July 21, 1925.

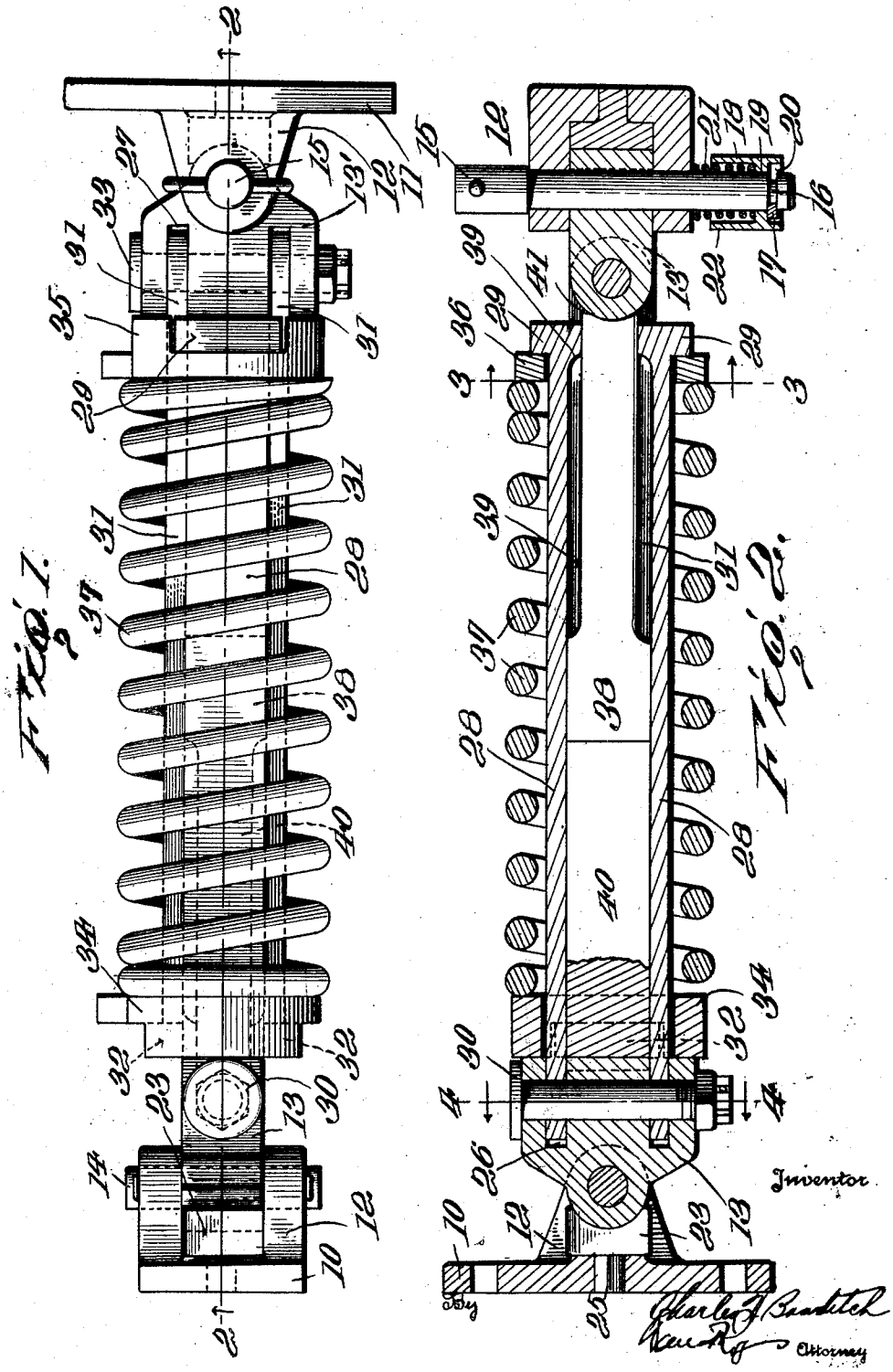
1,546,710

C. H. BOWDITCH

COASTER CAR COUPLING

Filed Feb. 6, 1923

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

Fig. 4.

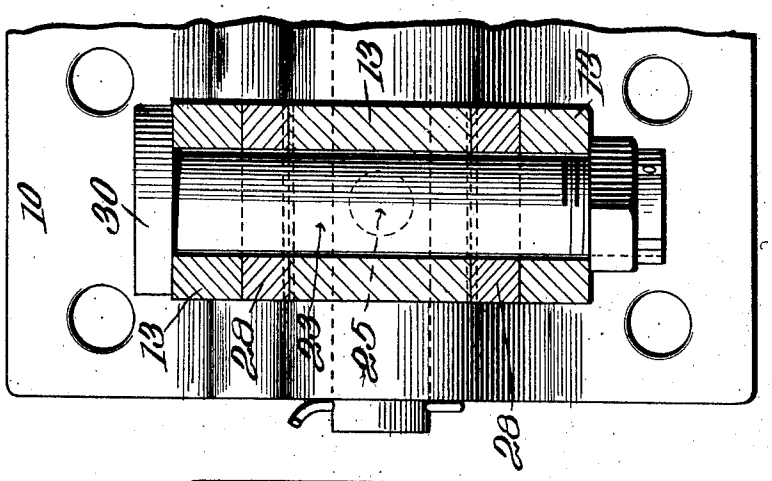
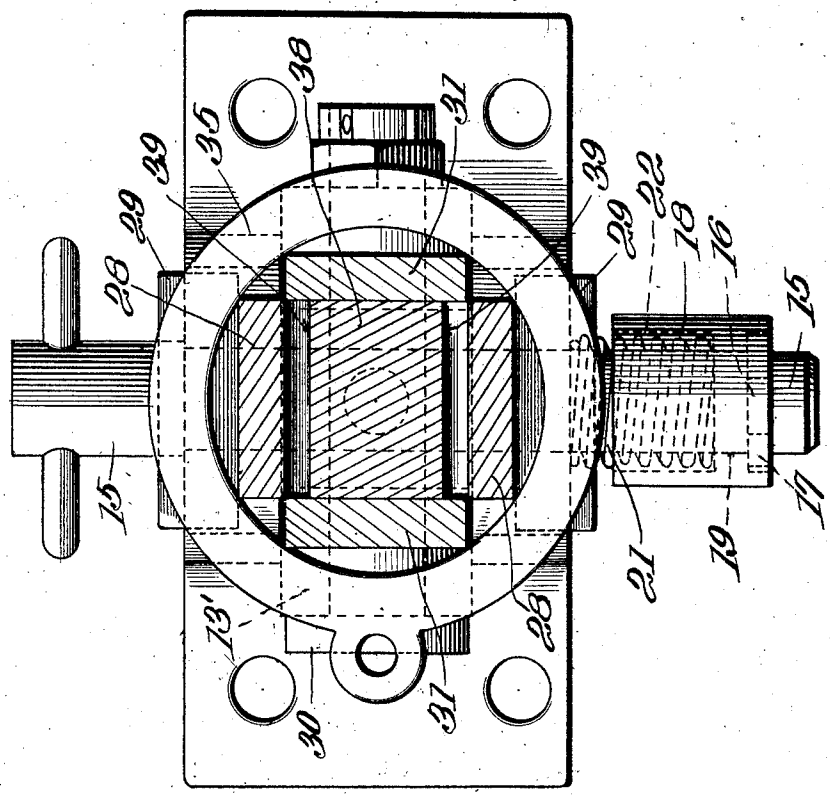


Fig. 3.



INVENTOR
Charles H. Bowditch

BY

ATTORNEY

July 21, 1925. 1,546,710

C. H. BOWDITCH

COASTER CAR COUPLING

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Fig. 5.

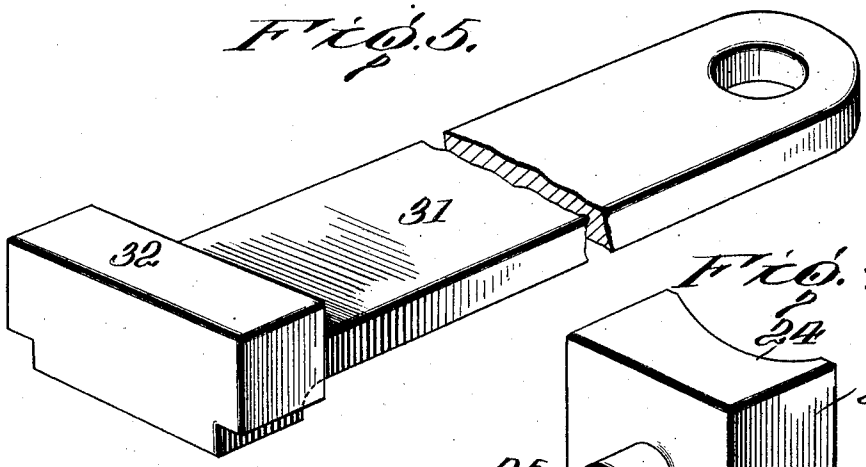


Fig. 7.

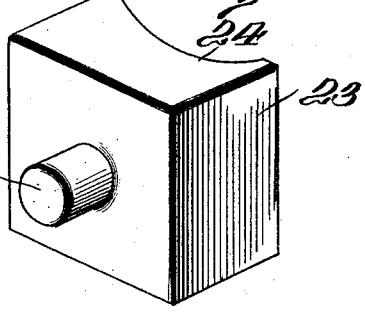
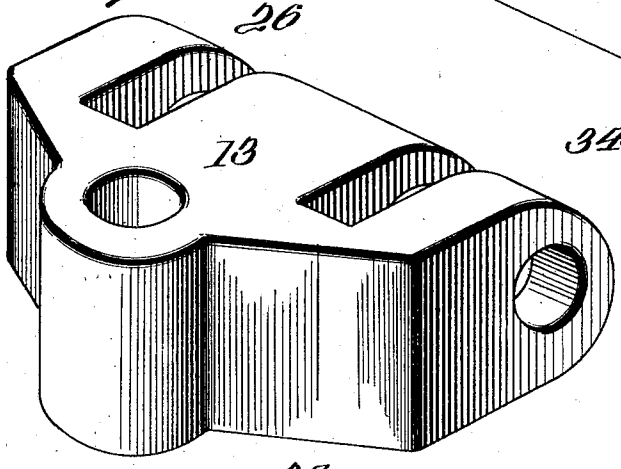


Fig. 6.



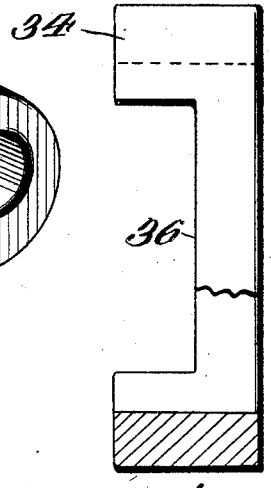


Fig. 9.

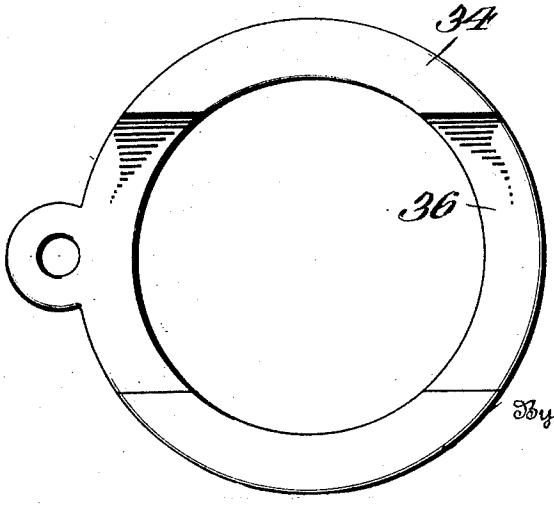


Fig. 8.

Inventor

Charles H. Bowditch

By Dana Rogers

Attorney

Patented July 21, 1925. 1,546,710

UNITED STATES PATENT OFFICE.

CHARLES H. BOWDITCH, OF ERDENHEIM, PENNSYLVANIA, ASSIGNOR TO PHILADELPHIA TOBOGGAN COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

COASTER-CAR COUPLING.

Application filed February 6, 1923. Serial No. 617,412.

To all whom it may concern:

Be it known that I, CHARLES H. BOWDITCH, a citizen of the United States, residing at Erdenheim, county of Montgomery, State of Pennsylvania, have invented new and useful Improvements in Coaster-Car Couplings, of which the following is a specification.

This invention relates to an improvement in coaster car couplings, particularly adaptable to roller coasters and other amusements where two or more cars or the like are attached to each other.

The coupler consists of brackets attachable to car ends, and pivotally connected to the brackets are yokes; a sleeve composed of a plurality of plates provided with T-shaped heads, the free ends of two oppositely disposed plates being pivotally attached to one of the yokes and the other two oppositely disposed plates having their free ends pivotally connected to the other yoke; rings engaging the heads of the plates and located at each end of the sleeve; a spring interposed between said rings, and a coupling bar mounted within the sleeve and having its ends engaging the respective yokes.

The coupling bar which is located within the sleeve will receive, due to the engagement of the ends thereof with the yokes, the shock that is transmitted in stopping the cars, while the strain or pressure will be taken up by the spring in the movement of the complemental plates of the sleeve in opposite directions when the cars are started in motion and during their travel as all the pulling effect is carried through the sleeve and yokes under the compression of the spring. The coupler in this manner has the utmost freedom of action, both from compression and through the joints for movement in both a horizontal and a vertical plane and will take care of all conditions of a coaster curve and dip construction.

The invention consists of certain novel features of construction and combination of parts which will be hereinafter more fully described and set forth in the claims.

In the accompanying drawings:

Figure 1 is a view in top plan;

Figure 2 is a longitudinal vertical sectional view on the line 2—2 of Figure 1;

Figure 3 is a transverse vertical sectional view on the line 3—3 of Figure 2;

Figure 4 is a transverse vertical sectional view on the line 4—4 of Figure 2;

Figure 5 is a perspective view of one of the plates;

Figure 6 is a perspective view of a yoke;

Figure 7 is a perspective view of a yoke bearing block;

Figure 8 is a view in side elevation of one of the rings;

Figure 9 is an end view of the ring partly in section.

Brackets 10 and 11 are attached to the car end in any suitable manner and these brackets are provided with arms 12. The arms 12 of the two brackets are arranged so that they are disposed at right angles to each other. The arms of the bracket 10 lying in a vertical plane while the arms of the bracket 11 lie in a horizontal plane. Yokes 13 and 13′ are pivotally mounted between the arms 12 of the brackets 10 and 11. The yoke 13 is held in position by means of a pin 14 and the other yoke 13′ by a coupling pin 15. The coupling pin 15 is provided at its lower end with an annular groove 16 in which is received a U-shaped key 17. The sleeve 18 is slidably mounted upon the pin 15 and is provided with an internal annular flange 19 forming sockets or pockets in the sleeve. The pocket 20 forms a closure for surrounding the key 17 and holding it in place. The sleeve 18 is held in its lowermost position by means of a spring 21 which is received around the pin 15 and in the upper or other pocket 22 of the sleeve 18. One end of the spring bearing against the arm 12 of the bracket 11 and the other end against the annular flange 19 of the sleeve 18.

Interposed between the brackets 10 and 11 and the rounded ends of the yokes 13 and 13′ are bearing blocks 23. The outer faces 24 of these blocks are recessed or concave to form a socket for the ends of the yokes whereby the strain on the coupling pins or bolts is eliminated and the shearing of these pins is prevented in any bumping action which may be imparted to the coupler. The bearing blocks 23 are provided with projections or pins 25 at their rear ends which are received in holes formed in the brackets 10 and 11 for maintaining them in position.

The right-angular positioning of the arms 12 of the brackets 10 and 11 causes a similar positioning of the yokes 13 and 13′.

The yokes 13 and 13′ are each provided with two slots 26, 26, and 27, 27 respectively. The slots 26 are located at right angles to the slots 27.

Complemental plates 28, 28 are each provided at one end with a T-shaped head 29 and their opposite ends are received in the slots 26 of the yoke 13. The pin 30 passes through the yoke 13 and plates 28 for fastening them in position. Similar complemental plates 31, 31 are each provided with T-shaped heads 32 and their opposite ends are received in the slots 57 of the yoke 13′. The ends of these plates are held in position in the yoke by means of a pin 33 which passes through the yoke and plates. The complemental plates 28 and 31 are arranged at right angles to each other producing a square shaped housing or sleeve and encircling each end of this sleeve or housing of the plates 28 and 31 are rings 34 and 35. The rings 34 and 35 are shown more particularly in Figures 8 and 9 and are provided on their outer faces with a transverse slot 36. The slot 36 of the rings 34 receive the T-shaped heads 32 of the plates 31 and the slot 36 of the ring 35 receive the heads 29 of the plates 28, thereby holding the rings against rotation about the plates. A spring 37 surrounds the plates and its ends engage respectively the rings 34 and 35 which normally holds the rings in engagement with the heads of the plates. Received between the plates 28 and 31 is a coupling bar 38. This bar is reduced from the center thereof toward each end as is indicated by the numerals 39 and 40. The reduced portion 39 is formed on the bar on two faces and the same is true of the reduced portion 40, but these reduced portions 39 and 40 are formed on the bar at right angles to each other so that the reduced portion 39 may receive the inwardly projecting head portion 29 of the plates 28 and the reduced portion 40 receive and guide the inwardly projecting head portion 32 of the bars 31. The central portion of the bar thereby limits the inward movement of the heads toward each other. The ends of the bar 38 are rounded as at 41 to conform to and engage the rounded inner face of the yokes 13 and 13′.

The construction as shown in Figures 1 and 2 show the normal position of the coupler when idle or during the coupling operation. The shock of the coupling or stopping of the car being taken up entirely by the bar 38 and yokes 13 and 13′. The yokes having an engagement with the brackets 10 and 11 by the bearing blocks 23 and the bar 38 engaging the inner faces of the yoke causes a transmission of the shock equally throughout all of these parts and their connecting pins, thereby eliminating the strain being imparted entirely to the connecting pins and coupler pin. When the pulling force is exerted upon the coupling in moving the cars, the strain is relieved from the coupling bar 38 and this strain is assumed by or transmitted to the plates 28, 31, rings 34 and 35, and yokes 13 and 13′, as well as the spring 37. This is produced by causing the heads 29 of the bars 28 to move longitudinally of the bar 38 in one direction and the heads 32 of the bars 31 in an opposite direction, in other words, the heads 32 move toward the head 39 thereby compressing the spring 37 between the rings 34 and 35. This compression of the spring causes these parts to assume the whole load required in the hauling of cars. When the car is stopped this strain or compression of the spring 37 is discontinued and the spring is allowed to expand causing the parts to return to the positions shown in Figures 1 and 2 and causing the coupling bar to receive the shock by the engagement therewith of the inner faces of the yokes 13 and 13′. The yokes and bar producing in effect a solid bar coupling through the machined seats of the various parts and at the same time there is the required flexibility of the coupler. There is no danger of the bars becoming disengaged or separated and when the coupling pin is released by removing the key 17, the pin may be withdrawn for disengaging the car. It is evident that by simply changing the spring 37 this coupler might be employed with both heavy and light trains.

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

1. In a car coupler, the combination of yokes, a plate connected to each yoke, a spring surrounding the plates, means for confining the spring between the free ends of said plates and a coupling bar interposed between the yokes and having engagement therewith.

2. In a car coupler, the combination of yokes, a plurality of plates, two complemental plates connected to a yoke, and two complemental plates connected to the other yoke and arranged at right angles to the first mentioned plates, a spring surrounding the two sets of complemental plates, means for confining the spring between the free ends of the two sets of complemental plates and a coupler bar located between the plates and having its ends in engagement with the yokes when the coupler is in its normal position.

3. In a car coupler, the combination of yokes, a set of plates connected to a yoke, and another set of plates connected to the other yoke, means for engaging the free ends of the two sets of plates, and a coupling bar interposed between the yokes and having engagement therewith.

4. In a car coupler, the combination of yokes, compressible means connected to the

yokes for sustaining the load in pulling the cars, and a coupling bar interposed between the yokes for receiving the shock in the stopping and pushing action.

5. In a car coupler, the combination of yokes, a set of plates pivotally connected to one yoke and another set of plates pivotally connected to the other yoke, each plate being provided at its free end with a head, rings received on the plates and engaging the heads, a spring surrounding the plates and interposed between the rings, and a coupling bar located between the plates and having engagement with the yokes, said bar being provided with reduced portions to receive the heads of the plates to guide the plates in their movement.

CHARLES H. BOWDITCH.