H. H. HARRIS.

SPRING TRUCK.

APPLICATION FILED MAR. 14, 1919.

1,393,360. Patented Oct. 11, 1921.

4 SHEETS—SHEET 1.

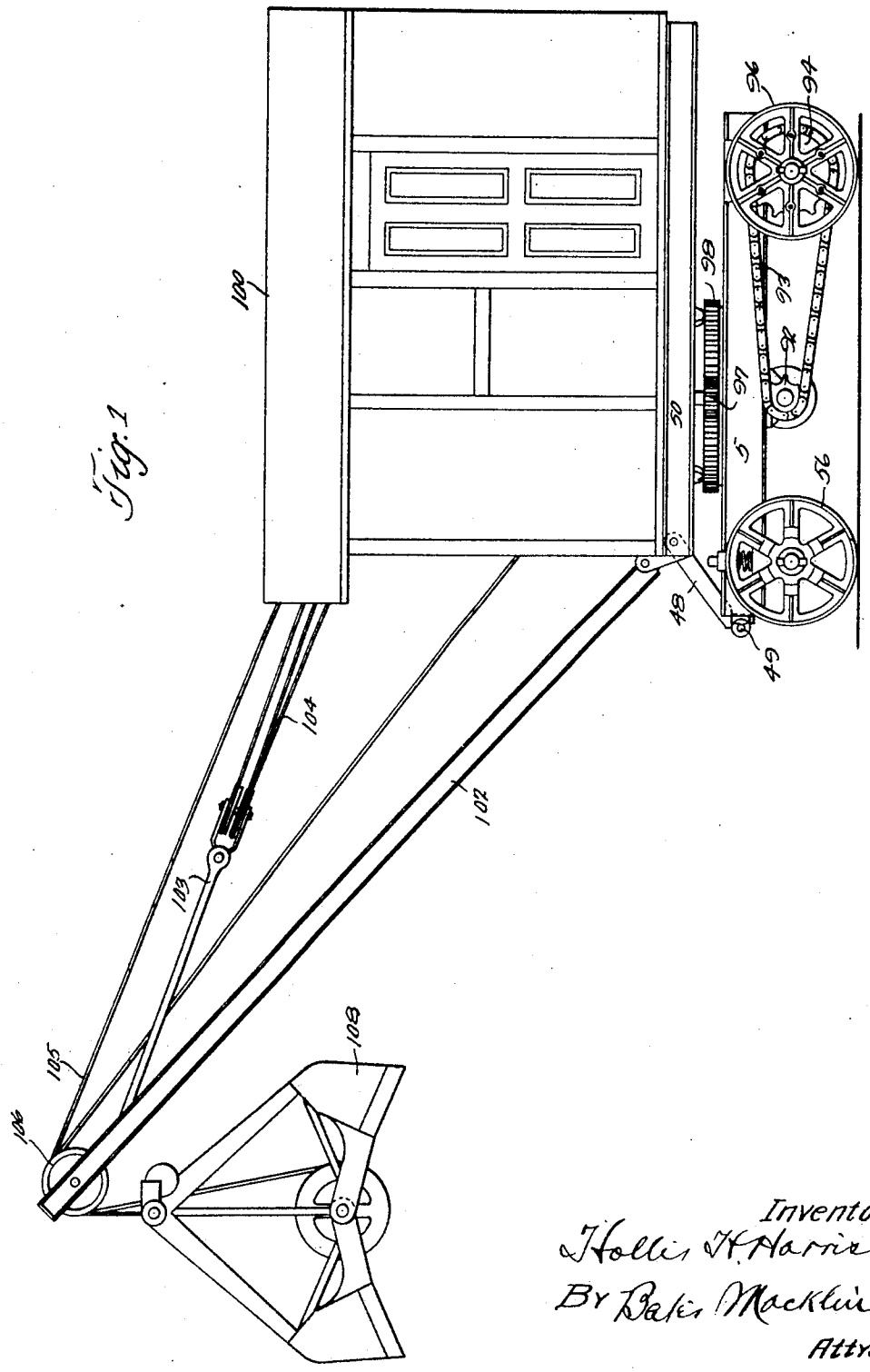


Fig. 1.

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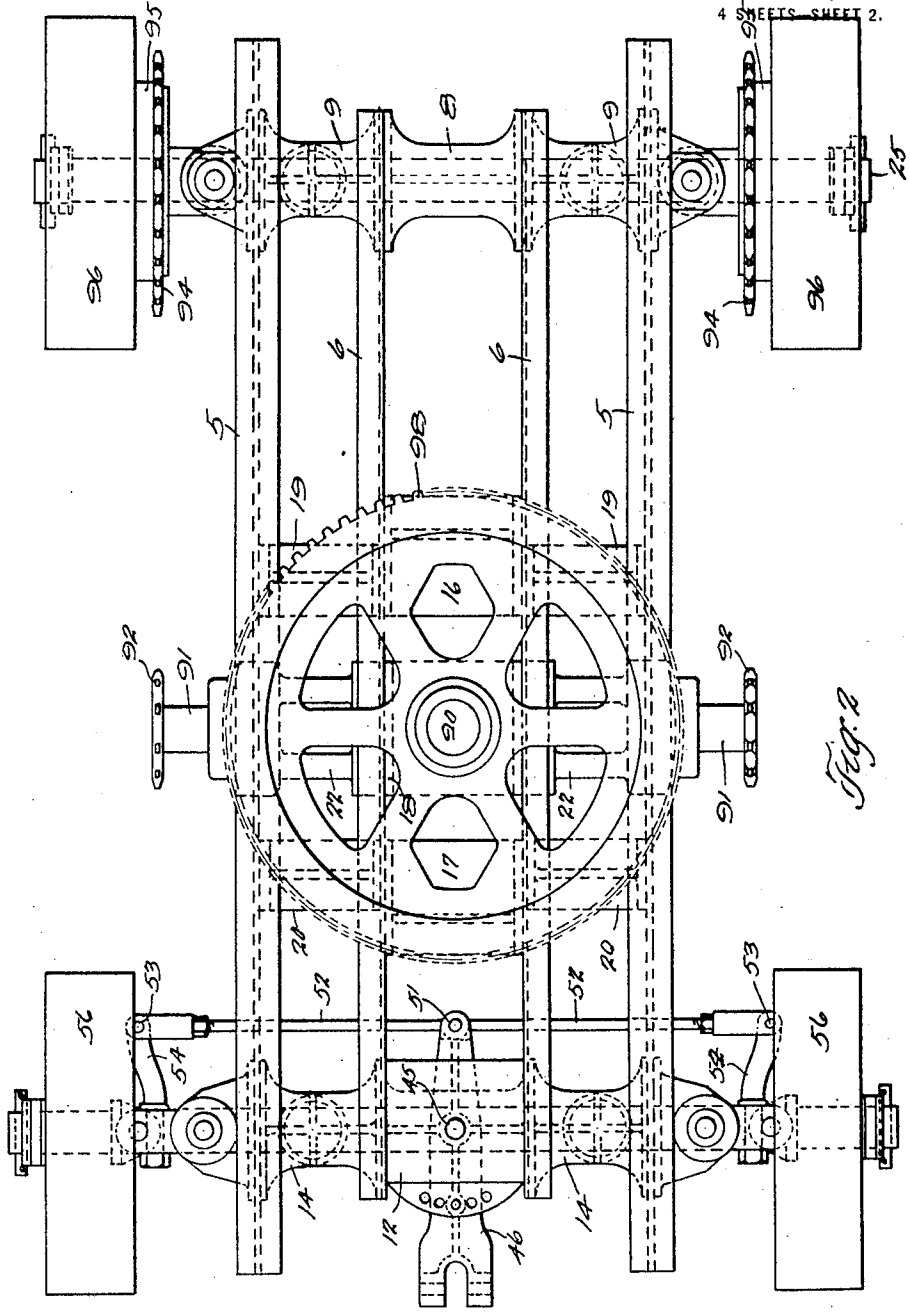


Fig. 2

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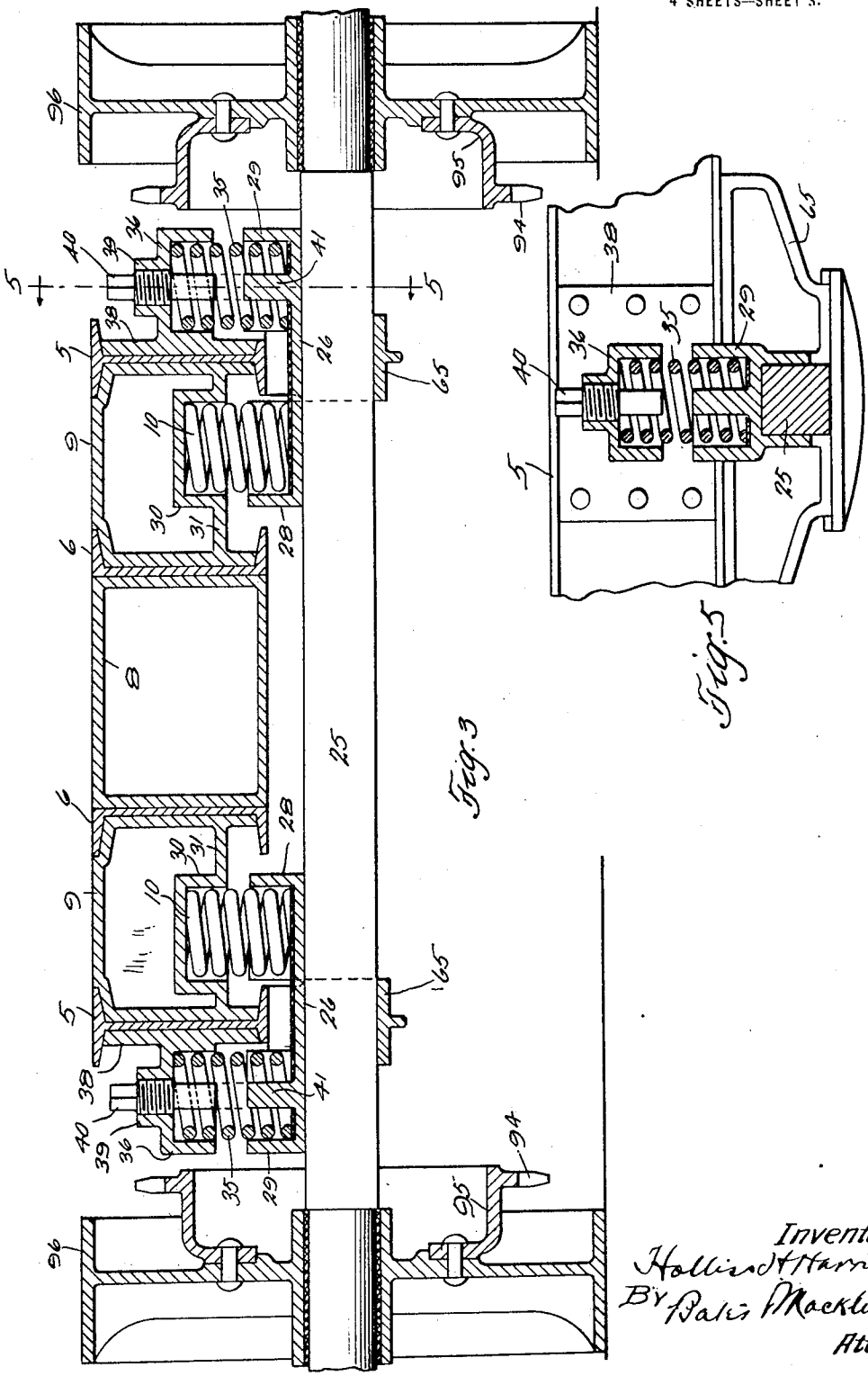


Fig. 3

Fig. 5

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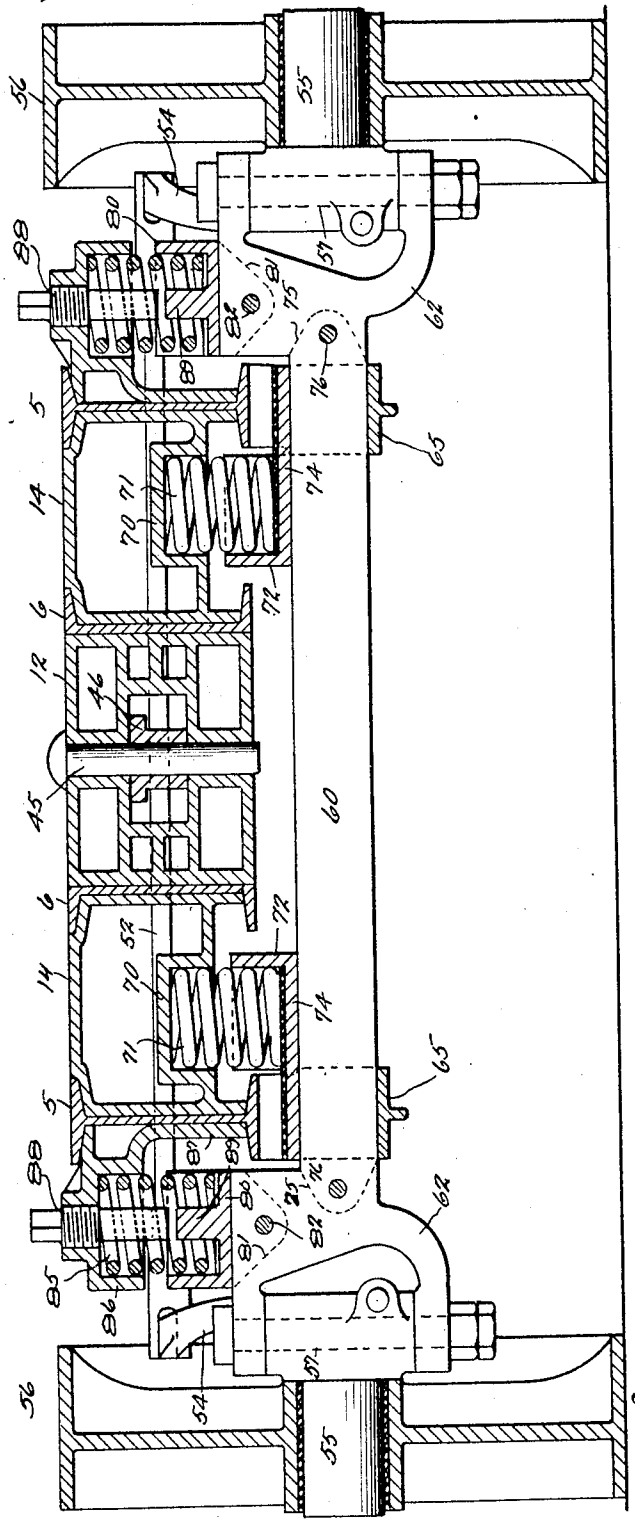


Fig. 4.

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UNITED STATES PATENT OFFICE.

HOLLIS H. HARRIS, OF LORAIN, OHIO, ASSIGNOR TO THE THEW SHOVEL COMPANY, OF LORAIN, OHIO, A CORPORATION OF OHIO.

SPRING-TRUCK.

1,393,360. Specification of Letters Patent. Patented Oct. 11, 1921.

Application filed March 14, 1919. Serial No. 282,550.

To all whom it may concern:

Be it known that I, HOLLIS H. HARRIS, a citizen of the United States, residing at Lorain, in the county of Lorain and State of Ohio, have invented a certain new and useful Improvement in Spring-Trucks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to trucks and is concerned particularly with the construction of trucks such as are adapted for carrying a superstructure such for example as a steam shovel or the like. The principal objects of this invention include the constructing of such truck in a fashion to provide strength, durability and an economical and efficient spring suspension of the frame on the axles of the truck.

More specific objects of the invention are set out in the following description of a preferred embodiment thereof. The essential characteristics are summarized in the claims.

In the drawings, Figure 1 is a side elevation of my truck shown as supporting a steam shovel mechanism; Fig. 2 is a plan of the truck proper; Fig. 3 is a transverse section taken substantially on a vertical plane through the axis of the rear axle; Fig. 4 is a similar section taken on a vertical plane through the axis of the front or steering wheels; Fig. 5 is a sectional detail on the line 5—5 of Fig. 3.

Describing the parts by the use of reference numerals, 5, 5 indicate longitudinal side beams, preferably in the form of I-beams. 6, 6 indicate parallel beams between the beams 5, 5, preferably of channel-beam construction with the channels facing outwardly toward the beams 5, 5. A hollow casting 8 is shown as secured between the beams 6, 6 above the rear axle, while castings 9, 9 are fitted between the beams 6, 6 and 5, 5 respectively and provide seats for springs 10, 10, as will be presently more fully described. The castings 8 and 9 form in effect a solid end beam construction connecting the longitudinal frame members.

At the forward end of the truck frame the beams 6, 6 are connected by a casting 12 fitted between the webs of the beams 6, 6, and castings 14, 14 are fitted between the beams 6, 6 and 5, 5, the castings 12 and 14 forming in effect a rigid strut or end member at the forward end of the frame.

The frame is intermediately braced by struts 16 and 17, which are preferably castings secured to the webs of the beams 6. A casting 18, which may be constructed in any suitable manner to support a driving mechanism, is also secured to the beams 6, midway between the struts 16 and 17. Transversely alined with the struts 16 and 17 are struts 19, 19 and 20, 20 respectively, fitted against the webs of the beams 5 and 6 and between the flanges of such beams to obtain maximum rigidity. Suitable brackets or struts 22 may be mounted between the beams 6, 6 and 5, 5 in transverse alinement with the casting 18 to provide bearings for portions of the driving mechanism as well as to strengthen the frame.

The rear axle 25 is provided, substantially beneath the beams 5, 5 with brackets 26 secured to this axle and having upwardly facing cup-like cavities formed at 28 and 29, the cavities 28 forming seats for the lower ends of the springs 10. The upper ends of these springs have a bearing in a downwardly opening cup-like cavity formed in the castings 9, the cavities being indicated at 30 as upwardly offset portions of transverse webs or walls 31 of the castings 9. Seated in the cavities 29 are additional springs 35, the upper ends of which seat in downwardly facing cup-like cavities 36 formed in brackets each having a web 38 fitted between the outwardly turned flanges of the I-beams 5 and secured against the web of those beams. These brackets are provided with bosses 39 through which extend screws 40 having downwardly extending tongues adapted to meet an upwardly extending projection 41, preferably formed integral with the brackets 26 in alinement with these screws, thus forming adjustable bumpers which may be set to meet to prevent vibration of the frame, rendering the springs inactive when desired.

It will be noted that the strut member 8, which as stated is preferably a casting, may be substantially rectangular in transverse cross section, whereby it may be readily secured to the webs of the beams 6 by rivets, bolts or the like, extending through the side walls thereof. The castings 9 are preferably provided with intermediate webs. The side

walls are shown as joined to the upper surface or top wall by offset portions complementary to the flanges of the beams 5 and 6.

It will be seen that I have provided by this means four alined springs arranged above the axle 25 and have provided seats for them in castings, which taken together, function as an end strut or beam for the frame. It is obvious that such an end beam provides a very rigid and durable construction.

The intermediate member of the strut or beam for the forward end of the truck frame, heretofore referred to, as a casting 12, is shown as constructed of a plurality of ribs and webs which are arranged to accommodate a pin 45 while an opening through this casting accommodates a lever 46 embracing the pin 45 intermediately of the lever. This construction lends itself to convenient embodiment of a steering mechanism forming the subject matter of a separate application Serial No. 282,551, executed on an even date herewith. The parts of this steering mechanism as shown may be briefly described as follows: The lever 46 has a bifurcated forward end adapted to receive the end of a strut or bracket 48 pivotally depending from a frame 50 comprising a platform suitable for a steam shovel or like structure. This strut 48 is preferably secured to the lever 46 by a pivot pin 49. At its rear end the lever 46 embraces and is pivoted at 51 to a link member 52, which is in turn pivoted at 53 to steering knuckle arms 54, rigidly attached to the bearings 55 for the front wheels 56 supporting the truck.

The front axle 60 is shown as provided with a yoke 62 at each end embracing the pivot pins 57 and upper and lower ends of the steering knuckle. The castings 14 may be constructed very similarly to the castings 9, heretofore described, and are provided with downwardly opening cup-shaped seats 70 for springs 71 having their lower ends seated in cup-like seats 72 formed in brackets 74 embracing the axle 60 and secured thereto in any suitable manner, such as by the use of ears 75 through which pins or bolts 76 may extend.

Seated on a substantially horizontal shoulder formed at the upper portion of the yokes 62 are cup-shaped spring seats 80 having ears 81 embracing the sides of the yoke and secured by pins 82. The lower ends of springs 85 are seated in the spring seats 80, and their upper ends are seated in inverted spring cups 86 similar to the seats 36 for the springs 35 heretofore described, the cup being formed on a bracket having a web 87 secured against the web of the adjacent beam 5 and having suitable shoulders fitting the inner sides of the outwardly facing flanges thereof. Screws 88 are provided with extensions engaging upward projections 89 in the spring seats 80 providing an adjustable bumper or stop limiting the downward movement of the frame over the axle 60.

The axles are shown as connected with the frame and guided by brackets 65, secured to the lower sides of the frame members 5 and having rectangular openings slidably embracing the axles as shown in Fig. 5.

As above mentioned, any suitable driving mechanism may be conveniently provided for the truck and may be supported by the castings and brackets 18 and 22. In the drawings I have indicated a shaft 90 through which power may be transmitted to drive shafts 91 by any suitable mechanism, as for example, bevel gears within the casting 18. On the shaft 91 are shown sprockets 92 from which sprocket chains may lead to sprockets 94 on suitable drums, as for example 95 secured to the rear wheels 96. The chains connecting the sprockets 92 and 94 are indicated in Fig. 1 at 93.

As above mentioned the turning of the frame 50 may turn the wheels 56 to steer the truck. This operation is rendered automatic and the turning of the frame may be conveniently accomplished by the use of a pinion 97, on a shaft depending from the super-structure, and meshing with the gear 98 shown as concentric with the shaft 90.

The super-structure, as shown in Fig. 1 comprises any suitable housing 100 for mechanism for operating a steam shovel. A boom 102 is shown as braced by a link 103 and cables 104, while cables 105 extending over pulleys 106 may support and operate a clam shell bucket 108.

Having thus described my invention what I claim is:

1. In a truck, the combination of longitudinal structural side members, an intermediate longitudinal member between the side members, transverse castings fitted between the intermediate member and the side members, axles below said transverse members, wheels on the axles, and springs seated on the axles and fitted to the side and transverse members.

2. In a truck, the combination of a pair of longitudinal side frame members, intermediate longitudinal structural frame members, a series of castings near each end of the frame members arranged transversely of the longitudinal members and fitted and secured thereto to constitute rigid end members, axles beneath each of said series of castings, wheels on the axles, brackets on the axles having spring seats, spring seats formed above the spring seats on the axles in the castings of the transverse series, and spiral springs fitted in said series.

3. In a truck, the combination of structural side frame members, parallel inter-

mediate frame members extending longitudinally between the side frame members, a casting forming an end cross strut near each end of the intermediate members, strut units between the intermediate members and the side members fitted thereto and transversely alined with the casting, whereby a series of castings at each end of the truck frame may form a rigid transverse end frame member, axles beneath each series of castings, spring seats on the axles, spring seats formed in said castings and said side members, and spiral springs fitted in said seats and carrying the weight of a truck.

4. In a truck, the combination of substantially parallel structural side frame members, an intermediate longitudinal frame member substantially parallel with the side frame members, a plurality of structural units at each end of the truck fitted between the intermediate frame member and the side frame members near each end of the frame and forming rigid end frame beams, said units having upward depressions forming downwardly opening seats, spiral springs fitted in said seats, axles below said end beams, wheels thereon, brackets formed on said axles and having upwardly opening seats receiving the lower ends of said spiral springs, brackets secured to the side frame members and transversely alined with the end beam units and having downwardly opening spring seats, spiral springs having their upper ends seating therein, and seats on the axles receiving the lower ends of the last named spiral springs.

5. In a truck, the combination of axles, wheels thereon and a frame supported thereby, said frame comprising structural longitudinal members having vertical webs and horizontal flanges and transverse frame members formed of a plurality of hollow castings conforming to and secured to the webs of said structural members certain of said castings having shoulders conforming to said flanges, said castings being transversely alined to form the transverse end struts of the frame.

6. In a truck, the combination, with wheels and axles therefor, of a frame comprising a pair of longitudinal I-beams, intermediate parallel longitudinal channel beams arranged with the webs vertical and the flanges facing outwardly, box-like castings between said channel beams adjacent to the ends thereof, box-like castings conforming to the webs of the channel beams and having shoulders conforming to the flanges thereof and also fitted against and having shoulders conforming to and engaging the inwardly turned flanges of the I-beams, said last mentioned castings being alined with the first mentioned castings.

7. In a truck, the combination, with axles and wheels therefor, of a frame supported thereby and driving mechanism for the wheels of one of the axles, said frame comprising a plurality of parallel structural members having vertical webs and horizontal flanges and extending from one axle to the other, the cross struts of the frame comprising series of alined castings fitted against the webs and engaging the flanges, some of said castings being adapted to provide bearings for the driving mechanism and others of said castings having spring seats, and springs therein connecting the frame with the axle.

8. In a truck, the combination of an axle, wheels thereon and a truck frame comprising longitudinal side members of I-beam construction, intermediate longitudinal frame members between the I-beams and having vertical webs and lateral flanges, of a hollow frame member fitted against the vertical webs of and between the last named frame members, hollow castings transversely alined with said hollow member fitted against the webs and flanges of the intermediate frame members and extending to and fitted against the webs and flanges of I-beam members to form a rigid transverse strut or beam for the frame, upward depressions in the walls of said castings forming downwardly facing spring seats, brackets mounted on the axle having upwardly facing spring seats adapted to aline therewith, spiral springs carried in said spring seats, additional spring seats mounted on the axle, brackets on the outside of the I-beam frame members having spring seats facing downwardly, and spiral springs in the last mentioned spring seats.

9. In a truck, the combination of parallel longitudinal structural side members, an intermediate longitudinal member between the side members and castings fitted between the intermediate member and the side members and arranged to form transverse end members, axles below said end members, wheels on the axles, springs seated on the axles and fitted to the transverse members, and adjustable bumpers limiting the movement of the frame toward the axles.

10. In a truck, the combination of an axle, wheels thereon and a truck frame comprising longitudinal side members of I-beam construction, intermediate longitudinal frame members between the I-beams and having vertical webs and lateral flanges, of a hollow frame member fitted against the vertical webs of and between the last named frame members, hollow castings transversely alined with said hollow member fitted against the webs and flanges of the intermediate frame members and extending to and fitted against the webs and flanges of the I-beams and forming a rigid transverse strut or beam for the frame, upward depressions in the walls of said castings forming downwardly facing spring seats, brackets mounted on the axle having upwardly facing spring seats adapt-

ed to aline therewith, spiral springs carried in said spring seats, additional spring seats mounted on the axle, brackets on the outside of the I-beam frame members having spring seats facing downwardly, spiral springs in the last mentioned spring seats, a tongue and adjustable screw arranged centrally of the last mentioned springs and carried by the spring seats therefor providing an adjustable bumper limiting the movement of the truck frame toward the axles.

11. In a truck, the combination of an axle, a truck frame comprising intermediate longitudinal structural members, said longitudinal members having vertical webs and lateral flanges, a hollow frame member fitted against the vertical webs over and between intermediate members, hollow castings transversely alined with said hollow member fitting against the webs and flanges of the intermediate and side frame members to form a rigid transverse beam, upward depressions in the walls of said castings forming downwardly facing spring seats, brackets mounted on the axle having upwardly facing spring seats in registry therewith and spiral springs carried in said spring seats.

12. In a truck, the combination of four parallel, longitudinal, structural frame members, alined castings fitting between the intermediate and side members forming portions of rigid transverse end members, axles below said end members, downwardly facing spring seats formed in the walls of the castings, upwardly facing spring seats mounted on the axle in registry therewith, springs carried in said spring seats, and adjustable bumpers limiting the movement of the frame toward the axles.

13. In a truck, the combination of parallel, longitudinal, structural side members, rigid transverse end members comprising alined castings fitted between the longitudinal members, axles below the end members, brackets on the outside of the side frame members above the axles and having spring seats facing downwardly, spring seats mounted on the axle in registry therewith, helical springs in said spring seats, a tongue and adjustable screw arranged centrally of the springs and carried by the spring seats providing an adjustable bumper limiting the movement of the truck frame toward the axles.

In testimony whereof, I hereunto affix my signature.

HOLLIS H. HARRIS.