

No. 771,428.

PATENTED OCT. 4, 1904.

G. I. KING.

METALLIC PASSENGER CAR.

APPLICATION FILED JUNE 9, 1904.

NO MODEL.

10 SHEETS—SHEET 1.

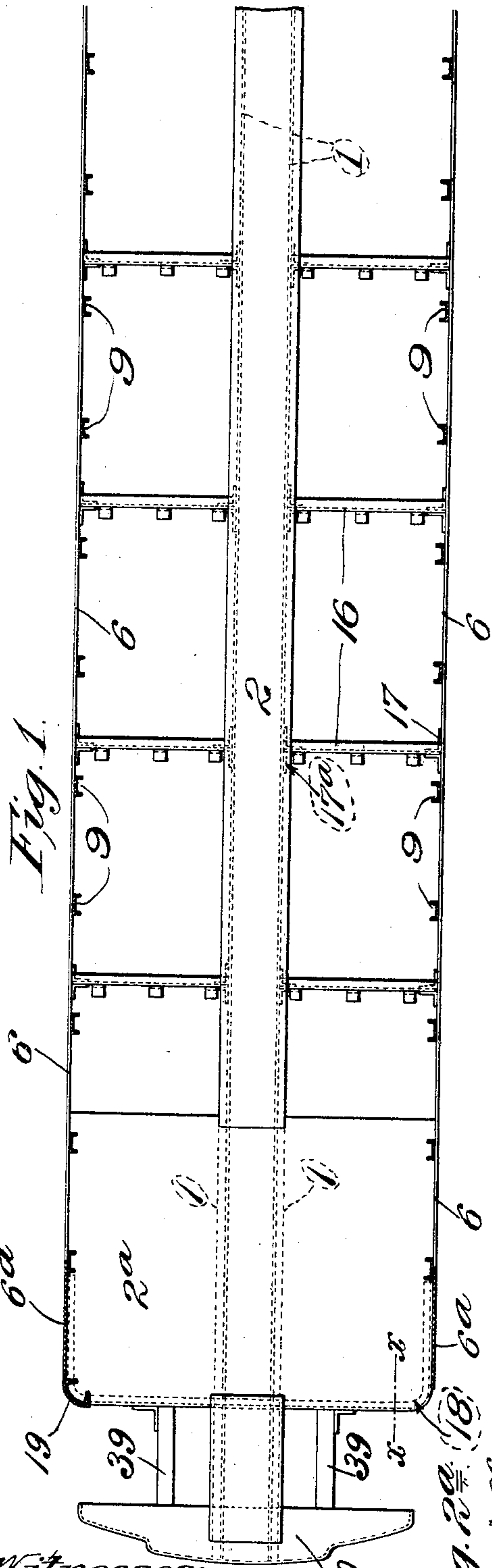
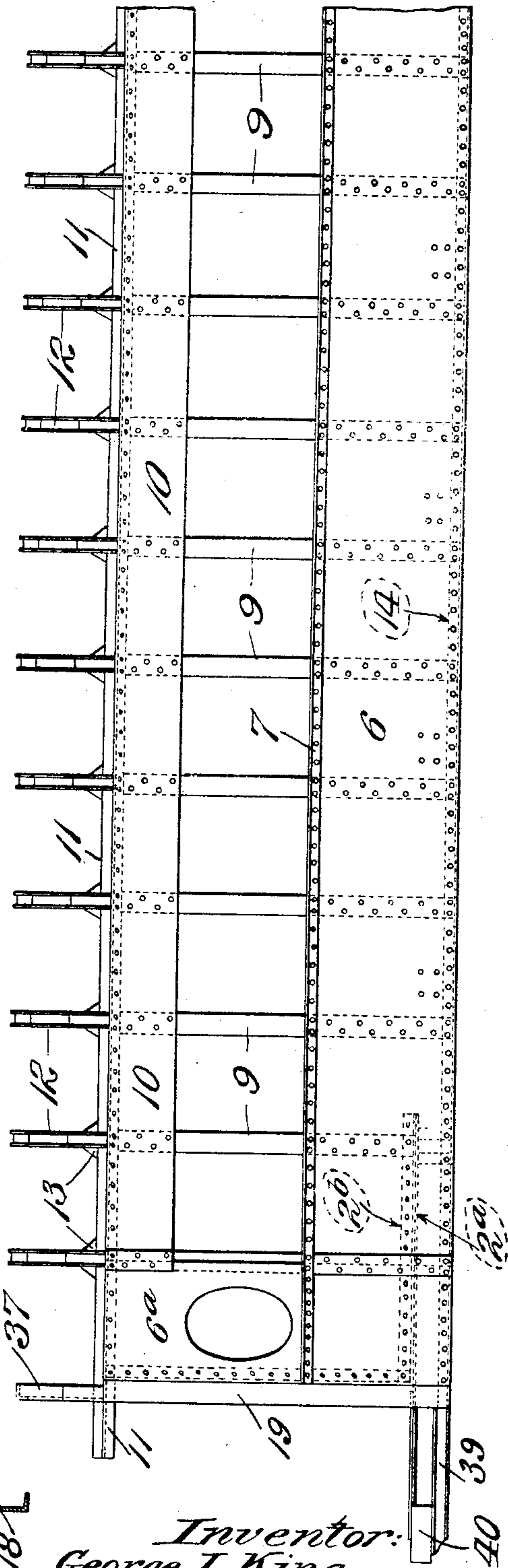


Fig. 1.

Fig. 2.



Witnesses:
G. A. Pennington
Ralph K. Hall

Inventor:
George I. King,
by Bokewell Cornwall
Attys.

No. 771,428.

PATENTED OCT. 4, 1904.

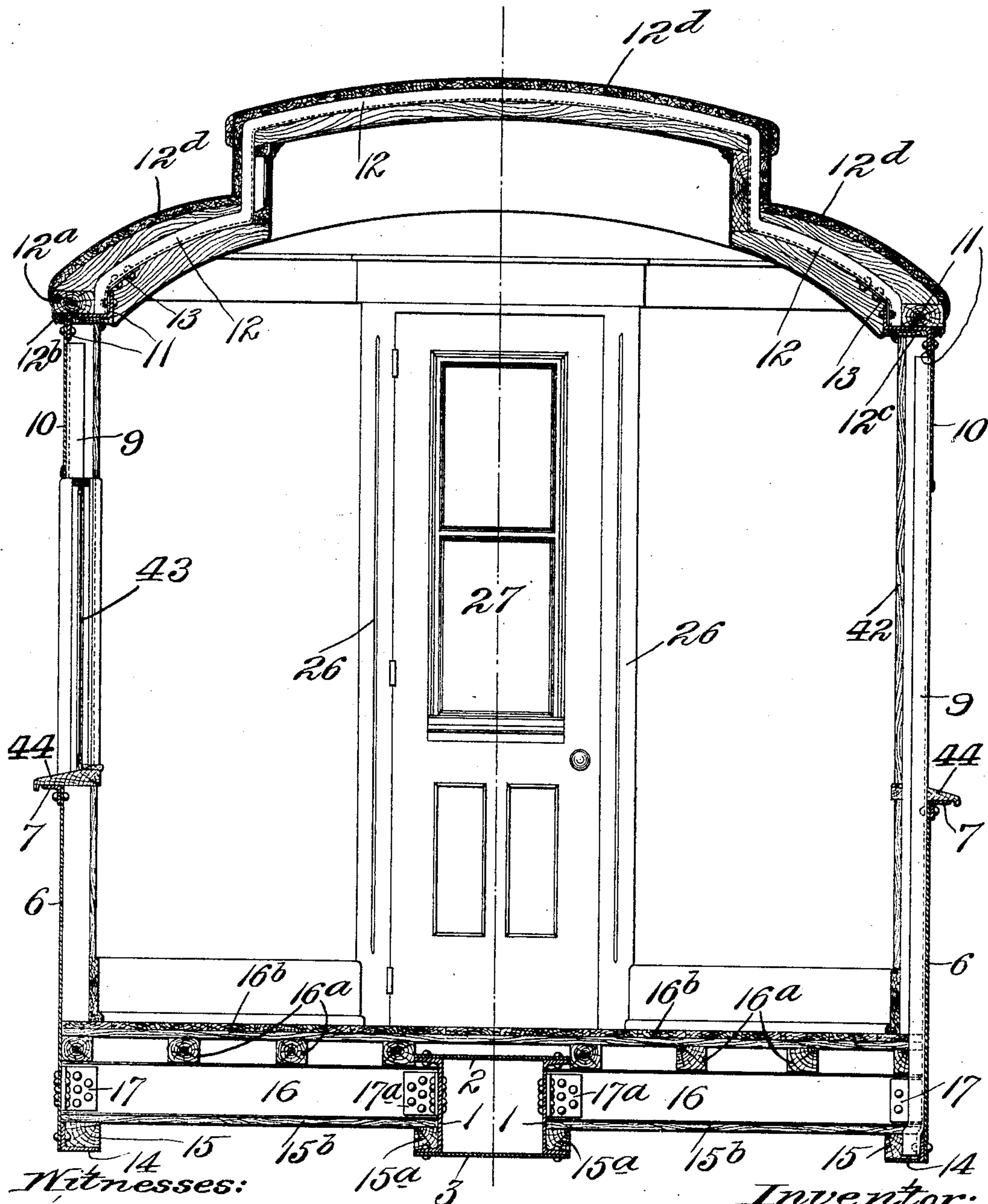
G. I. KING.
METALLIC PASSENGER CAR.

NO MODEL.

APPLICATION FILED JUNE 9, 1904.

10 SHEETS—SHEET 2.

Fig. 3.



Witnesses:

G. W. Pennington
Ralph Halish

Inventor:

George I. King,
by Bakerwell Cornwall
Attys.

No. 771,428.

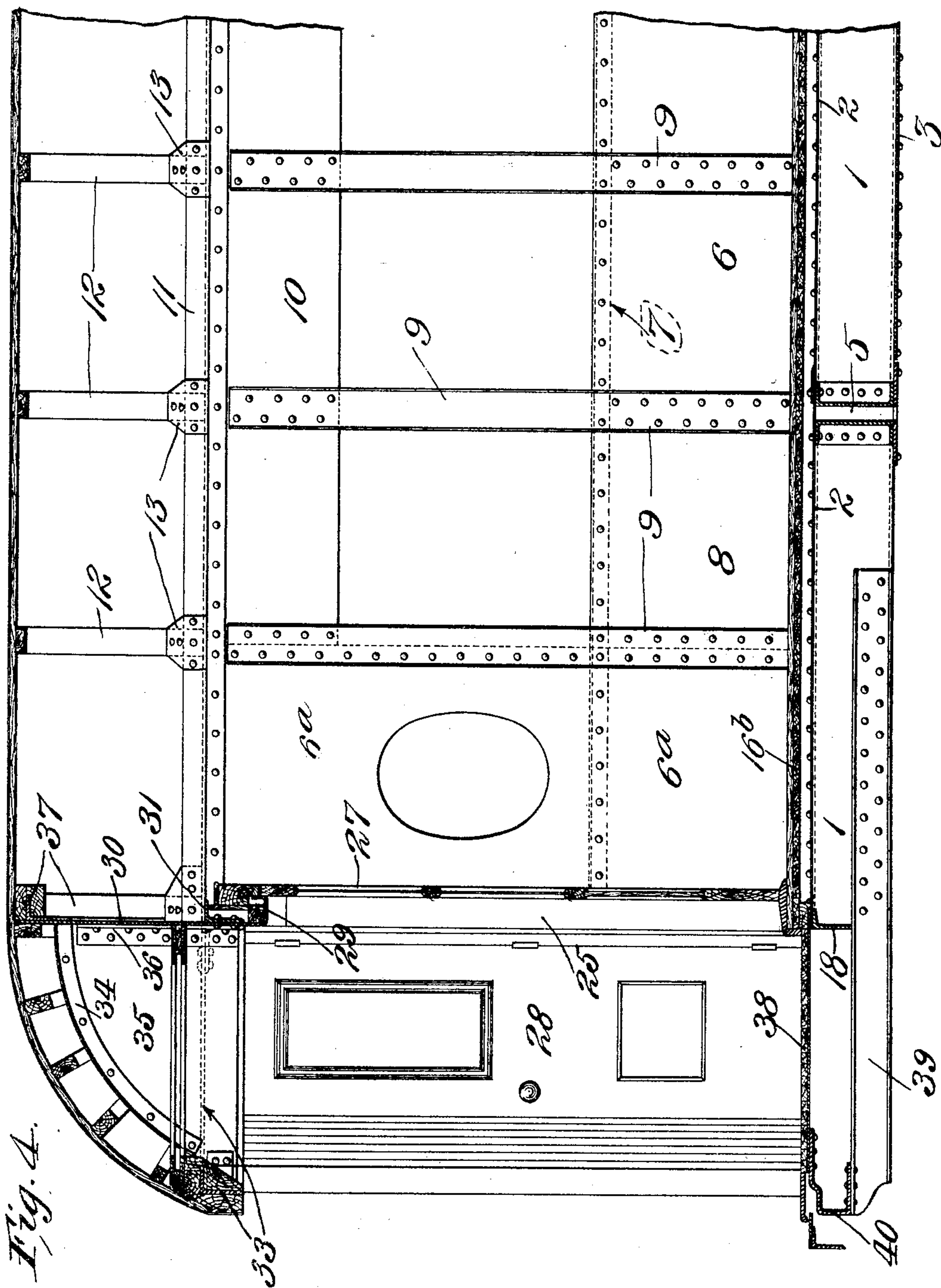
PATENTED OCT. 4, 1904.

G. I. KING.
METALLIC PASSENGER CAR.

NO MODEL.

APPLICATION FILED JUNE 9, 1904.

10 SHEETS—SHEET 3.



Witnesses:

G. W. Pennington
Ralph Kalish

Inventor:
George I. King,

by Bakewell Cornwall
Attys.

No. 771,428.

PATENTED OCT. 4, 1904.

G. I. KING.
METALLIC PASSENGER CAR.

NO MODEL.

APPLICATION FILED JUNE 9, 1904.

10 SHEETS—SHEET 4.

Fig. 5.

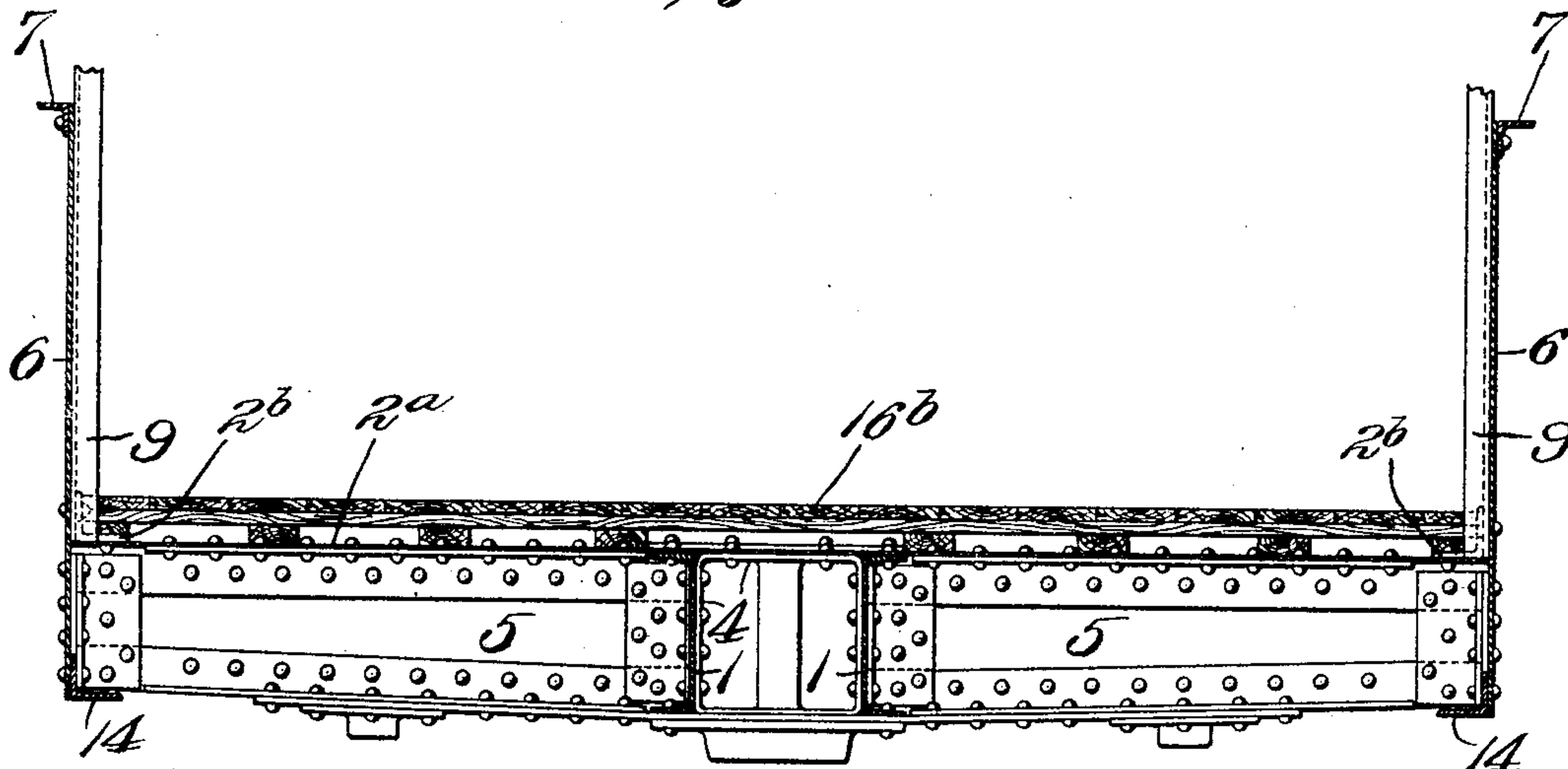
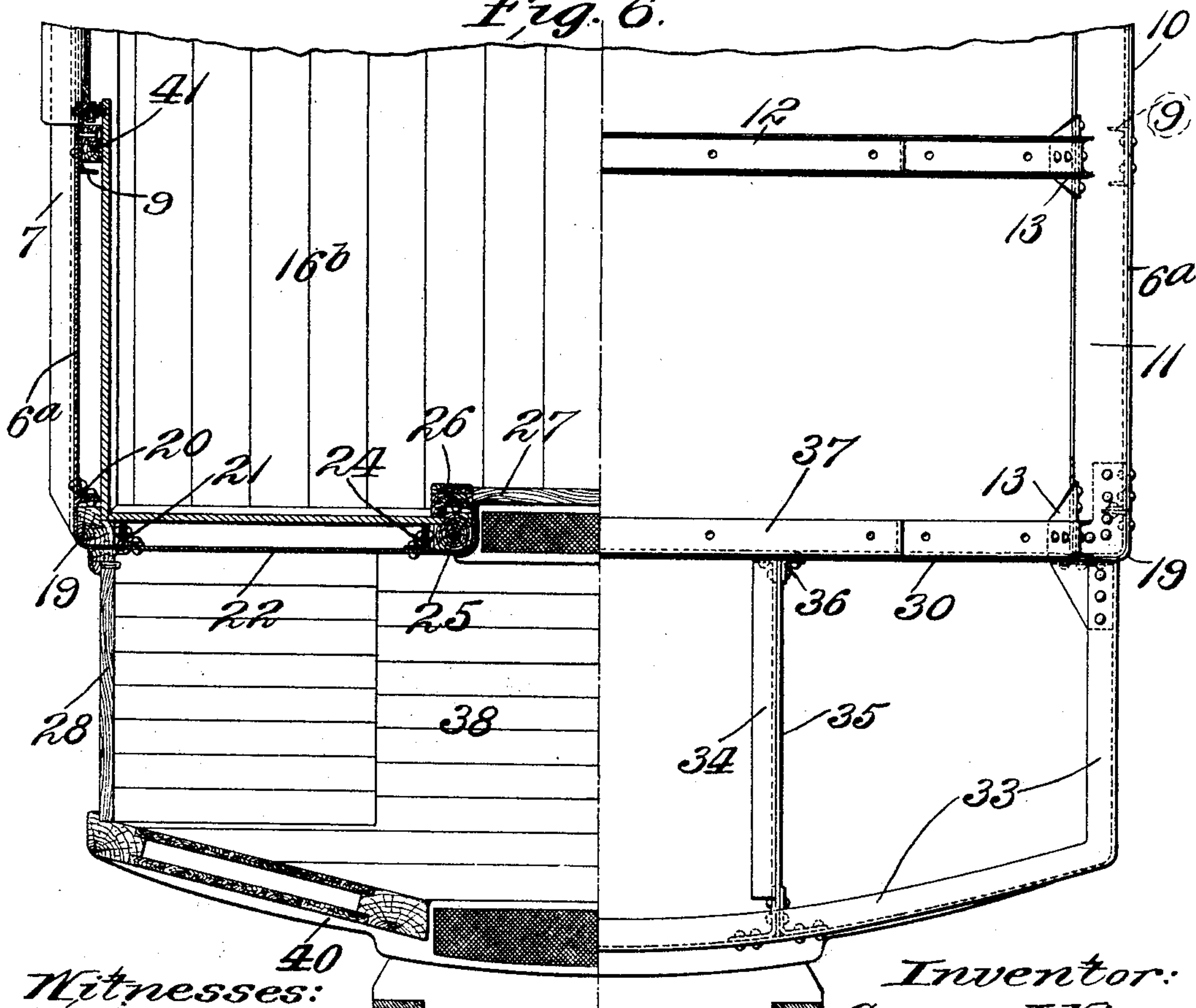


Fig. 6.



Witnesses:

G. A. Pennington
Ralph Kalcik

Inventor:
George I. King,
by Bakewell Cornwall
Attys.

No. 771,428.

PATENTED OCT. 4, 1904.

G. I. KING.

METALLIC PASSENGER CAR.

APPLICATION FILED JUNE 9, 1904.

NO MODEL.

10 SHEETS—SHEET 5.

Fig. 8.

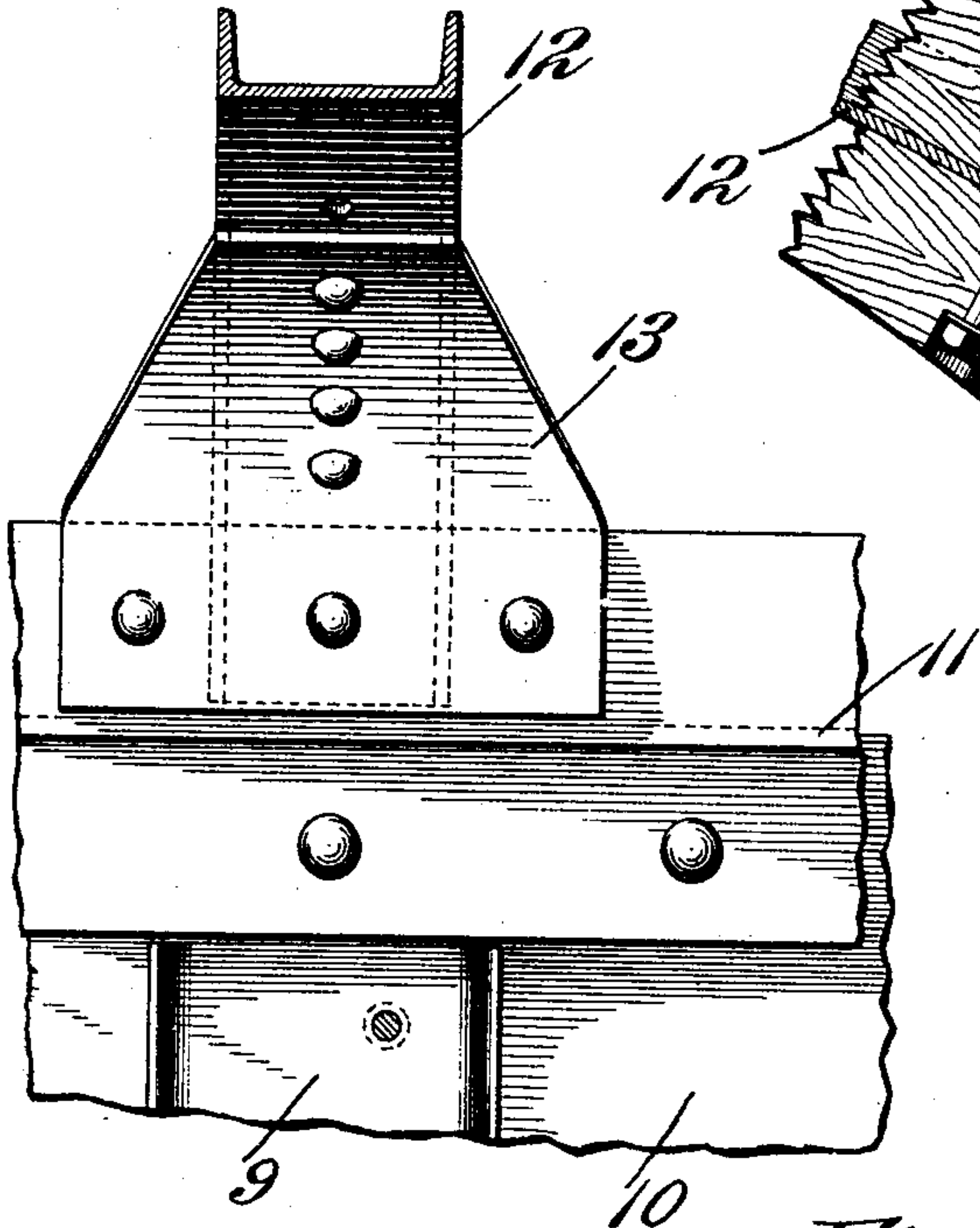


Fig. 7.

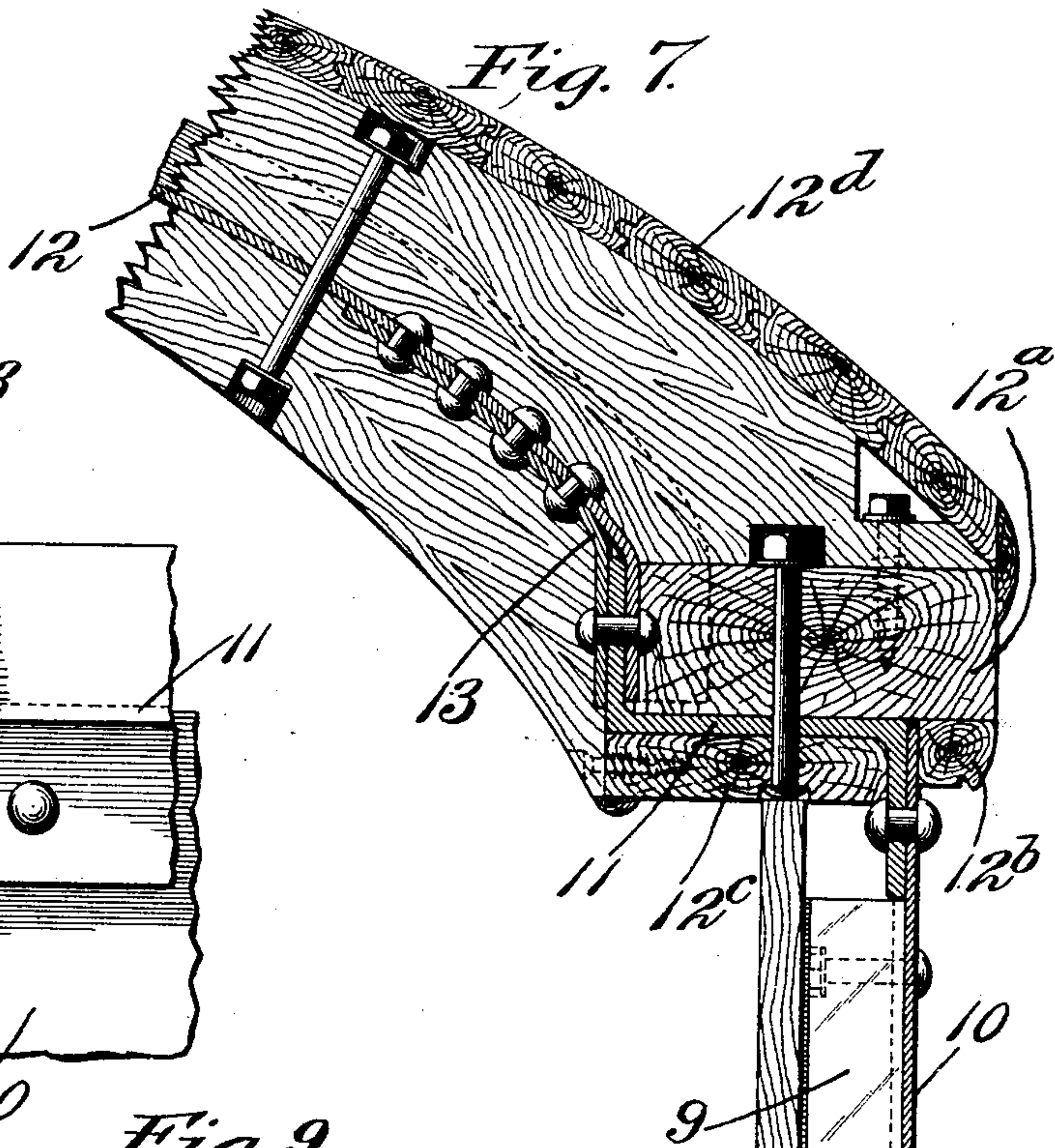


Fig. 10.

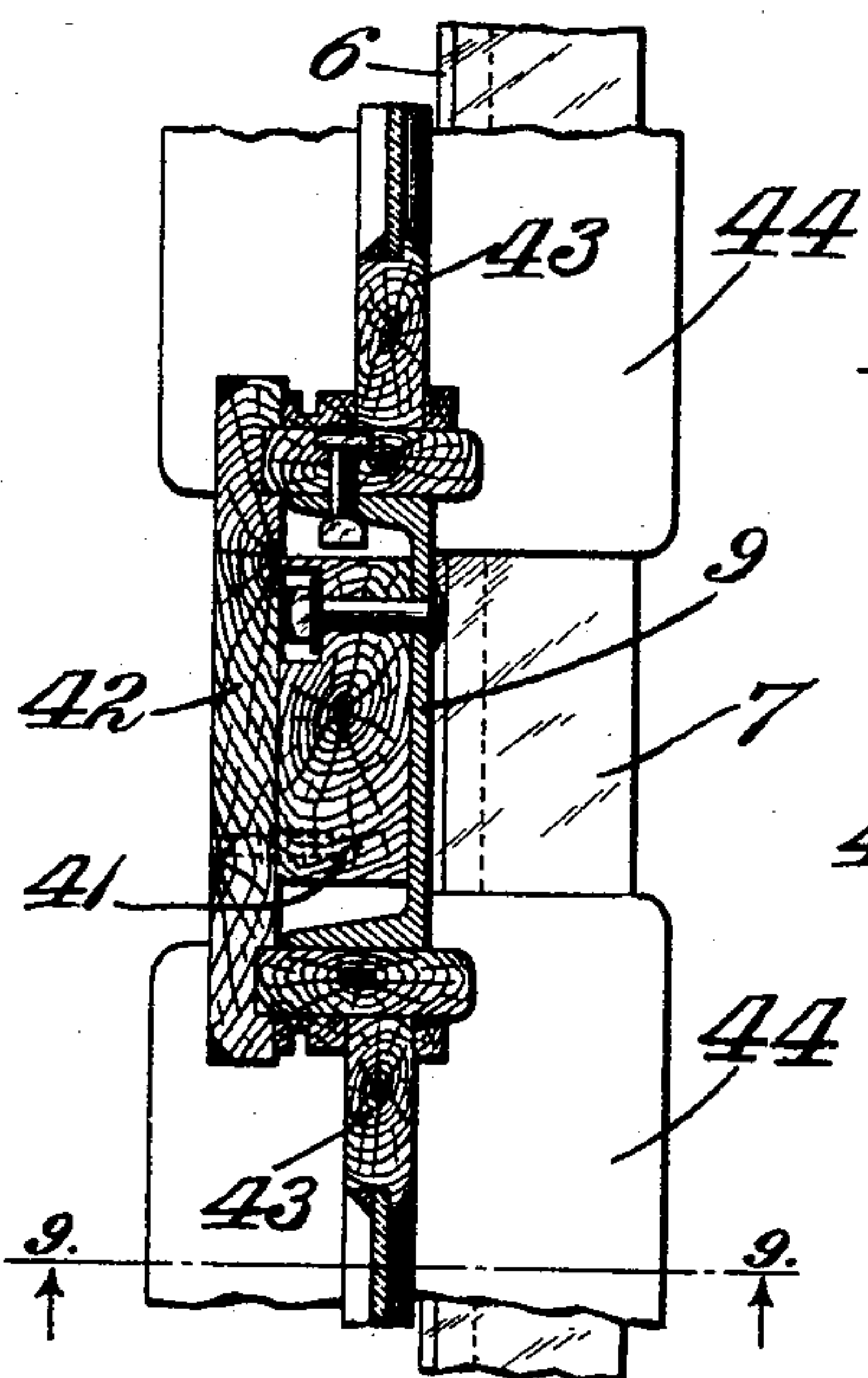
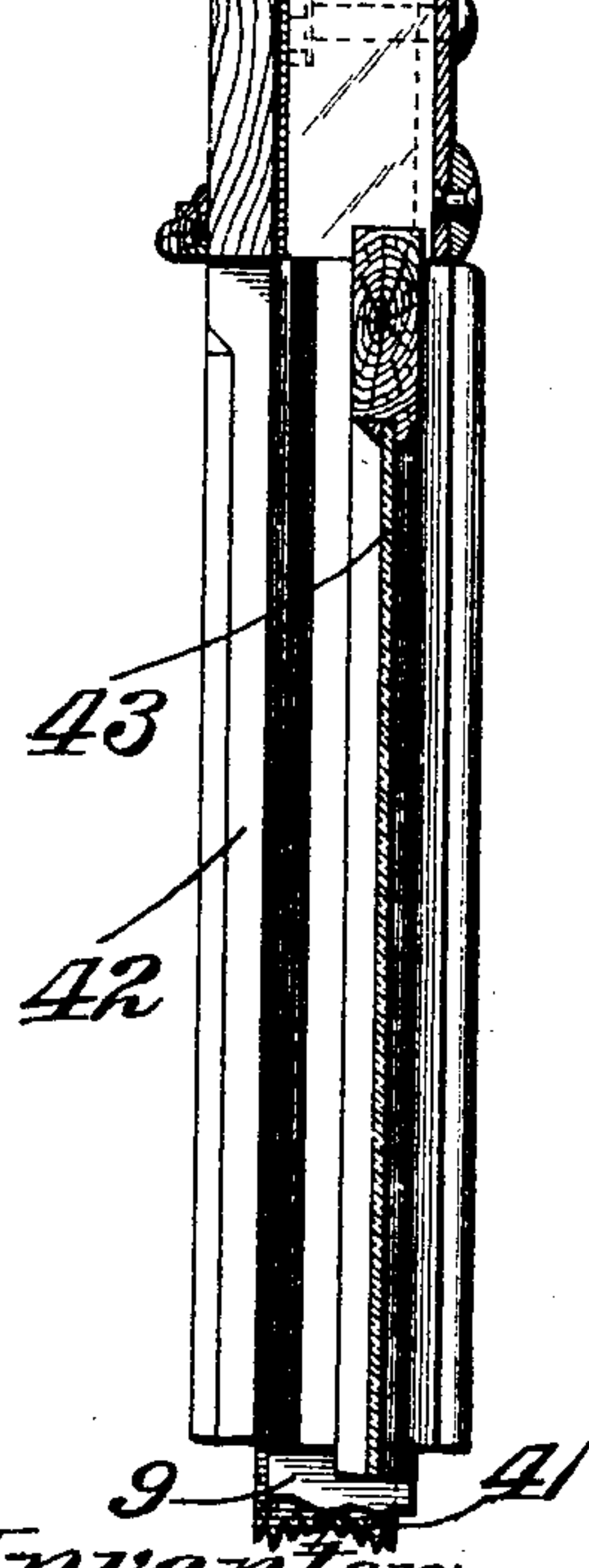
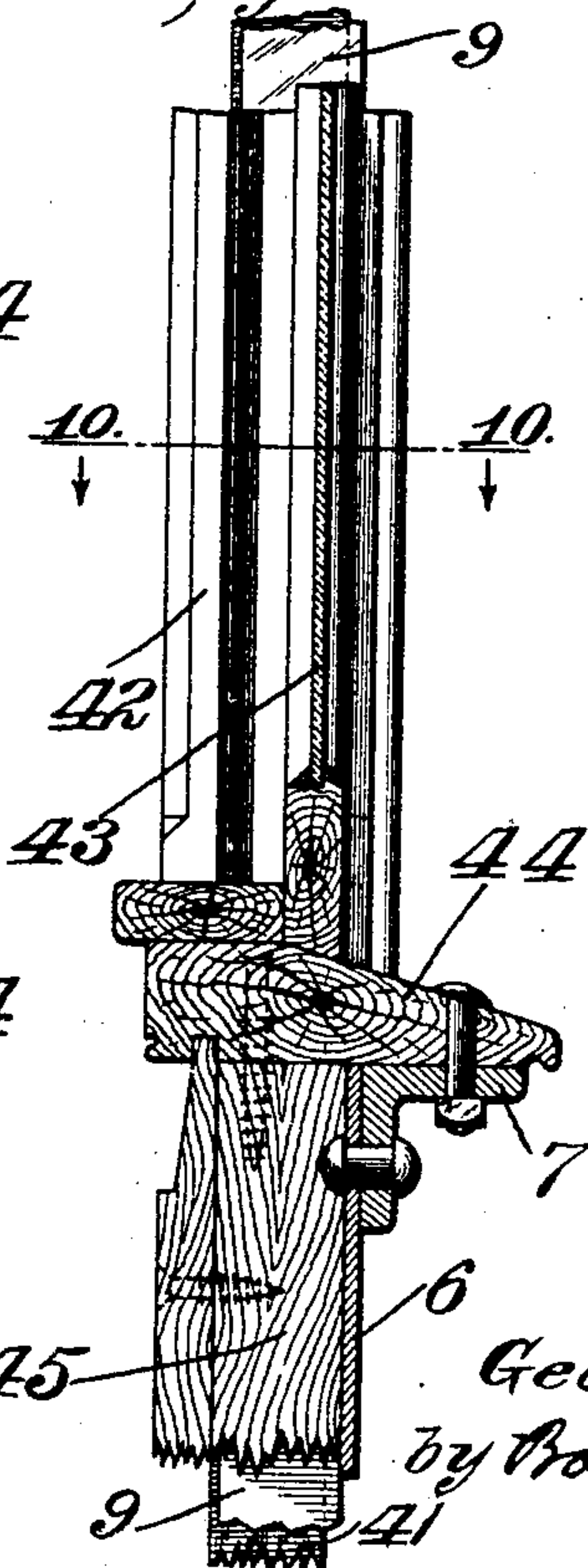


Fig. 9.



Witnesses:
E. A. Pennington
Ralph Kalish

Inventor:
George I. King,
by Markwell Cornwall
Attys

No. 771,428.

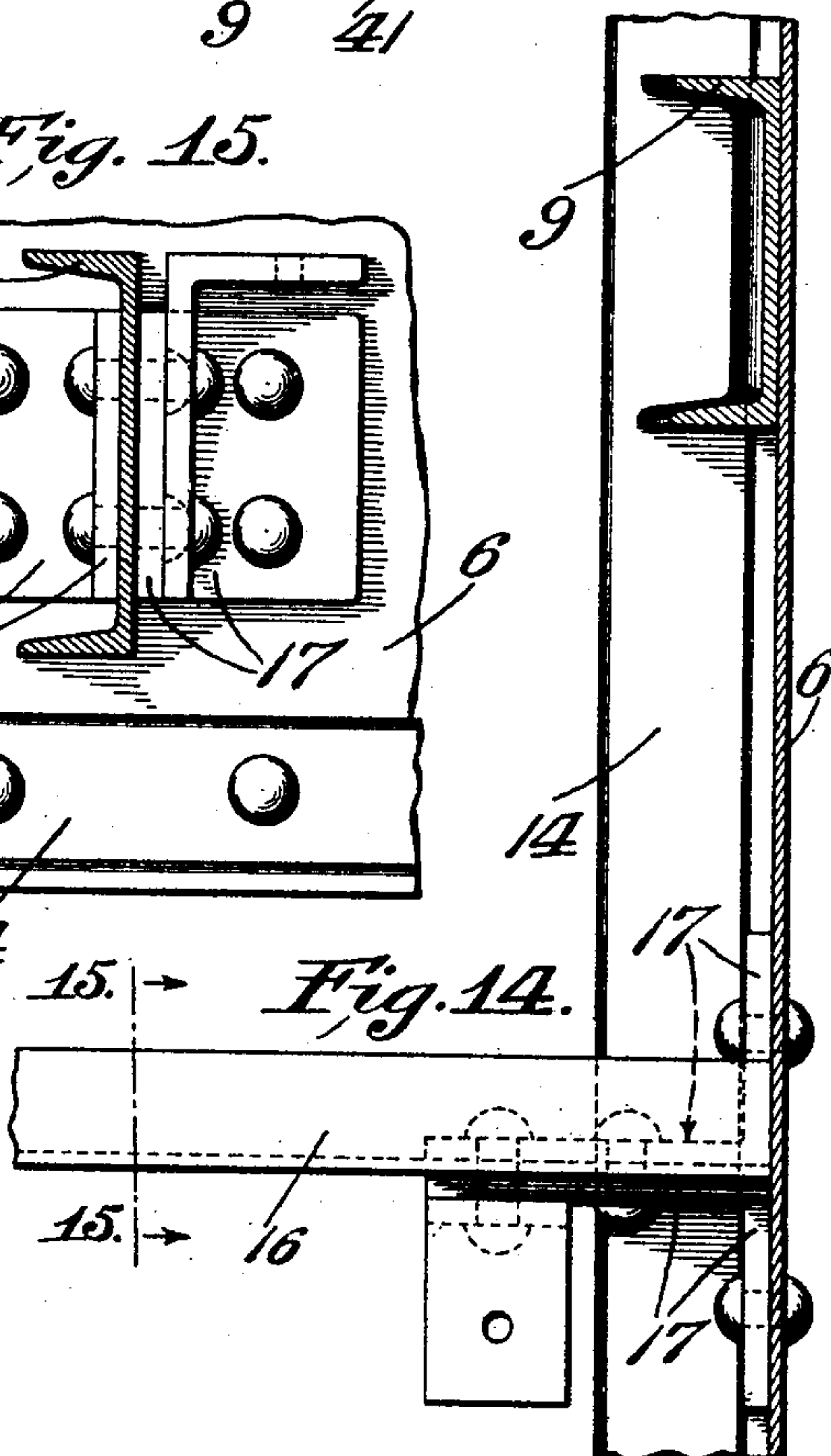
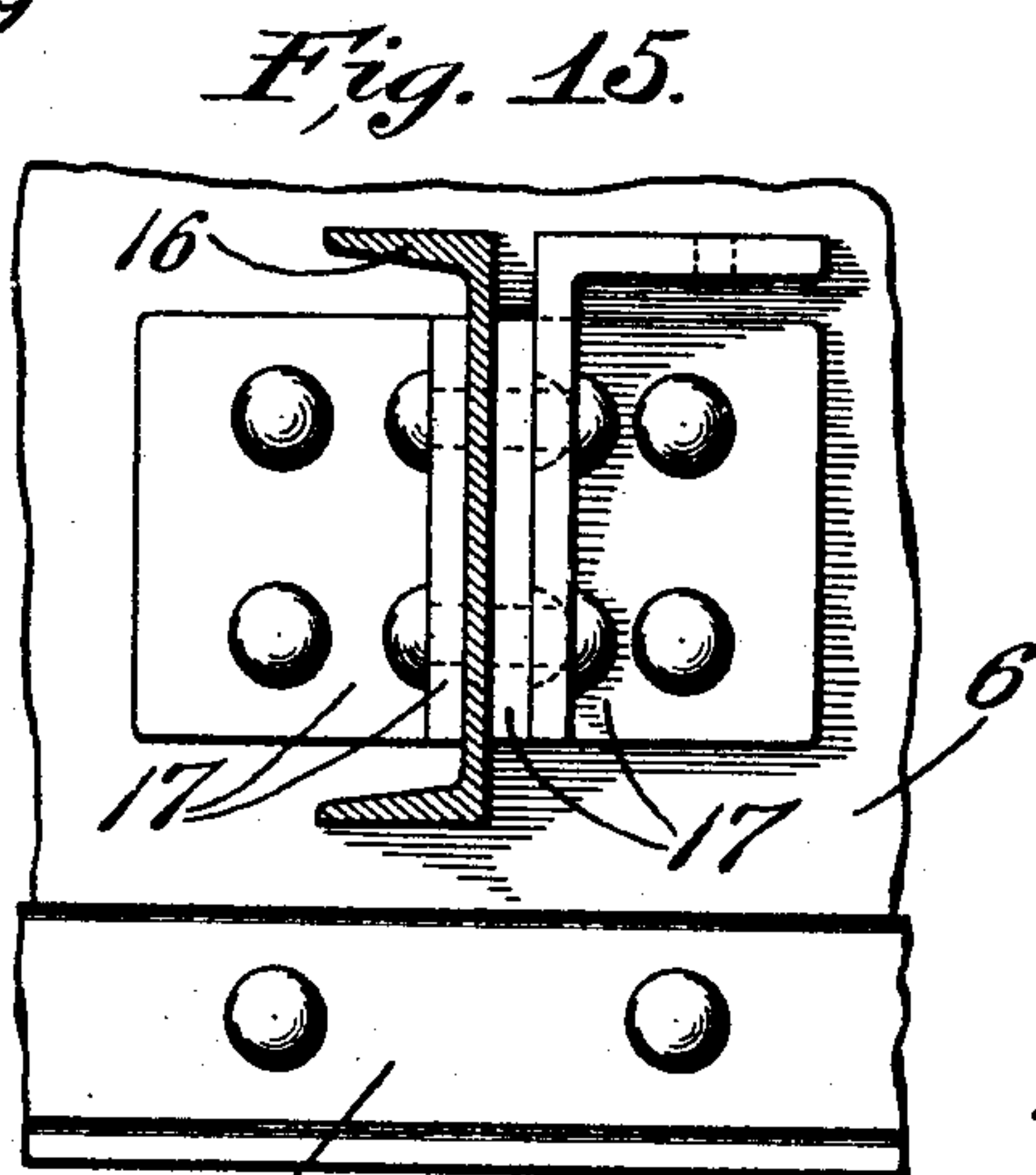
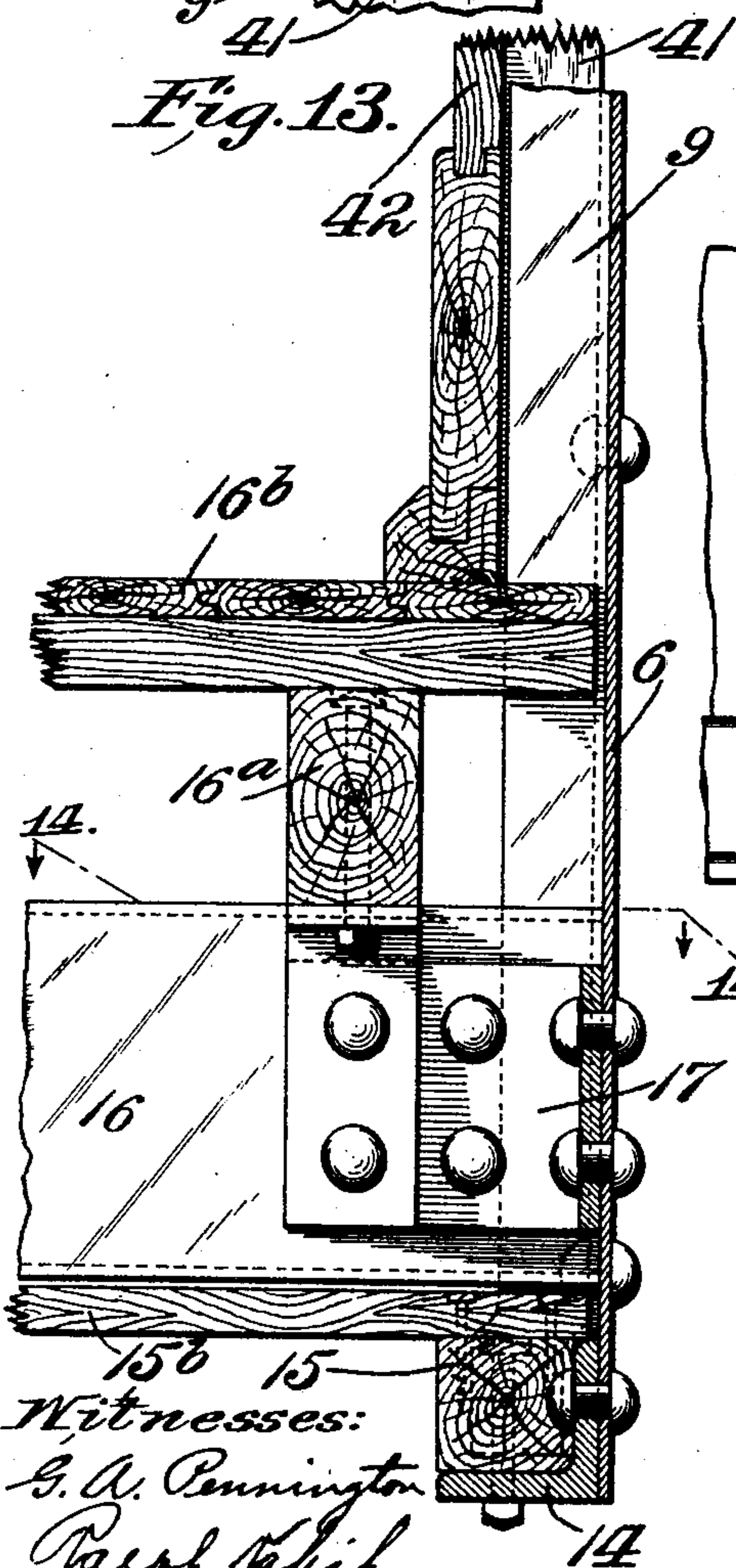
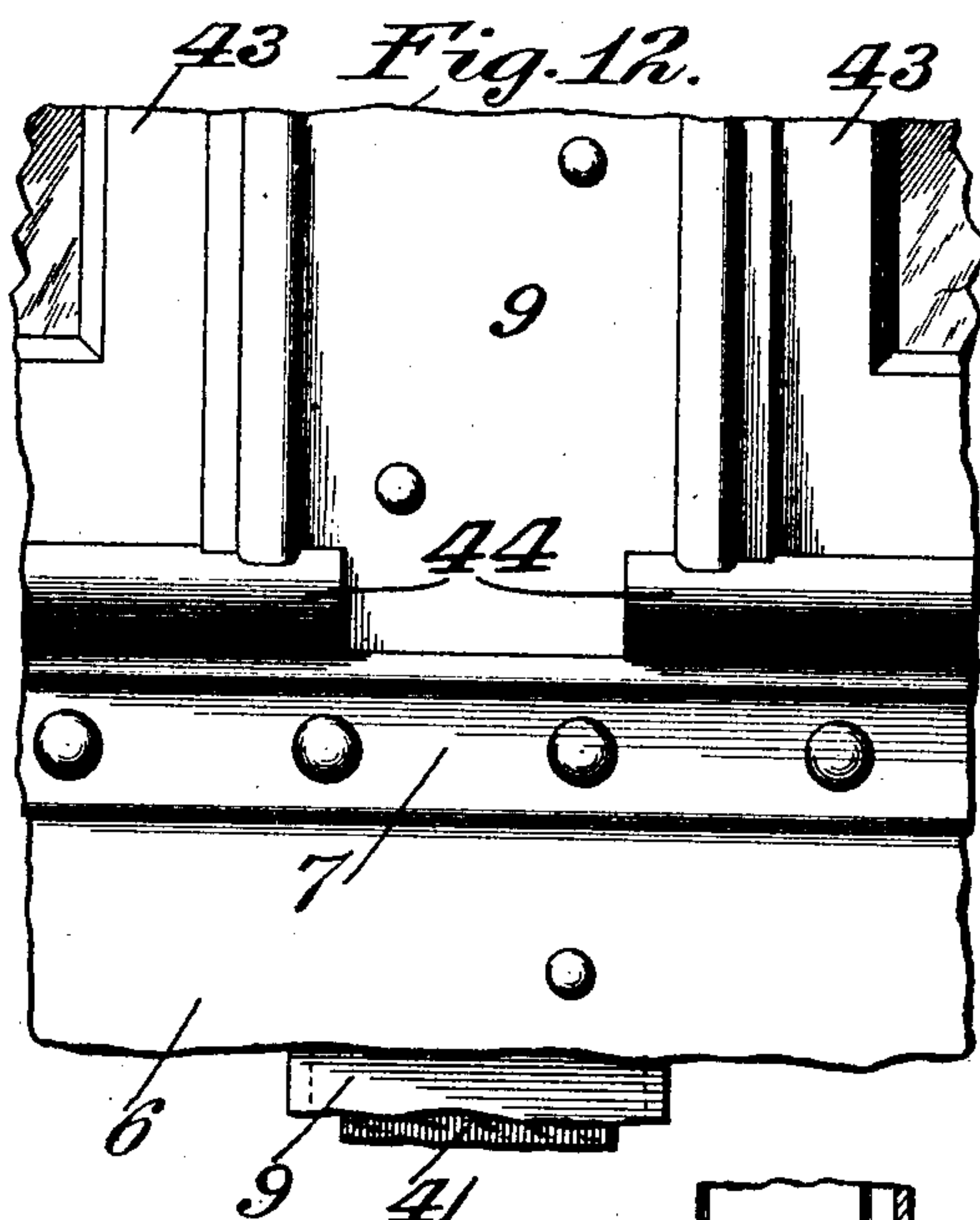
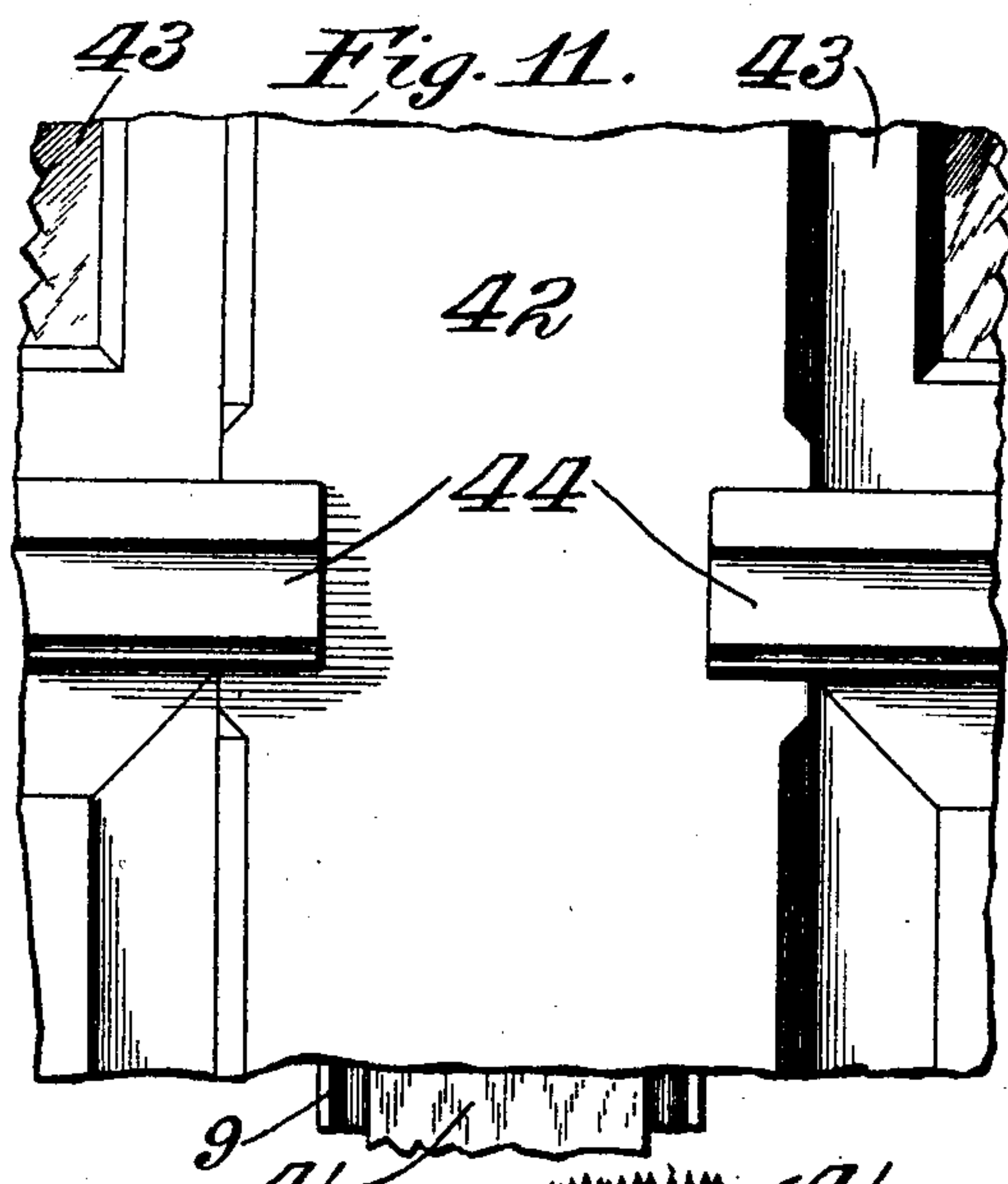
PATENTED OCT. 4, 1904.

G. I. KING.
METALLIC PASSENGER CAR.

NO MODEL.

APPLICATION FILED JUNE 9, 1904.

10 SHEETS—SHEET 6.



Witnesses:
G. A. Pennington
Ralph Malik

Inventor:
George I. King,
by Baker & Cornwall
Attys

No. 771,428.

PATENTED OCT. 4, 1904.

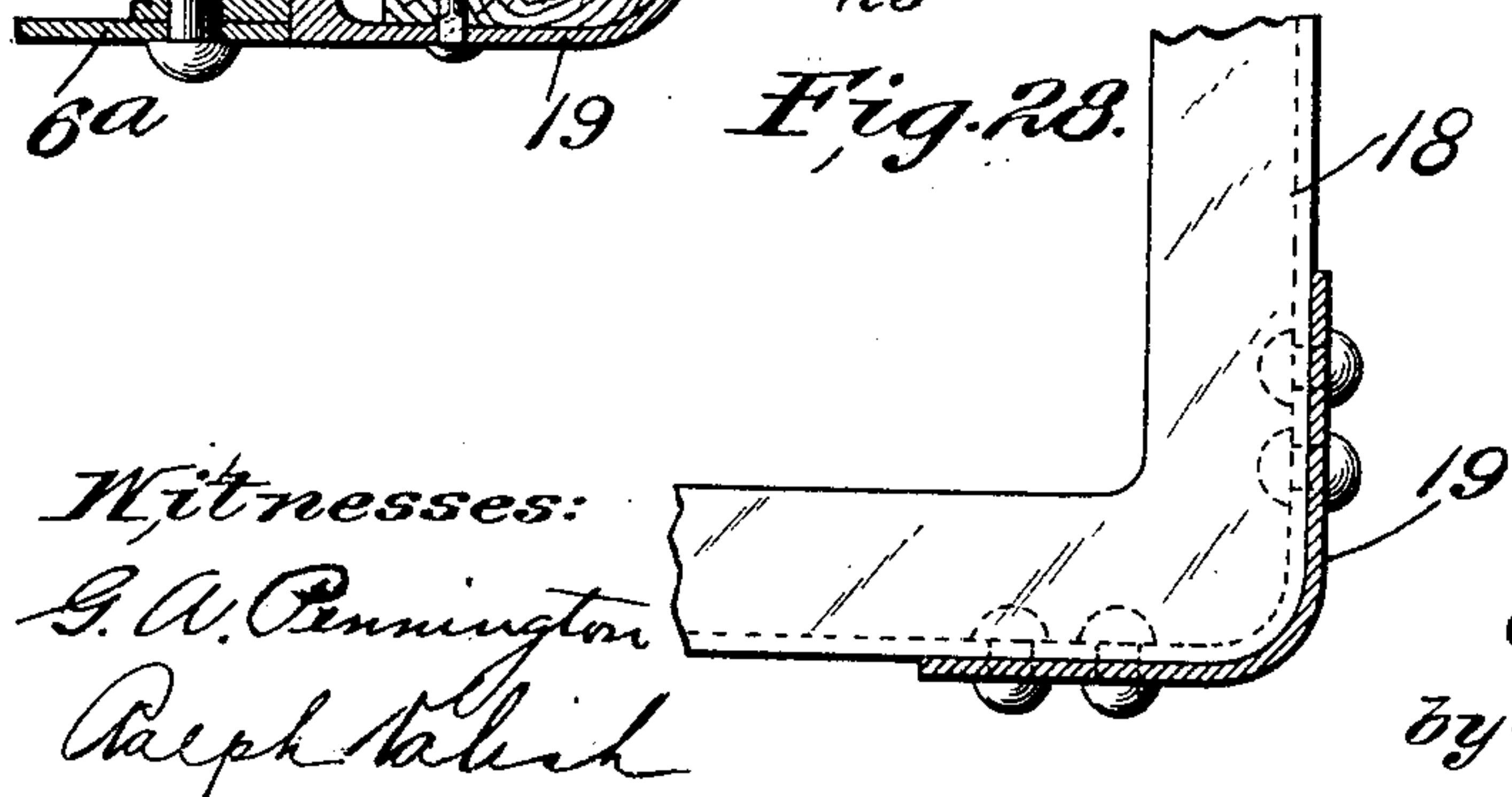
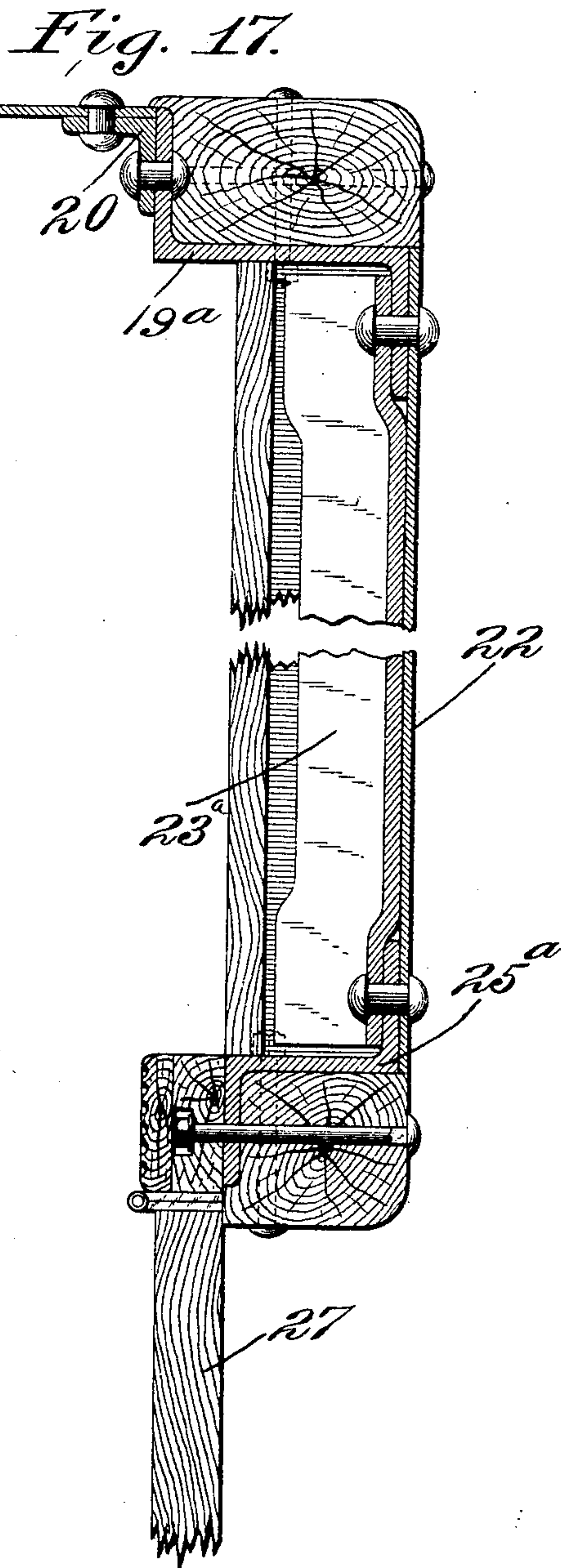
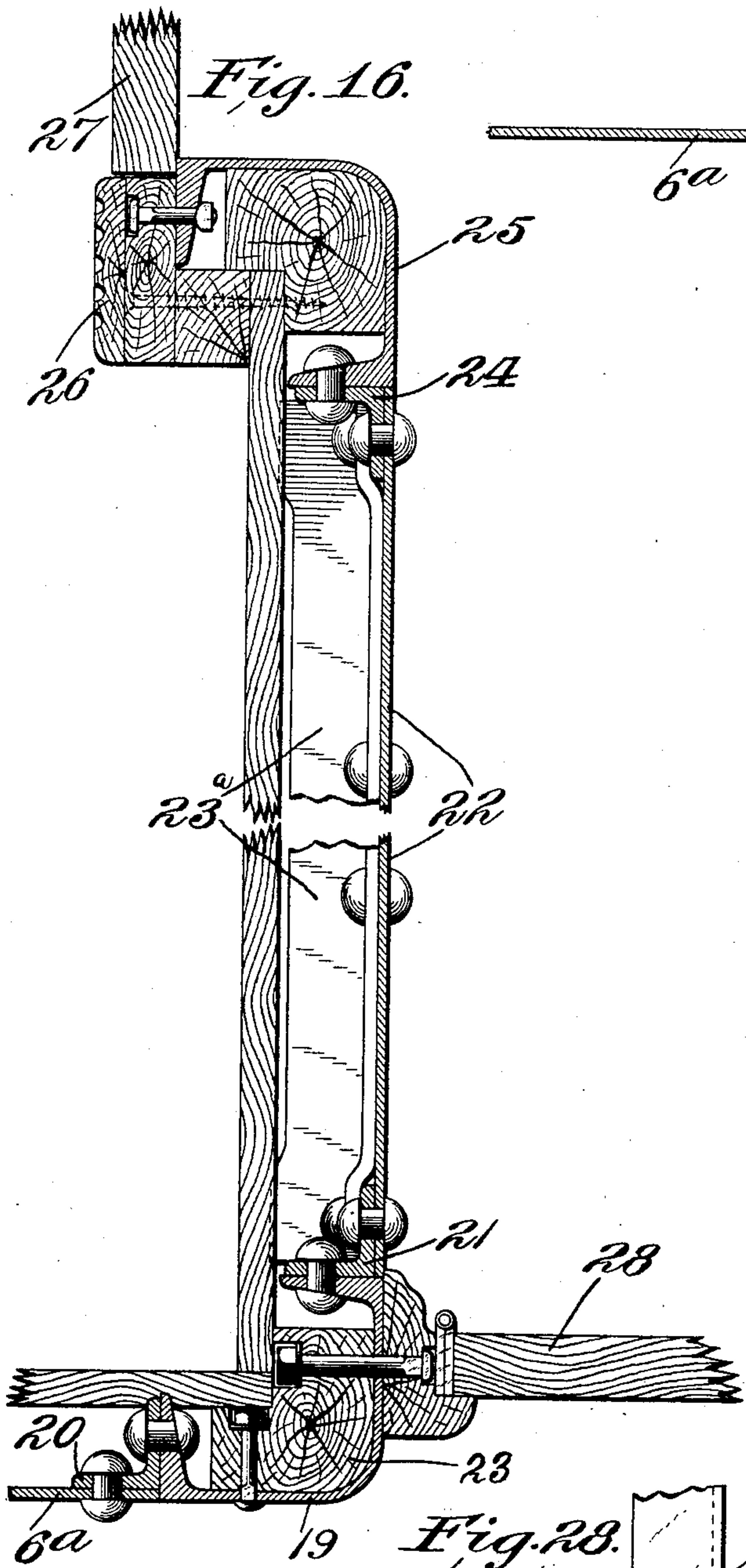
G. I. KING.

METALLIC PASSENGER CAR.

APPLICATION FILED JUNE 9, 1904.

NO MODEL.

10 SHEETS—SHEET 7.



Witnesses:

G. A. Pennington
Ralph Talbot

Inventor:
George I. King,
by B. Kewell & Cornwall
Attys.

No. 771,428.

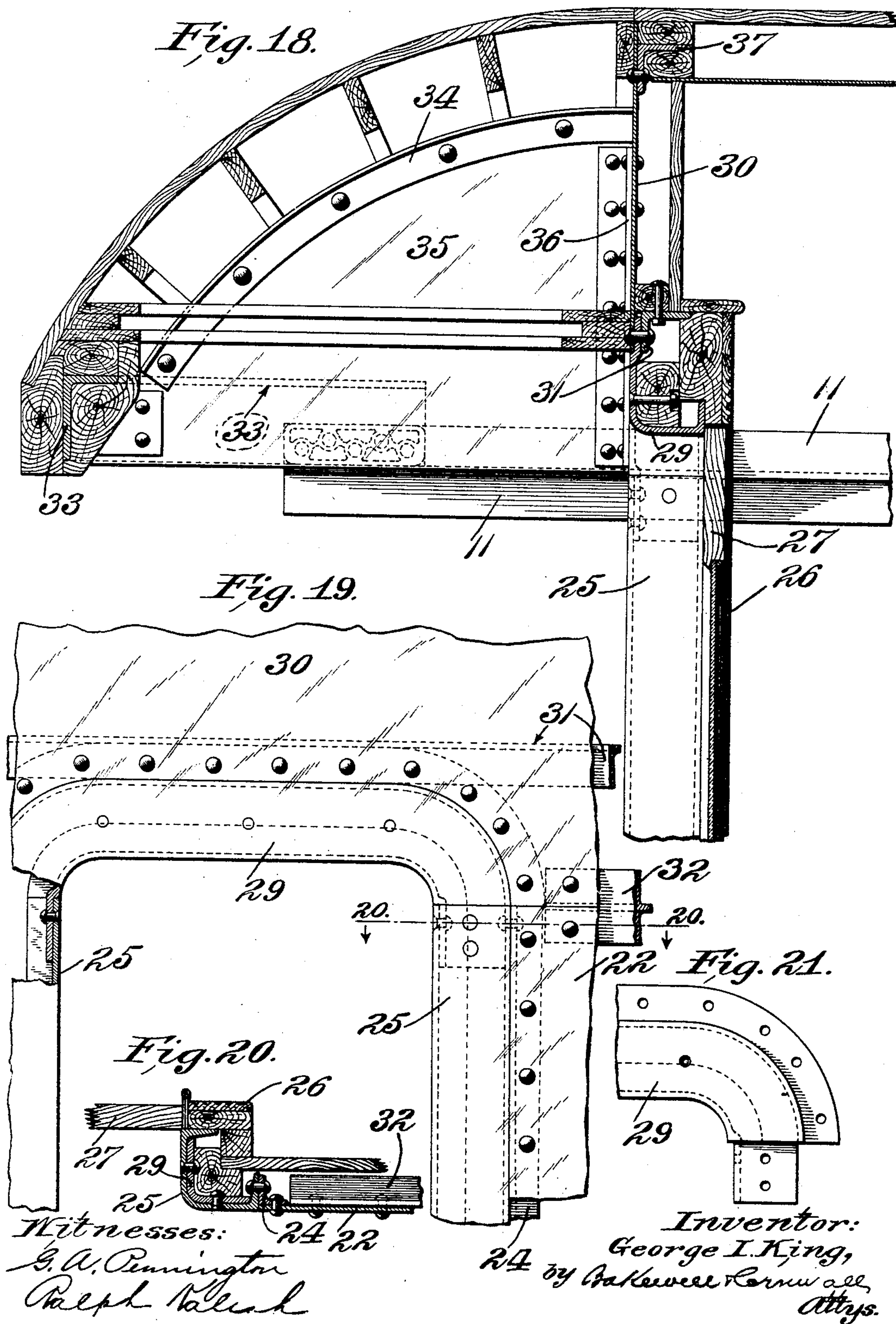
PATENTED OCT. 4, 1904.

G. I. KING.
METALLIC PASSENGER CAR.

NO MODEL.

APPLICATION FILED JUNE 9, 1904.

10 SHEETS—SHEET 8.



No. 771,428.

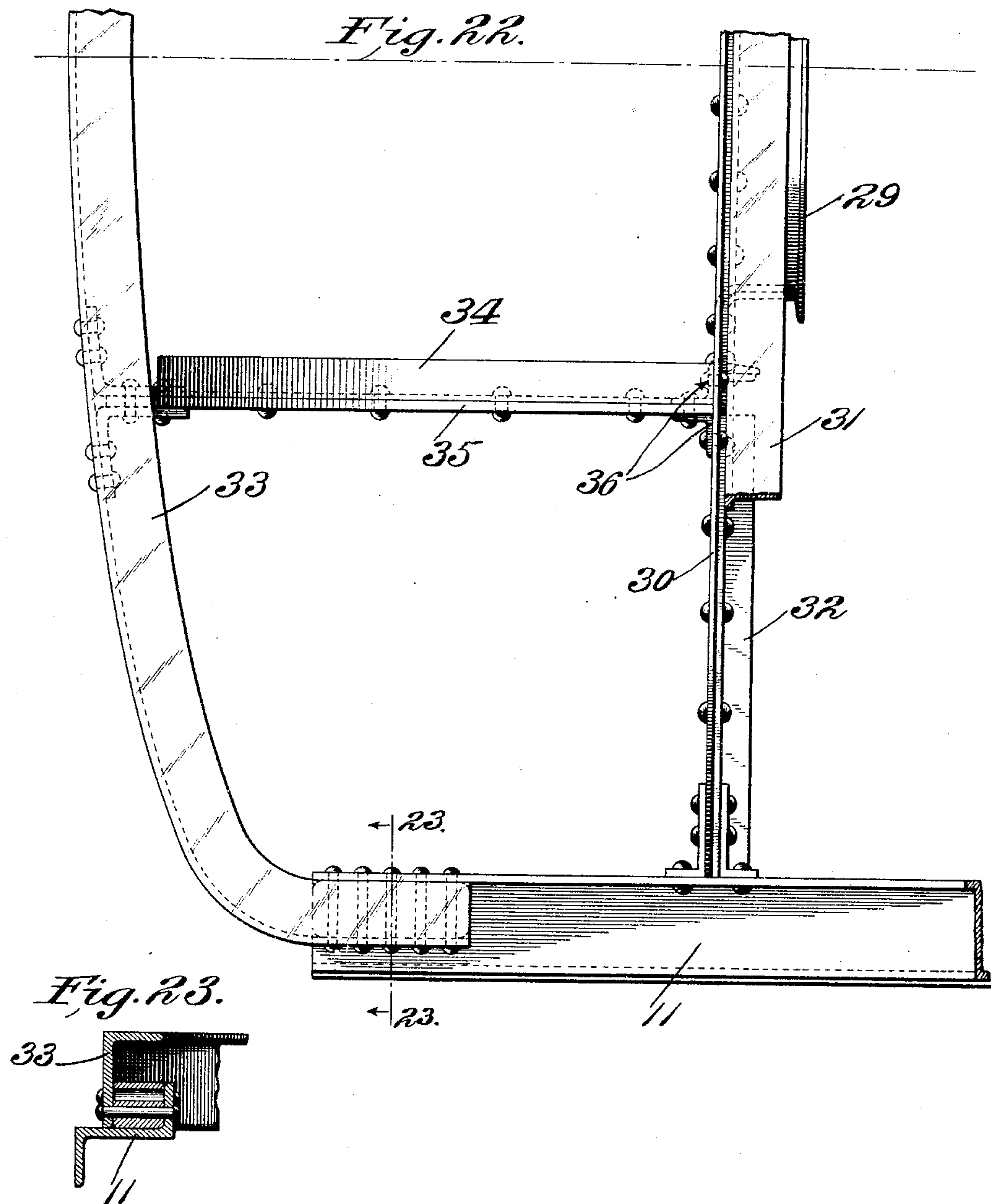
PATENTED OCT. 4, 1904.

G. I. KING.
METALLIC PASSENGER CAR.

NO MODEL.

APPLICATION FILED JUNE 9, 1904.

10 SHEETS—SHEET 9.



Witnesses:

G. A. Pennington
Ralph Nalish

Inventor:
George I. King,
by R. Kewell & Cornwall
Attys.

No. 771,428.

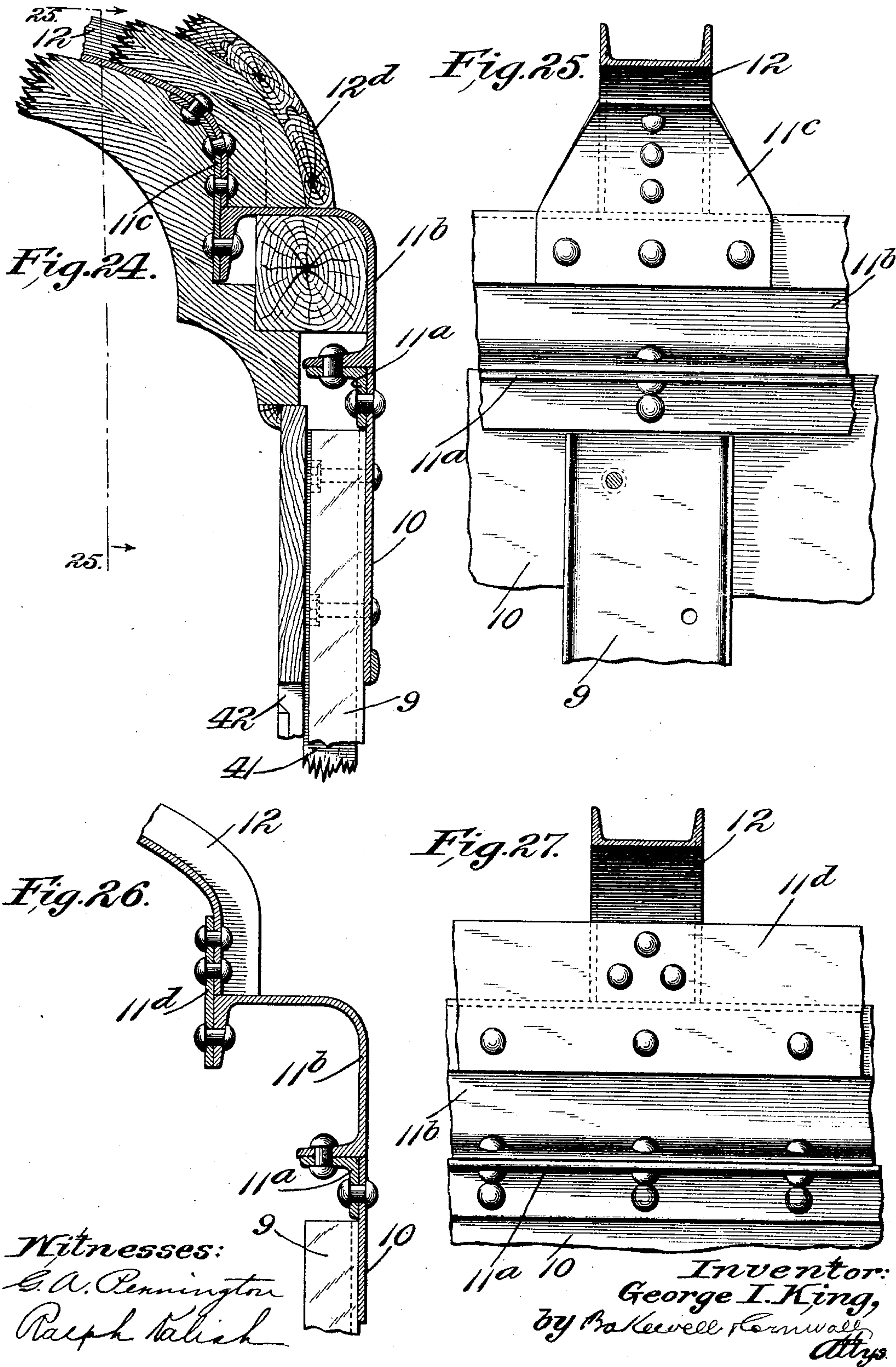
PATENTED OCT. 4, 1904.

G. I. KING.
METALLIC PASSENGER CAR.

APPLICATION FILED JUNE 9, 1904.

NO MODEL.

10 SHEETS—SHEET 10.



UNITED STATES PATENT OFFICE.

GEORGE I. KING, OF MIDDLETOWN, PENNSYLVANIA.

METALLIC PASSENGER-CAR.

SPECIFICATION forming part of Letters Patent No. 771,428, dated October 4, 1904.

Application filed June 9, 1904. Serial No. 211,767. (No model.)

To all whom it may concern:

Be it known that I, GEORGE I. KING, a citizen of the United States, residing at Middletown, Dauphin county, Pennsylvania, have
 5 invented a certain new and useful Improvement in Metallic Passenger-Cars, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to
 10 reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of one end of my improved framing for passenger-cars, the car-
 15 lines being omitted. Fig. 2 is a side elevational view of the same. Fig. 2^a is a sectional view on the line X X, Fig. 1. Fig. 3 is a vertical cross-sectional view through a passenger-car in which my improved framing is em-
 20 ployed, the left half of said section being through a window and the right half between the windows. Fig. 4 is a vertical longitudinal central sectional view through one end of the car. Fig. 5 is a cross-sectional view through
 25 the underframing, showing the bolster in elevation. Fig. 6 is a horizontal sectional view showing one end of the car and its platform, the hood members and carlines being shown at the right half of said view. Fig. 7 is an
 30 enlarged vertical sectional view showing the side plate of the car and its connections. Fig. 8 is a sectional view through the carline and showing its connection to the side plate member. Fig. 9 is an enlarged vertical sectional
 35 view through the window, said figure being practically a downward extension of Fig. 7. Fig. 10 is a horizontal sectional view on the line 10 10 of Fig. 9. Fig. 11 is a fragmentary view showing the interior finish between the
 40 windows. Fig. 12 is a fragmentary view showing the exterior finish between the windows. Fig. 13 is an enlarged vertical sectional view, being practically a continuation of Fig. 9. Fig. 14 is a horizontal sectional
 45 view on the line 14 14 of Fig. 13. Fig. 15 is a vertical sectional view on the line 15 15 of Fig. 14. Fig. 16 is a horizontal sectional view through the door and corner posts of a car and their associate parts. Fig. 17 shows modified
 50 forms of door and corner posts. Fig. 18 is an

enlarged vertical section through the over-
 hanging hood at the end of the car. Fig. 19
 is a fragmentary elevational view showing the
 door-posts, lintel, and end framing with the
 hood removed. Fig. 20 is a horizontal sec- 55
 tional view on the line 20 20 of Fig. 19. Fig.
 21 is a detail view of one end of the lintel.
 Fig. 22 is a plan view of a portion of the hood-
 framing. Fig. 23 is a sectional view on the
 line 23 23 of Fig. 22. Fig. 24 is a modified 60
 form of side plate. Fig. 25 is a sectional view
 on the line 25 25 of Fig. 24. Fig. 26 is another
 modified form of reinforced side plate. Fig.
 27 is a fragmentary inside elevational view of
 a portion of the same, showing the carline in 65
 section; and Fig. 28 is a horizontal sectional
 view showing the manner of connecting the
 corner-post to the end sill.

This invention relates to a new and useful
 improvement in passenger-cars, and particu- 70
 larly to the framing thereof.

One of the objects of this invention is to
 construct a steel framing for passenger-cars
 which will possess the requisite strength not
 only to avoid sagging, but also to resist tele- 75
 scopic strains.

Another object is to so construct the fram-
 ing that it can be combined with wood in such
 a manner as to eliminate the disastrous effects
 of excessive expansion and contraction of an 80
 all-steel car.

A further object is to combine an attractive
 wood interior finish with a strong steel frame,
 so as to minimize the effect of exposure to the
 hot sun and in this way contribute to the 85
 comfort of passengers; and a still further
 object is to so design the frame that the car
 may be equipped with the ordinary and usual
 appliances which contribute to the comfort
 and safety of the passengers, such as sound- 90
 deadening devices, &c.

I will here state that the steel frame of my
 improved car is so constructed that the weight
 of the car-body is transmitted through side
 plate-girders located below the car-windows, 95
 in addition to which the center sill serves as
 a support for the floor and also transmits part
 of the load. If desired, truss-rods may be
 used in connection with the center sill. The
 platform at each end of the car is so con- 100

constructed as to receive and accommodate the ordinary extension-vestibule, and the overhanging hood or canopy of the vestibule may also accommodate the buffer apparatus connected with the extension-vestibule. I prefer that the roof of the car be made of wood, as usual, and in order to support the roof in position I extend posts up from the plate-girders at the sides and connect the same with a side plate having a facia-flange, which considerably strengthens the roof. The carlines may be iron, such as channels or bars, or of wood.

Other features and details will be described hereinafter under appropriate headings.

The underframe.—1 indicates the center sills, which are preferably channels with their flanges presented outwardly, said center sills between the bolsters being reinforced by a top cover-plate 2, riveted to the upper flanges, and by a bottom cover-plate 3, riveted to the lower flanges. Instead of the lower plate lattice-bars may be employed, as well understood, and, further, truss-rods may be used in connection with this center sill. Center sills 1 may extend from end sill to end sill of the car, or they may be interrupted at the bolster, if desired.

2^a indicates a cover-plate riveted to the top flanges of the bolster members, center sills, and end sills, said cover-plate extending from side to side of the car and being connected to the plate-girder sides by angles 2^b (see Figs. 2 and 5) and to the end sheets by angles 2^c. (See Fig. 2^a.) Instead of the angles 2^b and 2^c it is obvious that the plate 2^a can be flanged at its side and end edges.

5 indicates the bolster, which may consist of plates having flanges along their upper and lower edges, together with the top and bottom cover-plates, as usual. In the event that the bolster is interrupted at the center sills a filler-block 4, having an appropriate opening for the king-bolt, may be arranged between the center sills and in the transverse plane of the bolster, the said bolster being provided with the usual center and side bearings.

Extending from the center sill at appropriate distances apart are floor-supporting members 16, which may be in the form of rolled channels or I-beams. These members 16 are provided with brackets to which are secured the wooden longitudinals of the car. The outer ends of these floor-supports are attached to the plate-girder sides of the car.

The side framing.—Each side of the car consists of a plate-girder construction 6, whose compression-flange is preferably located beneath the window-openings. The top flange of this plate-girder may be integral with the web, or it may be in the form of an angle 7, riveted in position and having its horizontal leg presented outwardly. This angle is preferably continuous throughout the length of the web of the plate-girder and

extends across the vertically-disposed plate 6^a. The bottom flange of the plate-girder may also be integral with the web thereof; but I prefer to provide this lower or tension flange in the form of a separate angle riveted to the lower edge of the web of the plate-girder and of such length as to extend beyond each end of said plate-girder web, the horizontal leg of this angle extending inwardly. This tension-flange is indicated at 14 in the drawings.

At each end of the car there is a vertically-disposed plate 6^a, whose lower edge is riveted to the angle 14 and whose upper edge is flush with the side plate of the car. This plate 6^a may be provided with an elliptically-shaped window-opening, as usual. As in cars as at present constructed, one of the plates 6^a would form the side wall of the lavatory.

9 indicates posts which are preferably in the form of channels whose lower ends are riveted to the web of the plate-girder, said posts having their upper ends riveted to the facia of the car. This side plate is shown more clearly in Figs. 7 and 8.

10 indicates the facia-plate, located above the window-openings of the car and carried by the upper ends of the posts 9, as above described, said facia-plate extending somewhat above the posts 9 for the purpose of having the side plate 11 riveted thereto. This side plate may be in the form of a Z-bar, as shown in Figs. 7 and 8, one leg of which is riveted to the upper edge of the facia-plate, while the web extends inwardly, and the opposite leg extends upwardly from the inner edge for the purpose of providing a connection for the metallic carlines.

Instead of having the side plate in the form of a Z-bar, as shown in Figs. 7 and 8, I may arrange an angle 11^a along the upper face of the facia-plate 10, as shown in Figs. 24 and 25, and rivet to this angle a bent channel 11^b. The piece 11^b may have connection-plates 11^c secured to the flange on its upper inner edge and to which the carline 12 is riveted, or instead of the connection-plates 11^c a continuous plate 11^d may be employed, as shown in Fig. 27.

In the preferred construction shown, where a Z-bar 11 is employed, connection-plates 13 are used for the attachment of the carlines 12. (See Figs. 3 and 8.) These connection-plates may be arranged on the outer face of the flange, as shown in Fig. 3, or on the inner face of the flange, as shown in Fig. 7.

The roof.—The carlines 12 are preferably formed of channels appropriately bent so as to follow the contour of the roof, and to these carlines are secured the usual roof-timbers. 12^a indicates a furring-strip received by the metallic side plate, said furring-strip projecting beyond the facia and providing a roof-apron to which a finishing-molding 12^b may be secured. Bolts are employed to hold this furring-strip in place, said bolts projecting

through the web of the Z-bar and also securing a finishing-strip 12^c in place. This finishing-strip serves as a window-hood and is similar to a soffit-board. Bolts are employed to
 5 secure the furring-strips above and below the carlines, the lower furring-strip having the interior ceiling finish secured thereto, while the upper furring-strip forms a support for the roof-sheathing boards 12^d. A sheet-metal
 10 roof may be arranged on these sheathing-boards, as is well understood. Ventilating-windows may be employed in the deck of the roof in a well-known manner.

The floor.—The plate-girder sides, as before
 15 stated, have an angular flange at their lower edges, and upon this flange is arranged a nailing-strip 15, a corresponding nailing-strip 15^a being arranged upon the lower flange of the center sill. Upon these nailing-strips is carried the deafening-ceiling 15^b, which is located
 20 under the floor-supports 16, said floor-supports being secured to the side plate-girders by the connection-plates 17 and the centers by connection-plates 17^a. The supports 16
 25 carry the wooden longitudinal nailing-strips 16^a, upon which the floor 16^b is arranged.

The end sill.—18 indicates a channel (see Fig. 4) which forms the end sill of the car-body, the ends of said end sill being bent
 30 around the sides of the car, as shown in Fig. 1, and riveted to the lower edges of the plates 6^a.

The end framing.—19 indicates the corner-posts of the car, which consist of channels having their webs curved transversely to con-
 35 form to the bend of the end sills. The flanges of the corner-posts are cut away opposite the end sills, as shown in Fig. 28, and the webs of the end sill and corner-post are riveted together, as shown. The upper end of the
 40 corner-post terminates under the Z-bar 11, to which it is connected by appropriate connection-plates. The flanges of these corner-posts, as shown in Fig. 16, are riveted to connection-angles 20 and 21, respectively, the former connection-angle being riveted to the
 45 plate 6^a and the latter to a plate 22, forming the end wall of the car. A filling-post 23 is bolted in position in this end post, so as to form a nailing-strip for the side and end interior finishing walls or panels of the car.
 50 The end plate 22 is reinforced by an angle 23^a, said angle and plate 22 being riveted to a connection-angle 24, attached to the door-post 25. This door-post 25 is similar to the
 55 corner-post 19 and contains a filling-post to which the wooden interior finish of the car is secured, said finish being bolted to the door-post. The door-finishing facing (indicated at 26) is used to cover the bolt-heads.

60 27 indicates the door between the car and the vestibule, and 28 is the side vestibule-door. (See Fig. 16.) In Fig. 17 I have shown a modified form of end framing in which a Z-bar 19^a is employed as a corner-
 65 post and a Z-bar 25^a is employed as a door-

post. These Z-bars have filling-posts bolted to them, as well as nailing-strips, and where these Z-bars are employed the connection between the end post and end sill will be modified. The door-lintels 29 (see Fig. 19) are
 70 preferably in the form of castings whose ends are appropriately fashioned to fit into the upper ends of the door-posts 25, to which they are riveted.

30 indicates an end plate riveted to an up-
 75 wardly-projecting flange on the lintel 29, said plate 30 being reinforced by an angle 31, which carries a nailing-strip to which the interior wood finish of the car is secured.

32 indicates a splice-plate, preferably in
 80 the form of a T-bar, which connects the end plates 22 and 30.

The hood.—By referring to Fig. 18 it will be observed that the Z-bar 11 extends beyond the end of the car-body and has riveted to its
 85 extremities an angle 33, which is bent to form the hood-bow. To this angle are secured, by means of suitable connection-plates, the hood-carlines 34, said carlines being riveted to a brace-plate 35, connected by an angle 36 to
 90 the end plate 30. The upper end of this end plate has riveted to it an angle 37, which angle serves practically as the hood end carline. Suitable nailing-strips are provided for the overhanging roof, in addition to which the
 95 bow member provides means of attachment for the roof-apron and eaves-molding, which are secured thereto by suitable bolts. Instead of projecting the Z-bars 11 beyond the ends of the car the hood-bow 33 may be continued
 100 inwardly to the end framing of the car and secured thereto by suitable connection-plates, as is obvious.

The platform.—The platform-floor 38 is supported in position by the short platform-
 105 beams 39, which beams carry the usual platform end sill 40. I have not shown any part of the draft-rigging or the vestibule extensions and buffing apparatus, as these are well known and can be attached to my improved
 110 car as desired.

The interior side finish.—The posts 9 before referred to, which are in the form of channels, have nailing-strips 41 bolted to them, to
 115 which the panels 42, between the windows 43, are secured. The window-casings are also secured to these posts, and the windows rest upon sills 44, which extend over the compression-flanges of the plate-girder sides. Nailing-
 120 strips 45 are secured to the webs of the plate-girder sides for the attachment of suitable panels.

From the above it will be seen that the principal load-transmitting members of my improved framing are of flanged structural ma-
 125 terial, and, further, that the nailing-strips or filling-blocks are bolted within the recesses or pockets provided by these structural shapes. In this way space is economized and the interior wood finish is secured to the wooden nail-
 130

ing-strips so as not to be affected by the expansion and contraction of the metallic framing. In addition to this the nailing-strips and interior finish act as non-heat conductors, which is conducive to the comfort of passengers in hot weather, particularly when the rays of the sun strike the exposed metallic parts of the framing.

I am aware that minor changes in the construction, arrangement, and combination of the various parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a passenger-car, the combination of plate-girder sides, posts riveted to and carried by said sides, and a facia-plate riveted to the upper ends of the posts and a flanged side plate secured to the facia-plate; substantially as described.

2. In a passenger-car, the combination of plate-girder sides, posts riveted thereto, a facia-plate riveted to the upper ends of the posts, and a flanged side plate riveted to the facia-plate; substantially as described.

3. In a passenger-car, the combination of plate-girder sides, posts riveted thereto, a facia-plate riveted to the posts, a flanged side plate riveted to the facia-plate, and carlines riveted to the side plate; substantially as described.

4. In a passenger-car, the combination of plate-girder sides, posts riveted thereto, a facia-plate riveted to the posts, and a flanged side plate riveted to the facia-plate; substantially as described.

5. In a passenger-car, the combination of plate-girder sides, posts riveted thereto, a facia-plate riveted to said posts, and a Z-shaped side plate having one of its flanges riveted to the upper end of the facia-plate; substantially as described.

6. In a passenger-car, the combination of plate-girder sides, posts riveted thereto, a facia-plate riveted to the upper ends of the posts, a flanged side plate connected to the upper edge of the facia-plate, metallic carlines, and connection-plates for securing said carlines to the flanged side plate; substantially as described.

7. In a passenger-car, the combination of flanged side plates, connection-plates riveted thereto, and continuous metallic carlines riveted to said connection-plates and bent to form the deck-posts; substantially as described.

8. In a passenger-car, the combination of plate-girder sides, posts riveted thereto, a facia-plate riveted to said posts, and vertically-disposed sheets at the ends of the car riveted to the plate-girder sides and facia-plates; substantially as described.

9. In a passenger-car, the combination of corner-posts, plate-girder sides, side posts riv-

eted to the plate-girder sides, a facia-plate riveted to the upper ends of said side posts, and a vertically-disposed sheet riveted to the corner-post, the facia-plate and plate-girder sides; substantially as described.

10. In a passenger-car, the combination of plate-girder sides, a vertically-disposed sheet at the end of the car, and an angular flange forming the compression-flange of the plate-girder side and extending across the vertically-disposed sheet; substantially as described.

11. In a passenger-car, the combination of a corner-post, a vertically-disposed sheet riveted thereto, a plate-girder side, and an angular flange forming the compression member of said plate-girder side, said flange extending across the vertically-disposed sheet to the end post; substantially as described.

12. In a passenger-car, the combination of a plate-girder side whose tension-flange is inwardly disposed, a nailing-strip which rests upon said flange, and a deafening-ceiling attached to said nailing-strip; substantially as described.

13. In a passenger-car, the combination of a center sill having an outwardly-disposed flange, a nailing-strip supported by said flange, a plate-girder side having an inwardly-disposed tension-flange, a nailing-strip supported by said flange, and a deafening-ceiling attached to said nailing-strips; substantially as described.

14. In a passenger-car, the combination with a center sill and plate-girder sides, of nailing-strips secured to said parts, a deafening-ceiling attached to said nailing-strips, and a floor-support above said deafening-ceiling and riveted to the center sill and said plate-girder side; substantially as described.

15. In a passenger-car, the combination of a metallic underframe comprising center sills, an end sill and a bolster, a cover-plate riveted to said parts, longitudinally-disposed wooden nailing-strips arranged above said cover-plate, and a wooden floor supported by said nailing-strips; substantially as described.

16. In a passenger-car, the combination of plate-girder sides, vertically-disposed sheets connected to said sides, end sheets, an end sill, center sills, a bolster, and a cover-plate connected to all of said parts; substantially as described.

17. In a passenger-car, the combination of center sills continuous from end to end of the car, bolsters, a cover-plate for said center sill extending from bolster to bolster, an end sill which is bent around the sides of the car, and a cover-plate extending from bolster to the end sill and from side to side of the car and riveted to said parts; substantially as described.

18. In a passenger-car, the combination of an end sill and center sills, centrally-arranged platform-beams, a platform end sill, and a cover-plate for the centrally-arranged platform-beams; substantially as described.

19. In a passenger-car, the combination with an end sill bent around the sides of the car, and a corner-post embracing the bent portions of said end sill; substantially as described.

5 20. In a passenger-car, the combination with end sills bent around the sides of the car, and flanged corner-posts having the flanges at their lower ends cut away so that the webs of said posts may be riveted to the end sill; substantially as described.

10 21. In a passenger-car, the combination of an end sill bent at the corners of the car and extending along the sides of the car, and corner-posts comprising channels whose webs are curved to conform to the bends in the end sill, said webs being riveted to the end sill; substantially as described.

20 22. In a passenger-car, the combination of an underframe, and a post connected thereto, said post comprising a channel having a curved web, and a wooden filling-strip secured in said post; substantially as described.

25 23. In a passenger-car, the combination of an underframe, corner-posts in the form of channels whose webs are curved so that their flanges stand approximately at angles of ninety degrees to each other, and end and side sheets connected to the flanges of the corner-post; substantially as described.

30 24. In a passenger-car, the combination of an underframe, corner-posts in the form of channels whose webs are curved so that their flanges stand approximately at angles of ninety degrees to each other, and end and side sheets connected to the flanges of the corner-posts by means of connection-angles riveted to said parts; substantially as described.

35 25. In a passenger-car, the combination of metallic side plates which extend beyond the ends of the car-body, and a flanged hood-bow riveted to the ends of the side plates, said bow having a vertical flange and a horizontal flange; substantially as described.

40 26. In a passenger-car, the combination of an end framing including corner and door posts, end plates connected to said parts, and a door-lintel riveted to said door-posts and said end plates; substantially as described.

50 27. In a passenger-car, the combination of door-posts in the form of channels whose webs

are curved, and a door-lintel whose ends are reduced to fit in the upper ends of the door-posts; substantially as described.

28. In a passenger-car, the combination of door-posts in the form of channels whose webs are curved, a cast lintel having ends fitting in the upper ends of the door-posts and riveted thereto, said lintel being also provided with a flange, and an end sheet riveted to said flange; substantially as described.

29. In a passenger-car, the combination of metallic door-posts in the form of channels whose webs are curved, a door-lintel riveted to the upper ends of said posts, and a wooden nailing-strip secured in said channeled door-posts; substantially as described.

30. In a passenger-car, the combination of side plates extending beyond the end of the car-body, a flanged hood-bow riveted to the projecting ends of said side plates, said bow having a vertical flange and a horizontal flange, end sheets, and hood-carlines; substantially as described.

31. In a passenger-car, the combination of side plates projecting beyond the ends of the car, hood end carlines riveted to said side plates, a commercial Z-beam hood-bow riveted to the projecting ends of the side plates, and hood-carlines connected to said bow and to said hood end carlines; substantially as described.

32. In a passenger-car, the combination of side plates projecting beyond the ends of the car, a hood end carline riveted to said side plates, corner-posts connected to said side plates, door-posts, a door-lintel, end sheets connected to said end posts, door-posts and door-lintel, a hood-bow riveted to the projecting ends of said side plates, plates connected to the end sheets and to the hood-bow, and hood-carlines riveted to the upper edges of said plates; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 31st day of May, 1904.

GEORGE I. KING.

Witnesses:

WM. A. CROLL,
C. G. CAMPBELL.