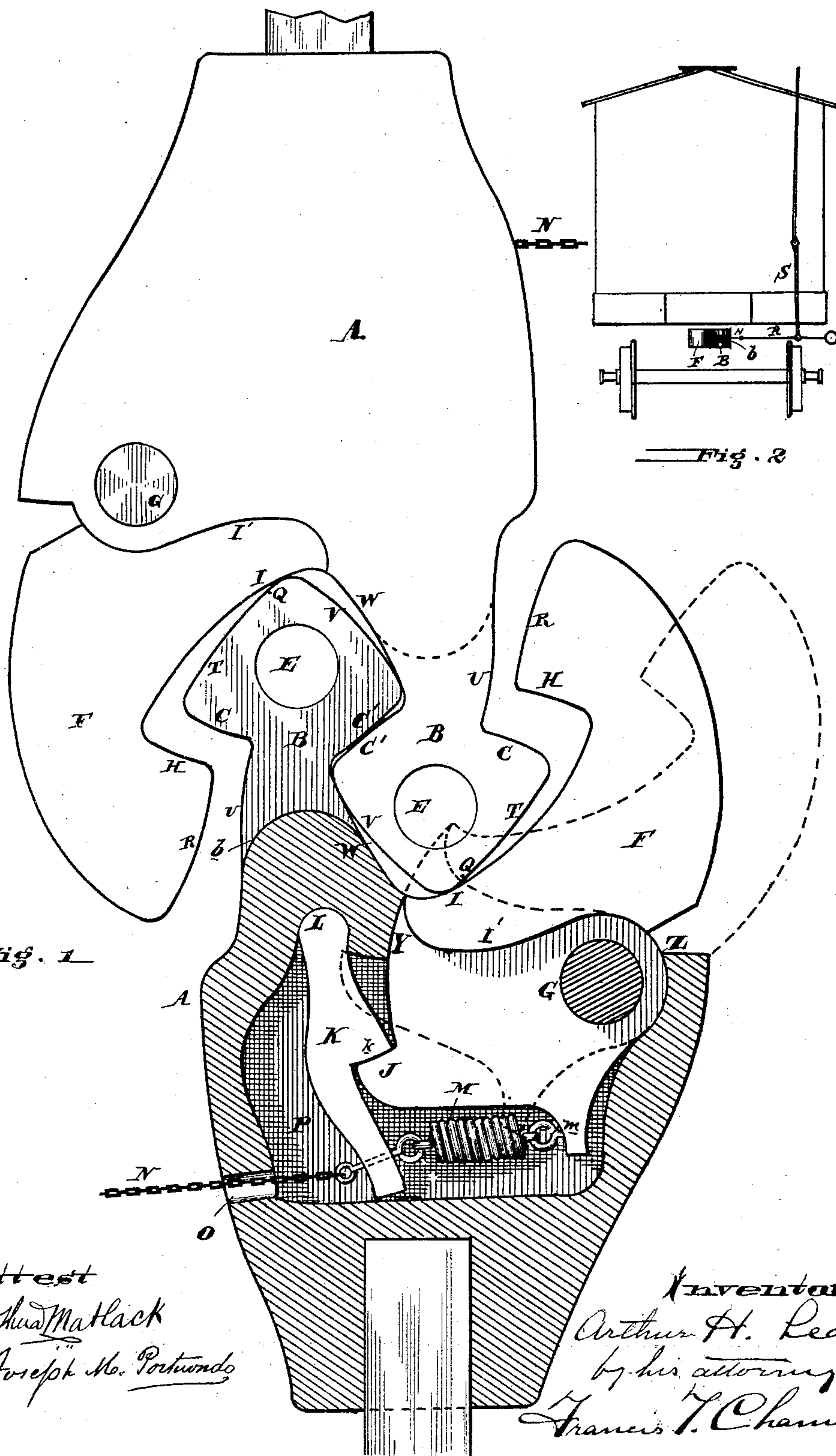


(No Model.)

A. H. LEA.
CAR COUPLING.

No. 315,151.

Patented Apr. 7, 1885.



Attest
Joshua Matlack
Joseph M. Portwando

Inventor
Arthur H. Lea
by his attorney
Francis T. Chambers

UNITED STATES PATENT OFFICE.

ARTHUR H. LEA, OF PHILADELPHIA, PENNSYLVANIA.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 315,151, dated April 7, 1885.

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To all whom it may concern:

Be it known that I, ARTHUR H. LEA, of Philadelphia, Pennsylvania, have invented a new and useful Car-Coupler, of which the following is a full, true, and accurate description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has reference to that class of car-couplers which consist of jaws or hooks. Heretofore couplers of this class have in general engaged by the hook or jaw of one car simply hooking into that of the other, and in many cases considerable freedom of unrestricted motion is left to the couplers when locked together, care only being taken that this motion shall not result in uncoupling them.

The object of my invention is to provide a coupler which shall be easily engaged and disengaged at pleasure, while at the same time strong and secure when in use, and the jaws of which, while allowing perfect freedom for the relative motion of the cars coupled, within the exigencies of railway use, shall yet be so designed that all of these motions shall be gradually checked, and not, as is generally the case, result in sudden and violent strains and blows on the coupler.

Reference being now had to the drawings, Figure 1 is a plan view of my improved couplers, one of which is shown in section, so as to exhibit the interior mechanism. Fig. 2 is a view of the end of a freight-car, showing an arrangement of levers by which my coupler can be readily uncoupled.

A is the draw-head or body of the coupler, which may be either a single casting or made in sections and bolted together. It is provided with an interior opening, P, and pierced for the reception of the bolt G.

From and forming a part of the body A projects the spear-headed arm B.

F is the movable jaw of the coupler, which projects into the opening in A, and is secured there by the bolt G, upon which it moves.

K is a pawl having a cylindrical head, L, fitting into and turning in a semi-cylindrical cavity in the block, as shown. It is provided with the projection *k*, the face of which is a section of a cylinder concentric with the cylinder L.

J is a projection or shoulder on the inner part of the jaw F, designed to engage with the projection *k* of the pawl, and its face is also cylindrical and concentric with that of *k* when they are engaged. As will be seen, all pressure on the movable jaw is by this construction transmitted by a direct longitudinal thrust along the pawl and through the center of its cylindrical head to the draw-head.

m is a heel or projection of the jaw F.

M is a spring secured to the heel *m* and to the end of the pawl K, and its function is to draw the pawl towards *m*, and lock the coupler and keep it locked, and also to draw *m* towards K, and throw the coupler open and keep it open.

N is a chain or rod secured to the end of the pawl K, and passing through an opening, O, in the block A.

As will be seen at once, when the pawl is drawn away from the end of the jaw F by the chain N the spring M will cause the jaw to spring to, open, and retain it so until it is pushed back again.

I make the surfaces Y and Z of the jaw F and block A cylindrical in shape, with their center in the middle of the bolt G, and cause them to fit sufficiently close to prevent the entrance of small stones or grit into the cavity P.

H is the head or hook of the jaw F.

The drawings show my couplers in the position they occupy just after the act of coupling is complete, or as they would be when the cars are being pushed together. The position of the jaw F when open is shown in dotted lines in the lower coupler. The lower surfaces, C and C', of the spear-shaped head of the arm B are cylindrical segments and centered at a point, Q, near the apex of the head, the radius of C' being somewhat longer than that of C. The inner surface of the hook H is made to practically coincide and be concentric with the surface C when they are in contact, the common center being at the point Q, above mentioned. The surfaces I of the jaw F and T of the head B are also practically concentric, and have a center each at about the point where the point Q of the other head B touches the curve I when the couplers are drawn apart and C and H in contact. The

face I of the jaw F is in its vertical thickness equal to the vertical thickness of the draw-head A, and the projecting sides or flanges of I are made to fit closely on the face of the draw-head A when the jaw is closed, as shown at I'. I prefer to make these surfaces of the S-like curved form shown in the drawings, as being better adapted than a plain surface to transmit blows or thrusts directly to the draw-head, and prevent undue strains on the pin G. The curvature of the surface V is made like that of T, and the two surfaces are arranged symmetrically about the longitudinal axis of B. The surface W is shaped so as not to interfere with the motion of the head B on the curved surfaces I or C'. The curvature of the surface U of the shank of B is concentric, or substantially so, with the curve T of the head of B. The face R of the jaw F is made so as to correspond with the face V of the head B when the jaw is open—that is, they are symmetrical about a line passing midway between them.

To avoid sharp angles I unite the various curved surfaces I have described by gradual curves, as shown in the drawings.

The operation of coupling with this device will readily be understood. Both of the jaws being open and the couplers pushed together, the heads B pass between each other and the hooks H of the extended jaws and strike against the surfaces I of the jaws, which are closed by the pressure, and the projections or shoulders J engaging with the pawls they are thus firmly locked, the concentric curvature of the surfaces J and K preventing any tendency to wedge or push the pawl back, no matter how great the pressure on the jaw. Even if only one of the jaws should be fully closed and locked in coupling, it is enough to effect a perfect and secure union of the cars. The surface I of the jaw, being flush with the top and bottom surfaces of the body A, enables two couplers to lock, even when the lower surface of one is so elevated as to strike nearly at the upper surface of the other. Therefore, cars in which the couplers are placed at different heights may by this device be easily and securely coupled.

It will readily be seen that any pushing-strains will be received on the surface I, and that they will be transmitted through it to the solid part of the body A. Further, it will be seen that the S-shaped surface of the head A relieves the pin G from strain and the jaw F from danger of displacement in pushing-strains.

It will be noticed that the head B acts not only as a keeper to prevent the hook H from disengaging, but is a point of draft as well as H, the surfaces C' C' being always in contact, as well as one or both of the pairs of surfaces C and H. Both the jaw and hook then act at the same time as hooks and as keepers, each for the other.

The distance between the neck and head B and jaw F of each coupler is made sufficiently

large with respect to the neck and head of B to enable the couplers, when united, to accommodate themselves to the angular movements of the cars without wedging, and in all the movements in the horizontal plane which the couplers make they are never entirely out of contact with each other, but always move with a sliding contact, which prevents sudden jars or shocks at once unpleasant to passengers and trying to the strength of the couplers—in other words, the couplers act as buffers and take up all shocks by a sliding contact.

To uncouple cars provided with my invention, it is necessary to cause both jaws F to spring back by pulling the chains N, and both the cars are then ready to be recoupled without further attention.

It will be seen at once that two cars cannot be separated without leaving each in proper condition to couple again.

The chains N may be fastened to levers in any of the well-known ways, and by securing such levers by a wedge or ratchet the pawl may be kept from engaging, when desired, and in this case the cars cannot be coupled, as the jaws F will always spring open whenever not under pressure to keep them shut.

The heads B may be made forked or divided and pierced with holes E, to enable an ordinary link-and-pin coupler to be used.

The couplers, as shown in Fig. 1, are carefully drawn to a scale. The proportions shown are those found by experiment to be well adapted for use, and a mechanic will have no difficulty in constructing my coupler directly from the drawings.

It is of course obvious that the benefits of my invention can be attained without exactly following the curves which I have pointed out as used by me, and which I believe to be the best. I do not limit myself, therefore, to the exact curves specified, and in referring to the various curved surfaces in the claims I wish to be understood as meaning curves of a general conformation and relative arrangement substantially similar to those I have particularly described.

It will be noticed that the device of curving the surfaces J and K of the jaw F and pawl K so that they are, when engaged, both concentric with a center in the middle of the cylindrical head L, not only prevents any tendency to disengage the jaw from the pawl, as already pointed out, but also enables the pawl to be drawn back and the train uncoupled without the exercise of much force, even when the pressure on the pawl is very great, the motion of the pawl taking place by a simple sliding on the face of J, and the jaw not being moved in any way until the pawl is completely removed.

While I have referred to my coupler as a hook-coupler, it will be observed that the projecting parts of the two couplers do not hook into but merely rest upon each other, the surfaces in contact when the couplers are being

pulled apart being inclined obliquely away from their shanks, and only prevented from sliding apart by the keeper on the other side. This construction facilitates the uncoupling of the cars, and aids the spring M in opening the movable jaw.

Couplers embodying many of the features of my invention can be made by making the inner sides of the projections or arms B without the inclined faces C', so that the union of the couplers is effected by means of the projections C and H alone; or B may be made without any projections, and the coupling be effected by causing the jaws F to hook into each other, B in this case serving merely as a keeper to prevent the jaws from sliding apart.

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

1. A car-coupler having the rigid spear-headed projection B, and hinged jaw F, provided with a locking-pawl, K, combined, substantially as described, so that the projection B and jaw F each serve the double purpose of a retaining-hook and guard when engaged with a similar coupler.

2. A car-coupler, substantially as described, having the surfaces C and C' of the head B and the surface H of the jaw F composed of cylindrical segments, centered, substantially as specified, so that when engaged with a similar coupler at least one of the heads B is always supported on both sides, the surface C sliding in surface-contact with the surface H, and the surfaces C' C' sliding in tangent contact.

3. A car-coupler, substantially as specified, having the surfaces C C' and T of the head B and the surfaces H and I of the jaw F curved,

substantially as specified, so that all horizontal and rotatory movements of the two similar couplers, when engaged, shall take place by one curved surface sliding on another.

4. A car-coupler consisting of two jaws adapted to close upon and retain a spear-headed projection from another coupler between them, and having curved surfaces C' and I, substantially as specified, upon which all forward and backward movements of the head within the jaws take place by sliding.

5. In a car-coupler, substantially as specified, the combination of the hinged jaw F and pawl K with the spring M, attached to and having constant action on both jaw and pawl, as and for the purpose described.

6. In a car-coupler, substantially as specified, the hinged jaw F, having a shoulder, J, and pawl K, having a shoulder, k, both of which shoulders have curved surfaces, concentric when the jaw F is closed with the center of motion of the pawl K.

7. In a car-coupler, substantially as described, the coupler body or block A, having an opening, P, in combination with the jaw F, hinged in the body at G, and both body A and jaw F having curved surfaces Y and Z centered at G.

8. In a car-coupler, substantially as specified, the movable jaw F, having its inner surface, I, equal in vertical depth to the draw-head A, and adapted to rest against the draw-head when closed.

In witness whereof I have hereunto set my hand.

ARTHUR H. LEA.

Witnesses:

FRANCIS T. CHAMBERS,
ISAIAH MATLACK.