

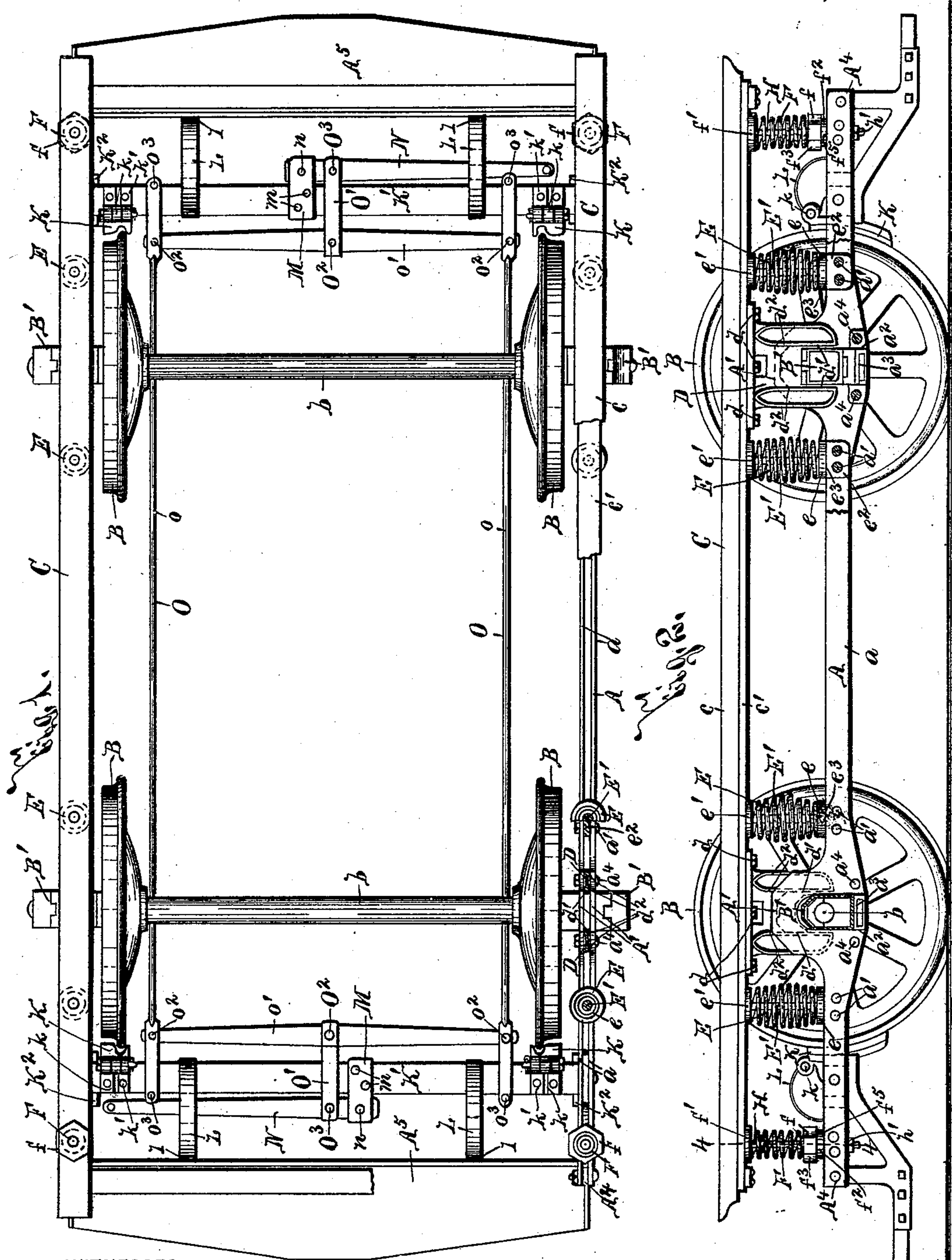
(No Model.)

2 Sheets—Sheet 1.

J. T. & C. M. ROBINSON.
CAR TRUCK.

No. 512,749.

Patented Jan. 16, 1894.



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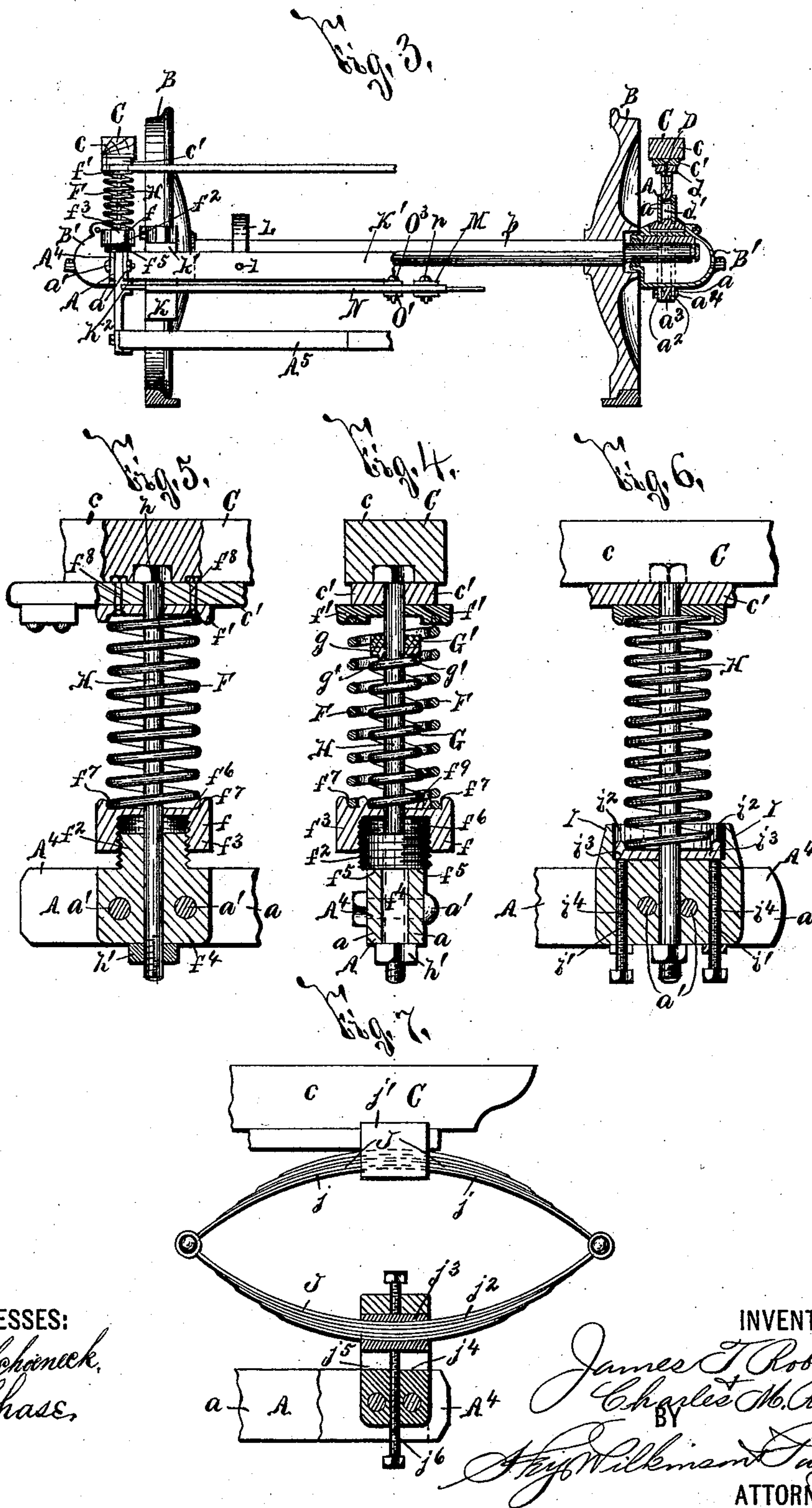
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UNITED STATES PATENT OFFICE.

JAMES T. ROBINSON AND CHARLES M. ROBINSON, OF ALTOONA, PENNSYLVANIA.

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 512,749, dated January 16, 1894.

Application filed October 22, 1892. Serial No. 449,912. (No model.)

To all whom it may concern:

Be it known that we, JAMES T. ROBINSON and CHARLES M. ROBINSON, of Altoona, in the county of Blair, in the State of Pennsylvania, have invented new and useful Improvements in Car-Trucks, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

Our invention relates to improvements in car trucks of the same general construction and arrangement as that set forth in our pending application, Serial No. 444,358, and has for its object the production of a highly efficient, simple and practical construction of truck for preventing end or oscillatory movement of the car upon the truck, and for permitting ready adjustment of the springs for yieldingly supporting the car; and to this end it consists, essentially, in frame bars at the opposite longitudinal sides of the truck, top frame bars above the former bars, springs between the opposite ends of the lower and upper frame bars, an adjustable spring support mounted on one of said frame bars for supporting one end of one of the springs, a second spring also mounted on said support and formed of less length than the other spring thereon, and a tie bar between the lower and upper frame bars provided with an adjustable shoulder.

The invention furthermore consists in the detail construction and arrangement of the parts, all as hereinafter more particularly described and pointed out in the claims.

In describing this invention, reference is had to the accompanying drawings forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is a top plan view of the detached car truck having one of its top side bars partially broken away for the purpose of showing the underlying parts. Fig. 2 is a side elevation of the parts shown at Fig. 1. Fig. 3 is an end view, partly in section, of the parts as shown at Figs. 1 and 2. Fig. 4 is a detail sectional view, taken on line 4—4, Fig. 2, clearly representing the supporting springs for the upper frame bars and the adjustable support for the lower ends of said springs. Fig. 5 is a similar sectional view, taken in a

plane at right angles to the plane of Fig. 4, representing a slightly modified form of our invention, in which but one spring is mounted upon the adjustable support. Fig. 6 is a similar sectional view, taken in the same plane as Fig. 5, of a further modified form of our invention; and Fig. 7 is a detail elevation, partly in section, of a still further modified form of our invention.

As stated in our previous application, it is well known that when cars, and particularly electric surface street cars are passing quickly over uneven surfaces, especially when unevenly loaded, they are extremely liable to rock or oscillate endwise, thereby greatly straining the parts and particularly the springs of the truck, and inconveniencing and annoying the passengers.

Our own practical experience has convinced us that car bodies, even though made seemingly identical, and mounted on trucks of apparent similarity and provided with springs of apparently uniform elasticity and length, do not ride exactly the same but that one is more inclined to oscillate than the other, and is more or less yielding in practical use.

Our present invention is designed to entirely obviate the undesirable endwise oscillation or rocking of the car body and to permit of adjustment of the springs in order that the cars may yield uniformly and that the springs at both ends of each car may also yield uniformly; and our invention is so simple in construction and arrangement that the cost of the truck is not materially increased even though its efficiency is greatly augmented.

The main side bars —A— of our truck are arranged along its longitudinal sides and are each composed, preferably, of a pair of divisions —a—a— arranged edgewise and formed of steel or other suitable material. The divisions —a—a— are secured together at intervals by suitable clamps or bolts —a'— which also serve to secure to said bars the spring supports presently described.

—B—B— are the wheels, —b—b— the axles for said wheels, and B' B' the journal boxes for the opposite ends or journals of the axles.

The bars A A are provided with slots $a^2 a^2$ for receiving the journal boxes B' B' and be-

neath said journal boxes are cross bars $a^3 a^3$ having their opposite ends secured by clamps a^4 to the bars A A.

The described construction of frame bars 5 is particularly simple, practical and effective, is economically manufactured, and is highly efficient in use.

Arranged above the frame bars —A—A— are the upper frame bars —C—C— adapted 10 to support the car, not necessary to herein illustrate or describe. These frame bars preferably consist of an upper wooden strip —c— and a lower metallic strip —c'—.

It will be readily understood by one skilled 15 in the art that the upper frame bars C C for supporting the car body may be omitted, and that the parts secured to said frame bars, as presently described, may be attached directly to the under face of the car body bottom, and 20 that the car body bottom then becomes essentially the upper bar of the truck. It is also evident that the central portions of the bars C—C may be removed if desired.

—D— represents plunger plates having 25 their upper ends secured to the bars —C—C— by suitable clamps —d—d— and their lower ends bifurcated and passed between the divisions —a—a— of the bars —A—A— and provided with opposite bearings —d'— 30 d'— adapted to bear against the opposite faces of the journal boxes —B'—B'—. Projecting from the sides of the plunger plates —D— are ribs —d²— adapted to bear against the inner faces of the divisions —a—a— of 35 the bars —A—A—. As stated in our afore-said application, Serial No. 444,358, this peculiar construction of plunger plate having separated transverse bearings —d'—d'— and side bearings —d²—d²— tends greatly to ob- 40 viate lateral movement and endwise, oscillatory or rocking movement of the car body mounted on the bars —C—C—.

—E— represents the springs interposed between the central portions of the lower and 45 upper frame bars —A—A— and —C—C—. As preferably constructed, one of these springs is mounted on opposite sides of each plunger plate —D— and its opposite ends are engaged with bearings or pockets —e—e'— se- 50 cured, respectively, to the bars —A—A—, —C—C—. The pockets —e— are each formed with a depending lug —e²— interposed between the sections —a—a— of the supporting frame bar —A— and with outwardly ex- 55 tending shoulders —e³— bearing upon the upper edges of said divisions, and are secured in position by clamps —a'—, previously described. These lugs —e²— serve to separate the divisions —a—a— and permit 60 the spring supports or pockets provided therewith to be economically and firmly secured in position.

The supports or pockets —e'— may be of any desirable form, size and construction and 65 are secured in position by suitable fastening means, not necessary to herein illustrate or describe.

Within the springs —E— are suitable guide bars —E'—E'— of any desirable form, size and construction. 70

—F—F— are springs interposed between the opposite ends of the upper and lower frame bars —A—A—, —C—C—, and —f—f'— are supports for the lower and upper ends of said springs. The lower support —f— preferably consists of a lower section —f²— and an upper section —f³— adjustable lengthwise 75 on the former section. This section —f²— is provided with a depending ear —f⁴— interposed between the divisions —a—a— and se- 80 cured in position by clamps —a'—a'—, previously described, and is also provided with laterally extending shoulders —f⁵—f⁵— resting upon the top edges of the divisions —a—a—. The upper end of the section —f²— is screw- 85 threaded and enters a screw-threaded socket —f⁶— in the under face of the section —f³— and the upper end of the section —f³— is formed with a bearing face provided with a groove —f⁷— for supporting the lower end 90 of the spring —F—. The upper support —f'— is secured in position by suitable fastening means —f⁸— and is formed on its under face with a socket for receiving the upper end of the spring —F—. 95

We preferably use within each of the springs —F—, an inner spring —G— having its lower end supported in a socket —f⁹— in the upper face of the lower support section —f³— and its upper end provided with an in- 100 ternal sleeve —g— having an annular flange —g'— bearing against the upper end of the spring. The inner springs —G— are of less length than the outer springs —F—, and consequently, in order to prevent rattling of the 105 parts when the outer springs —F— permit the upper supports —f'— to descend sufficiently to tension the springs —G—, we place upon the sleeve —g— a rubber cap —G'—.

—H— represents tie bars between the op- 110 posite ends of the lower and upper frame bars —A—A—, —C—C— for limiting the separation of said extremities and guiding the springs —F—G— in their movement. Each of these bars —H— preferably consists of a 115 bolt passed longitudinally through an inner spring —G— and having its upper end provided with a shoulder —h— bearing upon the top face of the metallic strip —c'— of one of the upper frame bars —C— and its lower end 120 passed through the corresponding spring support —f— and provided with an adjustable shoulder —h'— adapted to bear against the under face of the frame bar —A— carrying said support. As the car body descends, the 125 springs —F— are, in addition to the springs —E—, compressed and the bar —H— is forced longitudinally through the support —f— and as the car assumes its normal position, the shoulders —h'— upon the bars —H— 130 limit the upward movement of the car.

If the springs —F—F— are too stiff to permit the necessary easy downward movement of the car, the movable section —f³— of the

support —*f*— may be screwed downwardly, thus lengthening said springs *F F* and if the springs yield too easily, the said section may be screwed upwardly in order to decrease the length of the springs. Consequently, as the action of the end springs may be regulated at will, and as the power of these springs is liable to vary, it is a simple matter to adjust these springs so that both yield uniformly, and thereby tend to prevent rocking or oscillatory movement of the car body.

The internal springs —*G*— are brought into action only when the car body descends and compresses the springs —*F*— and they also tend to prevent oscillatory or rocking movement of the car as at the very instant when one end is descending a sufficient amount to cause such an undesirable movement of the car, an additional spring force is present to resist such a motion. Consequently, this peculiar construction of end springs and adjustable supports therefor auxiliaries greatly the action of the plunger plates in preventing rocking or oscillatory movement of the car and enables the tension or force of the end springs to be adjusted at will. Moreover, the construction of these springs and their adjustable supports is particularly durable, efficient and economical in manufacture.

At Fig. 5 we have shown a modified form of our invention in which no internal spring —*G*— is shown within the spring —*F*— and as with this exception the parts of this modification correspond exactly in construction and operation with the preferable form of our invention, we have similarly lettered said parts.

At Fig. 6 we have shown a construction of our invention similar to that shown at Fig. 5 with the exception that the spring —*F*— is mounted upon a support —*I*— consisting of a lower section —*i*— formed with screw-threaded guide openings —*i'*—*i'*— and with an upper socket —*i²*—, and an upper movable section —*i³*— mounted in the socket —*i²*— and adapted to be elevated by adjusting screws —*i⁴*—*i⁴*— movable in the guide openings —*i'*—*i'*— against the under face of the upper section —*i³*—.

At Fig. 7 we have shown a still further modified form of our invention in which an elliptical spring —*J*— is interposed between the frame bars —*A—C*—. The upper division —*j*— of the spring —*J*— is secured to the bar —*C*— by a clip —*j'*— and the lower division —*j²*— of said spring is provided with an angular sleeve —*j³*— movable in a guide —*j⁴*— of a support —*j⁵*—. A suitable adjusting screw —*j⁶*— is movable in said guide and bears against the under face of the sleeve —*j³*— for compressing the spring —*J*—.

—*K*— represents brake shoes arranged at the outside of the wheels —*B*— and adapted to bear against their adjacent peripheries. These shoes are preferably pivoted at their upper extremities at —*k*— to supports —*k'*—

upon brake carrying bars —*K'—K'*— which are guided at their opposite extremities upon shoulders —*K²*— upon the inner faces of the frame bars —*A—A*— and are supported upon the inner ends of spring bars —*L*— having their inner ends secured at —*l*— to cross bars —*A⁵—A⁵*— between the ends of the side frame bars —*A—A*—.

—*M*— represents outwardly extending arms secured at —*m*— to the brake carrying bars —*K'—K'*— and —*N*— brake actuating levers hinged at —*n*— to the outer ends of the arms —*M*— and adapted to be connected at their opposite ends to any suitable construction of actuating means not necessary to herein show or describe.

—*O*— is a connecting frame between the brake shoe carrying bars —*K'—K'*— whereby both are actuated simultaneously. This frame preferably consists of longitudinal bars —*o—o*— and cross bars —*o'—o'*— secured at —*o²*— to the longitudinal bars —*o—o*—. The outer ends of the bars —*o—o*— are formed with shoulders or pins —*o³*— bearing against the opposite extremities of the outer faces of the brake shoe carrying bars —*K'—K'*—. The central portions of the cross bars —*o'—o'*— of the connecting frame —*O*— are formed with outwardly extending arms —*O'—O'*— hinged thereto at —*O²*— and hinged at —*O³*— to the brake actuating levers —*N—N*—. As the outer ends of either of the bars —*N—N*— are rocked outwardly their opposite ends are forced inwardly and work the brake shoes upon the adjacent brake carrying bar —*K'*— against the wheels —*K*— and through the medium of the frame —*O*—, also rock the brake shoes upon the opposite bar —*K'*— against the opposite pair of wheels —*B*—. This brake mechanism is but briefly described, as the same forms no part of our present invention.

The operation of our invention will be readily understood from the foregoing description and upon reference to the drawings and it will be particularly noted that the same is simple and practical in construction, economical in manufacture and durable and efficient in use and that the lateral movement and the oscillating or rocking movement of the car body mounted upon a truck provided with our invention, is prevented, and the yielding motion of the car upon its springs adjusted at will so that both ends of a single car and the bodies of a number of cars yield uniformly and greatly add to the convenience and ease of the passengers. It will be understood, however, that considerable change may be made in the relative arrangement and construction of the parts of our truck without departing from the spirit of our invention. Hence we do not herein specifically limit ourselves to such detail construction and arrangement.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a car truck, the combination with the wheels and axles; of a frame bar of the truck supported on the wheels, a side bar arranged above the former bar, springs interposed between the opposite extremities of the lower and upper side bars, and an adjustable support on one of said bars for supporting one of said springs, said support consisting of a stationary section rigidly secured to said bar, and a movable section secured to and movable lengthwise of the former section substantially as and for the purpose set forth.

2. In a car truck, the combination with the wheels and axles; of a frame bar of the truck supported on the axles, a side bar arranged above the former bar, springs interposed between the opposite extremities of the lower and upper side bars, an adjustable support on one of said bars for supporting one of said springs, and a second spring mounted on said support and formed of less length than the former spring, substantially as and for the purpose specified.

3. In a car truck, the combination with the wheels and axles; of a frame bar having its ends projecting beyond the wheels, a second frame bar above the former, springs interposed between the opposite ends of said side bars, and adjustable supports for said springs mounted on the opposite ends of one of said bars, substantially as and for the purpose set forth.

4. In a car truck, the combination with the wheels and axles; of a frame bar of the truck, a side bar arranged above the former bar, upright bars connecting the opposite ends of the upper and lower bars, springs encircling said upright bars, and an adjustable support upon one of said bars for supporting one of said springs, substantially as and for the purpose set forth.

5. In a car truck, the combination with the wheels and axles; of a frame bar of the truck, a side bar arranged above the former bar, upright bars connecting said opposite ends of the upper and lower bars, springs encircling said upright bars, an adjustable support upon one of said bars for supporting one of said springs, and a second spring encircling said upright bar and mounted upon said adjustable support and formed of less length than the former spring, substantially as and for the purpose specified.

6. In a car truck, the combination with the wheels and axles; of a frame bar having its ends projecting beyond the wheels, a second frame bar above the former, springs between the opposite ends of said bars, adjustable supports for said springs mounted on the opposite ends of one of said bars, and springs of less diameter than the former springs mounted on said supports, substantially as and for the purpose set forth.

7. In a car truck, the combination with the wheels and axles; of a frame bar of the truck, a second frame bar above the former, a spring support section having one end rigidly se-

cured to the frame bar and the other screw-threaded, a second spring support section having one end formed with a socket for receiving the screw-threaded portion of the former section and the other formed with an upper bearing face, and a spring interposed between the upper bar and the bearing face of the second spring support section, substantially as and for the purpose set forth.

8. In a car truck, the combination with the wheels and axles; of a frame bar of the truck, a second spring bar above the former, a frame support section having one end rigidly secured to the former bar, and the other screw-threaded, a second spring support section having one end formed with a socket for receiving the screw-threaded portion of the former section, and the other formed with an upper bearing face, a spring interposed between the upper bar and the bearing face of the second spring support section, and a second spring of less length than the former mounted on the bearing face of the latter section of the spring support, substantially as and for the purpose specified.

9. In a car truck, the combination with the wheels and axles; of the frame bar of the truck, a second frame bar above the former, a spring support section having one end rigidly secured to the frame bar and the other screw-threaded, a second spring support section having one end formed with a socket for receiving the screw-threaded portion of the former section and the other formed with an upper bearing face, a spring interposed between the upper bar and the bearing face of the second spring support section, and an upright bar having one end secured to the upper side of said bar and the other passed through said spring support and the spring thereon, substantially as and for the purpose set forth.

10. In a car truck, the combination with the wheels and axles; of a frame bar of the truck, a second frame bar above the former, a spring support section having one end rigidly secured to the frame bar and the other screw-threaded, a second spring supporting section having one end formed with a socket for receiving the screw-threaded portion of the former section and the other formed with an upper bearing face, a spring interposed between the upper bar and the bearing face of the second spring support section, and an upright bar having one end provided with a shoulder bearing against an upper face of the upper side bar and the other passed through said spring support and the spring mounted thereon and provided with an adjustable shoulder bearing against the under face of the spring support, substantially as and for the purpose specified.

11. In a car truck, the combination with the wheels and axles; of a frame bar of the truck, a second frame bar above the former, a spring support section having one end rigidly secured to the frame bar and the other screw-

threaded, a second spring supporting section having one end formed with a socket for receiving the screw-threaded portion of the former section and the other formed with an upper bearing face, a spring interposed between the upper bar and the bearing face of the second spring support section; an upright bar having one end provided with a shoulder bearing against an upper face of the upper side bar and the other passed through said spring support and the spring mounted thereon and provided with an adjustable shoulder bearing against the under face of the spring support, and a second spring of less length than the former encircling said upright bar and mounted on the second spring support section, substantially as and for the purpose set forth.

12. In a car truck, the combination with the wheels and axles; of a frame bar of the truck formed of separated divisions, a second bar above the former bar, a spring support section having a depending ear interposed between the divisions of the former side bar, a clamp for securing said ear to said divisions, a second spring support section adjustable lengthwise upon the upper extremity of the former section, and a spring interposed between the latter side bar and the adjacent face of the second spring support section, substantially as and for the purpose specified.

13. In a car truck, the combination with the wheels and axles; of a frame bar of the truck formed of separated divisions, a second bar above the former bar, a spring support section having a depending ear interposed between the divisions of the former side bar, a clamp for securing said ear to said divisions, a second spring support section adjustable lengthwise upon the upper extremity of the former section, a spring interposed between

the latter spring bar and the adjacent face of the second spring support section, and a tie bar between said side bars formed with an adjustable stop shoulder, substantially as and for the purpose set forth.

14. In a car truck, the combination with the wheels, axles and journal boxes; of a frame side bar supported on the journal boxes, a side bar above the former bar, a plunger plate having one end secured to the latter bar and the other end bifurcated and provided with opposite upright bearing faces movable along the opposite walls of the adjacent journal boxes, a spring interposed between said bars at one side of the plunger plate, and an adjustable support upon said frame bar for supporting said spring, substantially as and for the purpose specified.

15. In a car truck, the combination with the wheels, axles and journal boxes; of a frame side bar supported on the axles and consisting of separated divisions, a frame side bar above the former side bar, a plunger plate depending from the latter side bar and having its extremity movable between the divisions of the former side bar, a spring interposed between said bars at one side of the plunger plate, and an adjustable support upon one of said frame bars for supporting said spring, substantially as and for the purpose specified.

In testimony whereof we have hereunto signed our names, in the presence of two attesting witnesses, at Altoona, in the county of Blair, in the State of Pennsylvania, this 12th day of October, 1892.

JAMES T. ROBINSON.

CHARLES M. ROBINSON.

Witnesses:

JOHN H. CARR,

M. L. MCCARTNEY.