

Feb. 6, 1968

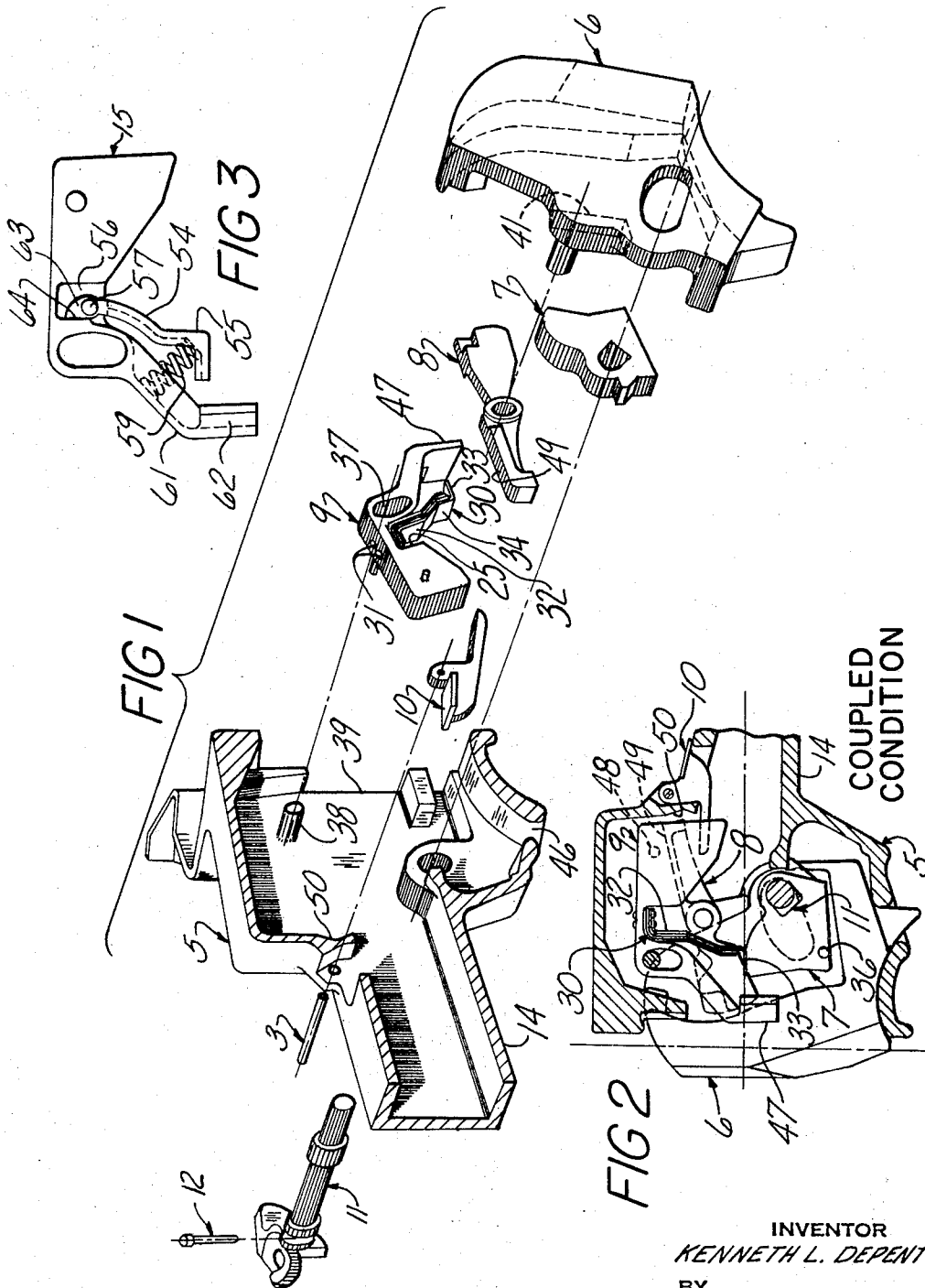
K. L. DE PENTI

3,367,516

CAR COUPLER WITH REVERSIBLE LOCK-SET

Filed March 30, 1966

2 Sheets-Sheet 1



INVENTOR
KENNETH L. DEPENTI

BY

Henry Kozak
ATTORNEY

Feb. 6, 1968

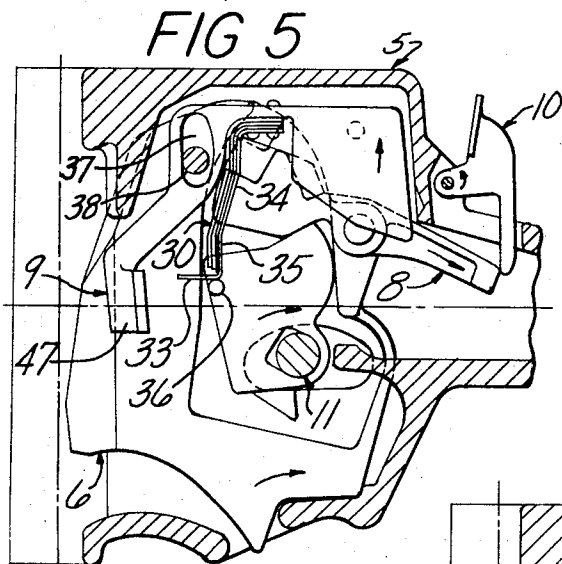
K. L. DE PENTI

3,367,516

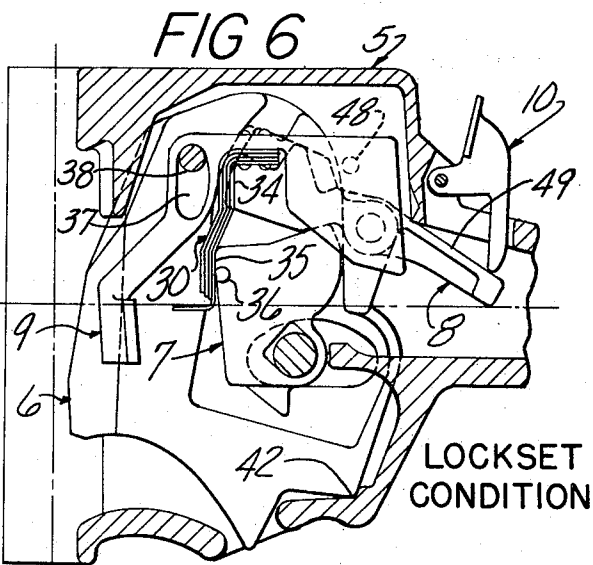
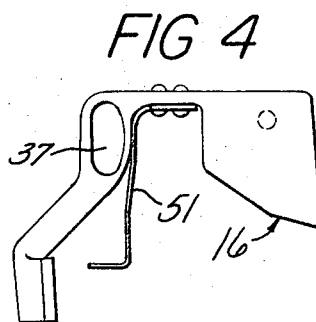
CAR COUPLER WITH REVERSIBLE LOCK-SET

Filed March 30, 1966

2 Sheets-Sheet 2

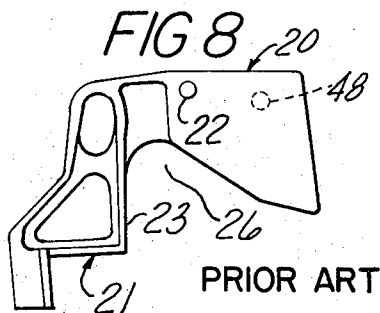
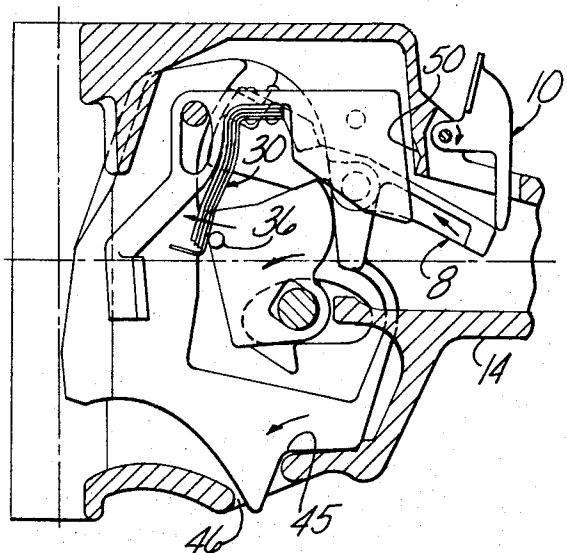


CONDITION (TRANSITORY)
OF PARTIAL
LOCK- RETRACTION



LOCKSET
CONDITION

FIG 7
CONDITION (TRANSITORY)
OF PARTIAL RETURN TO
COUPLING OR PRE-
COUPLING CONDITION



PRIOR ART

INVENTOR
KENNETH L. DEPENTI
BY
Henry Kozak
ATTORNEY

1

3,367,516

CAR COUPLER WITH REVERSIBLE LOCK-SET
Kenneth L. De Penti, Mayfield Heights, Ohio, assignor to
Midland-Ross Corporation, Cleveland, Ohio, a corpora-
tion of Ohio

Filed Mar. 30, 1966, Ser. No. 538,749

6 Claims. (Cl. 213-100)

This invention relates to fixed jaw or Willison couplers of the type which includes, among other usual internal parts, a lock-set piece which enables the coupler to be placed in a "lock-set" condition. By lock-setting a coupler, a condition is obtained in which one of two fully-engaged couplers has its internal components in their usual coupled condition and the other coupler has its lock-throwing rotor turned to coupler unlocking position with the lock fully retracted. This latter coupler is in "lock-set" condition wherein the lock-set piece is positioned to retain the lock-throwing rotor in its lock-retracted position, and the thrower, in turn, retains the lock in its retracted coupler unlocking position.

In using Willison couplers equipped with lock-setting mechanism, it is frequently desirable because of inadvertence or a change in train-makeup plans, to take a lock-set coupler out of lock-set condition. Depending on the type of conventional coupler in use, it is sometimes necessary to poke at the interior of the coupler with a rod from a position underneath the coupler, or in other instances, necessary to reach across the top of the coupler to pull upwardly on a handle connecting with the lock-set piece but mounted exteriorly of the coupler head.

Because of the presence of handle portions of the conventional coupler-operating rod at both sides of the car, it is an important object of this invention to provide a coupler having lock-setting mechanism which is operable by manipulation of the coupler operating mechanism.

The above and other objects which may become apparent below are accomplished in the coupler of this invention by improvements in the lock-setting mechanism. The essential improvement on which this invention is based resides in a lock-set piece comprising a resiliently supported rearward facing member, such as a spring or a spring-supported element, against which the lock-throwing rotor may rest in a position thereof wherein it holds the lock in its coupler unlocking position. For lock-set condition to exist, the opposing coupler is fully entered into the host coupler to hold the lock-set piece in its normal operative position. The resilient member of the lock-set piece is sufficiently resistant to the return of the lock-throwing rotor to its normal position of repose corresponding to the forward locking position of the lock to hold the rotor in retracted lock-set position against normal contingencies. However, it is readily yieldable to manual actuation imposed thereon through operation of the coupler-operating lever.

In the drawings in respect to which the detailed description below is relevant:

FIG. 1 is a perspective exploded view of the various components (the coupler head shown in section) of a coupler in accordance with the invention;

FIGS. 2, 5, 6, and 7 are fragmentary side elevations with a foreground wall of the coupler head removed, illustrating the coupler of FIG. 1 assembled and in the various conditions indicated;

2

FIGS. 3 and 4 are side elevation views of modified lock-set pieces; and

FIG. 8 is a side elevation view of a prior art lock-set piece.

As shown in the various figures of the drawing, but with special reference to FIG. 1, the coupler of the invention comprises a head 5, a lock 6, a lock-throwing cam 7, an anti-creep element 8, a lock-set piece 9, an indicator element 10, a rotor shaft 11 combining with cam 7 to form the lock-throwing rotor of the coupler, a pin 12 co-operating with the rotor 11 and a portion of the housing not shown for securing the rotor in the coupler head, and a pin 13 normally extending through the base portion of the coupler head shank 14 to support the indicator 10.

Although various features of the presently described coupler are likely familiar to those skilled in the art and are described in patent applications now filed, the present application is concerned essentially with the lock-set mechanism and the construction and function of the lock-set pieces 9 and such modifications thereof as lock-set pieces 15 and 16. These different species of a lock-set piece in accordance with this invention are interchangeable and one may be substituted for the other in cooperating with the other components above named.

For direct comparison with the prior art, a prior art lock-set piece 20 is shown in FIG. 8 which comprises a right-angle dihedral cam-throwing portion 21 which has heretofore been a rigid integral portion of the lock-set piece as a whole made usually as a metal casting. When a lock-set piece is made in this manner, it positively prevents a return movement of the lock-throwing rotor to its forward position as shown in FIG. 2. To get a coupler out of lock-set position which includes the prior art lock-set piece 20 in FIG. 8, the piece is provided with a laterally extending pin-like handle 22 which extends through a hole in the adjacent side wall of the coupler head into a region of access outside the coupler. The lock-set piece can then be lifted manually to a level releasing a portion of the lock-thrower engaging the rear facing surface 23 of the portion 21. Due to the center of gravity built into both the lock-throwing rotor and the lock, both drop forward as soon as the lock-set piece releases the rotor.

Considering now the lock-set pieces of the invention, each is constructed with a yieldable, resiliently-supported member providing a rearward facing cam surface corresponding to surface 23 of the prior art piece of FIG. 8. For example, the lock-set piece in FIG. 1 has a recess 25 similar to recess 26 of the prior art lock-set piece 20.

However, the forward side of the recess 25 of the improved lock-set piece 9 is formed by a tapered multiple leaf spring 30 attached to the remainder of the lock-set piece along an upper portion thereof by means such as a pair of rivets 31. The spring 30, as shown by the various assembly figures, comprises leaves which are progressively shorter at their lower ends in order to effect downward tapering of the spring toward its free lower end. The rearwardmost leaf 32 has a lower horizontal leg 33 meeting in a dihedral junction with its upward extending leg 34. Through these legs, the spring 30 fulfills a part of its function by fulfilling the entire function of the rigid structure found in the prior art lock-set pieces, such as the dihedral portion 21 of the prior art piece 20. That is to say, the underside of the lower leg 33 of the spring 30 is engaged by lifting-means such as a trunnion-like boss or lug

36 extending laterally from one side of the lock-throwing cam 7 to lift the piece 9. As lifting continues, the lug 36 passes rearwardly of the junction of the legs 33 and 34 into the recess 25 thereby allowing the lock-set piece to settle back down to a level at which a surface defining the upper extremity of its elongate aperture 37 rests on a supporting trunnion 38 therefor fixed to a side wall 39 of the head 5 (FIG. 6).

In fulfilling another function of the prior art, the upward leg 34 of the spring 30 provides a rearward-facing surface 35 engageable by the lug 36 as shown in FIG. 6. In this figure, the lock-throwing cam 7 is shown in engagement with a cam-following surface 31 of the lock, and supporting the lock against its strong tendency to return to the position shown in FIG. 2 by reason of its center of gravity being located substantially forwardly of a pivotal point of support on the bottom wall of the coupler head at 42. The lock-throwing cam 7 is in turn supported against the rear facing surface of the spring 30 provided by the leaf 32.

Other effects not essentially related to the invention but discernible in FIG. 6 are that the motion of the coupler components illustrated as partially executed in FIG. 5 has been completed. For example, the anti-creep element 8 has been carried to its rearwardmost position while also being tilted by engagement of its underside with the thrower cam 7. Also noteworthy is that the indicator 10 has been rotated by the rear portion of the anti-creep element 8 to a highly visible position outside the side profile of the coupler head.

FIG. 7 illustrates the function of the lock-set piece 9 giving rise to the present invention. The coupler, as illustrated by this figure, is in a transitory condition, i.e., at a stage of forced return movement of the lock-throwing rotor wherein the lock-throwing cam has engaged the leg 36 and deflected the spring 30. As this figure shows, the capacity of the spring to resist angular displacement relative to its upper cantilever support is being overcome by torsion forces exerted on the shaft 11 through a lever system not shown. This lever system may take the form of that conventionally provided on railway cars including the conventional operating rod having handles at both sides of the car. The direction in which the various components are moving is indicated by arrows placed on such components. As the rotation of the cam 7 is continued toward the position shown in FIG. 2, the lug 36 moves downwardly and forwardly out of contact with the spring 30 to permit it to return to its neutral position as shown in FIGS. 2, 5, and 6. As the thrower returns to the position of FIG. 2, the lock pivots about a shoulder 45 at the rear side of an aperture 46 in the bottom wall of the coupler head. To move by its own weight, the lock 6 drops forward to the position of FIG. 2.

The lock-set piece 9 is shown in FIG. 2 in the position it normally assumes when engaged by a coupler fully entered into the host coupler. The lock-set piece comprises a pad 47 by which it is engaged by an opposing coupler. However, when an opposed coupler is withdrawn from the host coupler, the lock-set piece rotates forwardly or clockwise as viewed in the various assembly figures in a manner known with respect to the prior art piece 20 of FIG. 8. As the piece 9 rotates, a lug 48 thereof engages on an upper surface 49 of the anti-creep element 8 whereupon the element 8 is rotated clockwise to carry its rear end portion downwardly out of alignment with a rear wall surface 50. As surface 50 is the stop primarily for the element and secondarily for the lock in anti-creep function, positioning of the rear portion of the element 8 for passage into the interior of the shank 14 prepares the lock for free rearward movement necessary for automatic coupling.

FIG. 4 illustrates a modified lock-set piece 16 which comprises a spring 51 of single leaf construction. In the modified lock-set piece 15 of FIG. 3 the springs of the

lock-set pieces 9 and 16 are supplanted by a pivoting cam follower 54 having a lower portion 55 of dihedral conformation conforming to the arrangement of legs 33 and 34 of the spring 30. The follower 54 is connected pivotally in the upper portion of the recess 56 by a pin 57 to a bearing portion or web 58 of the lock-set piece body. A compression spring 59 stands between the cam follower 54 and the supporting arm 61 for the pad 62 used to engage an opposing coupler. Counterclockwise movement of the follower 54, as seen in FIG. 3, is limited by engagement of a hub extension or lug 63 with a rearward-facing surface 64 of the lock-set piece body.

In addition to improving the safety and convenience with which the lock-setting condition of couplers may be neutralized, further advantage is derived by eliminating structure such as the conventional handle attached to the lock-set piece and the opening therefor provided in a side wall of the coupler head. This enables construction of a more enclosed coupler head less subject to admitting matter carried by the atmosphere.

The terms and expressions which have been employed are used as terms of description and not of limitation and there is no intention of excluding such equivalents of the invention described or of the portions thereof as fall within the scope of the claims.

What is claimed is:

1. In a fixed-jaw coupler which comprises a head having a cavity, a lock supported in said cavity for movement between a forward coupling position and a rearward position for releasing a coupler coupled with said coupler, a lock-set piece in pivotal connection with the head and in lateral juxtaposition with the lock, said piece being movable from a forward coupler-uncoupled position to a rearward position when engaged by an opposing coupler, and a lock thrower rotatable with respect to an axis in fixed transverse relation with the head through an angular ambit to carry the lock to said rearward position, said thrower including lifting means and said piece having a downwardly-facing surface engageable by said means for lifting said piece during movement of the thrower rearwardly and upwardly through a forward portion of said ambit, said piece having a downward-opening vertically-extending recess located immediately rearward of said downward-facing surface for receiving said lifting means, the forward side of said recess being formed by a rearward-facing surface retaining said lifting means when said piece is in its rearward position, wherein;

said piece comprises yieldable means resistant to free return movements of the thrower at said rearward position of the piece and defining a substantial portion of the piece and defining a substantial portion of said surface of the recess, said yieldable means being yieldable relative to the remainder of said piece to an extent enabling forced return movement of said thrower to its forwardmost position.

2. The coupler of claim 1 wherein:

said yieldable means is a resilient member yieldable in the forward direction of the coupler.

3. The coupler of claim 1 wherein:

said yieldable means is a leaf spring having a horizontal leg extending forward, and another leg extending upward from a junction of the legs at the lower extremity of said forward side of the recess, said spring is secured to the remainder of said piece by an upper end portion thereof for movement of its lower portion in the rearward to forward direction of the coupler, and said horizontal leg provides said downward-facing surface and said other leg defines substantially said forward side of the recess.

4. The coupler of claim 1 wherein:

the yieldable means is a multiple-leaf spring attached cantilever fashion to the remainder of the piece by an upper end portion and tapers downwardly, said spring having a horizontal leg formed by an exten-

5

sion of one leaf, and another leg extending upwardly from a junction of the legs, and said horizontal leg provides said downward-facing surface and said other leg defines substantially said surface of said recess.

5. The coupler of claim 1 wherein:

said yieldable means is a follower in resilient and longitudinally-guide relation with the remainder of said piece, and defines said downward-facing surface and said rear-facing surface of the recess.

6. The coupler of claim 5 wherein:

6

said follower is in pivotal relation with the remainder of said piece.

References Cited

UNITED STATES PATENTS

5

1,647,498	11/1927	Anliker et al.
1,990,887	2/1935	Wittmer et al.
2,591,275	4/1952	Metzger.

10 ARTHUR L. LA POINT, *Primary Examiner.*

D. E. HOFFMAN, *Assistant Examiner.*