(No Model.)

A. B. CLARK.

TRUCK FOR CARS.

No. 435,918. Patented Sept. 9, 1890.

Fig. 1.

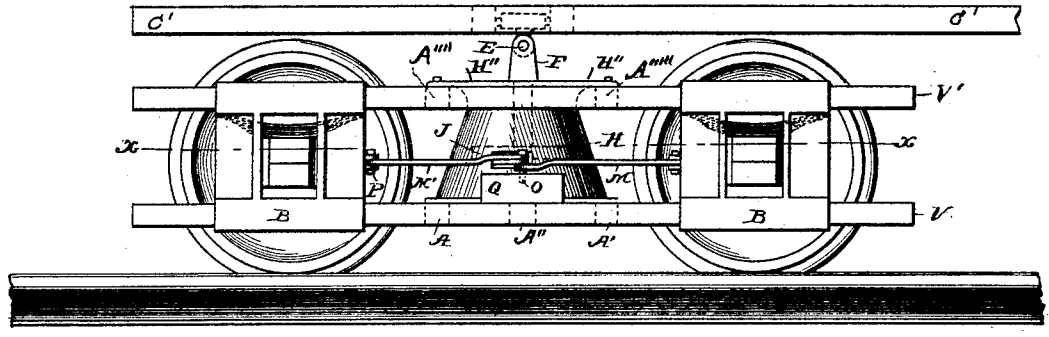


Fig. 2.

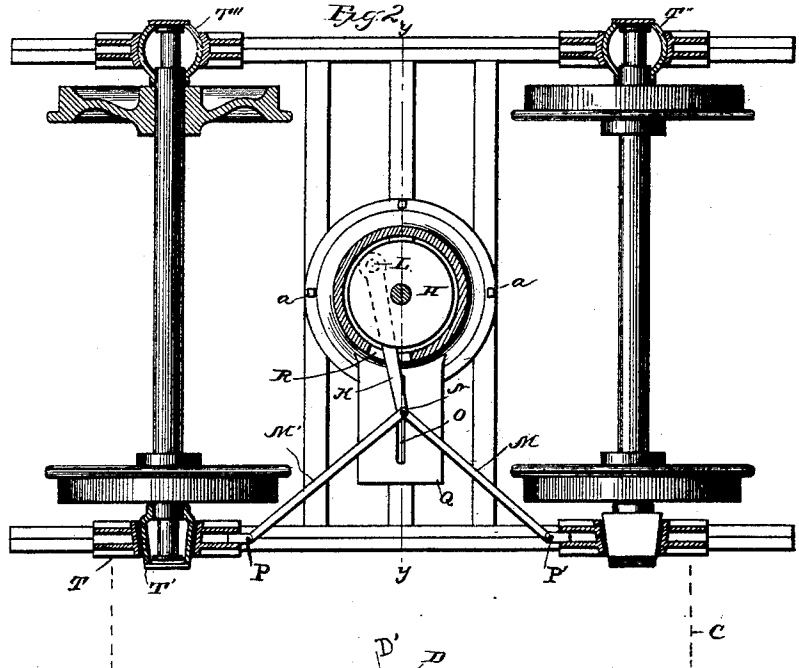
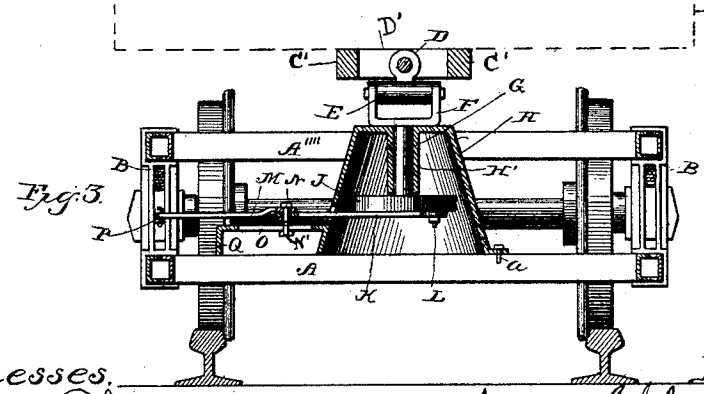


Fig. 3.



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UNITED STATES PATENT OFFICE.

AMASA B. CLARK, OF CHICAGO, ILLINOIS.

TRUCK FOR CARS.

SPECIFICATION forming part of Letters Patent No. 435,918, dated September 9, 1890.

Application filed May 22, 1890. Serial No. 352,726. (No model.)

To all whom it may concern:

Be it known that I, AMASA B. CLARK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Trucks for Cars, of which the following is a specification.

My invention relates to improvements in car-trucks in which an arrangement of devices is provided by which the movement of the car supported upon the truck in passing along and over a curve in the track will automatically change the lines of the axles of the truck so that each will approximate to a line in the radius of the curve of the track, and the curvature of the lines described by the wheels of the truck will approximately and closely correspond with the curvature of the track.

The object of my invention is to provide a truck of four or more wheels the lines of whose axles may be automatically diverged or converged from parallel lines corresponding to the curvature of the track over which they are passing, and thereby reducing the friction of the wheels upon the track and the danger of derailment. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation or view of the car-truck. Fig. 2 represents a horizontal sectional view of the car-truck upon the lines *x x*, Fig. 1. Fig. 3 represents a vertical sectional view of the car-truck upon the lines *y y*, Fig. 2.

Similar letters refer to similar parts throughout the several views.

Letters C and C′ represent the body of the car and the central longitudinal sills of the same, in which is firmly fastened, by bolts or otherwise, the plate D′, which rests and supports the weight of one end of the car upon the truck, in the manner and by the means hereinafter shown and set forth.

The king-bolt G is provided with a yoke F, which holds a pivoted bolt E with a pivoted lug or projection D, which is pivotally inserted in and held by the plate D′, as shown.

H H′ is a hollow central casting, whose base rests upon and is firmly bolted to the three lower cross-sills of the frame of the truck A A′ A″. This central casting is provided with lugs H″ on two sides at its upper or top surface, extending laterally and resting upon and bolted to the two upper cross-sills of the frame of the truck A‴ A⁗ by which means the weight of the car resting upon the central casting H H′ is distributed equally between the said upper cross-sills and the three lower ones. The central casting is provided integrally with a sheath or cylinder H′, extending downwardly from the top in the center of the casting to receive and retain the king-bolt G. This sheath may be affixed by other means to the central casting, instead of being made integral therewith. The central casting is provided with an opening R, through which the arm K passes. It may be provided with other openings, to admit of repairs, oiling, &c.

To the lower extremity of the king-bolt G is firmly attached a circular disk or crank J with a crank-pin L, which operates an arm K and toggle-rods M and M′, as hereinafter explained. The arm K and rods M and M′ are connected pivotally at N, and the rods are respectively connected pivotally at P and P′ with the pedestals that support and hold the boxing, journals, and axles of the two wheels on that side of the truck on which are located the toggle-rods.

Firmly attached to the central casting or the lower cross-sills A A′ A″, or to either or both, is a strong and unyielding plate or table Q, in which is a slot O. A pin or lug extends from the connection of the toggle-rods and the arm at N down into this slot, and by means of a nut N′ or other arrangement it is retained closely in the slot, so that the pivoted point N can move backward and forward toward and from the center of the central casting; but it can have no other movement. This plate or table Q may be of various forms of construction, and as it is necessary that the movement of the point N shall be in a direct line from and toward the center of H and shall also move in the same horizontal plane without variation a second plate with guide-slot may be located above the arm K and rods M M′, corresponding in size to the plate Q, or nearly so, to aid in retaining said parts in place and control their movement.

The frame of the truck, consisting of the several cross-sills and the bars attached thereto supporting the pedestals B B, is constructed in the usual manner in which such frames are constructed. I have shown such frame in its simplest form of construction. On each side of the truck are two supporting-bars V V′, which carry the pedestals, as shown. On the side of the truck opposite the toggle-rods the pedestals are rigidly and permanently fixed and attached to the truck-bars; but the boxing containing the bearings and journals of the axles are constructed with curved surfaces, as shown at T″, and rest in bearings in the pedestal, so that the axle and its boxing can turn slightly with the boxing as a center. The opposite side of the frame is of the same general construction; but the pedestals are constructed and so placed upon the truck-bars that they are capable of moving or sliding upon them for a limited distance—say about two or three inches—in either direction. With exception of this forward or backward movement on or along the truck-bars the pedestals are firmly fastened in place, and the extent of the movement is controlled by bolts or other well-known means not necessary to be explained. The boxing upon this side may be curved or convergent, the same as that shown for the other side. I prefer, however, that the boxing upon this side of the truck shall have curved or convergent lateral surfaces, as shown at T′, set or placed in openings or spaces in the pedestals.

Having thus described in detail the several parts of my device, I proceed to show its arrangements and mode of operation. The car being placed upon the truck, the disk or crank H is adjusted so that the point L will be at an angle of about forty-five degrees from a line longitudinally through the center of H. This point will vary somewhat with the angle made by the toggle-rods M M′, which in practical construction should form an obtuse angle, as they operate on the principle of the knee-joint, and even for the sharpest curves are only intended to produce slight changes in the lines of the axles of the wheels. When these parts have been adjusted and the car is moving in the direction P T, the toggle-rods of the front truck will be on the left side of the moving car. When the car comes upon a piece of track curving to the left, the instant the truck strikes the curve its axial line is deflected to the left, while the axial line of the body of the car continues in or nearly in a straight line. The car resting on the center pin or king-bolt G holds the disk or crank H firmly in position with relation to the car; but the truck having deflected from a straight line with the car the point N is swung or forced backward around L as a center, with the arm K as a radius. This shortens the distance between the point N and the center of H, and draws the converging toggle-rods nearer said center, and the toggle-rods are made to form a more acute angle and cause the pedestals and wheels to which they are attached to approach each other. The slot O, controlling the direction of the movement of the point N, distributes it equally to the toggle-rods, and in consequence they cause the pedestals and journals to move toward each other over equal spaces on the bars V V′. In this way the two wheels are brought nearer together upon the inner and shorter rail of the curve and the axles made to approximately conform to the lines of radii of the curve.

The toggle-rods of the rear truck of the car are upon the opposite side of the truck. It is evident that in respect to the rear truck at the moment the front truck enters upon the curve the axial line of the car will change instead of that of the truck. The car will cause the disk H to slightly revolve and the point L and the arm K to move outwardly toward the right-hand side of the truck. The toggle-rods will be caused to make a more obtuse angle and will force the pedestals and wheels farther apart upon the exterior and longer rail of the curve, and the axles will be made to approximately conform to the lines of the radii of the curve.

It is evident that when the car passes over a line of track curving to the right the reverse operation will take place. It is also evident that the sharper the curve over which the car passes the farther will be moved the crank and arm and the wheels will be correspondingly moved farther or closer toward each other, and the convergence and divergence of the axles will thus depend upon the curve. With mere mechanical modifications without departing in any manner from the principle of my invention it can be applied to trucks with any number of wheels. Thus in a truck of six wheels the toggle-rods may operate upon the two outside axles, leaving the central one radial.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In a car operated upon a track, the combination of a truck of four or more wheels with the body of the car, and means whereby in passing over a curve in the track the wheels upon only one side of the truck are automatically caused to approach or recede from each other, and the axle supported thereon to converge or diverge in lines approximating to radii of such curve.

2. In a car operated upon a track, the combination of the body of the car with trucks supporting each end of said car and means whereby the ends of the axles supporting the wheels upon only one side of the respective trucks are automatically caused to approach or recede from each other and the axles to converge and diverge upon one side of each respective truck, but upon opposite sides of said trucks as to each other.

3. The combination of a two-railed track, a truck of four or more wheels, a body of a car

supported thereon, and means whereby in passing over a curve in said track the ends of the axles upon only one side of the truck are automatically caused to approach or recede from each other, and the axles to converge or diverge in lines approximating to radii in such curve.

4. In a car, the combination of a truck of four or more wheels, the bed or body of the car supported thereon, a center-pin or king-bolt with a disk or crank, a crank-arm, and toggle-rods respectively connected with the pedestals of two or more wheels upon one side of the truck, whereby the wheels upon such side may be automatically made to approach or recede from each other, all substantially as shown.

5. In a car, the combination of a truck of four or more wheels, the bed or body of the car supported thereon, a central pin or king-bolt provided with a yoke at its upper end, with pivotal connections with the bed or central sills of the car, its lower end having firmly attached a disk or crank-arm, with connections with the pedestals of the wheels, a central hollow casting firmly affixed to the frame of the truck and supporting the car, provided with an interior or projecting tube or sleeve to receive and hold the king-bolt, and a plate or table provided with a slot to control the movement of said toggle-rods, whereby the wheels upon one side of said truck may be automatically made to approach or recede from each other, substantially as shown.

6. In a car, the combination of the body of said car with a truck of four or more wheels provided with a center-pin or king-bolt having a crank or crank-disk, crank-arm, toggle-rods, and movable pedestals, all substantially as shown.

7. In a car-truck, the combination of the frame thereof with the axles carrying their respective wheels, boxes with curved vertical surfaces containing and holding the journals of the axles and their bearings, and movable pedestals containing curved vertical or plane surfaces for the reception and retention of said boxes, all substantially as shown.

8. In a car-truck, the combination of the frame thereof with the axles carrying their respective wheels, boxes with curved vertical surfaces upon one side of said truck containing and holding the journals of the axles and their bearings, stationary pedestals provided with curved vertical surfaces in the spaces for the reception and retention of said boxes and upon the opposite side of said truck boxes with curved vertical or convergent surfaces containing and holding the journals of the axles and their bearings upon that side, and movable pedestals provided with curved vertical or plane surfaces for the reception and retention of said boxes, all substantially as shown.

9. In a car-truck, the combination of a center-pin or king-bolt provided with a yoke and means for pivotal connections at its upper end and with a crank or crank-disk at its lower end, a central casting holding and supporting said king-bolt, crank-arm, and toggle-rods, a slotted plate connected with said crank-arm and toggle-rods, and movable pedestals upon one side of said truck and stationary pedestals upon the other side, all substantially as shown.

10. In a car-truck, the combination, with the frame and cross-sills thereof, of a central casting, a king-bolt or center-pin provided with a yoke, a crank or crank-disk, and a crank-pin, all substantially as shown.

11. In a car-truck, the combination, with the frame and bars thereof, of movable pedestals on one side provided with openings or spaces having curved vertical surfaces, stationary pedestals corresponding upon the opposite side provided with openings or spaces having curved vertical or plane surfaces, and boxes containing the journals and bearings upon one side with curved vertical surfaces, and upon the other side boxes with curved vertical or convergent surfaces, all substantially as shown.

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Witnesses:
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