J. O. NEIKIRK.

RAILROAD CAR.

APPLICATION FILED JUNE 12, 1916.

1,289,877. Patented Dec. 31, 1918.

3 SHEETS—SHEET 1.

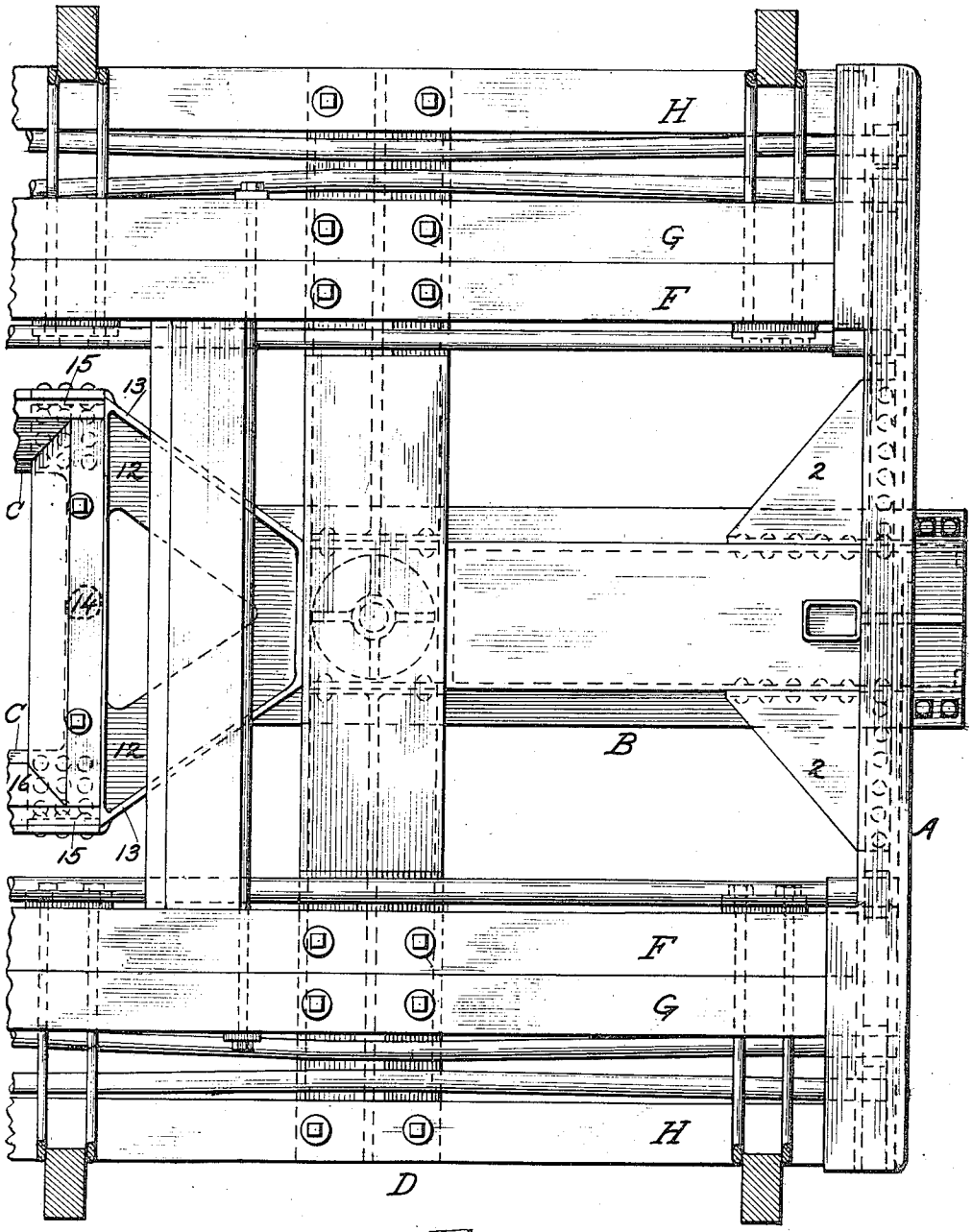


Fig. 1.

Witness:
C. C. Burnap

Inventor:
John O. Neikirk

By Sheridan, Wilkinson & Scott, Attys

J. O. NEIKIRK.

RAILROAD CAR.

APPLICATION FILED JUNE 12, 1916.

1,289,877.

Patented Dec. 31, 1918.

3 SHEETS—SHEET 2.

Fig. 2.

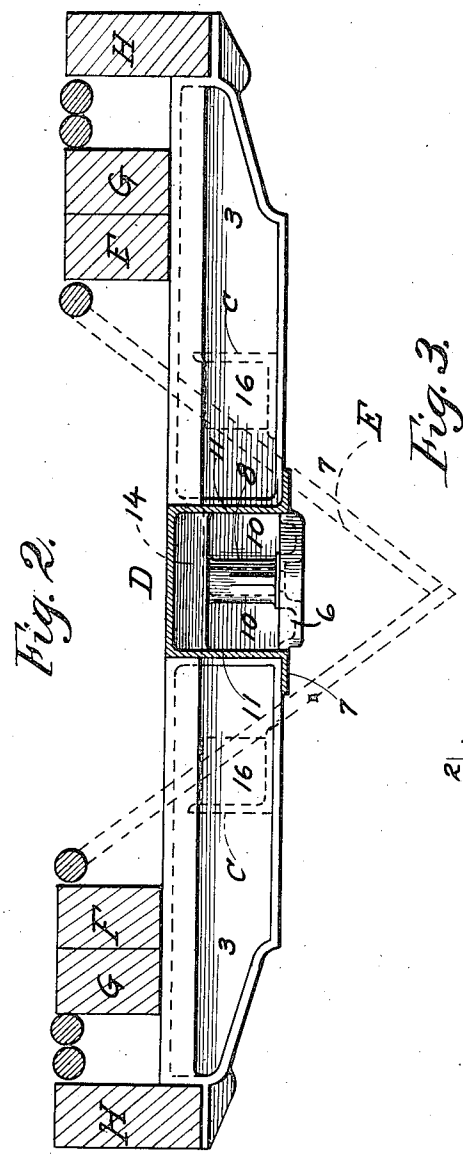
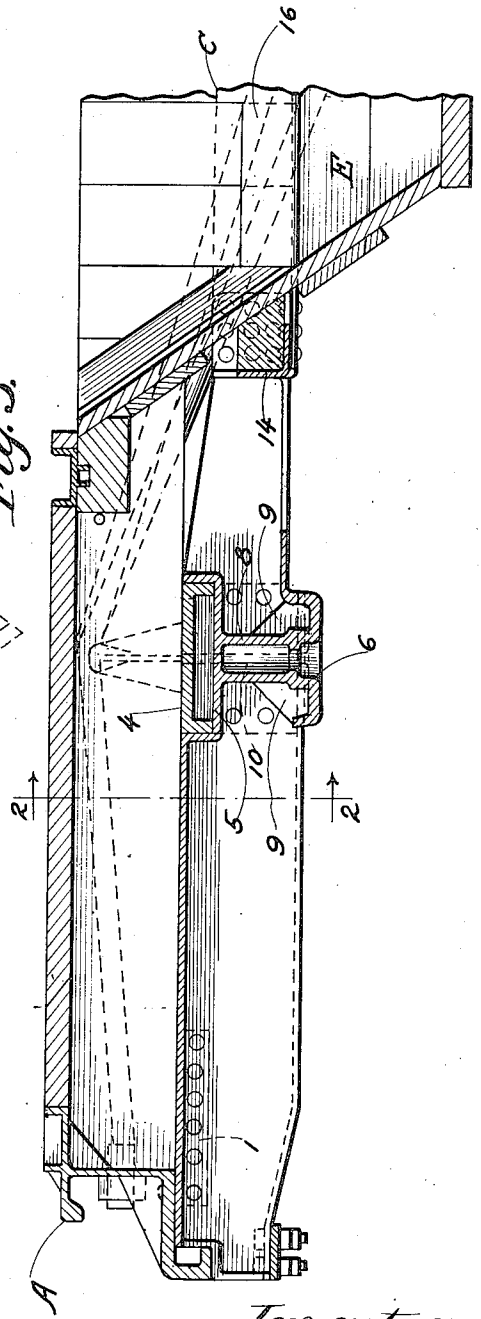


Fig. 3.



Witness:
C. E. Burnap

Inventor:
John O. Neikirk
By Sheridan, Wilkinson & Scott, Attys

J. O. NEIKIRK.

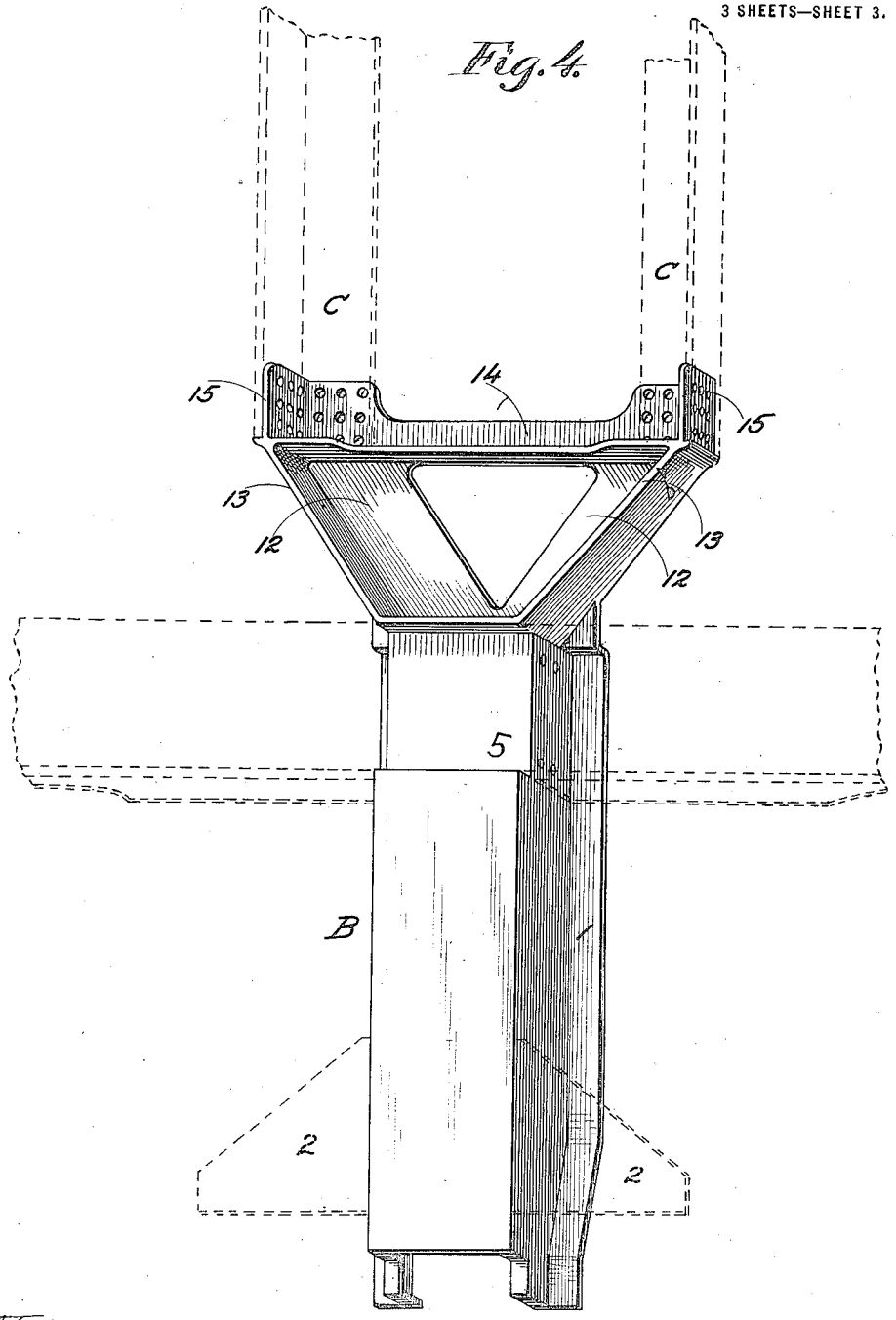
RAILROAD CAR.

APPLICATION FILED JUNE 12, 1916.

1,289,877. Patented Dec. 31, 1918.

3 SHEETS—SHEET 3.

Fig. 4.



Witness:
C. C. Burnap

Inventor:
John O. Neikirk
By Sheridan, Wilkinson & Scott, Attys

UNITED STATES PATENT OFFICE.

JOHN O. NEIKIRK, OF LOMBARD, ILLINOIS.

RAILROAD-CAR.

1,289,877. Specification of Letters Patent. Patented Dec. 31, 1918.

Application filed June 12, 1916. Serial No. 103,226.

To all whom it may concern:

Be it known that I, JOHN O. NEIKIRK, a citizen of the United States, residing at Lombard, in the county of Dupage, and State of Illinois, have invented certain new and useful Improvements in Railroad-Cars, of which the following is a specification.

My invention relates to an improvement in the underframe of railway cars. The object of the invention is set forth in the following description and accompanying drawings, in which—

Figure 1 is a plan view of one end of a car under-frame constructed according to my invention, the other end being a duplicate thereof.

Fig. 2 is a cross sectional view, taken on the line 2—2 of Fig. 3, that is, a transverse section between the bolster and end of the car, looking toward the bolster.

Fig. 3 is a longitudinal central section of one end of the car underframe; and

Fig. 4 is a perspective view of the draft sill structure and related parts.

My invention has been designed primarily for application to cars having a central hopper extending longitudinally of the car between the bolsters; but in its broad aspect the invention is not restricted to cars of that type. Hopper cars of the type referred to are illustrated and described in my prior Patents, Nos. 1,098,748 and 1,112,644, granted June 2, 1914, and October 6, 1914, respectively, and in Patent No. 761,674, granted to H. S. Hart and O. W. Meissner June 7, 1904, and No. 820,046, granted to E. S. Hart May 8, 1906. The cars described in the Hart & Meissner and Hart patents referred to have underframes constructed of wood, and in the structures of the other two patents the underframes are constructed of steel.

In railway cars of all types it is necessary that the longitudinal members of the underframe support not only the vertical load, due to the weight of the car and contents, but that these members should also sustain the pulling and buffing stresses. In the construction of cars of the type above referred to, provided with longitudinal central hoppers, the center sill, upon which reliance is usually placed to sustain the buffing and pulling stresses, is omitted, by reason of the fact that it is necessary to leave the center of the hopper unobstructed. In such cars, therefore, it is necessary to transmit the pulling and buffing stresses from the draft sills—which, of course, must lie at the longitudinal center of the car—to longitudinal members sufficiently remote from the car center to provide the necessary width for the hopper.

Formerly the size of cars ordinarily used and the weights which they were designed to carry were not as great as at present, and satisfactory results were obtained by constructing the longitudinal members of the underframes of wooden beams, as shown in the Hart & Meissner and Hart patents above referred to. With the increasing size of cars, and the increasing weight of the loads carried, difficulties were encountered in the use of wooden sills, and in recent years it has become customary to construct such cars with steel underframes, as shown in my two patents above mentioned.

While the use of steel in such cars has resulted in the provision of an abundance of strength to resist the stresses incident to service, the cost of the cars has been greatly increased, and at times the cost of steel has reached such points as to interfere seriously with the construction of such cars.

I have found that longitudinal car sills of wood possess an abundance of strength to carry the vertical load due to the weight of the car and contents, and that it is failure properly to carry the pulling and buffing stresses that has rendered wooden underframes inefficient when employed in cars of large capacity. In cars constructed with steel longitudinal sills the amount of steel employed is vastly in excess of that necessary to take care of the pulling and buffing stresses, such excess being necessary to carry efficiently the vertical load. The object of my invention is to construct a car in which wood is employed to carry the vertical load, and steel to receive the pulling and buffing stresses, this combination of material making it possible to use a comparatively small amount of the expensive material, steel, and to substitute the cheaper material, wood, for steel as the material for carrying the vertical load.

While the car illustrated in the drawings is of the central longitudinal hopper type, it will be apparent that my invention in its broader aspect may be equally useful in cars of other forms.

The car illustrated in the drawings comprises bolsters, end sills, draft sills, and lon-

gitudinal sills, formed and arranged in a manner adapted to meet the requirements above referred to. The end sills A, preferably of metal, may be of any preferred form. The draft sills and bolster of my improved car, however, are of novel construction. The draft sill construction B may be an integral member of cast metal, or may be built up from separate parts; but in any event it is a single unitary structure attached to the end sill A, and extending inwardly to a point beyond the bolster D, where it is widened transversely of the car to afford means of attachment for longitudinal sills C, C, which are spaced from the center of the car sufficiently to give room for the hopper E, which projects downwardly to a lower level than the underframe.

In the drawings the draft sill structure is represented as a casting, comprising the parts 1, 1, corresponding to the usual draft sills, which parts are attached to the end sill in any suitable manner. In the present instance gussets 2, 2 are shown, riveted, respectively, to the parts 1, 1 of the draft sill structure and to the end sill. The draft sill projects inwardly from the end of the car to a point beyond the bolster D. The bolster is of novel construction, and comprises the end parts 3, 3 projecting to the sides of the car, and the central part 4, of less depth than the end parts, the bolster being recessed from below at its center to fit over the top and sides of the draft sill structure. The draft sill, as clearly shown in Fig. 3, is also provided with a rectangular recess, as indicated at 5, into which recess the shallow part of the bolster D fits. By this means a mortised connection between the bolster and draft sill is provided. The shallower part 4 of the bolster constitutes the tension member thereof. The compression in the lower part of the bolster is sustained by the draft sill, as will be clearly apparent from Fig. 2. On the lower part of the draft sill, at its point of intersection with the bolster the center bearing 6 is formed, the center bearing being integral with the draft sill structure. In form the draft sill is a channel, as shown in Fig. 2, with outwardly projecting flanges 7, 7 at the lower edges of the side webs of the channel, the central web of the channel being at the top. The center bearing forms a connection between the side flanges of the draft sill channel, as clearly shown in Fig. 2, and a cylindrical shell 8 projects upwardly from the center bearing to the top web of the draft sill. As indicated in Fig. 3 diagonal braces 9, 9 extend from the central shell forwardly and rearwardly to brace the center bearing, and extending transversely from the cylindrical shell 8 are webs 10, 10 extending to the side webs 11 of the draft sill channel member. The transverse webs serve to brace the side webs of the draft sill against the compression imposed by the lower part of the bolster, which is subjected to a compressive strain.

The draft sill structure extends inwardly beyond the bolster, and at its inner end is widened transversely of the car. In the present instance I have shown diagonal members 12, 12 diverging from the draft sill structure at the inner sides of the bolster; but it will be apparent that this specific structure is not necessary in the application of the broad idea of my invention, it being merely necessary to suitably widen the inner end of the draft sill structure. The diverging arms 12, 12 of the draft sill structure are preferably of angle form, with vertical flanges 13, 13. Connecting the diverging ends of the arms 12, 12, and forming a part of the draft sill structure, is a cross member 14 extending transversely of the car, this cross member also being of angle form, as shown most clearly in Fig. 3. In Fig. 4 the transverse part 14 of the draft sill structure is shown of less width at its central part than at its ends. At the ends of the transverse parts of the draft sill structure vertical flanges 15 are provided. The longitudinal sills C, C, which extend between and are attached to the draft sill extensions, embrace the lower side of the cross member 14, and the outer sides of the upwardly extending flanges 15 at the ends thereof.

As heretofore described the structure provides means for effectually sustaining all pulling stresses imposed upon the car, and the spacing apart of the longitudinal sills C, C provides room for the downwardly extending hopper E, as most clearly indicated in Figs. 2 and 3. In this structure the draft sills in the assembled car, together with the longitudinal sills C, C, form a unitary structure extending from one end of the car to the other. In order to afford convenient support to the hopper, and to some extent to add to the buffing resistance of the underframe, I provide wooden fillers 16, 16 fitted into the angle longitudinal sills.

The vertical load of the car and contents are carried by the wooden longitudinal sills F, G, and H, which rest upon the bolsters and extend from one end sill of the car to the other.

By means of the construction above described the use of steel is restricted to those parts of the underframe upon which the severe pulling and buffing stresses are imposed, while cheaper material—wood—is employed to carry the vertical load thus making possible a great economy in the amount of steel employed, without sacrificing any element of strength or efficiency in the underframe as an entirety.

I claim:—

1. In a car underframe, a bolster, an end

sill, and a metal draft sill extending from the end of the car inwardly beyond the bolster, and at its inner end provided with expanded V-shaped means for attaching longitudinal sills.

2. In a car underframe, bolsters, end sills, and metal draft sills extending from the end of the car inwardly beyond the bolsters, the inner ends of said draft sills being provided with V-shaped means for attaching longitudinal sills spaced from the center of the car.

3. In a car underframe, bolsters, end sills, metal draft sills, said draft sills extending beneath the bolsters and having V-shaped means to which longitudinal sills may be attached, and center bearings formed integral with said draft sills.

4. In a car underframe, bolsters, end sills, metal draft sills, said draft sills extending beneath said bolsters, center bearings formed integrally with said draft sills, and means having diverging arms at the inner ends of said draft sills for attaching longitudinal sills.

5. In a car underframe, bolsters, end sills, metal draft sills, said draft sills extending beneath said bolsters, center bearings formed integrally with said draft sills, and means having diverging arms at the inner ends of said draft sills for attaching longitudinal sills spaced from the center of the car.

6. A car underframe comprising end sills, bolsters, draft sills, said draft sills extending inwardly from the end sills beyond the bolsters and having diverging arms, longitudinal sills spaced from the center of the car for the reception of a hopper and attached at their ends to said arms of said draft sills to form a rigid construction to resist pulling and buffing strains, and a longitudinal hopper extending downwardly between and below said longitudinal sills.

7. In a car, end sills, bolsters, draft sills, said draft sills extending inwardly from the end sills beyond the bolsters and having diverging arms, longitudinal sills spaced from the center of the car and attached at their ends to the arms of said draft sills, said bolsters being recessed in their under sides and engaging the top and sides of the draft sills.

8. In a car, end sills, bolsters, draft sills, said draft sills extending inwardly from the end sills beyond the bolsters and having diverging arms, longitudinal sills spaced from the center of the car and attached at their ends to the arms of said draft sills, said bolsters being recessed in their under sides and engaging the top and sides of the draft sills, and center bearings formed integrally with said draft sills.

9. In a car underframe, a draft sill structure comprising spaced parallel members to receive the draft rigging, said parallel members having divergent extensions at their inner ends for attachment to longitudinal sills spaced from the center of the car.

10. In a car underframe, a bolster, a draft sill structure comprising spaced parallel members to receive the draft rigging, and a transversely widened extension inwardly of the bolster for attachment to longitudinal sills spaced from the center of the car.

In testimony whereof, I have subscribed my name.

JOHN O. NEIKIRK.