

No. 777,473.

PATENTED DEC. 13, 1904.

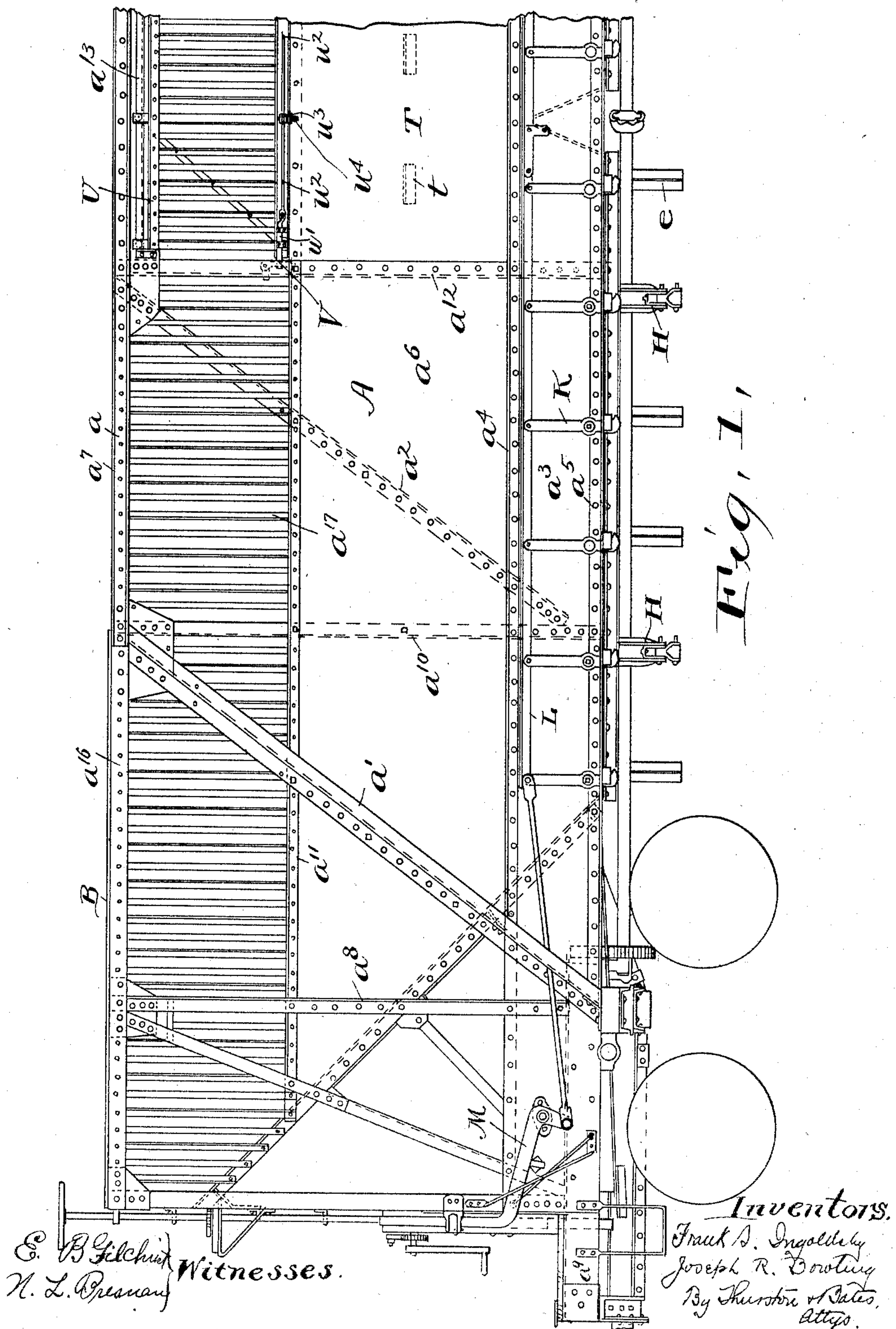
F. S. INGOLDSBY & J. R. BOWLING.

RAILWAY CAR.

APPLICATION FILED FEB. 2, 1903.

NO MODEL.

5 SHEETS—SHEET 1.



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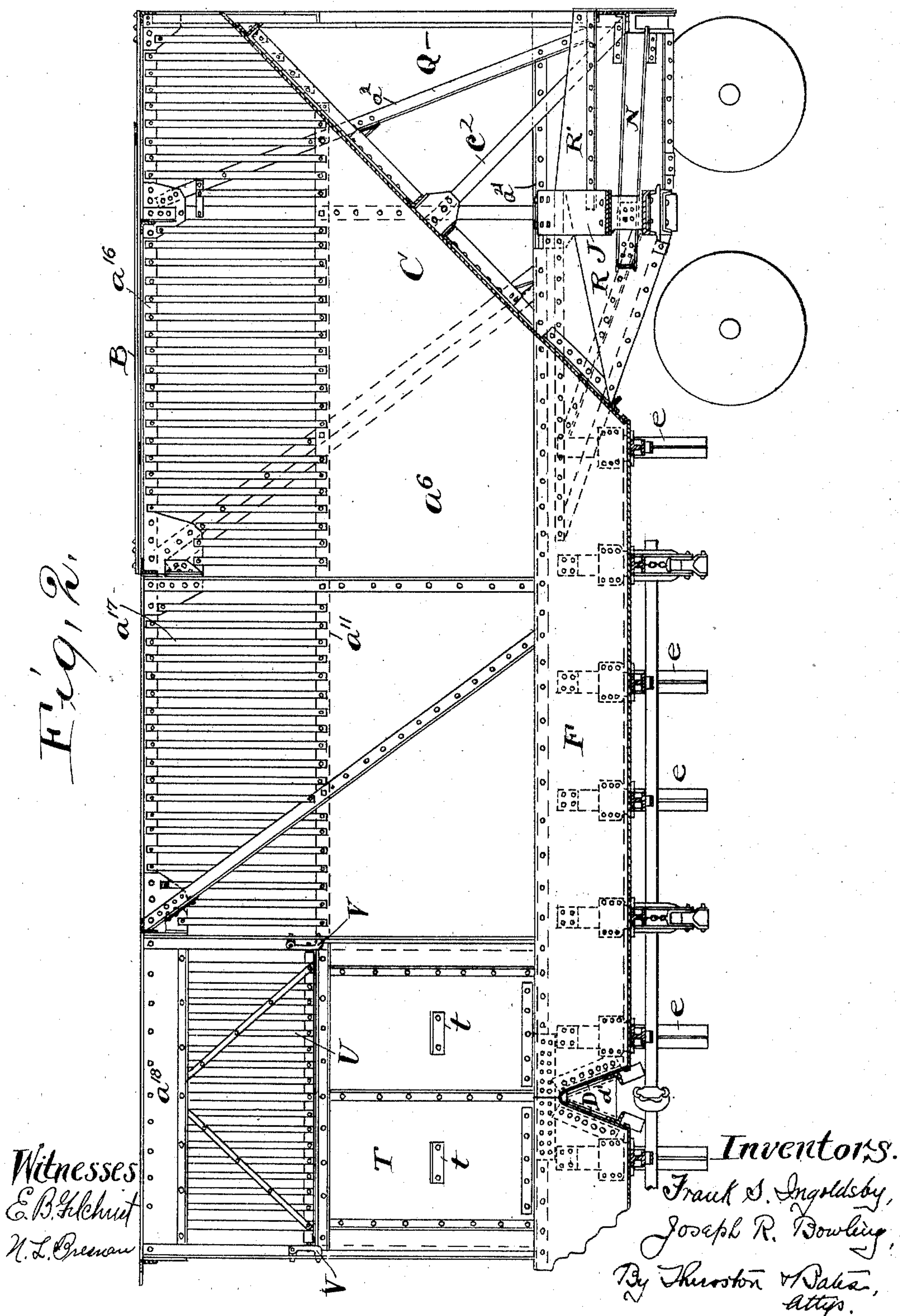
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5 SHEETS—SHEET 2.



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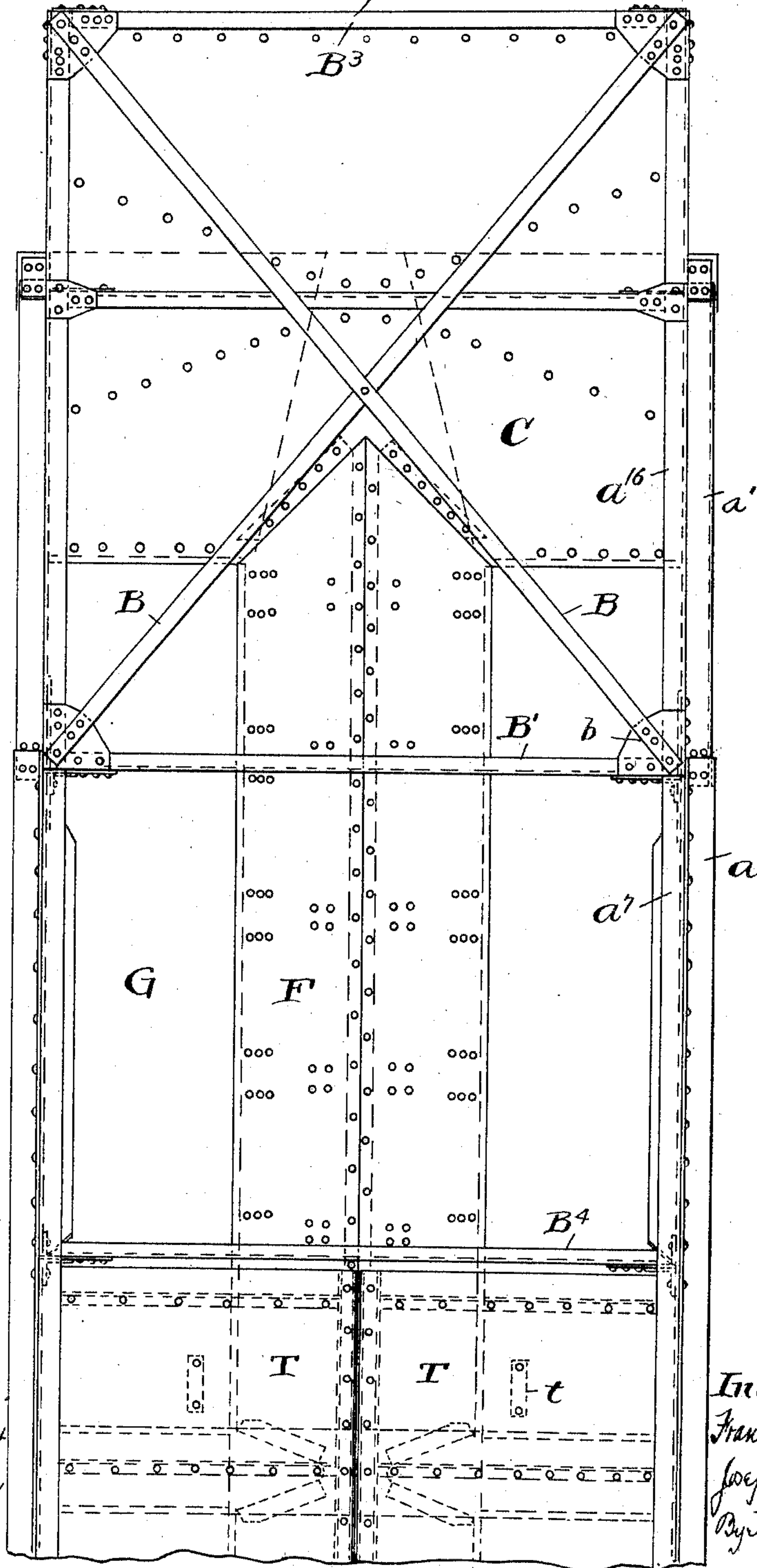
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5 SHEETS—SHEET 3.

Fig. 3.



Witnesses.
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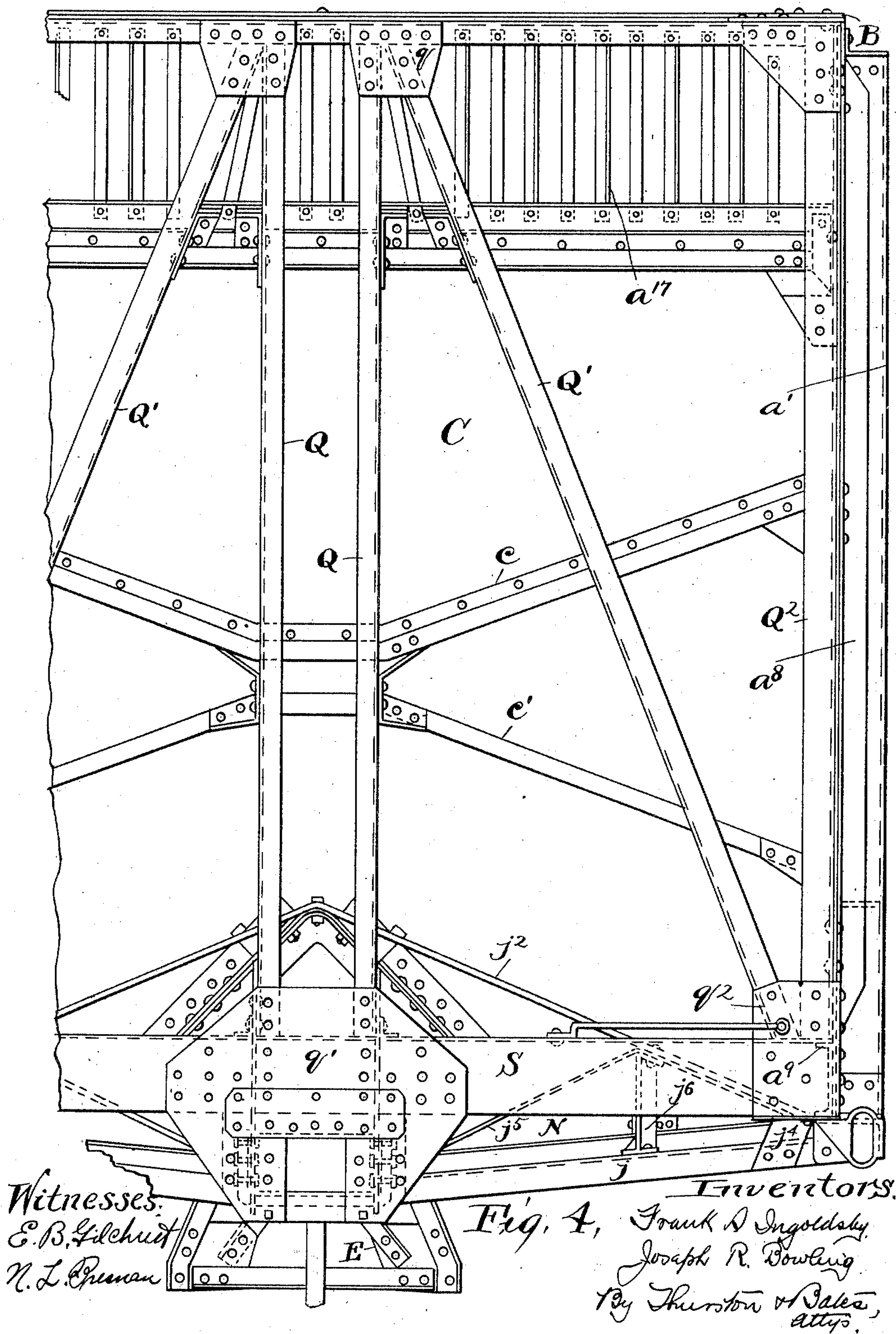
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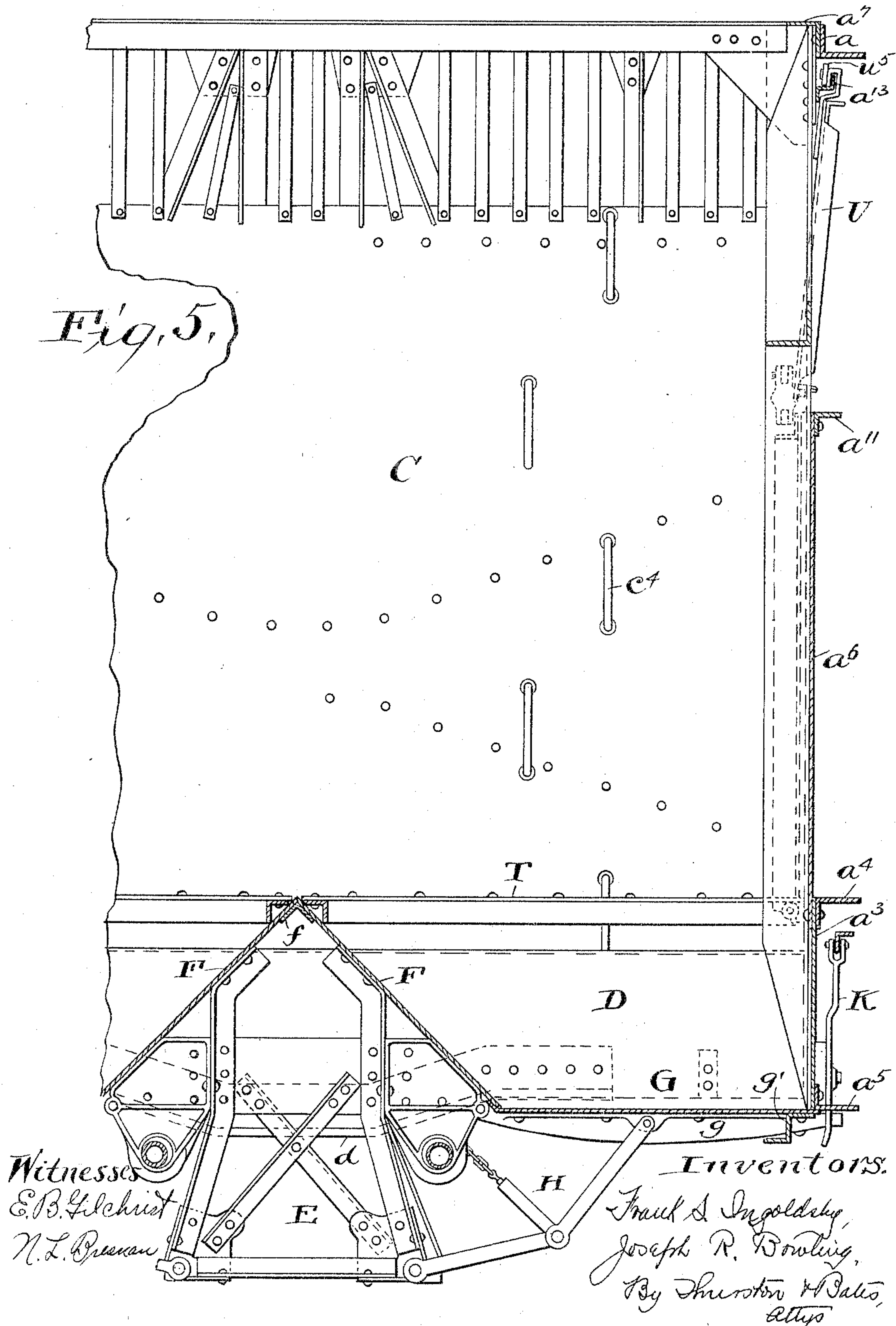
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NO MODEL.

5 SHEETS--SHEET 5.



UNITED STATES PATENT OFFICE.

FRANK S. INGOLDSBY AND JOSEPH R. BOWLING, OF ST. LOUIS, MISSOURI, ASSIGNORS TO THE INGOLDSBY AUTOMATIC CAR COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF WEST VIRGINIA.

RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 777,473, dated December 13, 1904.

Application filed February 2, 1903. Serial No. 141,415. (No model.)

To all whom it may concern:

Be it known that we, FRANK S. INGOLDSBY and JOSEPH R. BOWLING, citizens of the United States, residing at St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Railway-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention relates to certain improvements in railway-cars, particularly such as are constructed of metal.

Many of the improvements are designed more especially with reference to dumping coke-cars of the Ingoldsby type. One of the prominent features of the Ingoldsby type of car is a central longitudinal beam to which are hinged dumping-doors which swing downward at their outer edges. A coke-car embodying this type is shown in our prior application, Serial No. 120,923, filed August 25, 1902, and many of the features in the present invention are an improvement thereon. Other features of the invention, however, are applicable to various railway-cars whether of the Ingoldsby type or not and whether they are dump-cars or of other style.

The features which are peculiar to the present invention will be herein clearly described and definitely set out in their essential combination in the claims, to which reference is hereby made for a summary of the invention.

In the drawings, Figure 1 is a side elevation. Fig. 2 is a vertical section, and Fig. 3 is a top plan, each of these figures showing a little over half of the car. Fig. 4 is an end view, and Fig. 5 a transverse section, of the car.

The side of the car is designated A. It is composed of a truss whose lower chord is a plate-girder. Thus the truss, as shown, consists of the upper chord a a^7 , the main inclined struts a' , and other inclined struts a^2 and vertical struts, as a^{10} a^{12} , and a lower chord, itself a plate-girder, composed of the plate a^3 , an upper flange a^4 therefor, and a lower flange a^5 . The plate a^3 of this girder stands outside of and continues downward from the plate a^6 , the two plates making the side wall of the car.

As will be seen by an inspection of Figs. 1 and 2, the angle-flanges a^4 a^5 terminate at the struts a' , from which point to the end-inclined struts a^2 the girder is provided with an angle-flange a^{21} on the upper inner side thereof. As the struts a' cross the plane of the inclined-end floor at a point slightly above the external angle-flange a^4 , this construction locates the girder-flanges where they will not interfere with the discharge of the cargo from the sides and inclined ends of the car and at the same time permits the employment of an upper flange for the girder at a point between the strut a' and the end of the car where it will not interfere with the operation of the dumping mechanism.

By having the lower chord of the truss in the form of a plate-girder we do away with the necessity for counters for unequal loading, for any tendency of the truss to become distorted is resisted by the stiffness of the girder, which would have to bend across its depth to allow such distortion. By doing away with the necessity for counters we are enabled to make a doorway in the car side. This feature is of great importance. It enables us to carry the load by a most effective structure—namely, a truss—and at the same time it enables us to have one or more open rectangular panels in that truss. It is not necessary to make the girder strong enough to carry the entire load, but simply to have sufficient tensile strength to act as the tie of the truss and sufficient stiffness against bending to provide for the unequal loading, as above explained.

The upper chord of the truss is composed of a pair of oppositely-facing angle-beams a a^7 , riveted back to back through their vertical sides. This makes a top beam of large horizontal width to resist the outward bowing of the car caused by the load. This wide upper chord is secured at its ends to the upper ends of the main struts a' , and it forms a beam between these points. To securely anchor these points, we provide the diagonal braces B, running across the car from near the upper ends of the main struts to the corner of the car at the opposite side, connect-

ing-plates b and rivets accomplishing the anchorage.

The top beams of the car sides are extended by the beams a^{18} running to the end of the car.

5 Across the end of the car at the top is the beam B^3 , and across the top, opposite the main struts a' , is the beam B' . This makes a very rigid anchorage for the long intermediate beams composed of the angles a a' , securely
10 holding the ends of these long beams. In order to insure against said long beams bending intermediately of their ends, due to outward pressure of the load in one direction caused by centrifugal force when the car goes around
15 a curve, we provide cross-braces B^4 across the car, tying the long beams a a' on one side to those on the other, wherefore both the sides of the car come into play in assisting to prevent bending of either side.

20 The result of the above-described construction is that the whole horizontal top of the car becomes, in effect, a cross-braced truss, with the stress varying according to the centrifugal force, but with the parts so arranged as
25 to distribute and take care of that stress.

At each end of the car are sloping inclined-end floors C , braced transversely by angle-strips c c' and supported intermediately by struts c^2 . Opposite these inclined-end floors
30 the struts a' a^8 are on the outside of the car, so that they will not interfere with the discharge of the load on the inclined-end floors. Intermediately of the car the struts a^{10} and a^{12} are on the inside of the car, so as not to interfere with the girder-flange a^4 .
35

At the center of the car is a cross-beam D , which is riveted at its ends to the plate-girder and is braced by the strengthening angle-irons d .

40 J represents the body-bolsters of the car. F represents the central longitudinal beam, made in two alined sections, each section passing through one of the inclined-end floors C and secured to the bolster and at their proximate ends each resting on and secured to the cross-beam D .
45

The cross-plate d' within the cross-beam D in alinement with the ridge-plate L serves to transmit the buffing and tugging strains.
50 The ridge-plate F may be made of as many separate pieces of metal as desired. For example, each sloping side may be a separate piece connected together by the angle-iron f beneath the ridge. The central beam is braced
55 laterally by composite braces E . The construction and support of the central beam is shown, described, and claimed partly in our prior application Serial No. 120,922, filed August 25, 1902, and partly in the application of
60 Frank S. Ingoldsby, filed August 25, 1902, and serially numbered 120,959.

Pivoted to the longitudinal beam are the dumping-doors G , which are shown provided with toggle mechanism P for raising them.

These doors have floor-beams g , which are 65 adapted to be engaged by hooks K , pivoted to the sides of the car and projecting through the lower flange a^5 thereof, these hooks being connected together by a link L , which is adapted to be operated by a lever M . The arrange- 70 ment of the hooks passing through the flange a^5 and of the plate of the door G , abutting the lower side of that flange, is described and claimed in application by us filed February 2, 1903, and serially numbered 144,915. 75

A feature of importance in the present invention, however, is the means we employ for stiffening the outer edge of the door G , so that it shall not be bent by the bumping it receives when it drops and impinges the bump- 80 ers e , of which four are shown for each door and which are carried by the cross-braces E . This stiffening means consists of a Z -bar g' , riveted to the under side of the door near its free edge. The web of the Z -bar is perforated to allow the passage of the floor-beams 85 g ; but this perforation being more or less nearly in the neutral axis of the Z -bar does not weaken it to any great extent. The construction makes a very stiff and effective 90 brace.

J represents the body-bolsters, having an upper tension member j^2 , a lower compression member j , and an additional tension-strap j^5 , which is the full width and length of the bolster and passes between the center frame of 95 the same and the compression member and then diagonally upward over the struts j^6 and then downwardly along the tension-strap j^2 and over the end of the compression member 100 j , where it is secured, as represented in Fig. 4.

j^4 represents the stirrup.

The main struts a' of the car side, the plates a^3 of the side girders, and the channel-beams a^9 , which form extensions of the lower chord 105 of the car sides, rest on and are secured to the stirrup-plates j^4 of the bolster. The diagonal I -beams N , passing through the car from its ends to its sides, pass through the bolster and are there suitably secured. 110

The details of construction of the bolster do not form any part of the invention covered by this application, the same being shown, described, and claimed in application Serial No. 156,358, filed May 9, 1903, a division of this 115 application.

At the end the car is braced by beams Q running from the end sill S of the car to the top thereof and the diagonal beams Q' , running from the corners of the car to an intermediate position at the end of the top. 120 Corner-posts Q^2 are also provided for the car. Connecting-plates q q' and q^2 , properly located, and suitable rivets serve to make the connections desired. 125

The metal plates a^6 , which constitute the side walls of the car, do not run to the extreme height thereof, but terminate some-

thing over half-way up with an angle-strip a^{11} . Above this angle-strip we provide suitable vertical slats a^{17} , leading to the top of the car. This makes a very light structure and one very suitable for handling coke.

The doorway through the car side is adapted to have its lower portion closed by the door T, which is hinged at the lower edge of the doorway. This door may thus be turned down into a horizontal position, as shown in full lines in Fig. 5, forming a platform upon which the load may be wheeled by a wheelbarrow in filling the car, or it may be turned up vertically to close the doorway, as shown in dotted lines in that figure. On the under side of this door it is provided with steps t to enable the attendant to more easily climb out of the car. For the same purpose handholds c^4 are provided on the inclined end floors of the car in such position, however, that they will not interfere with the discharge of the load. The upper portion of the doorway above the door T and below the plate a^{18} of the car side is adapted to be closed by a small sliding door U, which carries at its upper end rollers u^5 , whereby the door may be slid along and suspended from a track a^{18} , carried by the outer side of the car side. When in position, the lower edge of this door is swung into the doorway, thus not only closing the doorway, but holding itself from longitudinal shifting. This is shown, described, and claimed in our application Serial No. 120,923 referred to.

V designates gravity-latches pivoted to the opposite sides of the doorway, so as to be swung down and engage the upper edge of the door T and hold the same closed.

The door U carries a pair of sliding bolts u' , connected by a link u^2 to an operating-handle u^3 . When this operating-handle is drawn outward, the bolts are drawn toward each other, and when the operating-handle is forced inward the bolts are spread outward. In this outward spreading the bolts pass between the flange a^{12} and the edge of the latch V, and thus hold the upper door in place against either inward or outward movement. A seal-pin u^4 through the operating-handle u^3 and a stationary clip holds the bolts in place.

The details of the door mechanism do not form any part of the invention covered by this application, the same being shown, described, and claimed in application Serial No. 182,064 filed November 22, 1903, a division of this application.

We claim—

1. A dump-car having inclined-end floors and a doorway through the side, upright stiffening members on the outer side of the car side opposite the end floors and on the inner side of the car side adjacent to the doorway, and a door adapted to be confined between the struts at the doorway.

2. In a dump-car, a dumping-door having

floor-beams beneath it, a stiffening member secured to the under side of the door near its free edge, the floor-beams projecting through said stiffening member.

3. In a dump-car, the combination of a dumping-door made of sheet metal with floor-beams secured to its under side, and a Z-bar secured to the under side of the door near its free edge and extending along substantially parallel with that edge, said Z-bar being perforated through its web for the passage of said floor-beams.

4. A car side having a beam along its upper edge of extra width at the intermediate portion of the car and diagonal sway-braces extending from the ends of the extra wide portion of said beam to the opposite corners of the car.

5. A car having along the upper edges of its sides oppositely-facing angle-beams, diagonal sway-braces, connecting plates and rivets connecting the inner ends of said sway-braces with the inner ones of said angle-beams, said sway-braces being connected at their opposite ends with the corners of the car.

6. A car having an inclined-end floor with handholds thereon, arranged so as not to interfere with the discharge of the load.

7. In a car, the combination of bolsters, trussed sides, inclined struts extending from the bolsters to the upper chords of said sides, the lower chords of each of said sides consisting of a plate-girder provided with external flanges extending from one of said inclined struts to the other.

8. In a car in combination, bolsters, trussed sides, the upper chord of each of said sides consisting of oppositely-facing angle-beams extending for a portion of the length of said side and a single angle-beam extending from said oppositely-facing beams to the ends of said side, and inclined struts extending from the bolsters to the junction of the single and double angle-beams at the top of each side.

9. In a car, in combination, bolsters, trussed sides each having an upper chord and a plate having attached thereto another plate extending its entire length and constituting a lower chord for the trussed side, inclined struts extending from the bolsters to the upper chord, and external flanges on the plate forming the lower chord extending from one of said inclined struts to the other.

10. In a car, the combination of the sides, of a beam extending along the upper edge of each of said sides, said beam being of extra width at its intermediate portion, struts extending from the lower portion of each of said sides to the junction of the heavier and the lighter portions of the beam, and diagonal sway-braces extending from said junction to the opposite corners of the car.

11. In a car, in combination, sides, and inclined floors, a girder secured to the lower

edge of each of said sides and having external
flanges extending beyond the junction of said
inclined floors with said girder, angle-iron
struts on the inside of the car between the end
5 floors, and angle-iron struts on the outside of
the car opposite the inclined floors and se-
cured to said sides and to the portion of the
girder unprovided with external flanges.

In testimony whereof we hereunto affix our
signatures in the presence of two witnesses. 10

FRANK S. INGOLDSBY.
JOSEPH R. BOWLING.

Witnesses:

ALBERT H. BATES,
N. L. BRESNAN.