Oct. 24, 1967 N. B. AKITT 3,348,500

EIGHT WHEEL RAILWAY TRUCK WITH SPAN BOLSTER

Filed Jan. 8, 1965 2 Sheets-Sheet 1

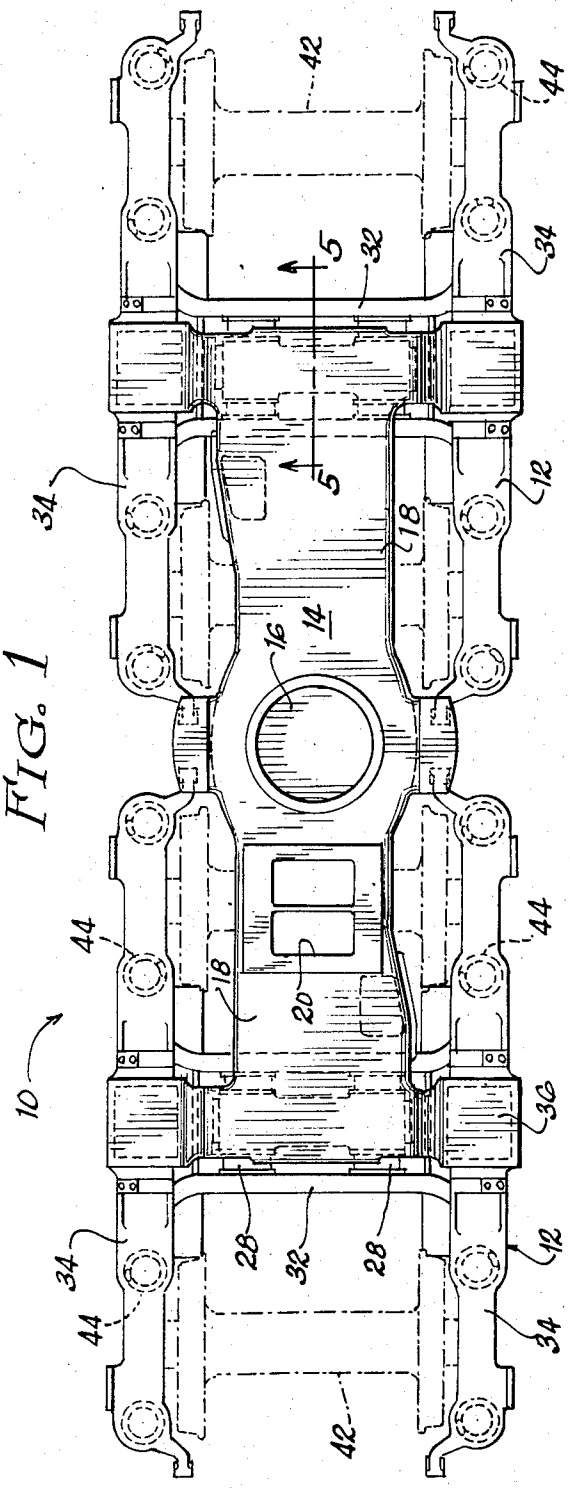


FIG. 1

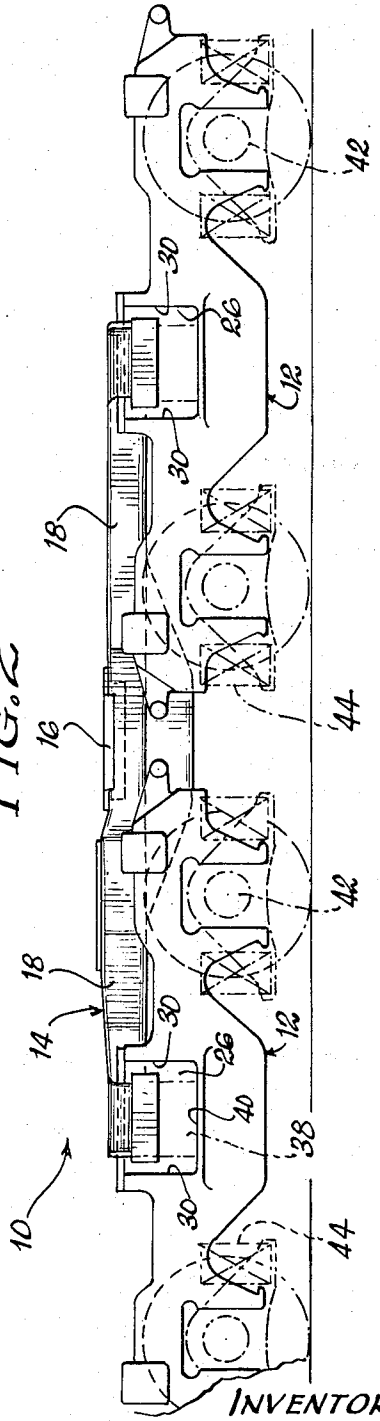


FIG. 2

INVENTOR
Norman B. Akitt
by McDougall, Hersh & Scott
Attys

Oct. 24, 1967 N. B. AKITT 3,348,500

EIGHT WHEEL RAILWAY TRUCK WITH SPAN BOLSTER

Filed Jan. 8, 1965 2 Sheets-Sheet 2

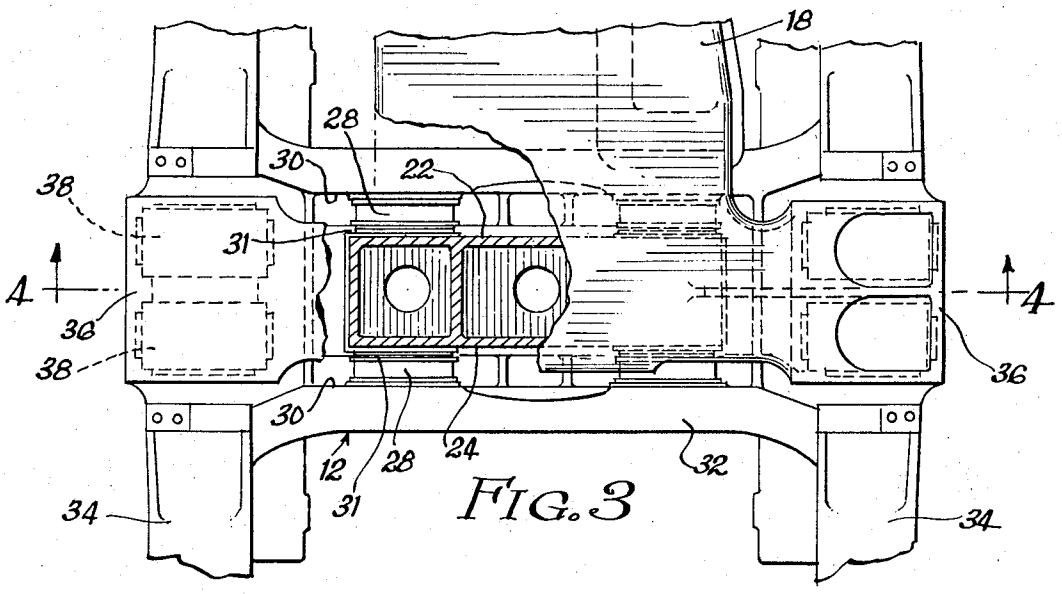


FIG. 3

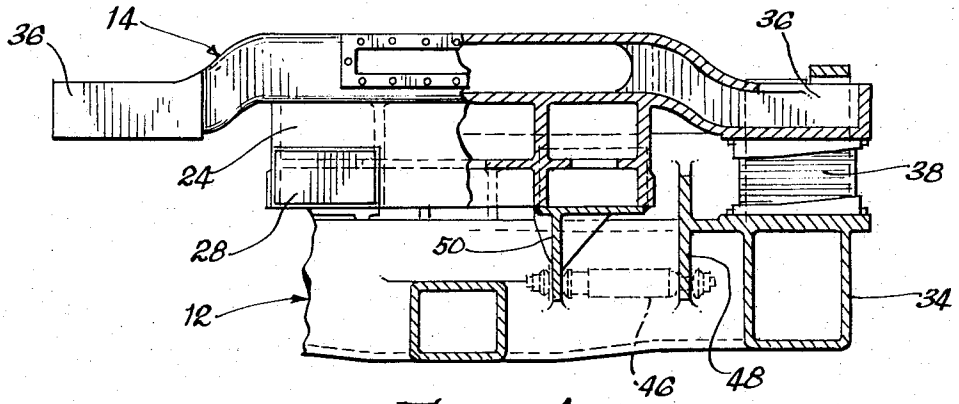


FIG. 4

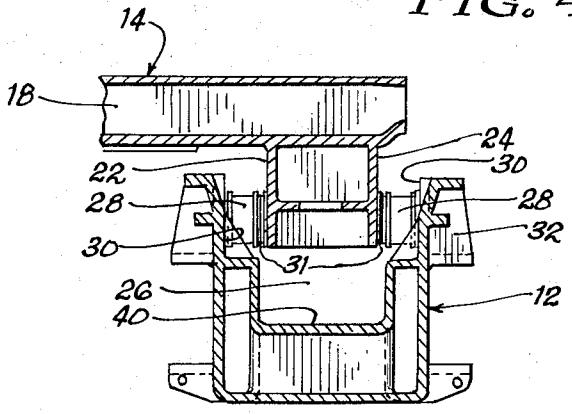


FIG. 5

INVENTOR
Norman B. Akitt
by McDougall, Hersh & Scott
Att'ys

United States Patent Office

3,348,500
Patented Oct. 24, 1967

3,348,500

EIGHT WHEEL RAILWAY TRUCK WITH SPAN BOLSTER

Norman B. Akitt, Schenectady, N.Y., assignor to Adirondack Steel Casting Co., Inc., Watervliet, N.Y.

Filed Jan. 8, 1965, Ser. No. 424,242
6 Claims. (Cl. 105—183)

ABSTRACT OF THE DISCLOSURE

A railway truck construction including a pair of truck frames supporting wheels permitting movement of the truck frames along a track. The truck frames define transversely extending recesses which receive depending portions of a bolster spanning, and interconnecting the truck frames. An arrangement of resilient members is interposed between opposed surfaces of the truck frames and span bolster. First resilient means are located between opposed vertically extending walls which run transversely of the construction. Additional resilient means are interposed between horizontally disposed surfaces, and the combination provides for reaction to both longitudinally applied and vertically applied surfaces. The design permits the construction of compact railway trucks which can be economically produced and which are unrestricted during operation.

This invention relates to railway trucks, particularly of the type employed with locomotives and on other heavy railway equipment. The particular construction of this invention involves an arrangement wherein independent railway trucks are associated with a span bolster and wherein the superstructure is connected to the bolster.

In the use of large railway equipment, particularly locomotives, it is necessary to provide trucks having extremely high load carrying capabilities. It has previously been established that a plurality of trucks must be associated with locomotives in order to provide for distribution of the load in a desirable manner. In a typical application, eight axles are associated with a locomotive by providing four individual two-axle trucks.

It is extremely important to provide the necessary number of trucks in the most economical fashion since the railway supply industry is extremely competitive and cost conscious. One important consideration from the standpoint of cost relates to the design of the bolsters used with the trucks. Thus it has been determined that the use of "span" bolsters which are associated with a pair of two-axle trucks provides a more economical arrangement. Difficulties arise however, since these bolsters comprise massive castings which are extremely expensive.

Other attempts to economize have involved the use of frames having four axles fixed thereto. This design, however, unduly restricts the mobility of the axles associated with the frame. Thus, the large frame comprises a rigid member whereby the movement of the axles is restricted as when a curve is to be negotiated. Such arrangements also unduly restrict the utility of locomotives with which they are associated since extremely high rates of wear are occasioned due to the lack of mobility.

It is an object of this invention to provide a novel arrangement comprising adjacent railway trucks and a span bolster associated with the trucks.

It is a further object of this invention to provide an arrangement of the type described which includes a span bolster of a relatively small size whereby the cost of such an assembly can be materially reduced without sacrificing load bearing capabilities.

It is an additional object of this invention to provide a truck and span bolster assembly of the type described which is characterized by completely satisfactory mobility whereby the assembly can be utilized under any standard conditions and without undue wear.

These and other objects of this invention will appear hereinafter and for purposes of illustration, but not of limitation, specific embodiments of this invention are shown in the accompanying drawings in which:

FIGURE 1 is a plan view of the truck and bolster assembly of this invention;

FIGURE 2 is a side elevational view of the assembly of FIGURE 1;

FIGURE 3 is an enlarged detail view partly cut away illustrating the connection between the span bolster and a railway truck;

FIGURE 4 is a cross-sectional view taken about the line 4—4 of FIGURE 3; and,

FIGURE 5 is a cross-sectional view taken about the line 5—5 of FIGURE 1.

The construction of this invention comprises an assembly including a pair of truck frames having axles and wheels associated therewith in a conventional fashion. A span bolster is provided for interconnecting the adjacent truck frames. The specific span bolster includes a centrally located support portion which is adapted to be pivotally connected to the superstructure which may comprise a locomotive.

The particular span bolster includes longitudinally extending sections on either side of the central support portion. Resilient means interconnect these sections with the respective railway trucks, and these resilient means are adapted to react to longitudinal forces which are set up during operation of the construction. Such forces may result during stopping and starting or during turning movement at which time differential forces will be set up in the respective resilient members.

Each of the span bolsters includes laterally extending sections located at either end of the longitudinally extending sections. Resilient means are located between these laterally extending sections and the truck frame, and these resilient means react to vertical and lateral forces set up during operation.

As will appear, the span bolster of this invention is particularly desirable due to the fact that it can be effectively employed even though it is of relatively small size. The basic novelty of this invention also involves the use of resilient means for interconnecting different portions of the span bolster with the truck frame whereby all of the forces normally set up during operation can be accommodated.

FIGURE 1 illustrates an assembly **10** comprising truck frames **12** and a span bolster **14**. The span bolster includes

a centrally located pivot **16** which is provided for connection with the superstructure of a locomotive or other railway vehicle adapted to be carried by the assembly.

Longitudinally extending sections **18** are integrally formed in the span bolster. Openings **20** are provided as air ducts, and it will be appreciated that any suitable number of such openings is contemplated.

The ends of each of the sections **18** define opposed transverse wall **22** and **24**. When the span bolster is located in place with respect to the railway trucks, these walls are situated in recessed portions **26** defined by the respective trucks. Disposed between the ends of the span bolster and the walls **22** and **24** are resilient members **28**. One face of these members is secured to one of the opposed walls **30** of the recess **26**. The other face presses against wear plates **31** for sliding engagement therewith. It will be appreciated that all forces which are applied in a longitudinal direction will be resisted by the action of these resilient members **28**. Forces encountered during change in speed will generally be directly applied in the longitudinal direction. During turning of the assembly, the trucks are free to move relative to the span bolster **14** and, in such case, some of the members **28** will be in compression and the others in tension, depending upon the direction of turning.

It will be noted that each of the trucks **12** comprises a generally H-shaped frame having a transom **32** forming the transverse leg and members **34** forming the longitudinal sections thereof. The recess **26** is defined in the transom portion of each of the trucks.

Laterally extending portions **36** are associated at each end of the bolster **14**. Resilient members **38** are disposed between these lateral portions and the base **40** of the recess **26**. It will be apparent that the resilient members **38** are adapted to react to forces which are applied vertically in the construction. In the particular embodiment shown in FIGURE 3, a pair of resilient members **38** is associated with each of the lateral portions **36** of the bolster. Furthermore, these resilient members will react to shear forces set up during turning and to forces resulting from sidewise jolts, etc., during operation.

The truck constructions illustrated in the drawings comprise axles **42** having conventional journal associations with the truck frame. Springs **44** are adapted to be associated with the truck frames to provide a conventional means for mounting of the axles. It is also contemplated that a snubber **46** be included between plate portions **48** and **50** defined, respectively, by the truck frame and span bolster. It will be appreciated, however, that the arrangement of this invention provides the resilient members **28** and **38** as the elements which give the major resistance to applied forces.

It will be appreciated that during operation of the illustrated embodiment of this invention, the load of the superstructure will be distributed primarily to the lateral portions **36** for transmission to the respective trucks. It has been found that an arrangement of this type provides extremely effective load distribution to the extent that loads equivalent to the loads carried by prior art constructions can easily be accommodated.

Additional advantages are achieved by the arrangement of this invention since an assembly having a high load bearing capacity and having relatively small dimensions has been provided. This is particularly true with regard to the height of the assembly since in many cases the prior art has located the span bolsters entirely above the axles and wheel assemblies. The provision of the recessed portion **26** in the transom of the railway trucks is partly responsible for this advantage in the instant construction since the span bolster can be located whereby it extends for only a short distance above the truck frames. The assembly thus permits locating of the locomotive lower to the rail to provide a lower center of gravity which is a highly desirable feature.

It should also be noted that in the instant arrangement,

the ends of the span bolster take the place of truck bolsters normally provided. The elimination of these truck bolsters permits a substantial reduction in height thereby contributing greatly to the provision of a lower center of gravity. The elimination of the truck bolsters along with the swing hangers and spring planks employed therewith also reduces the cost of the inventive combination to a substantial degree.

The arrangement of this invention can be produced in a highly economical fashion since the span bolster does not comprise a prohibitively large casting. In addition, the particular arrangement of the resilient members **28** and **38** provides for highly efficient assembly since there are no complicated steps involved in locating and securing the resilient members during formation of the assembly. Bonded rubber sandwiches are particularly suitable since they will stand up under both shear and compression forces. Thus, it will be appreciated that the span bolster and associated trucks are subjected to forces which require relative lateral movement as well as relative vertical movement. Bonded rubber sandwiches are considered more suitable than coil springs under conditions of this type.

It will be understood that various changes and modifications may be made in the construction described which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

That which is claimed is:

1. In a railway truck construction including a pair of truck frames, axles associated with each frame, and wheels associated with each axle, and including a span bolster interconnecting said truck frames, said bolster including a center support portion adapted to be pivotally connected to the superstructure supported by said construction, the improvement comprising means for securing said bolster to said truck frames, said bolster including longitudinally extending sections formed on either side of said center support portion, vertical walls extending transversely across said longitudinally extending sections adjacent the ends thereof, and oppositely facing vertical walls formed in said truck frames, resilient means interposed between said vertical walls adapted to react to longitudinally applied forces, horizontally disposed surfaces defined by said longitudinally extending sections, and oppositely facing horizontally disposed surfaces defined by said truck frames, and additional resilient means interposed between said horizontally disposed surfaces adapted to react to shear forces and to vertically applied forces.

2. A truck construction in accordance with claim **1** wherein said truck frames are H-shaped and include transversely extending transom portions, said resilient means being attached to said transom portions.

3. A truck construction in accordance with claim **2** wherein each of said transom portions defines a recess along its length, the respective recesses defining the vertical walls and horizontally disposed surfaces of the truck frames, said resilient means being secured within said recesses whereby the height of the construction can be maintained at a minimum.

4. A truck construction in accordance with claim **3** wherein said longitudinally extending sections comprise downwardly extending members adapted to be received in the recesses defined by the respective transoms, said downwardly extending members defining said vertical walls located in opposed facing relationship with respect to the said vertical walls defined by said recesses, and wherein said first mentioned resilient members are interposed between said opposed walls on both sides of said recess.

5. A truck construction in accordance with claim **3** wherein said bolster includes laterally extending portions formed integrally with said longitudinally extending sections, said longitudinally extending portions defining bot-

tom walls located in opposed facing relationship with the bottom walls defined by said recesses, and wherein said additional resilient members are interposed between the respective bottom walls.

6. A truck construction in accordance with claim 3 wherein said resilient members comprise bonded rubber sandwiches.

References Cited

UNITED STATES PATENTS

1,144,328	6/1915	Howard et al.	105—196
1,936,343	11/1933	Barrows	105—183
2,217,682	10/1940	Johnson	105—183
2,229,768	1/1941	Pflager	105—183
2,252,382	8/1941	Lanning	105—196
2,709,971	6/1955	Rossell	105—197 X
2,728,305	12/1955	Candlin	105—197 X
2,753,814	7/1956	Dilworth	105—197 X
3,181,479	5/1965	Rumsey et al.	105—197 X
3,220,357	11/1965	Tack	105—226

ARTHUR L. LA POINT, *Primary Examiner.*

H. BELTRAN, *Assistant Examiner.*