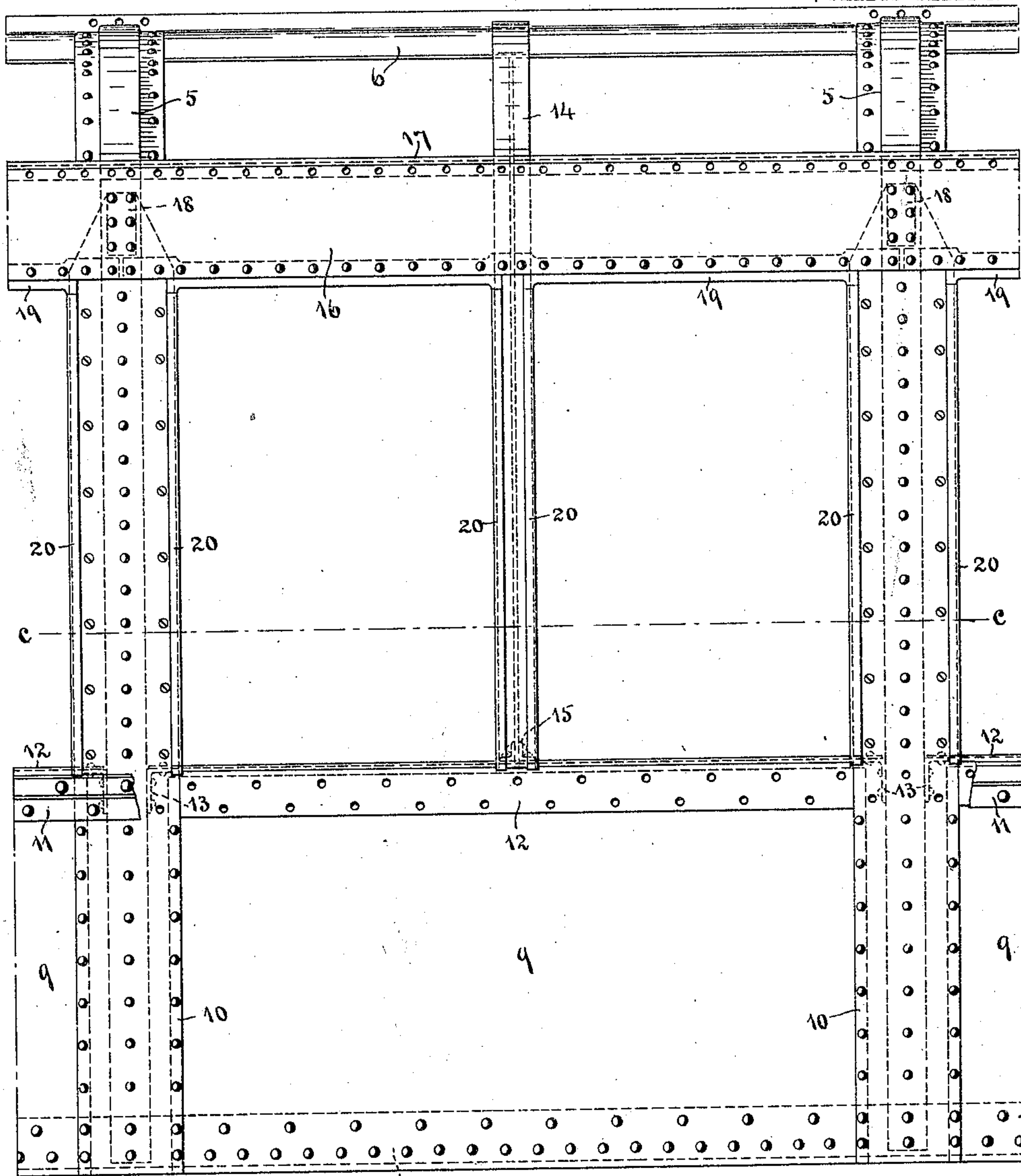


Fig. 4.

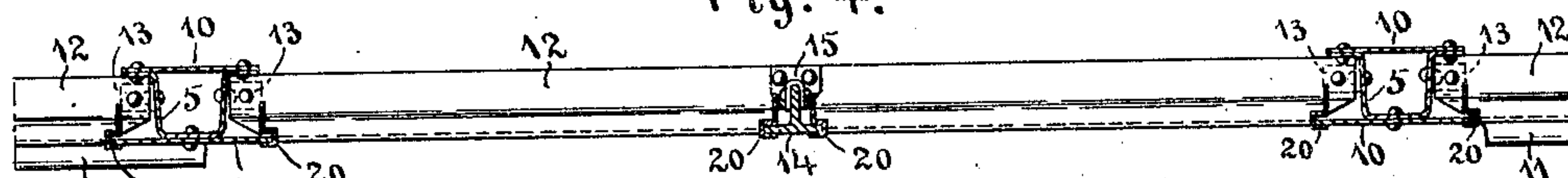


Fig. 5.

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7 SHEETS—SHEET 5.

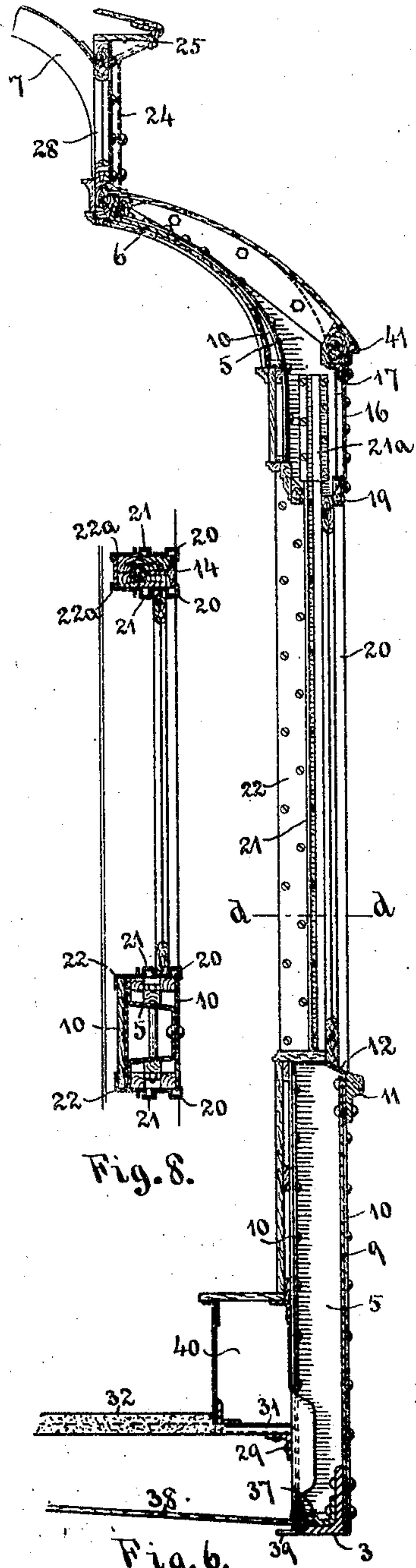


Fig. 8.

WITNESSES:

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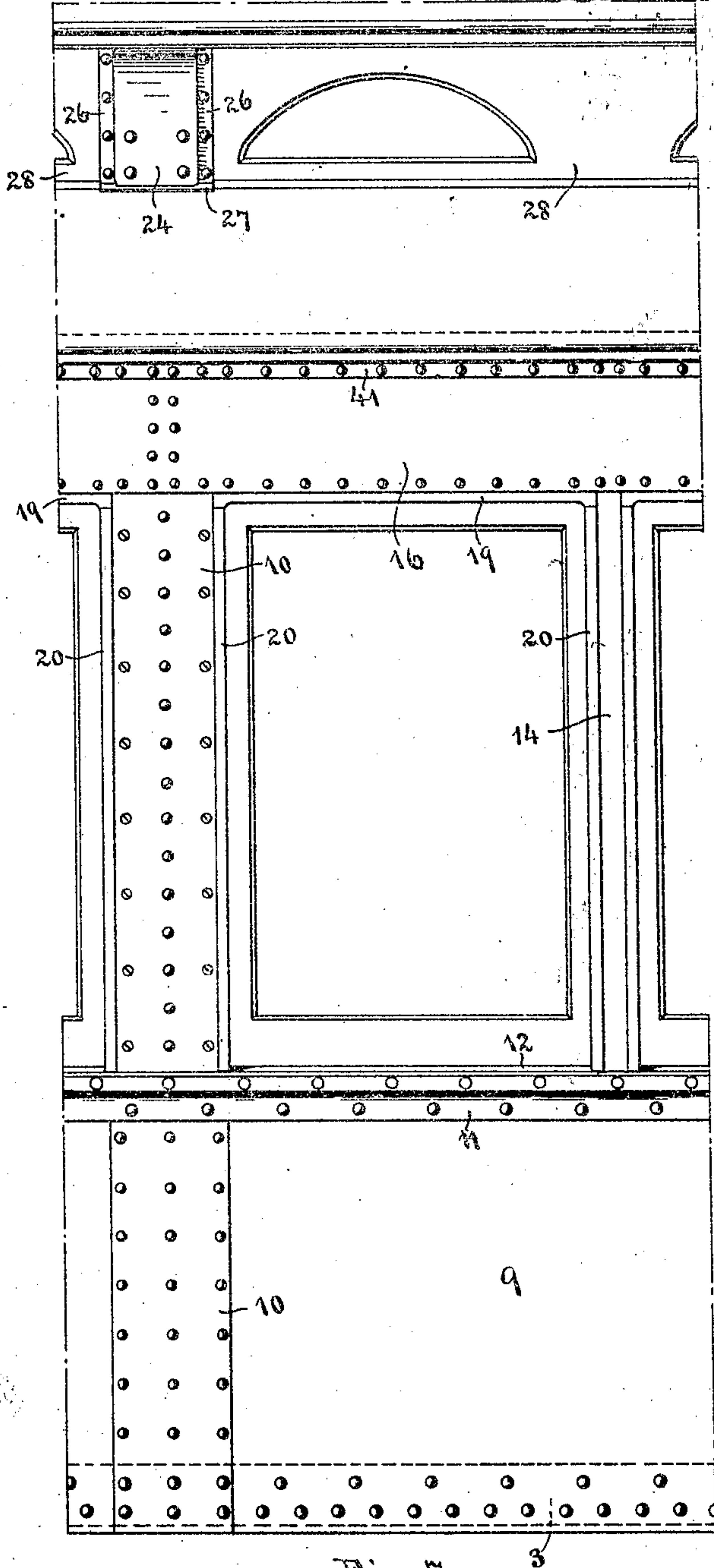


Fig. 7.

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7 SHEETS—SHEET 6.

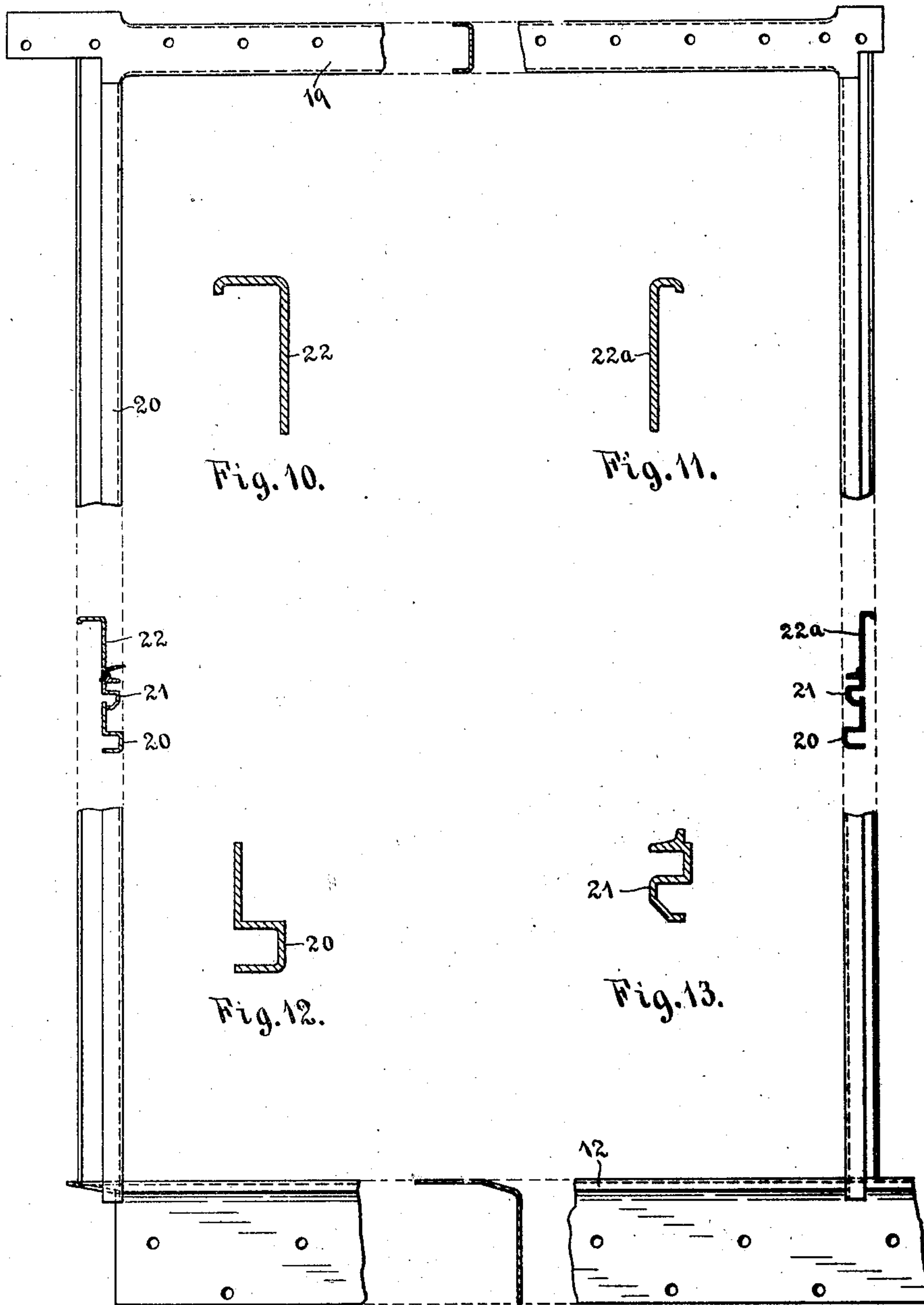


Fig. 9.

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7 SHEETS—SHEET 7.

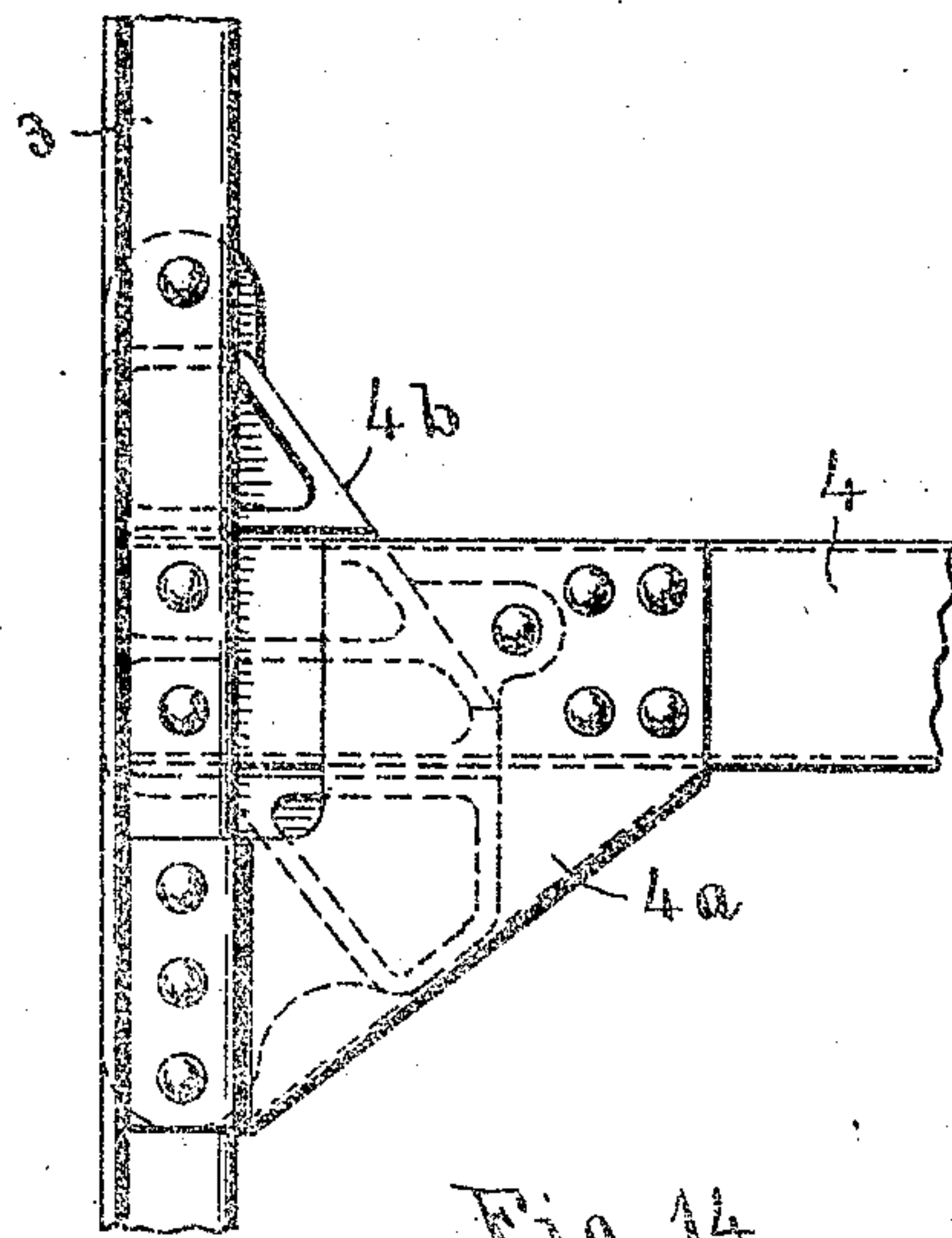


Fig. 14.

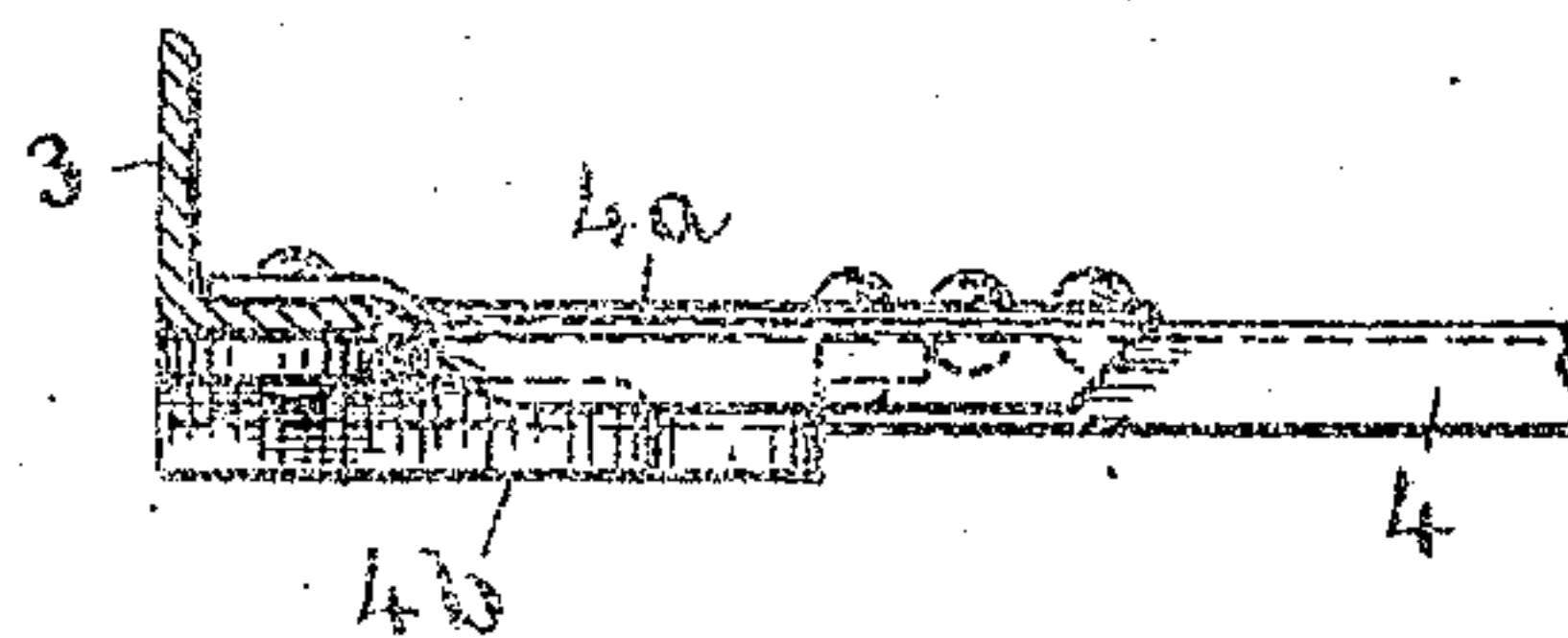


Fig. 15.

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# UNITED STATES PATENT OFFICE.

WILLIAM F. KIESEL, JR., OF ALTOONA, PENNSYLVANIA.

## RAILWAY-CAR FRAME.

No. 842,889.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed March 6, 1906. Serial No. 304,534.

*To all whom it may concern:*

Be it known that I, WILLIAM F. KIESEL, Jr., a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Car Frames, of which the following is a specification.

This invention relates to improvements in steel railway-cars of the passenger type, and has to do more particularly with the construction of the body portion of the cars between the ends, my object being to provide a light, strong, and well-braced framework and outside sheathing for the car-body, giving to the car sides the requisite strength and stiffness where cut out for the continuous window-openings, and to design said framework especially with reference to applying it to an underframe supported by a center sill without the use of body-bolsters, such as described in my Letters Patent, No. 809,921, dated January 9, 1906.

Other features of novelty will be more fully described hereinafter and pointed out particularly in the claims.

I attain my object by constructing and arranging the parts of the car-body and window-framing substantially as illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of a portion of a car embodying my improvements; Fig. 2, a transverse section through the car-body on the line *a a* in Fig. 1 looking to the right; Fig. 3, a longitudinal section through the car-body on line *b b* in Fig. 2; Fig. 4, a side elevation, on a larger scale, of a panel of the car-body between posts, the upper-deck members being omitted; Fig. 5, a longitudinal section on line *c c* in Fig. 4; Fig. 6, a vertical section through one side of the car on the line *a a* in Fig. 1 and drawn to the enlarged scale of Fig. 4; Fig. 7, a side elevation of Fig. 6 showing part of a side panel; Fig. 8, a longitudinal section of the window-framing on line *d d* in Fig. 6; Fig. 9, a detail, on a still larger scale, showing the members of one of the window-frames; Figs. 10 to 13, inclusive, sectional views of the several members of said frame; and Figs. 14 and 15, details showing plan and side views of the side bearings as applied to this car for use in connection with six-wheel trucks, such as described in my Letters Patent No. 796,733, dated August 8, 1905.

Like numerals designate like parts in the several views.

This car-body is designed to be supported upon a steel underframe similar in features of construction to that described in my Letters Patent, No. 809,921, previously referred to, comprising a box-girder center sill extending from end to end of the car with the side sills supported from the box-girder by cross-bearers suitably located at points between the ends and without the employment of body-bolsters. The ends of these cars will be provided with the vestibule construction described in a companion application filed conjointly herewith, the present invention having to do only with the body of the car between the ends. As in said Letters Patent the center sill consists of a pair of I-beams or channels joined at the top and bottom by cover-plates, and from the sides of said center sill at suitable points intermediate the ends to properly support the car-body and transfer the weight thereof to the center sill project cross-bearers 2, upon the outer ends of which rest the side sills 3, preferably of angle-bar form, having their vertical limbs placed outward. Connecting the side sills with the center sill at proper intervals between the cross-bearers and car ends are cross-braces 4, of channel form, with flanges turned downward, the outer ends of said braces being riveted beneath the side sills and the inner ends being attached to the sides of the center sill by suitable angle-plates. The cross-braces at the front and rear of the center-plates will be braced at their outer ends by triangular brace-plates 4<sup>a</sup>, and where six-wheel trucks are used side bearing-castings 4<sup>b</sup> will be attached to the under side of the side sills at these points. (See Figs. 1, 3, 14, and 15.)

From the side sills at the points where the cross-braces and cross-bearers are joined thereto rise the posts 5, dividing the car sides into panels of equal widths. These posts are of pressed steel of U-shaped cross-section, bent inward at the top to form the lower-deck carlines and having outside and inside cover-plates 10 riveted thereto. The inside cover-plates are bent inward at the foot and riveted to the cross-braces and cross-bearers, as shown at 39 in Figs. 2 and 6, while the outside cover-plates are riveted to the vertical limbs of the side sills which they overlap. Joining the free ends of these carline extensions are angle-bars 6, which run continuously through the length of the car, the ends of these angles being riveted in with the vestibule-framework, as described in my



said companion application. These angle-bars are preferably formed with a broad horizontal limb curved to conform with the line of curvature of the lower-deck carlines, thereby providing transverse stiffness in the upper car-frame and a strong longitudinal brace member at each side of the car to withstand end shock and to support the upper-deck structure. Passing across between opposite posts are the upper-deck carlines 7, the ends of said carlines being riveted to the vertical limbs of the angles 6 at points in line with the posts. These carlines are also of pressed steel of U-shaped cross-section, with the flanged sides turned outward and upward. This combined post and carline construction is the same as that described in my Letters Patent No. 809,920, dated January 9, 1906. The upper-deck carlines are connected together throughout the length of the car by longitudinal angle-braces 8, which also form the supports for the upper-deck roof. At the ends of the car these longitudinal braces are brought down by curved angles to the vestibule-ceiling sheet, as described in my said copending application, thereby providing continuous lines of longitudinal brace members between the upper-deck carlines from one extreme end of the car to the other.

The side panels of the car are filled in by sheathing-plates 9, riveted to the side sills 3 at the bottom and at the ends overlapped by and riveted to the outside cover-plates 10, which are riveted to the outside of the posts 5, these outside cover-plates extending up to near the top of the posts, as shown more clearly in Fig. 4. Outside of the outside cover-plates 10 and extending the entire length of the car are belt-rails 11, of rolled steel, and between these belt-rails and the top of the sheathing-plates 9 are riveted the downturned flanges of the window-sill plates 12. These sill-plates 12 are bent into the shape shown in Fig. 9 to form an inclined apron and have the ends of their horizontal flanges riveted to the sides of the posts 5 by means of angle-plates 13, the vertical flanges being cut to fit in between and lie flush with the outside cover-plates 10. The sill-plates are of a length sufficient to take in the width of two windows, and they support at their centers the window-posts 14, which are formed from T-bars, said window-posts rising to the top of the sides of the car and being curved over at the top to form lower-deck carlines, the free ends thereof being riveted to the longitudinal deck-angles 6. The lower ends of these window-posts are secured to the sill-plates 12 by means of socket-pieces 15. Above the window-openings a continuous top side plate 16 extends from end to end at each side of the car, being riveted to the posts 5 and window-posts 14 just below where these posts are bent over to

form the lower-deck carlines. The outside cover-plates 10 pass up inside of these top side plates 16, filling-in plates 18 being employed to fill the space between these plates caused by setting out the top side plates from the cover-plates and window-posts to allow for the insertion therebetween of the ends of the window-frame lintels 19. These lintels 19 are formed from pressed channel-plates with their ends flattened and cut to lap over the cover-plates and window-posts beneath the top side plates. (See Figs. 4 and 9.) The top side plates are thin steel strips, preferably of one-eighth-inch thickness, like the sheathing-plates, and are stiffened along their upper edges by the angles 17, said angles also serving to support the wooden string-pieces, to which the lower-deck roofs are attached.

The window-sash frames consist of outer side plates 20, preferably formed of extruded brass, in the shape shown more clearly in Figs. 9 and 12, the outside flanges thereof overlapping the cover-plates 10 and window-posts 14, and the inside flanges, which are set at right angles to the outside flanges, being secured to wood filling-strips fastened to the sides of the posts 5 and window-posts 14. (See Fig. 8.) The grooves for the window-sash are completed by the middle frame-plates 21, of extruded brass, (see Figs. 9 and 13,) which overlap the inner edges of the plates 20 and have also formed upon them the grooves for the window-shades. The inner edges of these middle plates 21 are rabbeted to overlap the inside frame-plates 22, also of extruded brass, which are flanged at the inside to form the inside finish of the window-casing for the main posts 5, plates 22<sup>a</sup> with narrow flanges being used at the posts 14. The flanges on the frame-plates 22 and 22<sup>a</sup> overlap the edges of the inside panels, which may be of wood, composite board, or metal, (see Fig. 8,) and the plates 21, 22, and 22<sup>a</sup> are secured to the wood filling-strips at the sides of the posts by screws, as shown in Fig. 6, the complete side frames for each window comprising plates 20, 21, and 22 at the main frame-posts on the one side and plates 20, 21, and 22<sup>a</sup> at the window-posts on the other side. The lower ends of the plates 20 are fitted to the incline of the apron on the sill-plate 12. Above the lintels 19 the plates 21 have continuations provided in the form of short plates 21<sup>a</sup>, to provide guideways for the window-sash and window-shades back of the top plate 16, the rollers for the shades being mounted between posts in this space above the plates 21<sup>a</sup>. (See Fig. 6.)

To the sides of each of the carlines are riveted deck-side plates 24, pressed outward at the top to support the longitudinal angles 25, which carry the eaves of the upper-deck roof. The side plates 24 are pressed inward at the sides and provided with flanges 26, to which



are secured the ends of the upper-deck sashes 28. At the bottom the plates 24 are flanged outwardly at 27 to overlap the lower-deck roof and make a weather-tight joint therewith, the upper and lower deck roofs and the interior finish being applied to this metal framework in the manner shown more clearly in Fig. 6. At the ends of the car the upper-deck sash have their outer ends secured to end deck-plates 45, forming part of the vestibule construction.

The floor for this car will consist of corrugated plates 31, resting at the center upon stringers 30, of Z-shaped cross-sections riveted to the top of the center sill along the sides and at the sides upon angle-bars 29, secured to the posts 5. The floor will be finished off by a plastic surface-filling 32. I also provide a subfloor below the main floor with a space between the two floors, which may be either an air-space or filled with mineral wool or other non-conducting material. This subfloor on each side of the center sill consists of two lines of boards 38, the inside ends of which are held between the top cover-plate of the center sill and supporting-plates 36, riveted to the under side of the center-sill flanges, the outside ends resting upon the side sills 3 and being held in place by plates 37, riveted in with the side-sill angles. The intermediate ends of the boards have short angles 35 bolted or riveted thereto, said angles being bolted to the hangers 34 when the boards are set in place. The hanger-plates 34 run longitudinally through the length of the car and are fastened to the corrugated floor-plates by the angles 33, riveted thereto. The plates 34 and angles 33 may be formed in one piece. By this construction the subfloors may be readily put in place or taken down and sections thereof may be easily removed and replaced when required.

At 40 is shown the longitudinal box for the heater-pipes, which is built up from angles attached to the floor-plates 31 and to the posts 5. These radiator-boxes may be connected with the subfloor air-spaces by air-ducts, as indicated in Figs. 2 and 6.

The eaves of the lower-deck roof are formed by extruded-metal strips 41, riveted in with the angles 17 to the top of the side plates 16, this eave-molding being described more fully in my said copending application. At each end of the car, where the toilet-rooms are located, I provide a single window in place of the double windows in the intermediate car-panels. The window-frame for the single window is built up in the same manner as described for the double windows except that the side frame-plates 20 are made to overlap sheathing-plates 42, which fill the spaces between the window-casing and the outside cover-plates 10 on the one side and between the window-casing and the corner-posts on the other side. These filling-in plates 42 are

stiffened at the sides of the window-frames by angles 43, (see Fig. 3,) and a short window-sill 44 is employed in place of the longer sills 12, said sill 44 being similar in cross-section.

The side bearing-plates over the trucks are attached to the under side of the side sills, and where the car is to be carried upon the six-wheel trucks, described in my said Letters Patent No. 796,733, there will be two side bearing-plates at each side positioned over the truck side bearings. These bearing-plates are steel castings in the form shown at 4<sup>b</sup> in Figs. 1, 14, and 15, being cored out and ribbed on the upper side for lightness and strength and having their under faces set in the arc of the circle traversed by the truck-bearings. They are positioned at points immediately below the posts 5 for obvious reasons and are cut out at the top to straddle the ends of the transverse braces 4, being riveted to the side-sill angles and to the transverse braces. The bearings are further braced by the flanged angle-plates 4<sup>a</sup>, which also serve to stiffen the underframe.

The car-body, as above described, is composed of comparatively light thoroughly-braced side frames built up from the side sills and joined together at the top by the carlines, and the windows are so framed in thereby as to avoid any weakness in the side frames, due to their continuous line of openings. The weight of the body is transferred from the side sills directly to the center sill at properly distributed points by way of the cross-bearers, the center sill resting directly upon the trucks without the employment of body-bolsters.

Certain features of the car-body framework herein shown and described will be found more fully described and claimed in a third copending application and are not, therefore, claimed specifically herein.

Having thus described and particularly pointed out the several features of my improved car-body construction, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a car-frame, the combination with the side sills, of posts rising therefrom, top side plates riveted to the posts at their upper ends, sill-plates for the windows extending between and riveted to the sides of the posts, and intermediate window-posts resting upon said sill-plates and riveted at their upper ends to the top side plates.

2. In a car-frame, the combination with the side sills, of posts rising therefrom, top side plates riveted to the posts at their upper ends, sill-plates for the windows extending between and riveted to the sides of the posts, and intermediate window-posts resting upon said sill-plates and riveted at their upper ends to the top side plates, said frame-posts and intermediate window-posts being bent inward at the top to form lower-deck car-lines.



3. In a car-frame, the combination with a series of main frame-posts spaced apart the width of two or more windows, of sill-plates extending between and supported by the posts, and intermediate window-posts rising from and supported by the sill-plates.

4. In a car-frame, the combination with a series of main frame-posts spaced apart the width of two or more windows, of sill-plates extending between and supported by the posts, intermediate window-posts consisting of T-bars rising from said sill-plates with their flanged sides placed outward, and top side plates riveted to the upper ends of all said posts.

5. The intermediate window-posts of T-shaped cross-section bent inward at their upper ends to form lower-deck carlines.

6. In a car-frame, the combination with a series of frame-posts having outside cover-plates riveted thereto, of sill-plates for the windows having horizontal flanges extending between and riveted to the sides of the posts and having vertical flanges extending between and lying flush with the cover-plates, and a belt-rail extending along the car outside the cover-plates and sill-plates and riveted thereto.

7. In a car-frame, the combination with the side sills, of posts rising therefrom, cover-plates on said posts overlapping the side sills at their lower ends, sill-plates for the windows extending between posts and having vertical flanges extending between and lying flush with the cover-plates, sheathing-plates overlapping the side sills at their lower ends and lying inside of and riveted to the cover-plates and window-sill flanges, and top side plates passing along outside the cover-plates at their upper ends and riveted thereto and to the posts.

8. In a car-frame the combination, with posts and a top side plate riveted outside the posts at their upper ends, of channel lintel-plates for the windows having their ends flattened and inserted between the top side plate and the posts, said lintels having their webs riveted to the top side plate.

9. In a car-frame, the combination with posts having outside cover-plates, of sill-plates for the windows supported between posts and having vertical flanges extending between and lying flush with the cover-plates, a top side plate riveted to the posts outside the cover-plates, lintel-plates riveted to the lower edge of the side plate with their ends inserted between the cover-plates and side plate, and side frame-plates for the windows having flanges at the outside overlapping the cover-plates.

10. In a car-frame, the combination with posts having outside cover-plates, of sill-plates for the windows supported between posts and having vertical flanges passing across between the cover-plates, intermedi-

ate window-posts resting upon the sill-plates, a top side plate riveted to the several posts outside the cover-plates, lintel-plates riveted inside the lower edge of the side plate and having their ends extending beyond the window-openings and riveted in between the side plate and the cover-plates and intermediate posts, and side frame-plates for the windows having flanges at the outside overlapping the cover-plates and intermediate posts.

11. In a car-frame, the combination with posts having outside cover-plates, of sill-plates for the windows supported between posts and having vertical flanges lying flush with the cover-plates, T-shaped intermediate posts resting upon the sill-plates with their flanged sides placed outward in line with the cover-plates, window side frame-plates and lintels having their sides and ends overlapping the cover-plates and T-posts, and a top side plate overlapping the lintels.

12. The combination, with a car-frame comprising a center sill, depressed side sills, and posts for the sides rising from the side sills, of a floor resting upon flanged joists riveted to the top of the center sill and to the sides of the posts.

13. The combination, with a car-frame comprising a box-girder center sill, depressed side sills, and posts for the sides rising from the side sills, of floor-joists comprising longitudinal Z-bars riveted to the top of the center sill at each side, and longitudinal bars having flanges on a level with the top of the Z-bars riveted to the posts.

14. The combination, with a car-frame comprising a center sill, side sills, and posts for the sides rising from the side sills, of floor-plates resting upon longitudinal joists attached to the center sill and to the posts, longitudinal hangers depending from the floor-plates between the center sill and side sills, angle-bars secured to the lower edges thereof, and subfloors resting upon said angles and upon longitudinal supports at the center and sides of the car-frame.

15. The combination, with a car-frame comprising a center sill, side sills, and posts for the sides rising from the side sills, of floor-plates resting upon longitudinal joists riveted to the top of the center sill and to the posts, longitudinal hangers depending from the floor-plates between the center sill and side sills, angle-bars removably secured to the lower edges thereof at each side, sub-floor boards having said angles attached thereto at one end, the opposite ends of said boards being inserted in grooves formed upon the center sill and side sills.

16. The combination with a car-frame and transverse floor-plates supported thereby, of supports for a subfloor at the center and sides of the frame, and longitudinal hangers depending from the floor-plates between



center and sides, said hangers having angle-bars removably attached to their lower sides to which the subfloor boards are attached.

17. In a car-frame, the combination with  
5 a center sill, side sills and posts rising from the side sills, of cross-braces extending from the center sill to the side sills at the points of attachment of the posts, and side bearing-plates attached to the side sills and cross-  
10 braces below the posts.

18. In a car-frame supported upon six-wheel trucks, the combination with a center sill, side sills and posts rising from the side sills, of cross-braces extending from the center  
5 sill at each side of the truck center plate to the side sills where the posts are attached thereto, angle-braces between the cross-braces and side sills, and side bearing-plates

riveted in with said angle-braces to the cross-braces and side sills below the posts and having their under faces set in the arc of the  
20 circle traversed by the truck side bearings.

19. The side bearing-plates 4<sup>b</sup> of the frame substantially as herein shown and described.

20. In a car-frame the combination with  
25 the angle-bar side sills and channel cross-braces riveted thereto at their outer ends, of flanged triangular brace-plates riveted to the horizontal limb of the side sills and to the web of the cross-braces.  
30

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

WILLIAM F. KIESEL, JR.

Witnesses:

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J. C. STORM.