Aug. 20, 1957 W. H. SALE 2,803,354

CAR COUPLERS

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Fig. 1

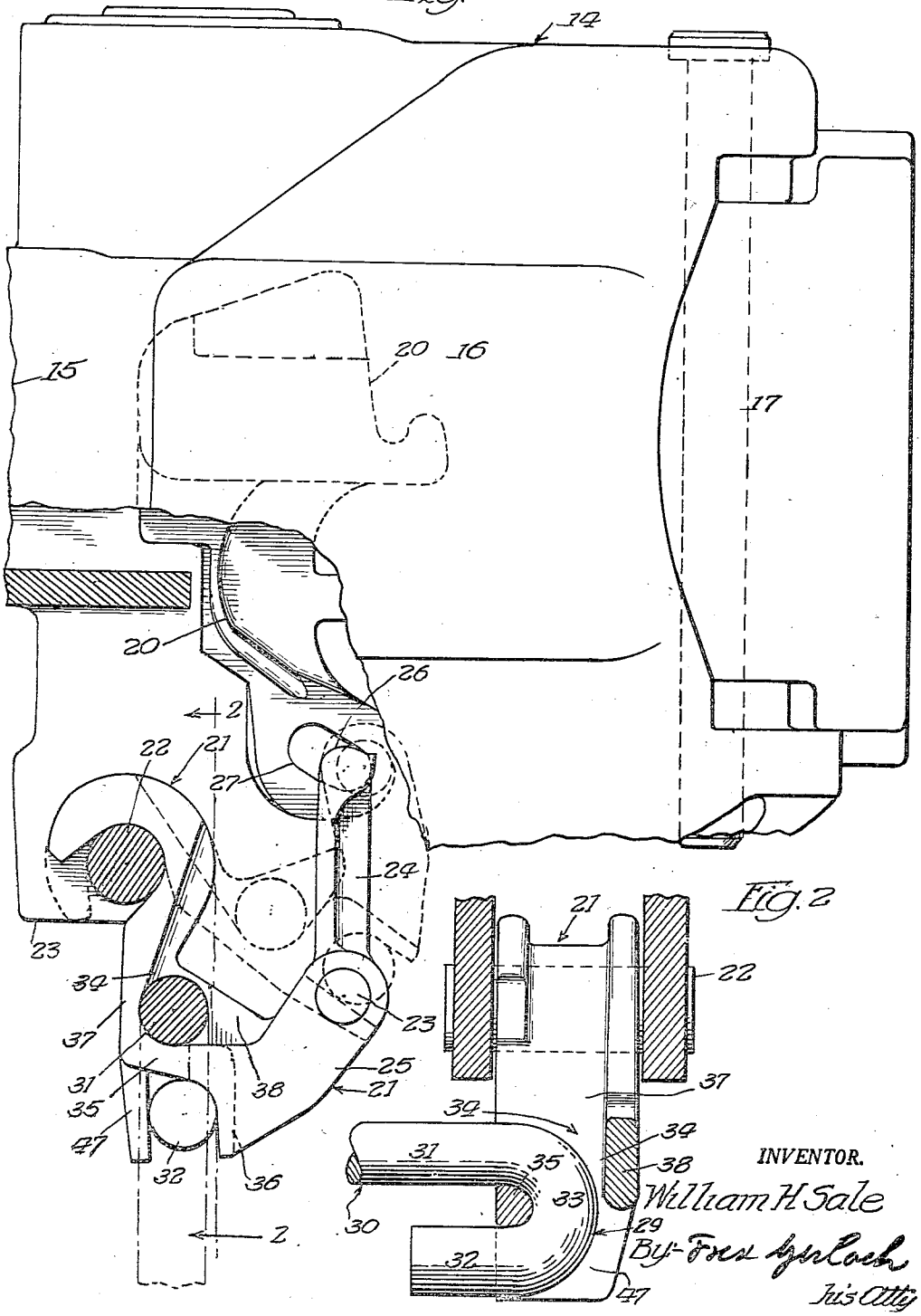


Fig. 2

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Fig. 3

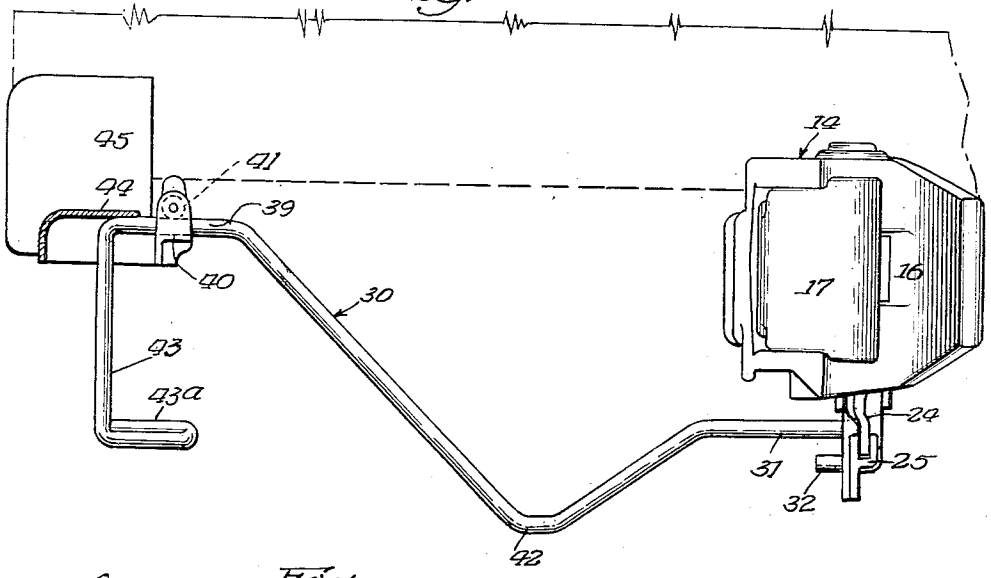


Fig. 4

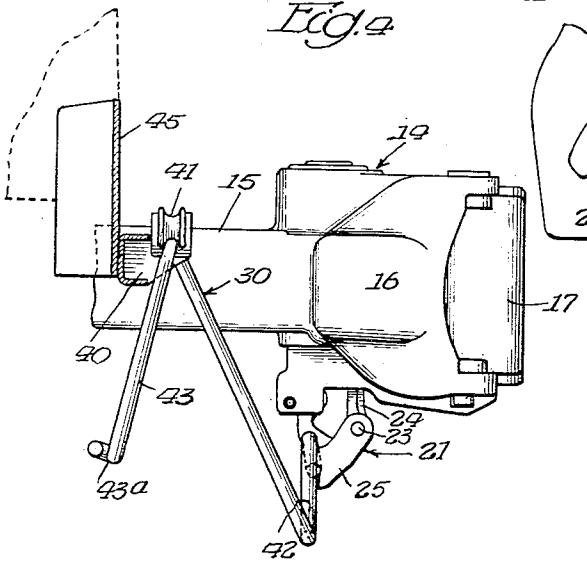
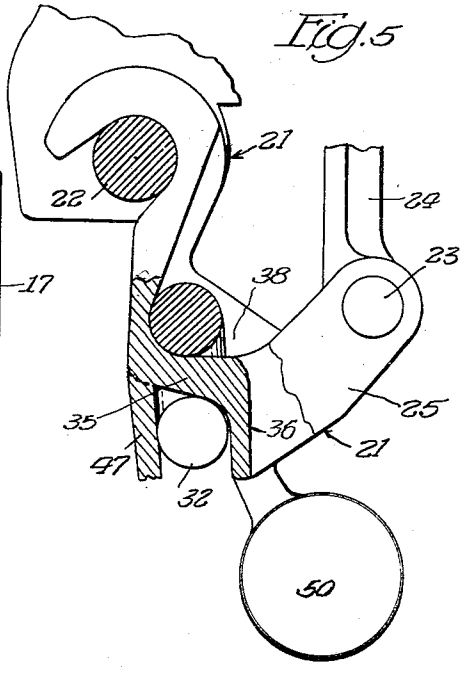


Fig. 5



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CAR COUPLERS

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Application October 21, 1953, Serial No. 387,437

2 Claims. (Cl. 213—168)

The invention relates to devices for operating standard automatic car coupling mechanism, and more particularly to means for preventing the displacement of the lock for the knuckle to release it by shock stresses produced during train operation.

Present standard automatic car coupler mechanisms, usually include; a knuckle, a lock for the knuckle, a lock lifter for operating the lock to release the knuckle, and a manually operable lever or rod for shifting the lock lifter to release the lock. In these prior constructions so far as I am aware, a loose or lost motion connection had to be used between the lock lifter and the operating lever, which permitted initial free swinging movement of the lever in the lifter. This lost motion permitted the inner end of the lever to jump in or vibrate relatively to the lock lifter when the coupler was subjected to shock stresses during train operation. This jumping or vibration was a contributory factor in causing the shock stresses to induce sufficient pivotal movement of the lock lifter to displace the lock and accidentally release the knuckle and uncouple the cars. It has been proposed to provide stop means between the coupler body and the operating lever for limiting relative vertical movement between the lever and the coupler body without eliminating this free pivotal movement of the lever or positively connecting the lever and the lock lifter. As a result these devices were not efficient in preventing displacement of the lock lifter by shock stresses and the accidental uncoupling of the cars.

One object of the invention is to eliminate this free pivotal movement of the operating lever and to apply and adequately utilize the lever to restrain forward and upward pivotal movement of the lock lifter for preventing accidental displacement of the lock lifter to release the lock.

Another object of the invention is to provide an improved construction in which the operating lever is efficiently utilized for preventing accidental displacement of the lock lifter and resultant release of the lock for the knuckle, by shock stresses during train operation.

Other objects will appear from the detailed description.

The invention consists in the several novel features hereinafter set forth, and more particularly defined by claims at the conclusion hereof.

In the drawings:

Fig. 1 is a side elevation, parts being shown in section, of a coupling mechanism embodying the invention;

Fig. 2 is a section taken on line 2—2 of Fig. 1;

Fig. 3 is an end elevation of the coupler and the operating lever, the car body being shown in dotted lines;

Fig. 4 is a side elevation, parts being shown in section;

Fig. 5 is a detail of the lock lifter provided with a weight for increasing the resistance of said lifter to pivotal movement to aid in preventing displacement of the lifter.

The invention is exemplified with a standard type of automatic coupler which comprises a coupler body 14

provided with a shank 15 which is cushioned and slidably mounted in the under frame of a railway car and with a head 16; a knuckle 17 which is pivoted in said head to swing laterally between open and closed positions when impacted by a knuckle in a mating coupler; a lock 20 which is movably supported in head 16 for locking the knuckle in its closed position, as well understood in the art; a lock lifter 21 which is pivotally supported on a pin 22 which is mounted in depending flanges of the coupler head 16; and a toggle-link 24 which is connected by a pivot pin 23 to an arm 25 on the lock lifter 21 and by a trunnion 26 to a slot 27 in the lock 20. The elements thus far described may be of standard construction except for the addition to the lock lifter and the operative characteristics hereinafter described.

The lifter 21 is pivoted on pin 22 to swing forwardly and upwardly for raising link 24 to operate lock 20 into position to release the knuckle 17 for uncoupling the cars. The lock 20 drops into its locking position when the knuckle is closed by impact with a knuckle in a mating coupler. The position of the lock lifter and the lock when the knuckle is locked is shown by full lines in Fig. 1.

An operating lever, generally designated 30, is operatively supported on the car body and the lock lifter for forward and upward pivotal movement to the lifter to release the lock 20. The lever 30 is formed of a round rod bent to provide its several parts and comprises a hook 29 at its inner end which is supported in an eye 34 on the lock lifter. The hook 29 includes a straight upper portion or member 31, a semi circular bend 33 between member 31 and a lower out-turned terminal 32. Eye 34 includes a forward front wall 36 which is engaged by the front face of the lower portion of bend 33, a depending lug or wall 47 engaged by the rear face of the lower portion of bend 33, a back wall 37 engaged by the rear face of the upper portion of bend 33, a bridge 35 around which the inside of said bend extends, and an end wall 38 engaged by the outside of the bend 33. The bridge 35 confines the hook 29 against vertical movement in the eye 34. The bridge 35 and end wall 38 confine the bend 33 in the eye 34 and shift the lever 30 longitudinally when the coupler body is shifted laterally relatively to the car body during the operation of the car around curves in the track. This construction provides a positive connection between the inner end of lever 30 and the lock lifter 21, which eliminates lost motion between the lifter and said lever. Such lost motion permits shock stresses to cause the lever to jump or vibrate relatively to the lock lifter and contributes to pivotal movement of the lock lifter by shock stresses. This connection also makes it possible to utilize the force or resistance of the lever to oppose the upward and pivotal swinging of the lock lifter by shock stresses.

The operating lever 30 also comprises: a straight outer end portion 39 which is slidable and pivotally movable in a bracket 40 which is provided with an overlying roller 41 for supporting the outer end of said lever; a pendant loop 42 between the portions 31 and 39 of said lever; and a handle 43a of dual members on the lower end of a crank arm 43 on the outer end of said lever. A guard 44 overlies the outer end portion 39 of lever 30. Bracket 40 and guard 44 are supported on a plate or bracket 45, which is secured to the corner of the car body. The angular position of the loop 42 relatively to the center of gravity of lever 30 is such that gravitational force in lever 30 will be applied through hook 29 to oppose forward and upward pivotal movement of the lock lifter by shock stresses.

The bracket 40 supports lever 30 for pivotal movement of hook 29 on a long radius and said hook is confined against pivotal movement in the eye 34 of the lock lifter

which is pivotally movable on a short radius between said eye and the pivot pin 22. As a result, forward and upward pivotal moments initiated in the lock lifter will exert bending or torsional stresses in the lever between the hook 29 and loop 42 which will produce resistance to, and supplement, the gravitational force in lever 30 for opposing the forward and upward pivotal movement of the lock lifter by shock stresses. The pendant loop 42 increases the gravitational force of the operating lever in opposing the forward swinging movement of the lock lifter.

In operation, assuming the knuckle 17 to be locked in the coupler head and the car in service, the operating lever 30 and the lock lifter 21 will be in the position shown in full lines in Fig. 1. The rear face of circular bend 33 between members 31 and 32 straddles the bridge 35 and abuts the front face of lug 47 below said bridge, and the lower portion of said bend abuts the rear face of front wall 35, so that there is no lost-motion between the upper and lower portions of the hook 29 and the lock-lifter when forward swinging movements are applied to the lifter by shock stresses, such forward swinging movements would cause the entire inner hook or end of the lever to swing positively around the axis of the trunnion 22, while the outer portion 39 of the lever is pivotally movable in bracket 40 on an axis which is eccentric to the axis of trunnion 22 on which the inner end of the lever swings. The positive engagement of the lock-lifter and hook 29 tends to move the upper and lower members 31 and 32 of hook 29 in differential arcs around the axis of trunnion 22 and relatively to the fulcrum of the lever in bracket 40. This positive engagement between the hook and the lock-lifter, produces bending or twisting movements in the lever between its inner end and its fulcrum portion 39 causes resistance to the forward pivotal movement of the lock-lifter by shock stresses. The preponderance of weight in the lever is in loop 42 and its portion 31 and is forward of its center of gravity, as shown in Fig. 4, so that gravity will force the hook 29 into engagement with the wall 37 and lug 47, and also resist forward displacement of the lock-lifter.

The resistance provided by the operating lever and the positive connection between said lever and the lock lifter effectively prevent swinging movement of the lock lifter by shock stresses and release of the lock 20 which results in accidental uncoupling of the cars.

When lock 20 is to be operated to raise the lock and release the knuckle, the operator will swing crank arm 43 forwardly and upwardly until the hook 29 and lock lifter are in the position shown by dotted lines in Fig. 1. In this operation, the swinging of hook 29 will swing the lock lifter forwardly and upwardly against the gravitational force in the lever.

The invention exemplifies an automatic coupler of standard type which eliminates lost motion between the hook on the operating lever and the lock lifter, by means of a positive connection between the hook and the lifter, as a factor in displacing the lifter by shock stresses and in which forces in the operating lever are utilized to efficiently oppose the displacement of the lifter by shock stresses.

When it is desired to additionally oppose the pivotal forward and upward displacement of the lock lifter by shock stresses, a weight 50 may be integrally formed on the arm 25 as shown in Fig. 5.

The invention is not to be undertsood as restricted to the details illustrated and described but may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

I claim:

1. In a car coupler comprising a knuckle, a lock for the knuckle and a lock lifter supported to swing for operating the lock to release the knuckle, and provided with an eye; a lifter-operating lever provided with means which is bendable to resist forward swinging movement of the lifter, the lever having its outer end pivotally supported on the car body and provided at its inner end with a hook including upper and lower portions and a connecting bend, the lever being supported eccentrically to the lifter and so it is bendable by pivotal movement of the hook with the lifter, for opposing swinging movement of the lifter to release the lock, the lifter having an integral bridge across the eye and forwardly and rearwardly facing surfaces abutting the upper and lower portions of the hook above and below the bridge, respectively, for opposing forward pivotal movement of the lifter relatively to the lever and preventing release of the lock by shock stresses.

2. In a car coupler comprising a knuckle, a lock for the knuckle and a lock lifter supported to swing for operating the lock to release the knuckle, and provided with an eye; a lifter-operating lever provided with means which is bendable to resist forward swinging movement of the lifter, having its outer end pivotally supported on the car body and provided at its inner end with a hook supported in the eye on the lifter and including upper and lower portions and a connecting bend, the lever being supported eccentrically to the lifter and so it is bendable by pivotal movement of the hook with the lifter, for opposing swinging movement of the lifter to release the lock, the lifter being provided with a bridge in the eye, and with integral forwardly and rearwardly facing surfaces abutting the upper and lower portions of the hook above and below the bridge, respectively, for preventing forward swinging movement of the lifter and release of the lock, and a weight on the lifter for additionally resisting forward swinging movement of the lifter.

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