2 Sheets—Sheet 1

G. H. AMES.
Car-Coupling.

No. 206,159 Patented July 23, 1878.

Fig. 1.

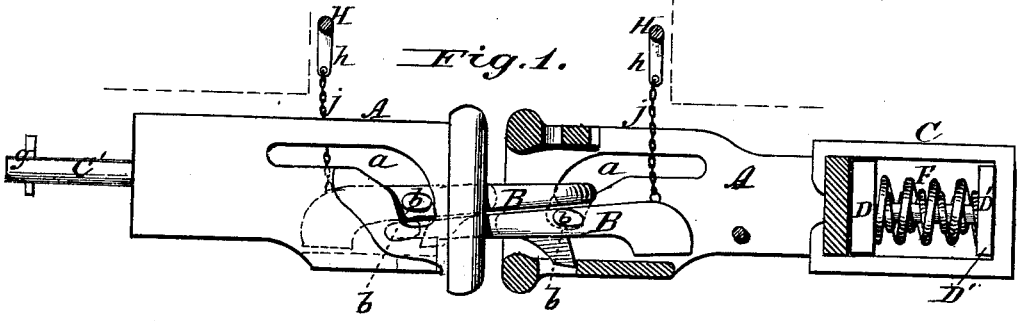


Fig. 2.

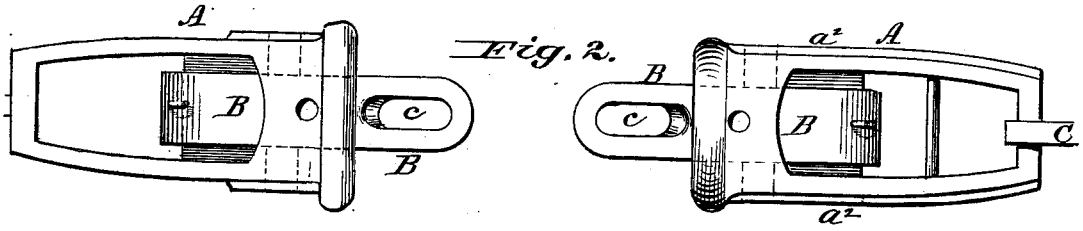


Fig. 3.

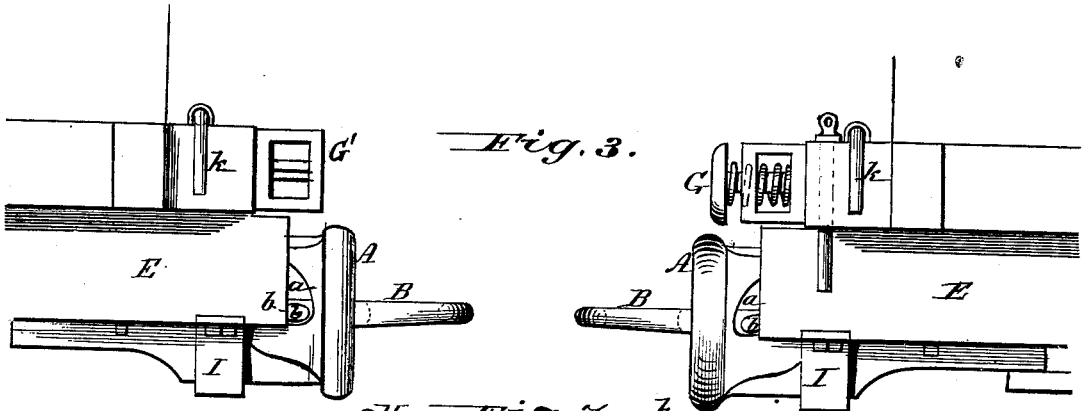


Fig. 7.

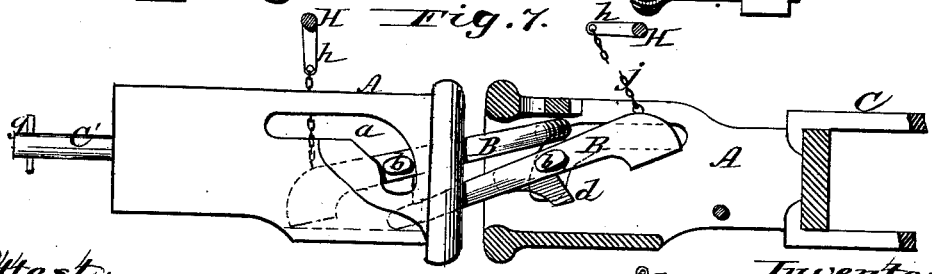
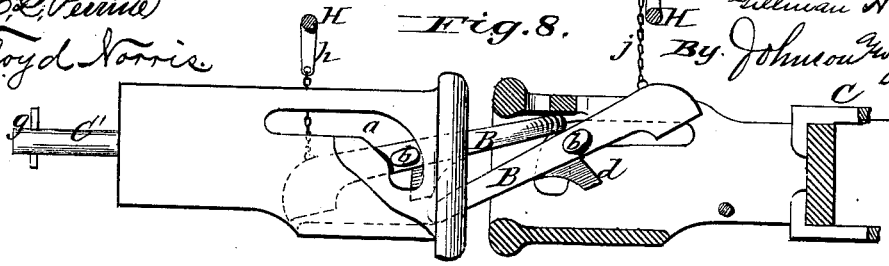


Fig. 8.



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2 Sheets—Sheet 2.

G. H. AMES.
Car-Coupling.

No. 206,159. **Patented July 23, 1878.**

Fig. 4.

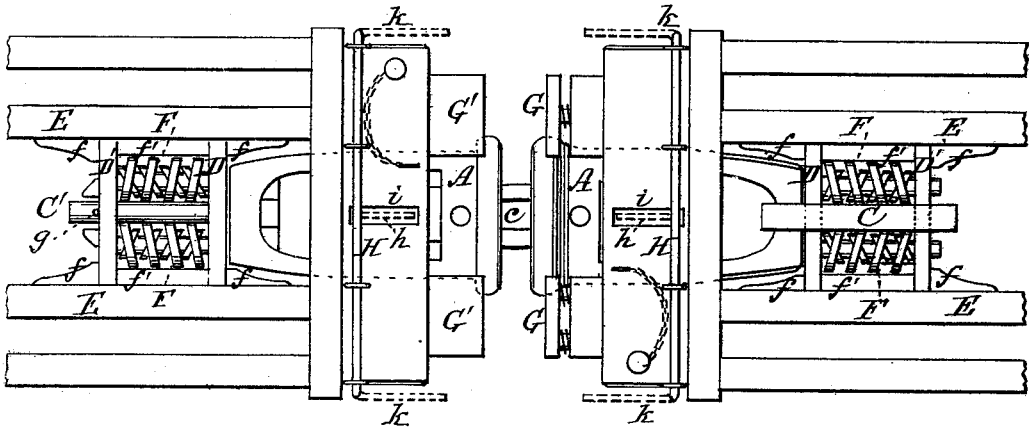


Fig. 5.

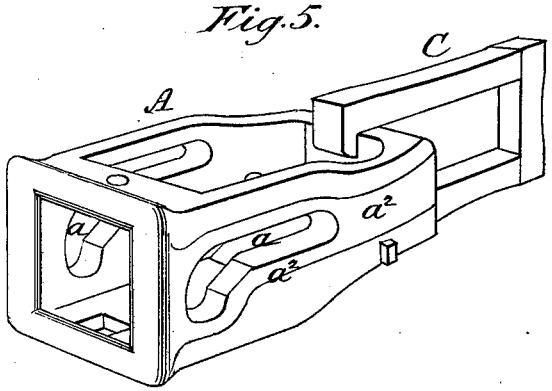
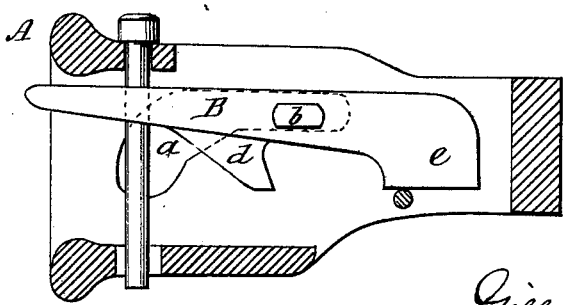


Fig. 6.



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UNITED STATES PATENT OFFICE.

GILLMAN H. AMES, OF ADRIAN, MICHIGAN.

IMPROVEMENT IN CAR-COUPLINGS.

Specification forming part of Letters Patent No. **206,159**, dated July 23, 1878; application filed February 24, 1877.

To all whom it may concern:

Be it known that I, GILLMAN H. AMES, of Adrian, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Car-Couplings; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings of the same, which form a part of this specification.

In my improved device for coupling railway-cars I employ a draw-head, a large portion of the top and bottom of which is open to reduce its weight and give freedom for the proper working of the rear or unconnected end of the coupling-bar, the latter being provided with side pins, which work in the side slots of the draw-heads, while the rear ends of the draw-heads are connected to the car.

The coupling-bars have each a front slot and subjacent hook, by means of which the coupling is effected as the cars are brought together.

The draw-heads are connected to the car by means of a yoke or shank and co-operating followers arranged between the bumper-timbers and suitable stops, and the draft and concussion are borne by springs, one within the other, and arranged side by side between the followers, to give greater resisting force and durability. In connection with the draw-head and its attachments, I use a protecting-bumper attached to the end of the car, the object of which is to relieve the draw-head and springs from too great pressure when the cars are brought together.

I have combined with the coupling-bar, unattached at its rear end, an open-top draw-head, an uncoupling-shaft, and center lever with chain-connection, whereby the uncoupling may be readily effected by raising the rear end of said coupling-bar.

The draw-head connection with the car and the coupling-bar connection with the draw-head are such as to afford a co-operating action of freedom or play to these parts in relieving the cars and giving an easier movement to them. In making the connection with the car and in giving protection to the coupling-bar the draw-head, with its curved or inclined side slots and yoke or shank, is complete in itself, and is advantageous in its construction and application.

When necessary to use the common crooked link in attaching my coupler to the old-style draw-bar, the coupling-bar is thrown back in the draw-head and a pin is employed, which is attached to and has its socket or rest in the draw-head.

In the accompanying drawings, Figure 1 represents two draw-heads with their attachments, the coupling-bars being coupled, and one of the draw-heads shown in section. Fig. 2 is a top view, showing the coupling-bars uncoupled. Fig. 3 is a side view of the couplers as applied to the cars and in positions ready for coupling. Fig. 4 is a top view of the same in positions when coupled, the floor of the cars being removed to expose the draw-head attachments. Fig. 5 is the draw-head and its attached yoke, and Fig. 6 is a view of the position of the coupling-bar and pin when necessary to use the common crooked link; Fig. 7, a section like Fig. 1, but showing the rear part of the under coupling-bar half-elevated and thrown forward as far as it will go to unhook it from the hook of the upper bar, the uncoupling-lever having been moved through half its arc; and Fig. 8, a similar section, showing the uncoupling-bar fully raised and drawn backward in the draw-head to maintain the separation of the coupling-bars until the cars are parted, the uncoupling-lever having been moved through its full arc to effect such relative positions of the coupling-bars.

In the claims I shall point out specifically the parts and combination which embrace my invention.

The draw-heads A are provided with curved or inclined slots *a* on each side, which extend rearwardly, and into which strong arms or pins *b* of the coupling-bars B extend and work. The function and advantage of these curved or inclined side slots of the draw-heads are that they give protection to the coupling-bar, when it comes in contact with obstacles, by allowing it to recede. They also admit of the coupling-bar being brought forward by its own weight when thrown out of coupling position.

The greater portion of the top of the draw-head is open, to give perfect freedom to the rear

end of the coupling-bar in all its various workings in coupling, uncoupling, &c., as well as to reduce the weight, which is still further reduced by leaving a portion of the bottom open and reducing the width of the vertical sides back of where the rear end of the coupling-bar rests when in coupling position. These two matters of reducing weight, affording freedom for the proper working and movements of the coupling-bars, are of much importance.

When the draw-heads are made of castings, either steel or iron, a ridge or bead, a^2, may be formed around the side slots a and along the sides, to strengthen the draw-heads and increase the wearing-surface of the slots within which the pins b work. Thus I obtain the greatest possible lightness with the requisite strength.

When the draw-heads are of wrought-iron, pieces of metal may be fitted and riveted or welded around the lower portion of the side slots for the purpose above stated, and a head or face plate may be riveted to the draw-head, or a solid or dropped head may be applied, as may be deemed best.

The draw-heads are connected to the car by means of a yoke or open frame, C, arranged to work in connection with followers and springs, as will be presently stated.

The coupling-bars B have each a slot, c, at their front ends, and a subjacent hook or prong, d, with rearwardly-declined outer side, and should be made heavier at their rear ends e to maintain them in horizontal or coupling positions. The side arms or pins b of these bars, which work in the curved side slots of the draw-head, are arranged near their center to allow of the proper coupling and uncoupling action of the bars.

The front ends of the coupling-bars are formed so as to readily slip by each other, and when the cars are brought together and the ends of the coupling-bars pass each other the front end of the lower bar strikes the outer side of the hook or prong of the upper bar, raising and passing under it until the hook of the upper bar drops into the slot of the lower bar, which completes the coupling operation.

If desired, the coupling-bars may be made in sections, to render their repairing more simple; and they may be steel-pointed to increase their wearing capacity.

The yoke or open frame C may be rigidly or loosely secured to the rear end of the draw-head. In either case it embraces two followers, D D′, which are arranged between the bumper-timbers E of the car, and are maintained in their respective positions against cheek-pieces or stops f f by springs F, arranged side by side between the followers, and bearing upon them. These cheek-pieces or stops are secured to the bumper-timbers E in front of the forward follower and back of the rear follower, and the latter rest and move upon plates f' f' bolted to the under side of the bumper-sills.

By this construction and arrangement I obtain a secure connection of the draw-heads with the cars and a proper resisting force.

In order to obtain the proper draft and resisting force and durability, I double the springs by arranging one, F′, within the other, F, the coils of which may be reversed.

When the cars are pulling, the rear followers D′ are brought forward, compressing the springs and keeping the draft upon them, because the forward followers are held in position by their cheek-pieces or stops f of the bumper-timbers. When the draw-heads are driven back the pressure is also received upon the springs as the action of the followers is released. The springs are held in place by pins fixed to and projecting from one follower through openings in the other, or short pins or projections may extend from each follower for this purpose. Instead of the yoke, a headed shank, C′, may be used in connecting the draw-heads to the car by the shank passing through the rear end of the draw-head and both the followers at their centers, and securely fastened back of the rear follower by a key, g, or other suitable way.

In connection with, and in order to add security to, the draw-heads, springs, &c., I use a protecting-bumper, G, one or more of which may be applied to each end of the car. They are used to receive the blow when the draw-heads are driven back a certain distance by the cars being forced together, and they should be made of sufficient size for the purpose.

When convenient, the protecting-bumpers may be placed on the dead-wood, and by arranging them directly in front of the center sills a greater security is given to the body of the cars. When used on the dead-wood, they may be fastened to that alone, or they may be bolted through both the dead-wood and end sills. Instead of the metallic protecting-bumper, an elastic or rubber bumper, G′, of sufficient size may be used.

The uncoupling of the cars is effected from the side of the car by means of a shaft, H, which passes across the end of the car, and is loosely secured to the top of the dead-wood or car. To the center of the shaft is attached a short lever, h, which works in a slot, i, in the dead-wood for that purpose. The center lever of the shaft is connected to the rear end of the coupling-bar by means of a chain, j, of suitable length.

At each end of the shaft is a crank-handle, k, turning up which raises the rear end of the bar, and depressing its front end releases the hook-connection and uncouples the cars.

A lever may be attached so as to uncouple the cars from the platform or top of the cars, if desired.

In connection with the uncoupling device and its attached coupling-bar, the open-top draw-head is an essential element, as it gives full freedom for the rear end of the coupling-bar to rise both in coupling and uncoupling.

The draw-head, with its curved inclined side slots and yoke, whether fixed or loosely connected therewith or the shank, as a means for making the connection with the car and of giving protection to the coupling-bar, is complete in itself, and is simple in construction and indispensable in its functions.

The draw-head is held loosely between the bumper-timbers by means of an angle-iron, I, bolted to the under sides of said timbers, and upon which the draw-heads rest, so as to have a little freedom or play both laterally and vertically upon their connections with the car. This freedom of the draw-head and the non-rigid connection therewith of the coupling-bar are important as a means of relieving the cars of side thrusts to a very great extent, and give an easier movement.

The draw-head connection with the car, whether by the yoke or the shank, is such as to give the accommodating action stated.

The yoke or open frame may be fixed to, and constitute a part of, the draw-head, or it may pass around the rear end of the draw-head, leaving the latter free to be moved backward independent of the yoke.

In Fig. 1 the coupling-bars are shown in positions at rest, with the pins or arms of the bars resting against the back of the lower part of the side slots of the draw-head; and in Fig. 7 the rear part of the under coupling-bar is half elevated, the arms of the bar thrown forward against the front of the side slots, and the point of the bar farther into the opposite draw-head, the slot of said under bar being thus disengaged from the hook of the upper bar, while in Fig. 8 the disengaging-lever is shown as fully turned up and the under bar drawn back in the draw-head far enough away from the hook of the upper bar, so that said under bar will remain back until the cars are separated, even though the uncoupling-lever turns back into its resting position; and this complete withdrawal of the coupling-bar must be effected whether the cars stop with the draw-heads close together or not. So, also, must the bars be thrown forward far enough to disengage the hook at the proper time in the movement of the bar, which is at the point of its half elevation. For this purpose the uncoupling device is used, as by it I get a motion forward to loosen and separate the slot of the lower bar from the hook of the upper bar, and a backward motion, whereby the bar is thrown back in the draw-head, completing the uncoupling operation.

Now, if the uncoupling-lever be turned up into a horizontal position, as shown in Fig. 7, the motion from the position in Fig. 1 has been not only to raise the rear end of the bar, but to throw it forward, and if the bar was sitting back any in the side slots, or there was any slack where the draw-heads were fastened to the car, it takes up such slack by throwing the side pins of the bar firmly against the front sides of the slots of the draw-heads, loosening the point where the two bars are connected, and throwing the end of the lower bar down off the hook, as seen in Fig. 7. This motion of the lever forward makes it possible for the bars to be uncoupled with little or no slack as the cars naturally stand, and this is often necessary, especially on a curve.

Thus far the motion has been upward and forward; but from the position shown in Fig. 7 to that shown in Fig. 8 the motion is upward and backward, carrying the bar clear back, and nearly or quite out of the other draw-head. Now, when the bar is in this position, as shown in Fig. 8, and the center lever *h* is allowed to drop down, the bar will remain back in the draw-head, and its arms will rest upon the second slant of the side slots, while it is held in position by the front end of the upper bar resting upon it until the cars are separated, so that the uncoupling-lever gives two motions in uncoupling, which are necessary to produce the desired result. The first movement is the forward movement until the bars are separated, and the second one is the rearward movement to throw the bars apart and out of the way of the hook.

In a patent granted to me October 27, 1874, I employ short weighted coupling-bars, with arms or pins working in side slots in the draw-heads, having deep sides and closed tops, and the coupling-bars compressed to be uncoupled by raising their rear ends within the draw-heads; but in my present invention I employ an open-top draw-head, with the short coupling-bar adapted so that the rear end of the coupling-bar can be raised above the top sides of the draw-head in the act of uncoupling. The draw-heads in this case, however, are not open at the top their entire length; but they are constructed with a closed front or face-plate at the top, in order to give security in keeping the bars coupled, which could not be the case if the draw-head was open its entire length, because the coupling-bars with weighted rear ends and side pins working in side slots of the draw-heads must not be used with draw-heads open at their front ends or top, for the draft would have a tendency to at once uncouple them. The top of the face-plate must therefore be kept closed to keep the bars in and coupled. The closed front also gives durability to the draw-head.

This construction gives the important advantage of a strong and comparatively shallow draw-head with less metal and less expense.

I claim—

1. The draw-head of a car having curved or inclined side slots and open at its top, but having an uninterrupted face-plate or closed front, in combination with a coupling-bar adapted to operate for uncoupling through the open-top draw-head and be held in coupled positions by said closed front, substantially as herein set forth.

2. The draw-head having vertical and lateral play upon its point of connection with the car, and the coupling-bar having freedom

for movement in any plane, as well as a frontward and rearward movement upon its connections with the draw-head for conjoint action, for the purpose described.

3. The draw-head having the curved or inclined side slots and the yoke or shank, as herein set forth.

4. The draw-head open at the top, and provided with the side beads to give strength and to increase the wearing-surface of its curved or inclined side slots, substantially as described.

5. The draw-head having an open top, an uninterrupted face-plate or closed front, and a weighted coupling-bar working therein, as described, in combination with the uncoupling-shaft H, its center lever *h*, and connecting-chain *j*, the radius of said lever having such relation to the point of connection with the coupling-bar as to cause the under coupling-bar to have a forward movement to loosen it from the hook of the upper bar as said lever is raised through part of its arc, and a rearward and upward movement through the open-top draw-head as said lever completes its upward turn or half-circle from its starting-point, whereby the complete separation of the bars is effected and maintained until the cars are separated, as described.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

GILLMAN H. AMES.

Witnesses:
D. C. DRURY,
L. A. DRURY.