

H. W. BLAKE.
CAR TRUCK.

APPLICATION FILED AUG. 24, 1911.

Patented Sept. 10, 1912.

8 SHEETS—SHEET 1.

1,038,481.

Fig 1

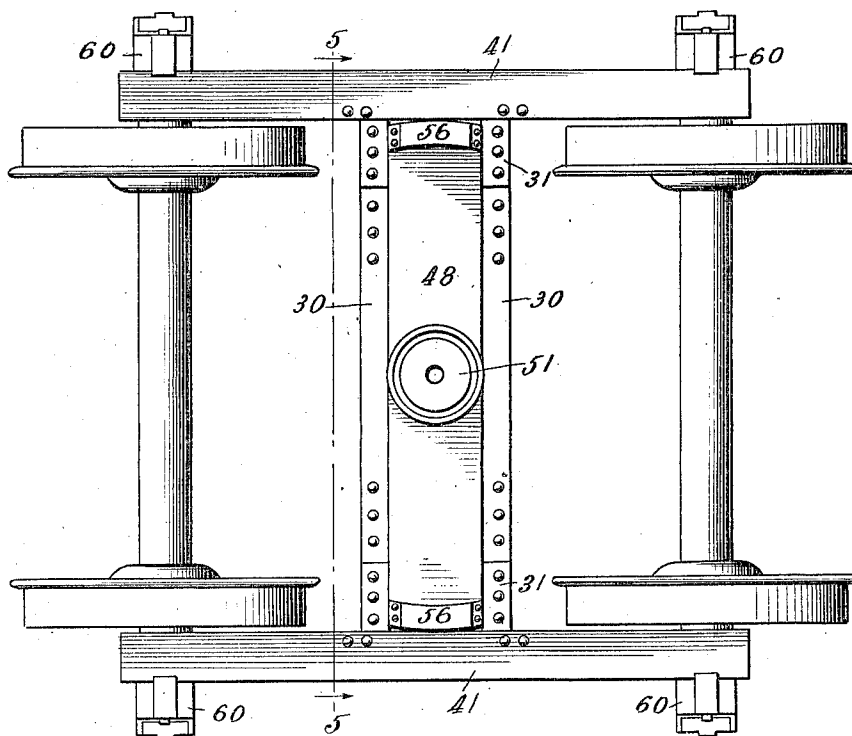
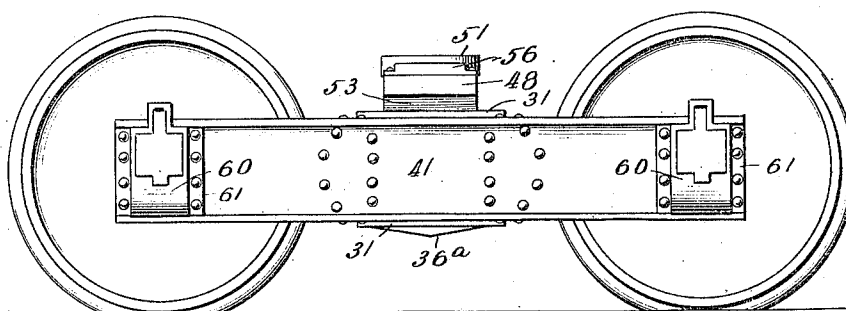


Fig 2



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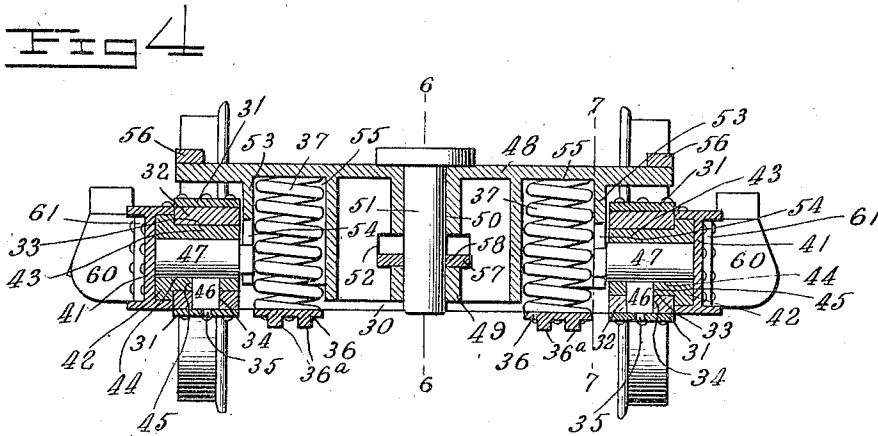
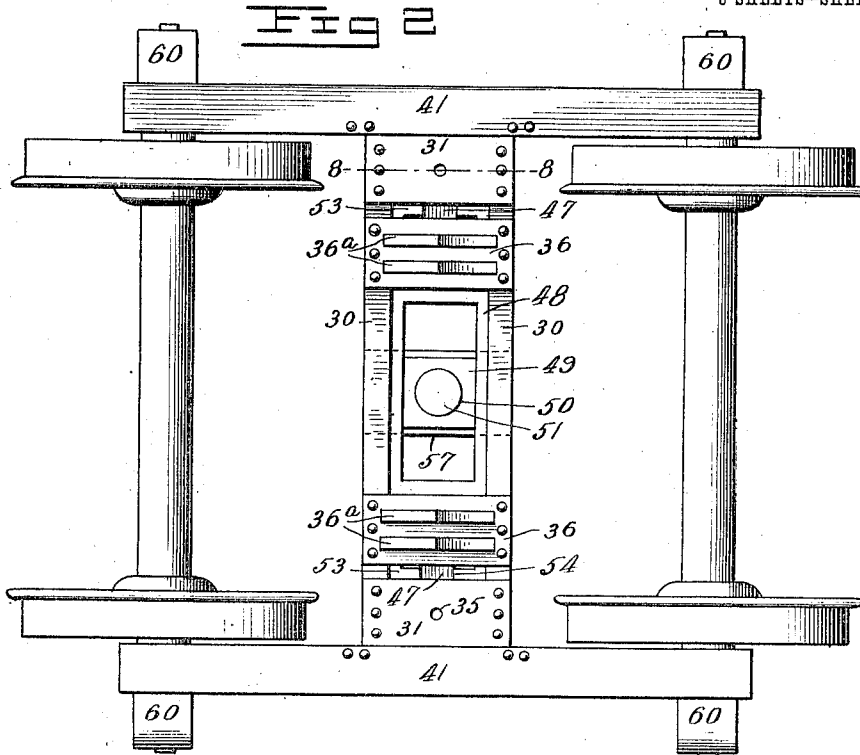
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8 SHEETS—SHEET 2.



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8 SHEETS—SHEET 3.

Fig 5

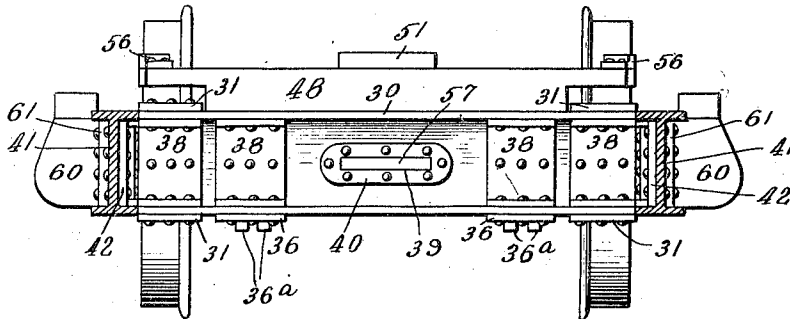


Fig 6

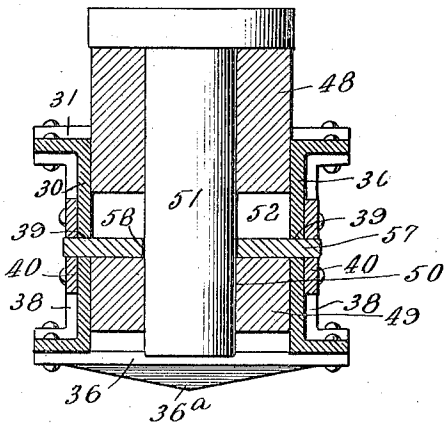


Fig 7

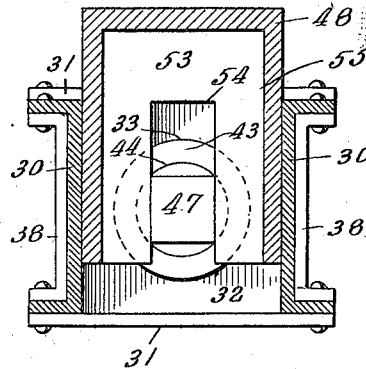
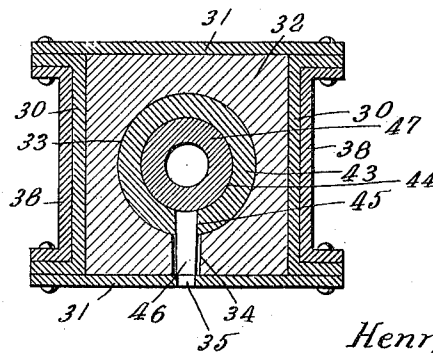


Fig 8



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8 SHEETS—SHEET 4.

Fig 9

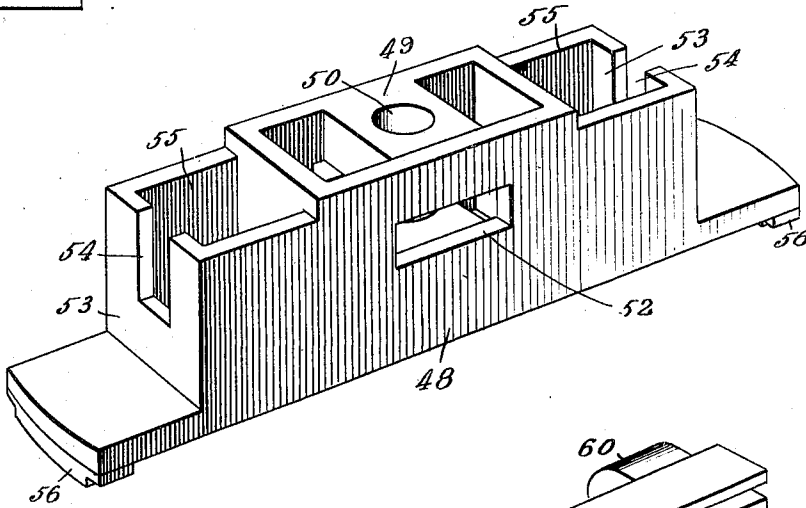


Fig 10

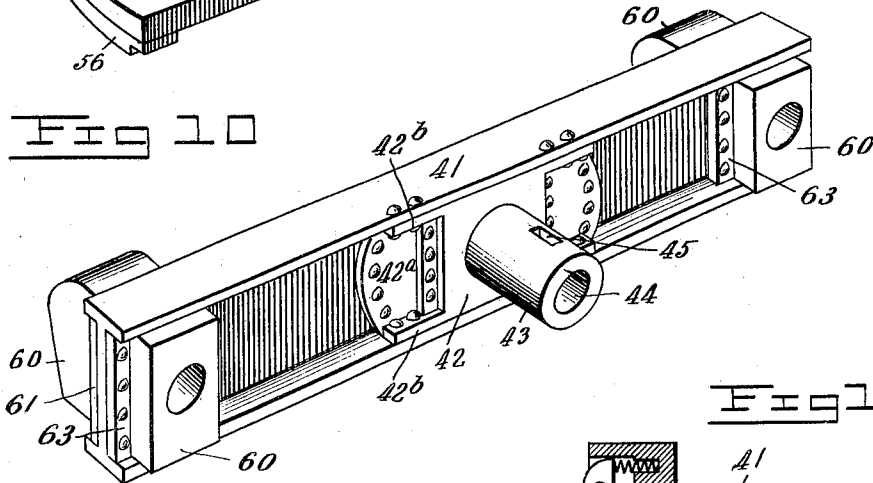


Fig 11

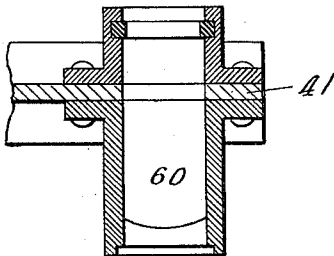
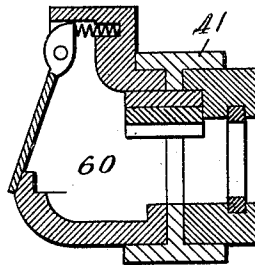


Fig 12



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8 SHEETS—SHEET 5.

Fig 13

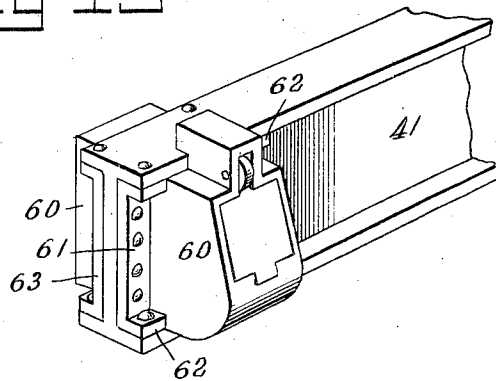


Fig 14

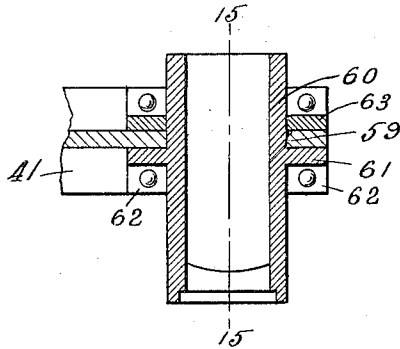


Fig 15

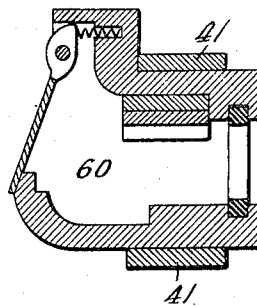
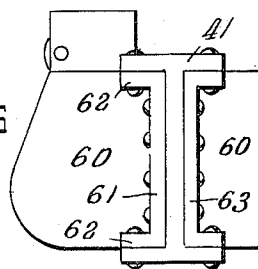


Fig 16



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8 SHEETS—SHEET 6.

Fig 17

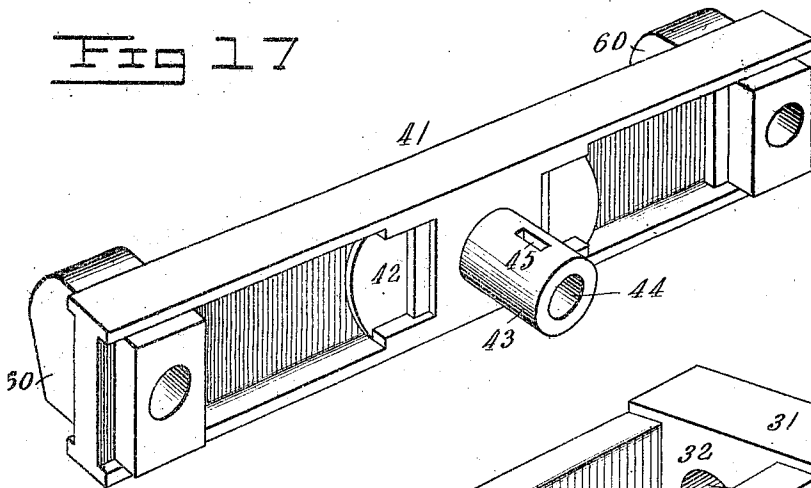


Fig 18

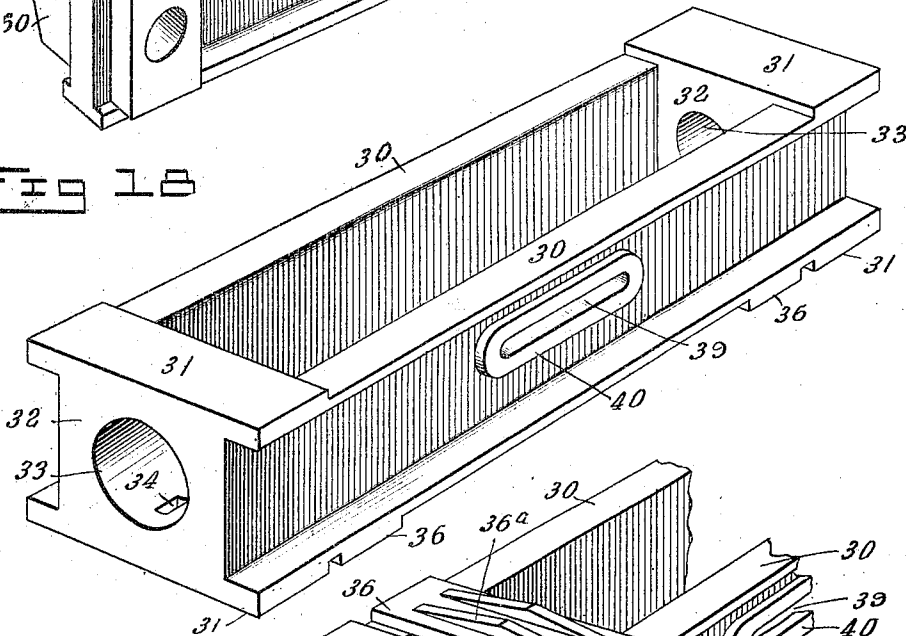
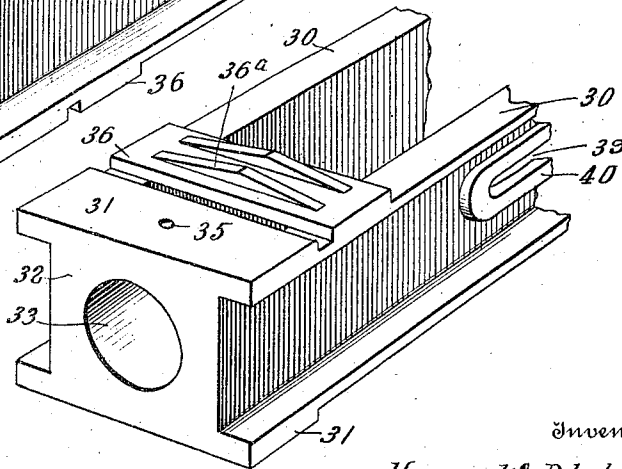


Fig 19



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8 SHEETS—SHEET 7.

FIG 20

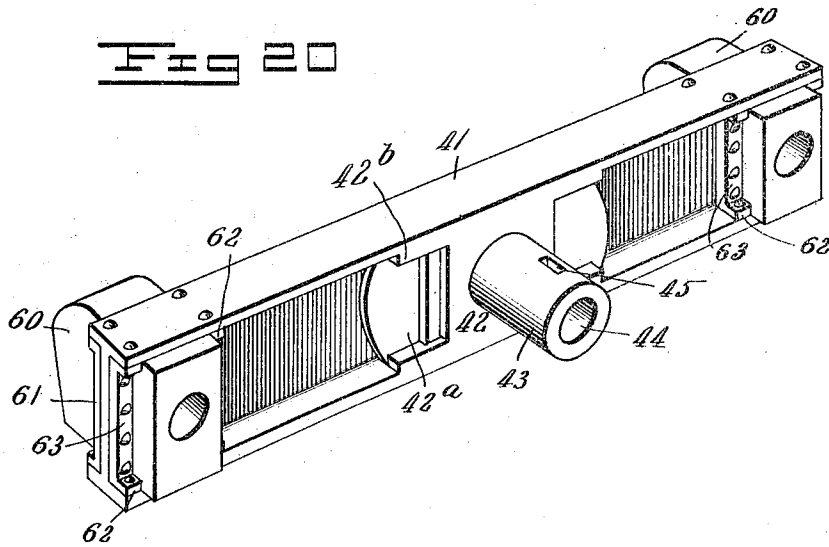
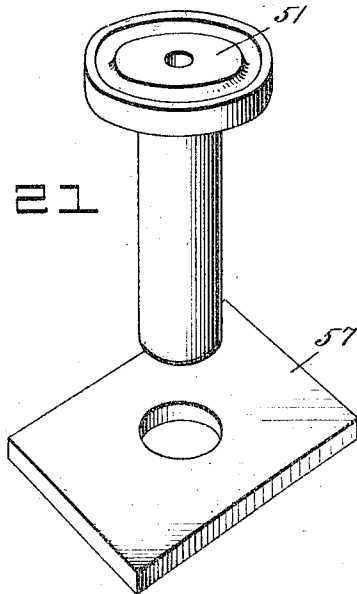


FIG 21



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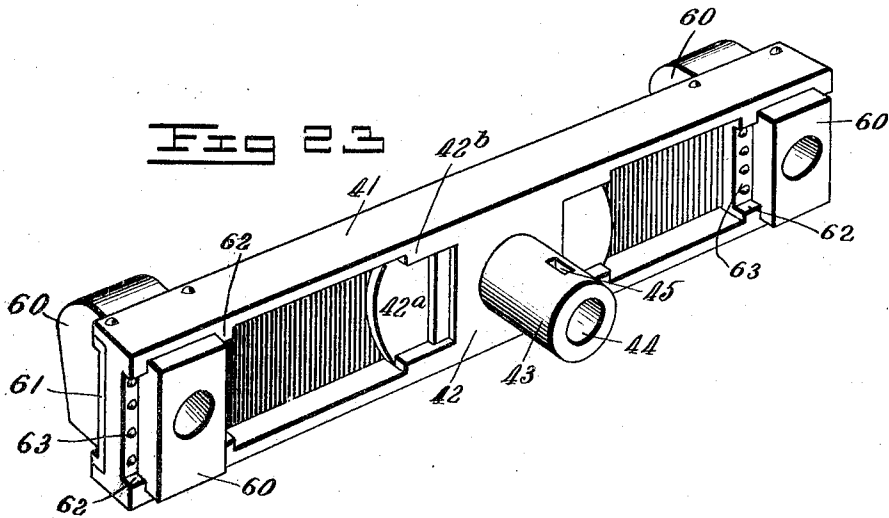
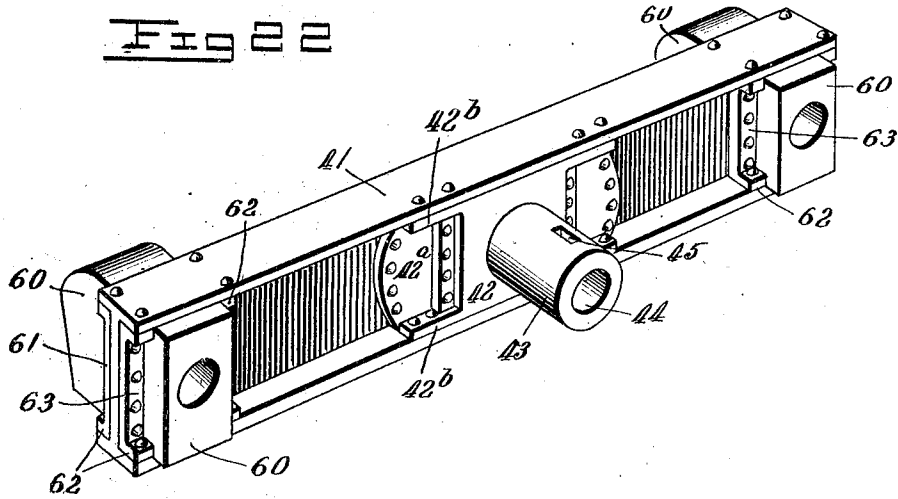
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8 SHEETS—SHEET 8.



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UNITED STATES PATENT OFFICE

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CAR-TRUCK.

1,038,481.

Specification of Letters Patent.

Patented Sept. 10, 1912.

Application filed August 24, 1911. Serial No. 645,750.

To all whom it may concern:

Be it known that I, HENRY W. BLAKE, a citizen of the United States, residing at Ball Ground, in the county of Cherokee and State of Georgia, have invented new and useful Improvements in Car-Trucks, of which the following is a specification.

My invention relates to improvements in car trucks, and has particular relation to the construction and relative arrangement of the elements thereof to provide a mutually supported structure.

The principal objects of my invention are:—(1) To provide a structure in which the side frames, transom, and bolster are each formed as unitary structures and having complementary parts so arranged as to be held in assembled relation by keys.

(2) To provide a structure of this character in which the transom and side frames are removably connected together, the connections being concealed. (3) To provide a structure of this character in which the transom and side frames are removably connected together, and separable only upon removal of the bolster. (4) To provide a structure of this character in which the transom is removably connected to the side frames, the latter being imperforate in the plane of the transom. (5) To provide a structure of this character in which the bolster and transom are removably connected together in a manner to permit relative movements, the connection being fixedly held by the king-bolt. (6) To provide a structure of this character in which the side frame is in the form of a metallic beam having its inner face provided with a supporting member for the transom, said member projecting inwardly beyond the normal plane of the side frame to cause the transom, when connected to the side frame, to not extend into the normal plane of the side frame beam. (7) To provide a structure of this character in which the side frames and transom are removably connected together, the parts being complementally formed to permit a relative pivotal movement within a limited range. (8) To provide a structure of this character in which the side frame is provided with an opening for the passage of a journal box, said opening being spaced from the end of the side frame, the journal box being secured in position by structures acting to reinforce the

side frame surrounding the opening. (9) To provide a combined side frame and journal box structure in which a one-piece journal box, having laterally extending flanges on its opposite sides, is inserted through the side frame to cause the flanges to abut the web of the side frame, the flanges being out-turned at their opposite ends to provide suitable members secured to the frame for locking the flanges thereto. (10) To provide an integral, or one piece, side frame, journal box and supporting structure for the transom.

Other and further objects are to provide a structure of great strength and durability, which is readily assembled, which is simple and efficient in operation, and which is relatively of low cost of manufacture.

To these and other ends, the nature of which will be readily understood as the invention is hereinafter disclosed, the said invention consists in the improved construction and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts in each of the several views,—Fig. 1, is a top plan view of a truck constructed in accordance with my invention, Fig. 2, is a bottom plan view of the same, Fig. 3, is a side elevation of the same, Fig. 4, is a section taken centrally of the truck and longitudinally of the transom. Fig. 5, is a sectional view taken on line 5—5 of Fig. 1, looking in the direction of the arrow. Fig. 6, is an enlarged sectional view taken on the line 6—6 of Fig. 4. Fig. 7, is an enlarged sectional view taken on the line 7—7 of Fig. 4. Fig. 8 is a sectional view taken on the line 8—8 of Fig. 2. Fig. 9 is a bottom perspective view of my preferred form of bolster. Fig. 10 is an inside perspective view of a side frame constructed in accordance with my invention. Figs. 11 and 12 are sectional views of one type of journal box capable of use with my improved side frames shown in Figs. 10 and 20. Fig. 13 is a detail perspective view of a portion of a side frame, and showing my preferred form of journal box structure, and the manner in which it is connected to the side frame of I-beam construction. Fig. 14 is a horizontal sectional view taken through the ends of a

side frame and the journal box secured thereto. Fig. 15 is a sectional view taken on line 15-15 of Fig. 14. Fig. 16 is an end elevation of Fig. 13 of the side frame, showing the journal box in secured position thereon, this journal box being adapted to the structures disclosed in Figs. 20 and 22. Fig. 17 is an inside perspective view showing the improved side frame and its appurtenant parts formed as an integral structure. Fig. 18 is a perspective view of a one-piece transom. Fig. 19 is a reverse view of the transom of Fig. 18. Fig. 20 is an inside perspective view disclosing the two-part detachable journal box applied to the integral side frame. Fig. 21 is a detail perspective view of the key or locking plate and the king bolt for engagement therethrough. Fig. 22 is a perspective view of one of the side frames inverted and carrying the detachable two piece journal box and support for the transom. Fig. 23 is a perspective view of one of the integral side frames inverted with its transom support, showing the one piece journal box and the reinforcement applied thereto.

The truck herein described consists of the side frames, the wheels, the transom, keys locking the transom to the side frames, plugs holding the keys in the frames, a locking plate carried through the transom, the bolster engaging the plugs to hold the same in place and having relatively wide openings loosely receiving the locking plate, and the king-bolt passing through the bolster and the locking plate. These elements are removably connected together to permit of a ready separation of the parts, the construction and relative arrangement of the parts being now described.

The transom preferably comprises two spaced apart parallel flanged plates or channel bars 30, of a length substantially equal to the distance between the side frames, and of a suitable width, said plates being secured together at their ends by suitable plates 31, extending across the flanges at the top and bottom of the bars 30, being secured to said flanges in suitable manner, as by bolts or rivets, the latter being preferred the space between the plates at each end being filled by a block 32, which acts as a spacing block for the channel bars or plates, and which is provided with an axial opening 33 to receive the projecting portion of the side frame presently described and which serves as a support for the transom when the parts are assembled. Each of the filling blocks is also provided with a radial recess 34, extending into the filling block from the opening 33, said recess being located intermediate the ends of the block and preferably at the bottom of the filling block, although it will be obvious that it may be provided at any other convenient points within the block, the

particular location described being preferred since it permits of ready manipulation of the key presently described through an opening 35 formed in the lower tie-plate 31, which latter opening leads into the recess 34.

Secured to the under face of the bars 30 at points adjacent the tie-plates 31, I secure supporting plates 36 on which the springs 37, for the bolster, are adapted to rest, said plates 36 being preferably strengthened by ribs 36^a, as shown in Figs. 2, 3, 4 and 6. I also preferably reinforce the channel bars 30 by reinforcing plates 38 positioned on the outer faces of the webs of said bars in substantial alinement with the supporting plates 36, as shown in Fig. 5. Substantially midway of the length of the bars 30 and at a point intermediate the top and bottom portions of the bars (preferably approximately midway of such width) I provide the web of each bar with an elongated opening 39, of suitable width, the openings of the two bars being opposite each other and having their walls reinforced by suitable reinforcing plates 40 secured to the outer faces of the webs of the bars 30.

The above described structure of transom provides a built-up construction of parts, and it is to be understood that the several parts described will be properly connected together by bolts or rivets, the drawings indicating the points where such connections should be provided. However, it is to be understood that this transom structure may be formed as an integral structure, and I have shown in Figs. 18 and 19 a way in which such integral structure may be provided; it being understood that either type will fall within the spirit and scope of the invention. It will also be understood that variations and modifications in the specific construction and arrangement of this bar may be found desirable and necessary in use, and I reserve the right to make such changes and modifications as may be found necessary to carry into effect the invention herein disclosed.

The side frames herein disclosed are substantial duplicates, and hence a description of one will suffice for both.

The side frame is preferably formed of a metallic beam 41, preferably of a commercial I-beam configuration in cross section, and each is provided with a journal box adjacent its ends, as presently described. Approximately midway of the length of the bar 41, I preferably secure to the inner face of the bar, a reinforcing structure 42, secured to the web and the flanges of the beam and preferably having a thickness substantially equal to the width of the flange, thereby providing an extended face between the opposing flanges of the beam and in approximately the plane of the edges of such

flanges, said face being preferably of an area approximately the area of the end of the transom, and having a configuration somewhat similar to the configuration of the end of the transom bar, the latter, when the parts are assembled, being in opposition to said face. The structure 42 is reduced at its ends, as at 42^a, and receives at such reduced portions rivets passing through the web of the side frame to hold the structure in position. The reduced portions 42 are disposed within the longitudinal edges of the structure 42 and thereby provide extensions 42^b lying against the opposed flanges of the frame, and being secured thereto preferably by rivets, as shown. Fig. 17, however, illustrates the manner in which the structure 42 may be fastened integral with the side frame 41 should it be so desired. Projecting inwardly from the face of the structure 42 is a projection 43, preferably cylindrical in cross-section, and which is of a diameter to fit the opening 33 of the block 32, the length of the projection being substantially equal to the length of the opening 33, so that when the parts are assembled, the free end of the projection will lie substantially flush with the inner face of the block 32. The projection 43 is preferably formed with a central longitudinal recess 44, also preferably cylindrical, thereby causing the projection 43 to assume somewhat the character of a cylinder, through the wall of which, at a proper point, extends an opening 45 adapted to aline with and form a continuation of the recess 34 of the filling block, the recess 34 being preferably of slightly greater width than the opening 45, as shown in Fig. 8.

In connecting the transom and a side frame together, the projection 43 is introduced into the opening 33 and when properly positioned, the key 46 is inserted through the longitudinal recess 44 and into the angular openings 45 and 34, respectively, the key 46 approximately fitting the recess and opening, with the exception of the slight excess width of the recess, the latter being provided for the purpose of permitting a slight pivotal movement of the transom on the projection 43 to accommodate for irregularities in the road bed over which the truck is adapted to travel, to prevent the truck from becoming sprung when off the track and to distribute the weight equally on all four wheels. The key, when in proper position, rests within the opening 45, but does not extend inward into the recess 44, the latter being adapted to be closed by a removable plug 47 substantially fitting the recess 44 and having its inner end provided with a preferably angular projection, as shown in Fig. 7.

By this construction it will be seen that when the parts are assembled, separation of

the side frame and transom by withdrawal of the projection 43 is prevented by the key 46, the latter being of a length sufficient to eliminate all liability of a shearing action to destroy the connection (there being little or no liability of a shearing movement under the relative pivotal movement of the transom on the projection); and that the key is locked in position by the plug 47 on the inside of the projection and the bottom tie-plate 31 on the outer side of the filler block, thereby preventing any liability of the key passing out of its proper position in the connection, the structure being such that the key is entirely concealed and incapable of a withdrawal movement as long as the plug 47 is in position.

The bolster is preferably of one-piece construction, as shown more particularly in Fig. 9, being of skeleton formation for the purpose of lightness with the skeleton walls so arranged as to provide for a maximum strength to the bolster. As shown, the bolster, indicated at 48, has its side walls of considerable depth, and is provided centrally with a block structure 49, which acts to support the side wall and at the same time provides a substantial structure through which the opening 50 for the king-bolt 51 extends. Said block structure and the side walls are formed with a laterally extending opening or channel 52 adapted to cooperate with the elongated openings 39 of the transom, said opening 52, however, being of a greater width than the openings 39, to permit of the vertical movement of the bolster when the latter is in position. The side walls of the bolster are preferably of a length approximating the distance between the opposing inner faces of the filling blocks 32 of the transom; and are connected at their ends by integral end plates 53, the latter being provided with a slot 54 having a width corresponding substantially with the width of the angular extension of the plug 47, as shown in Fig. 7, said end plates 53 being adapted to straddle said projecting portion of the plug when the bolster is in position. As shown in Fig. 9, the bolster is provided with a recess 55 on opposite sides of the center, the end plates 53 forming the end walls of the respective recesses; these recesses are adapted to receive the springs 37 as shown in Fig. 4, said springs forming the support for the bolster on the transom. The bolster is provided with projecting end portions which are adapted to overhang the ends of the transom, as shown in Figs. 1, 2, 4, and 5, the upper faces of the bolster being provided, adjacent its ends, with the usual side bearings 56.

Since the springs 37 are housed in the recess 55, the bolster 48 may be depressed without injury to the springs as the latter cannot bulge laterally and be bent out of

shape, or break, but are held in their true vertical position. In this manner the springs 37 are concealed and are protected from the accumulation of foreign substances thereon affecting the corrosion of the springs. The end extensions of the bolster protect the springs 37 by limiting the compression of the springs when the truck is overloaded and the extensions retain the bolster 48 in position without straining the truck upon the breakage of a defective spring.

When the side frames and transom are connected together as heretofore pointed out, and the springs 37 placed in position on the supporting plates 36, the bolster is introduced into the space between the filling blocks 32, with the end plates 53 straddling the projections of the plugs 47, the bolster moving down into a position where the upper ends of the springs contact with the closed bottom wall of the recess 55. When in this position, the end plates 53 serve to prevent any longitudinal movement of the plugs 47, as will be readily understood from the disclosure of Fig. 7, and at the same time, the bolster is free to be pressed downwardly within the transom without affecting any of the connections of the transom and side frames.

When the bolster is in the position just referred to, a locking plate or key 57 is passed through the openings 39 and 52, as shown in Figs. 2, 4 and 6, thereby locking the bolster against removal, but, by reason of the greater width of the opening 52, permitting a vertical movement of the bolster within the transom. The key 57 is provided with an opening 58 corresponding in size to the opening 50 for the king-bolt, said opening 58 being positioned within the key to cause it to aline with the opening 50 when the key is in proper position within the transom and bolster. When in this position, the king bolt is passed through the openings 50 and 58, thereby locking the plate or key 57 against withdrawal, and necessarily causing the entire structure to be fixedly held in position and substantially incapable of removal excepting upon removal of the king-bolt which is the first element which must be removed in order to permit the parts of the truck to be taken apart.

When it is desired to remove the wheels of the truck, the following operation is required: The king-bolt 51 is first removed, thereby freeing the key 57 from its locked condition; this plate or key is then removed, permitting the bolster to be lifted out; the removal of the bolster permits the plugs 47 to be removed, after which the keys 46 are removed by inserting a suitable implement through the openings 35 and pushing the keys 46 into the interior of the projections 43, thereby leaving the side frames and transom free from connection and ready to be separated by a simple movement of the side frame to withdraw the projection from its opening in the filling block.

As heretofore pointed out, each side frame is provided, adjacent its ends, with a journal box structure, the web of the side frame being formed with an opening through which the wheel axle extends. The journal box structure and its manner of mounting disclosed in Figs. 10, 11 and 12 is that which forms the subject matter of the patent granted to me April 18, 1911, Number 990,189, in which the journal box is formed in two parts or sections each of which is flanged, the flanges being secured to the side frame on opposite sides of the web. This particular type of journal box structure is adapted to be applied to the side frame of the present application, as indicated in said figures, but I prefer to employ the journal box structure and mounting shown in Figs. 13 to 16, which structure I will now describe. The opening in the side frame, indicated as 59, is, with this particular type of journal box, of greater area than the similar opening employed in connection with the journal box of Figs. 10, 11 and 12, the opening 59 being of a size to permit the passage therethrough of the journal box itself, which, in the present instance, is a one-piece structure, as shown in Figs. 14 and 15, the form of journal box capable of application to the side frame of an I-beam construction, as disclosed in Fig. 13, is indicated at 60, being provided with laterally extending flanges 61 which are adapted to abut against one side of the web of the side frame and thus limit the movement of the journal box in one direction. To prevent movement of the box in the opposite direction (the direction of withdrawal) I turn the ends of the flanges 61 out to provide suitable integral members 62 which are secured to the flanges of the side frame, said members forming a stop against the return movement of the flanges 61 in a direction to withdraw the journal box. The members 62 are of sufficient size to provide an efficient stop for this purpose, and are secured to the flanges of the side frame in suitable manner, as by bolts or rivets, the latter being preferred. For the purpose of strengthening the web adjacent the journal box, I provide a suitable reinforcement 63 on the opposite side of the web from that against which the flanges 61 abut, the reinforcements 63 being formed in one part. In this particular form of mounting the journal box provides a web-strengthening structure similar to a reinforce on opposite sides of the web on each side of the journal box and insures a structure of strength sufficient to meet all conditions. This is especially true by reason of the fact that

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this mounting of the journal box does not provide any cutting away of the flanges of the beam, the opening being entirely in the web, allowing the flanges to retain their normal structure.

In securing the various parts together permanently I may employ any preferred form of securing devices, examples of which are by bolts or screws, but I preferably secure them together by rivets, the drawings indicating the points where the connections are preferably made.

While I have shown and described the side frame and its journal box structure as built-up, it will be readily understood that this may be in the form of an integral structure, being cast instead of built-up. This will be indicated by an inspection of Fig. 17, in which the frame is shown as a one-piece structure. I desire it to be understood that either type may be provided and both are contemplated by the invention.

The advantages of this construction are believed to be apparent. The arrangement of parts is such as to provide an exceedingly strong construction of parts in which there is an entire absence of bolt connections for securing the several elements comprised in the truck make-up together, the only securing elements being the two key structures, neither of which are provided with devices adapted to work loose under service conditions, both types being positively held against any possibility of derangement or loss, and incapable of being manipulated excepting deliberately, and then only where the car is so positioned as to permit removal of the king-bolt, there being an absolute requirement that a sufficient amount of movement be given the latter as will enable it to be raised a distance sufficient to clear the top of the key 57 before even the first step required in disassembling the parts can be taken. Furthermore, each of the several parts comprised in the construction of the filling block are complementally formed so that one part acts as a safe-guard to an adjacent part to prevent tampering with the block. And as heretofore pointed out, the connections between the transom and side frames are entirely concealed, while the particular locking point for the key 57 is also concealed within the transom, in a position where it is protected against damage under service conditions.

This improved truck is adapted for use beneath cars equipped with the ordinary center plate and body bolster, but it is also designed for use in connection with the improved king-bolt and body bolster forming the subject-matter of my Patent No. 967,845, the king-pin 51 being discarded.

It will be noted that with this peculiar construction, a truck is produced which is capable of considerable flexibility whereby

it accommodates itself to inequalities in the road bed, particularly in rounding curves where there is a tendency for the outer wheels of the truck to rise over the rail, and insures an equal distribution of the weight on all four wheels. This flexibility of the truck prevents the same from being sprung when one end or side of the truck leaves the track, a circumstance not infrequent when used in connection with freight cars.

While I have herein shown and described the form of my invention which now appears to me to be the best embodiment thereof, service conditions and individual preference may necessitate changes and modifications therein to meet individual cases; and I reserve the right to make any and all such changes and modifications as may be found necessary or desirable in so far as they may fall within the spirit and scope of the invention as exemplified in the appended claims.

Having thus described my invention what I claim as new is:

1. A car truck comprising side frames, a transom, a bolster, all of said elements being removably connected together, and a king-bolt adapted to control the disconnection of all of the elements.
2. A car truck comprising side frames, a transom, a bolster, said side frames and said transom being removably connected together, and a king-bolt adapted, in normal position, to lock said frames and transom against disconnection.
3. A car truck comprising side frames, a transom, a bolster, all of said elements being removably connected together, and a king-bolt adapted, in normal position, to lock all of said elements against disconnection, an axial movement of the bolt in a direction to remove it rendering the elements free to be disconnected.
4. In a car truck, a pair of interfitting elements, a key engaging the elements to hold the same together, and a king-pin engaging the key for locking the same in position.
5. In a car truck, a transom, a bolster fitting in the transom, a key engaging through the transom and the bolster for holding the same together, and a king-pin mounted in the transom and the bolster and passing through the key to lock the same in position, said king-pin being held in position by gravity.
6. In a car truck, a truck frame formed of a plurality of elements removably connected together, said elements being disconnectible in predetermined sequence, and a king-bolt adapted to control the commencement of the successive disconnecting operations.
7. In a car truck, a truck frame formed

of a plurality of elements removably connected together, said elements being disconnectible in predetermined sequence, and a king bolt, said bolt in normal position preventing disconnecting action, an axial movement of the bolt in a direction to remove it, permitting commencement of the successive disconnecting operations.

8. A car truck, comprising side frames, a transom connecting said side frames, a bolster mounted in and removably connected to said transom, and a king-bolt adapted to prevent removal of the bolster.

9. A car truck, comprising side frames, a transom removably connecting said side frames, a bolster mounted in and removably connected to said transom, said bolster controlling the disconnection of the transom and side frames, and a king-bolt adapted to control the removal of the bolster.

10. A car truck, comprising side frames, a transom removably connected to said side frames, a bolster mounted in and removably connected to said transom, said bolster controlling the disconnection of transom and side frames and adapted to conceal the connections for the transom and side frames, and a king-bolt adapted to control the removal of the bolster.

11. A car truck, comprising side frames, a transom supported by said frames and removably connected thereto by a key connection, a bolster mounted in said transom and adapted to prevent disconnecting operation of said key connection, said bolster having a key connection with the transom to permit removal thereof, and removable means adapted to control the operation of said latter key connection.

12. A car truck, comprising side frames, a transom supported by said frames and removably connected thereto by a key connection, a bolster mounted in said transom and adapted to prevent disconnecting operation of said key connection, said bolster having a key connection with the transom to permit removal thereof, and a king bolt adapted to control the operation of said latter key connection.

13. In combination with an integral side frame for car trucks having an I-beam end with a transverse opening spaced from the extremity of the end, a journal box adapted for insertion through the opening and having channel bar flanges at its sides adapting the web and the flanges of the I-beam, and rivets engaging through the channel bar flanges of the box and the web and the flanges of the frame to hold the journal box in position.

14. A side frame for car trucks comprising an I-beam having a transverse opening in its web spaced from the end of the beam, a journal box adapted to be inserted through the opening and having flanges of channel

bar configuration on its opposite sides adapted to fit into one side of the I-beam, the journal portions of the box flanges engaging the web of the I-beam while the horizontal portions of the box flanges engage the inner faces of the flanges of said beam, and rivets passing through said box flanges and said I-beam to hold the journal box in position.

15. In a car truck, a transom, a side frame, interacting elements removably connecting the frame to the transom, and a gravity held device for locking the elements in position.

16. In a car truck, a side frame, a transom, and means for removably connecting said frame and transom together, said means comprising a vertical member inclosed and concealed within the side frame and the transom.

17. In a car truck, a side frame, a transom, said side frame having a permanent projection extending within the transom, and means adapted to removably secure said projection and transom together.

18. In a car truck, a side frame, a transom, said side frame having a permanent projection extending within the transom, and means adapted to removably secure said projection and transom together, said means normally preventing a withdrawal movement of the projection.

19. In a car truck, a side frame, a transom, said side frame having a permanent projection adapted to extend into the transom, and a key for removably securing the projection and transom together.

20. In a car truck, a side frame, a transom, said side frame having a permanent projection adapted to extend into the transom, and a key for removably securing the projection and transom together, said key normally preventing a withdrawal movement of the projection.

21. In a car truck, a side frame, a transom, said side frame having a permanent projection adapted to extend into the transom, and a key for removably securing the projection and transom together, said key normally preventing a withdrawal movement of the projection and permitting a slight relative rocking movement of transom and side frame.

22. In a car truck, a side frame having a permanent projection on its inner face, said projection having a radial opening, a transom having a member adapted to receive said projection, said member having a recess adapted to substantially aline with the opening of the projection, and a key removably seated in said opening and recess for normally preventing a withdrawing movement of the projection.

23. In a car truck, a side frame substantially imperforate at and in proximity to

its longitudinal center and having a permanent projection on its inner face, a transom having a member adapted to receive said projection, said member and projection having complemental cavities, and a key removably seated in said cavities and adapted to normally prevent substantial relative movement of said frame and transom to disconnect them.

24. In a car truck, a side frame having a permanent projection on its inner face, said projection having an axial recess, a transom having a member adapted to receive said projection, said projection and member having complemental cavities leading radially from said axial recess, and a key normally seated in said cavities and normally retaining said projection against withdrawal, said key being projectable into said recess to permit such withdrawal movement.

25. In a car truck, a side frame having a permanent projection on its inner face, said projection having an axial recess, a transom having a member adapted to receive said projection, said projection and member having complemental cavities leading radially from said axial recess, and a key normally seated in said cavities and normally retaining said projection against withdrawal, said key being projectable into said recess to permit such withdrawal movement, and removable means for preventing the projecting movement of the key.

26. In a car truck, a side frame having a permanent projection on its inner face, said projection having an axial recess, a transom having a member adapted to receive said projection, said projection and member having complemental cavities leading radially from said axial recess, a key normally seated in said cavities and normally retaining said projection against withdrawal, said key being projectable into said recess to permit such withdrawal movement, and a plug removably seated in said axial recess for preventing the projecting movements of the key.

27. In a car truck, a side frame having a permanent projection on its inner face, said projection having an axial recess, a transom having a member adapted to receive said projection, said projection and member having complemental cavities leading radially from said axial recess, a key normally seated in said cavities and normally retaining said projection against withdrawal, said key being projectable into said recess to permit such withdrawal movement, removable means for preventing the projecting movement of the key, and a bolster supported by the transom and adapted to normally prevent withdrawal of said means.

28. In a car truck, a side frame having a permanent projection on its inner face, said

projection having an axial recess, a transom having a member adapted to receive said projection, said projection and member having complemental cavities leading radially from said axial recess, a key normally seated in said cavities and normally retaining said projection against withdrawal, said key being projectable into said recess to permit such withdrawal movement, a plug removably seated in said axial recess for preventing the projecting movements of the key, and a bolster supported by said transom and adapted to normally prevent axial movement of the plug to remove it from its recess.

29. In a car truck, a side frame having a permanent projection on its inner face, said projection having an axial recess, a transom having a member adapted to receive said projection, said projection and member having complemental cavities leading radially from said axial recess, a key normally seated in said cavities and normally retaining said projection against withdrawal, said key being projectable into said recess to permit such withdrawal movement, a plug removably seated in said axial recess for preventing the projecting movements of the key, and a bolster supported by said transom and adapted to normally prevent axial movement of the plug to remove it from its recess, said plug and the transom normally concealing the key.

30. In a car truck, a side frame having its upper and lower edges formed with inturned flanges and having a reinforcing member at the longitudinal center of its web, a transom, said member having its inner face substantially flush with said flanges and also having a projection adapted to extend into the transom, said transom having a member adapted to receive said projection, and removable means for normally securing the projection and transom member against a withdrawal movement of the projection.

31. In a car truck, a side frame having its upper and lower edges formed with inturned flanges and having a reinforcing member at the longitudinal center of its web, a transom, said member having its inner face substantially flush with said flanges and of a configuration approximating that of the end of the transom, and also having a projection adapted to extend into the transom, said transom having a member adapted to receive said projection, and removable means for normally securing the projection and transom member against a withdrawal movement of the projection.

32. In a car truck, a side frame, a transom, said side frame having a projection on its inner face, said transom having a member adapted to receive said projection, said member and projection being of substantially equal axial length whereby the in-

ner end of the projection will lie substantially flush with the inner face of the member when the parts are assembled, and removable means for securing the projection and member against withdrawal of the projection.

33. In a car truck, a side frame, a transom, said side frame having a projection on its inner face, said transom having a member adapted to receive said projection, said member and projection being of substantially equal axial length whereby the inner end of the projection will lie substantially flush with the inner face of the member when the parts are assembled, removable means for securing the projection and member against withdrawal of the projection, and a bolster supported by the transom and having a face in close proximity to the inner face of the transom member.

34. In a car truck, a side frame, a transom, said side frame having a projection on its inner face, said transom having a member adapted to receive said projection, said member and projection being of substantially equal axial length whereby the inner end of the projection will lie substantially flush with the inner face of the member when the parts are assembled, and a removable key for securing the projection and member against withdrawal of the projection.

35. In a car truck, a side frame, a transom, said side frame having a projection on its inner face, said transom having a member adapted to receive said projection, said member and projection being of substantially equal axial length whereby the inner end of the projection will lie substantially flush with the inner face of the member when the parts are assembled, a removable key for securing the projection and member against withdrawal of the projection, means for retaining the key in normal position, said means having a reduced end adapted to project inwardly beyond the inner face of said transom member, and a bolster having a wall in close proximity to said inner face of the transom member and formed to straddle said reduced end, said wall being adapted to normally prevent movement of said means in a direction to permit manipulation of the key.

36. In a car truck, a side frame, a transom, said side frame having a projection on its inner face, said transom having a member adapted to receive said projection, said member and projection being of substantially equal axial length whereby the inner end of the projection will lie substantially flush with the inner face of the member when the parts are assembled, a removable key for securing the projection and member against withdrawal of the projection, means carried by and extending within said projec-

tion for retaining the key in normal position, said means having a reduced end adapted to project inwardly beyond the inner face of said transom member, and a bolster having a wall in close proximity to said inner face of the transom member and formed to straddle said reduced end, said wall being adapted to normally prevent movement of said means in a direction to limit manipulation of the key.

37. In a car truck, a transom having spaced apart members connected together at their ends, a bolster adapted to extend into the space between said members, said members and the bolster each having a transverse opening intermediate their ends, said openings being in alinement when the parts are assembled, a key adapted to extend through said openings to retain the bolster against removal, and means for normally retaining the key against removal.

38. In a car truck, a transom having spaced apart members connected together at their ends, a bolster adapted to extend into the space between said members, said members and the bolster each having a transverse opening intermediate their ends, said openings being in alinement when the parts are assembled, a key adapted to extend through said openings to retain the bolster against removal, and a king bolt for normally retaining the key against removal.

39. In a car truck, a transom having spaced apart members connected together at their ends, a bolster adapted to extend into the space between said members, said members and the bolster each having a transverse opening intermediate their ends, said openings being in alinement when the parts are assembled, a key adapted to extend through said openings to retain the bolster against removal, said key having an opening transverse to the opening of the bolster, and a king-bolt insertible into the bolster and through said key opening, whereby said key will be normally prevented against removal.

40. In a car truck, a transom having spaced apart members connected together at their ends, a bolster adapted to extend into the space between said members, said members and the bolster each having a transverse opening intermediate their ends, said openings being in alinement when the parts are assembled, the opening of the bolster being of greater width than the openings of the members, a key adapted to extend through said openings to retain the bolster against removal, and means for normally retaining the key against removal.

41. In a car truck, a side frame, a transom, said side frame and transom having interfitting parts, a single element engaging said parts and adapted to interlock the same, and a retaining member carried by said parts

and engaging said element to hold the same in position and adapted to inclose and conceal the same.

42. In a car truck, a transom, a side frame 5 having a projection fitting into the transom, a key carried in the projection and engaging loosely into the transom for holding the frame to the transom and admitting of the rocking of the frame thereon and a retaining member in the projection bearing 10 against the key to inclose and retain the same in position.

43. In a car truck, a transom, a side frame interfitted with the transom, and a key 15 carried by the frame and loosely engaging the transom for connecting said frame and transom together, said key being inclosed by the interfitted portions of the frame and the transom.

44. A side frame for car trucks comprising a flanged beam having a transverse opening in its web spaced from the end of the beam, a journal box adapted to be inserted through said opening, said box having 20 flanges on its opposite sides adapted to abut said web to limit the inserting movement of the box, and members secured to said beam flanges and positioned to retain said box flanges in contact with the web.

45. A side frame for car trucks comprising a flanged beam having a transverse opening in its web spaced from the end of the beam, a journal box adapted to be inserted through said opening, said box having 25 flanges on its opposite sides adapted to abut said web to limit the inserting movement of the box, members secured to said beam flanges and positioned to retain said box flanges in contact with the web, reinforcing members secured to the beam in op-

position to the box flanges, and means extending through the box flanges, the web and the reinforcing members for securing them together.

46. In a car truck, side frames, wheels 45 supported at the ends of the side frames, a transom connecting the side frames and having horizontal supports across its lower edges inwardly of the vertical planes of the wheels, vertical springs in the transom on 50 the supports, and a bolster engaging the upper ends of the springs and having an inclosing structure extending into the transom and housing the upper ends and sides of the springs and engaging snugly against the 55 edges of said horizontal supports when supporting the weight of a car.

47. In a car truck, side frames, a transom connecting the frames, springs in the opposite ends of the transom, and a bolster engaging in the upper side of the transom and 60 having pockets in its underside receiving the springs to completely cover the same.

48. In a car truck, a pair of frames, a transom connecting the frames, means for 65 removably connecting the frames to the transom and a gravity held king-pin mounted in the transom and adapted to interlock said means thereto.

49. In a car truck, a truck transom, a 70 truck bolster, and a gravity-held king-pin interlocking said transom and said bolster.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY W. BLAKE.

Witnesses:

J. C. WOODWARD,
J. D. WOODWARD.