Nov. 6, 1934. A. L. SCHULLER 1,979,908

VEHICLE COUPLER

Filed Sept. 6, 1933

Fig. 1.

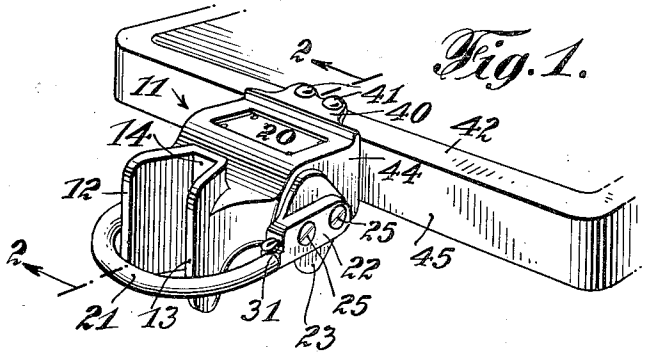


Fig. 8.

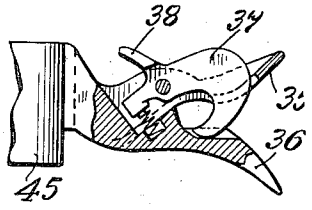


Fig. 2.

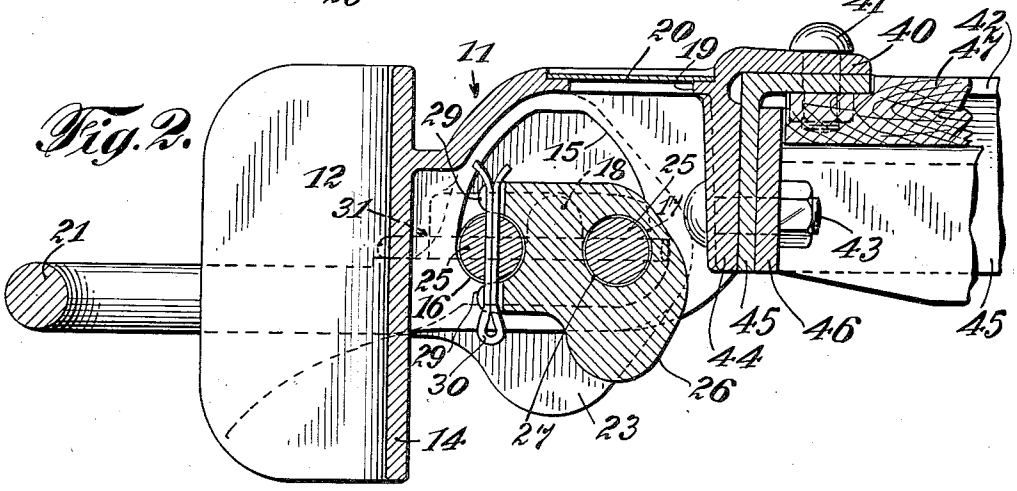


Fig. 3.

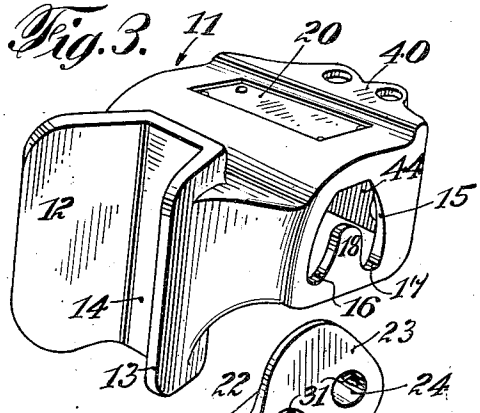


Fig. 5.

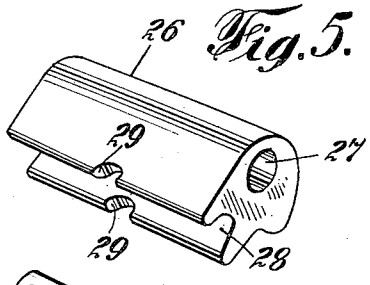


Fig. 6.

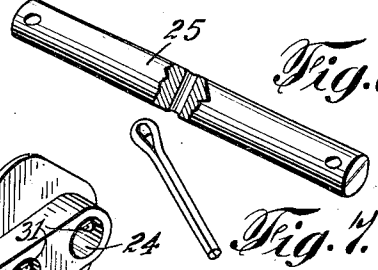


Fig. 4.

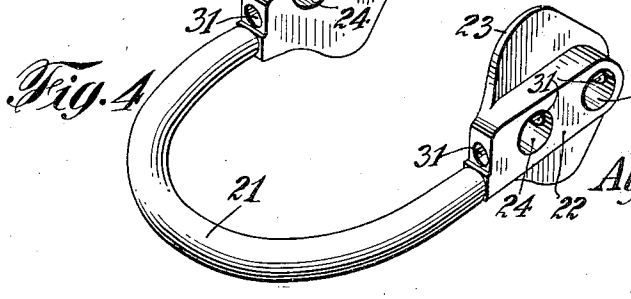


Fig. 7.

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VEHICLE COUPLER

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7 Claims. (Cl. 280—33.15)

This invention relates to couplers for vehicles. The type of coupler involved is applicable to vehicles generally, but is widely used for industrial trucks and trailers such as are used in factories, warehouses, etc.

The general type of coupler is one in which one end of a vehicle carries a bumper block having a horizontally positioned bail; and the vehicle end to be coupled to it carries a bifurcated draw bar that straddles the bail, top and bottom, and is latched thereto. It is desirable, of course, that the bail be able to swing upwardly and downwardly to facilitate the passage of a train of coupled cars over bumps and from a horizontal floor to inclines, and vice versa. On the other hand, it is desirable that on an uncoupled car the bail should remain in a suitable fixed position, so that a draw bar may make coupling engagement with it without manual control or manipulation of the bail.

Couplers of this general type have been made in which the bail was supported in a horizontal position (when uncoupled) by stop lugs which project beneath the bail. This holds the bail nicely for coupling and uncoupling; and it also permits the bail to swing upwardly, as is desirable when a train of coupled cars passes from a horizontal floor to an upward incline. However, this construction does not permit the bail to swing downwardly, as is desirable when a train passes (for example) from the top of an upward incline to a horizontal floor.

Couplers have also been built with the bail pivoted and so counterbalanced that the bail will stand in horizontal position when the cars are standing uncoupled on a level floor. This permits upward and downward inclination of the bail during pulling of coupled cars, but does not meet all coupling requirements. Car movement preparatory to coupling may start the ball swinging like a pendulum, making it necessary to manually arrest or control the bail during coupling. Also when an attempt is made to couple cars standing on an inclined plane the bail stands horizontally with respect to the earth, instead of parallel to the inclined plane, so that the bail is not in the correct position for coupling.

An object of the present invention is to provide a coupler having a coupler element (e. g. a bail) which can be tilted upwardly and downwardly during transit of coupled vehicles, but in which the coupling element is automatically held in a suitable fixed position (with respect to the vehicle) when the vehicle is uncoupled.

Another object of the invention is to provide a coupler which automatically holds a vertically movable coupling element in a fixed position (with respect to the vehicle) when the vehicle is uncoupled without permitting pendulum-like swinging of the coupling element.

Another object of the invention is to provide a self-contained unitary coupler which permits upward and downward tilting of the coupling element when coupled vehicles are in transit, but which automatically holds the coupling element in suitable coupling position when the vehicles are uncoupled.

Fig. 1 is a fragmentary view showing a car end equipped with a coupler embodying the present invention.

Fig. 2 is a cross section of the coupler taken approximately on the line 2—2 of Fig. 1.

Figs. 3 to 7 constitute an exploded view of the coupler except that duplicate parts are shown only once. Fig. 3 shows the coupler body; Fig. 4 the bail; Fig. 5 a weight associated with the bail; Fig. 6 a pin for attaching the bail to the coupler body; and Fig. 7 a cotter pin, three of which are used.

Fig. 8 is an elevation, partly in section showing a draw bar suitable for attachment to the coupler shown in Fig. 1.

A one piece malleable cast or cast steel coupler body 11 has a bumper portion consisting of diverging vertical wings 12 and 13 which are separated at their rear ends by a vertical web 14. The body 11 is hollow, and the opposite sides of it have identical cut-out areas 15 which provide sockets 16 and 17, separated by a nose 18. To save weight and facilitate access to the inside of the coupler, the top of the body 11 is cut away at 19 but may be closed by a light name plate 20.

A cast steel bail 21 is adapted to straddle the body 11, and its ends 22, 22 are provided with flanges 23, 23 which cover the side cut-outs 15 in the body 11. The bail ends are each provided with a pair of apertures 24, 24 which receive a pair of transverse pins 25, 25 that lie in the sockets 16 and 17 of the coupler body. A weight 26 is placed within the coupler body; and in assembly one of the pins 25 is passed through a bore 27 in the weight and the other pin 25 is passed through a groove 28 in the weight. The weight is provided with vertically aligned recesses 29, 29, so that a cotter pin 30 can be inserted as shown in Fig. 2 to hold the weight centrally on the pins 25, 25. The ends of the bail are cotter pinned at 31, 31 to the ends of the pins 25, 25.

Fig. 8 shows one of various draw bars which may be attached to the bail 21. The draw bar has a bifurcated end which provides an upper leg 35 and a lower leg 36 which straddle the bail 21 top and bottom. A spring pressed latch 37 automatically attaches the draw bar to the bail when the end of the draw bar is thrust against the bumper block. The latch 37 may be provided with a pedal 38 to facilitate raising of the latch for uncoupling.

It will be understood that one end of each car is provided with a coupler as shown in Fig. 1 and that the other end of each car is provided with a draw bar such as shown in Fig. 8. The power driven truck or tractor for pulling a train of cars is provided with the draw bar.

The draw bar shown has the advantage that no part of it projects above the car floor, where it might interfere with sliding of freight off of the car in unloading. The only part of the coupler which projects above the car floor is attachment flange 40, which is bolted at 41 to the top 42 of the metal car frame. This flange and bolting may, however, be omitted, the coupler being attached to the car by bolts 43 (one shown) which pass through the vertical web 44 of the coupler body and the vertical web 45 of the car frame. These bolts may also pass through internal strap 46 which is part of the supporting structure for the car floor 47.

It will be seen that the bail 21, the pins 25, 25, and the weight 26 constitute a system which can be tilted relative to the body 11 of the coupler. This system may be described as a "tilting coupling element system" or as a "tilting bail system". When a train of cars passes from horizontal to an upward incline, the bail tilts upwardly on the rear pin 25, the front pin 25 being lifted upwardly in its socket. As the train passes from the top of the incline back to horizontal, the bail tilts downwardly about the forward pin 25, the rear pin being lifted in its socket.

The bail system is supported at four spaced points; and the mass of the bail system (taken as a whole) is so distributed that its center of gravity lies on a vertical line passing through the area marked off by the four supporting points. The four points of support are provided by the two pairs of sockets 16 and 17 (duplicated on opposite sides of the body 11). These sockets receive the pins 25, 25 near the ends of the pins. The center of gravity of the bail system (bail 21, pins 25, 25, weight 26 and cotter pins 30 and 31) lies in a vertical plane that passes between pins 25, 25. Thus when a car is uncoupled, the bail system is in stable equilibrium; and if the bail 21 be displaced from its horizontal position (relative to the coupler) it automatically returns to the position shown in Fig. 2, without any pendulum-like swinging. If the cars to be coupled are on an incline, the bail is held in the same position relative to the coupler, i. e., the bail stands parallel to the floor whether the floor be horizontal or inclined. Thus, when a car is uncoupled the bail is automatically held in coupling position, so that coupling can be readily effected without manual control or manipulation of the coupler.

In the preferred form shown in the drawing, the center of gravity of the bail system lies below the plane of the axes of pins 25, 25, but since there are four points of support, this is not essential. For example, the construction will function in a similar manner if the bail system be turned up-side-down, as the bail will still be supported in stable equilibrium, similar to the equilibrium of a four-legged table.

I have disclosed the best form in which I have contemplated applying the invention, but since various modifications may be made, the disclosure is to be considered as illustrative and not as limiting.

Having described my invention, I claim:

1. A vehicle coupler comprising a body portion; and a tilting coupling element system supported by said body portion and capable of being inclined upwardly and downwardly with respect to the body portion, said tilting system including a pair of laterally spaced pins transversely engaging said body portion, and a coupling element attached to both of the pins; said tilting system having its center of gravity below a plane passing through the axes of said pins and lying in a vertical plane passing between the axes of said pins.

2. A vehicle coupler comprising a body portion; a pair of laterally spaced pins extending transversely of said body portion, the body portion supporting the pins adjacent to their ends while permitting each pin to be moved bodily upward; and a bail engaging both of said pins adjacent to each end thereof.

3. A vehicle coupler comprising a body portion; a pair of laterally spaced pins extending transversely of said body portion, the body portion supporting the pins adjacent to their ends while permitting each pin to be moved bodily upward; a bail engaging both of said pins adjacent to each end thereof; and a weight movable with the bail.

4. A vehicle coupler comprising a hollow body portion having means to attach it to the end of a vehicle; a coupling element attached to the body portion, the attachment permitting the coupling element to be tilted upwardly and downwardly with respect to said body portion; and means within the body portion operative to return the coupling element when released to a fixed position with respect to said body portion, regardless of whether the body portion be positioned horizontally or inclined upwardly or downwardly.

5. A unitary vehicle coupler comprising a body portion having means to attach the entire coupler structure to the end of a vehicle; a bail attached to the body portion, the attachment permitting the bail to be tilted upwardly and downwardly with respect to the body portion; and means carried at least immediately by said body portion to return the bail when released to a fixed position with respect to said body portion, regardless of whether the body portion be positioned horizontally or inclined upwardly or downwardly.

6. A vehicle coupler comprising a hollow body portion having two pairs of pivot-forming means, one pair of the pivot-forming means being located forwardly of the other pair, and the two pivot-forming means of each pair being in axial alignment at opposite sides of the body portion; and a tilting coupling element system having two pairs of pivot-forming means normally engaging the respective pivot-forming means of the body portion to support the coupling element system, and selectively cooperating pivotally, pair for pair, with the pivot-forming means of the body portion, the tilting system being capable of being inclined upwardly by pivoting about one set of

the cooperating pairs of pivot-forming means and being capable of being inclined downwardly by pivoting about the other set of the cooperating pairs of pivot-forming means.

7. A vehicle coupling comprising a coupling member adapted to transmit draft forces, a coupler body supporting said coupling member, and a pair of pivots connecting said member and said body, one of said pivots being effective when the draft force on said member is downward and the other of said pivots being effective when the draft force on said member is upward.

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