Oct. 31, 1950 E. P. KINNE 2,528,439

COUPLER OPERATING ROD

Filed April 19, 1944 2 Sheets-Sheet 1

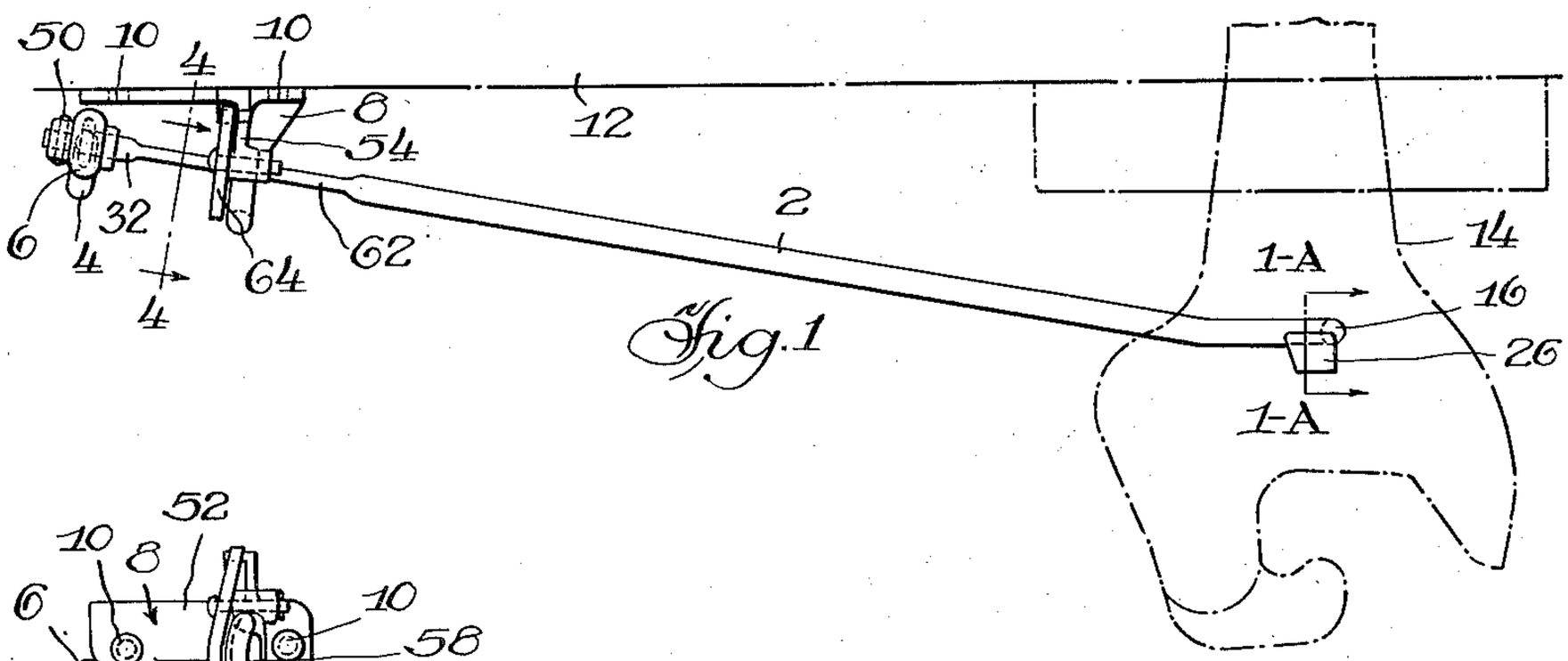


Fig. 1

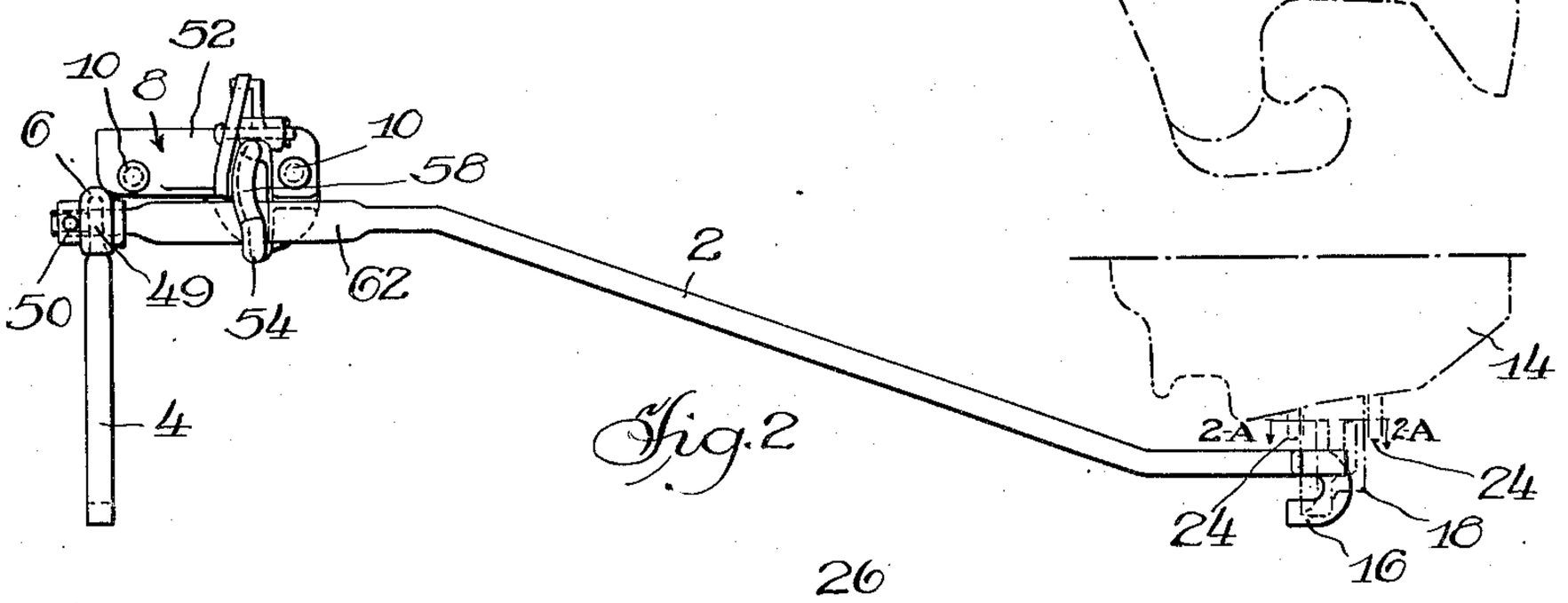


Fig. 2

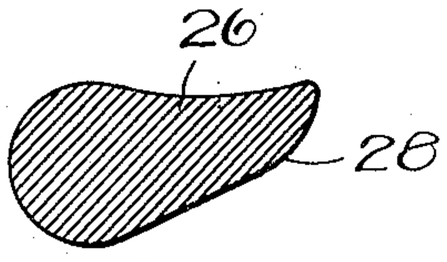


Fig. 1-A

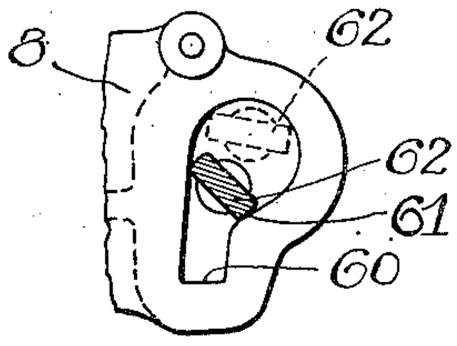


Fig. 7

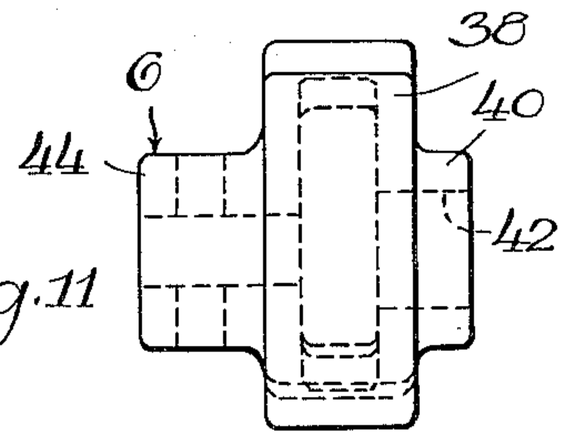
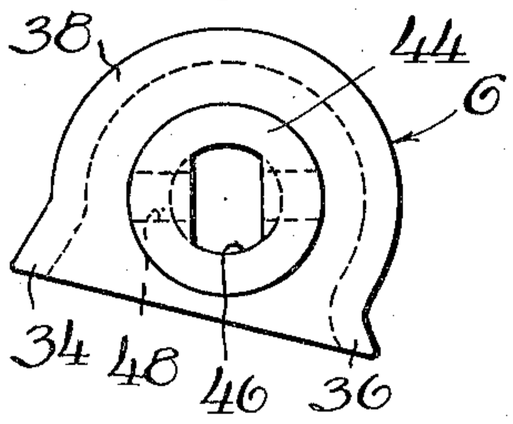


Fig. 11

Fig. 9



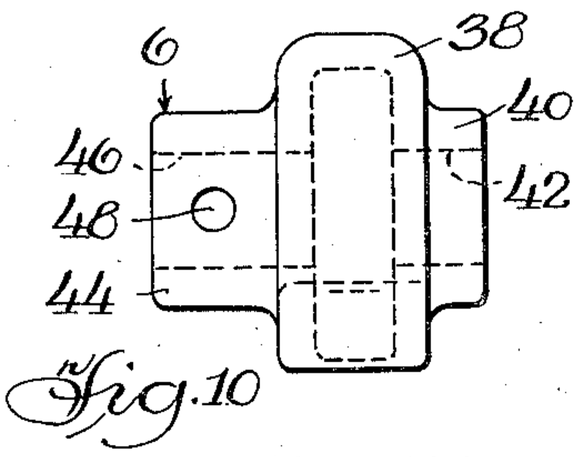


Fig. 10

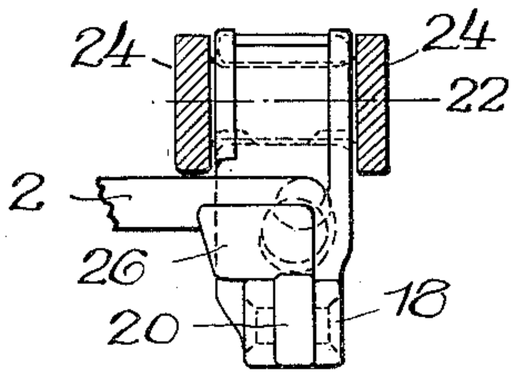


Fig. 2-A

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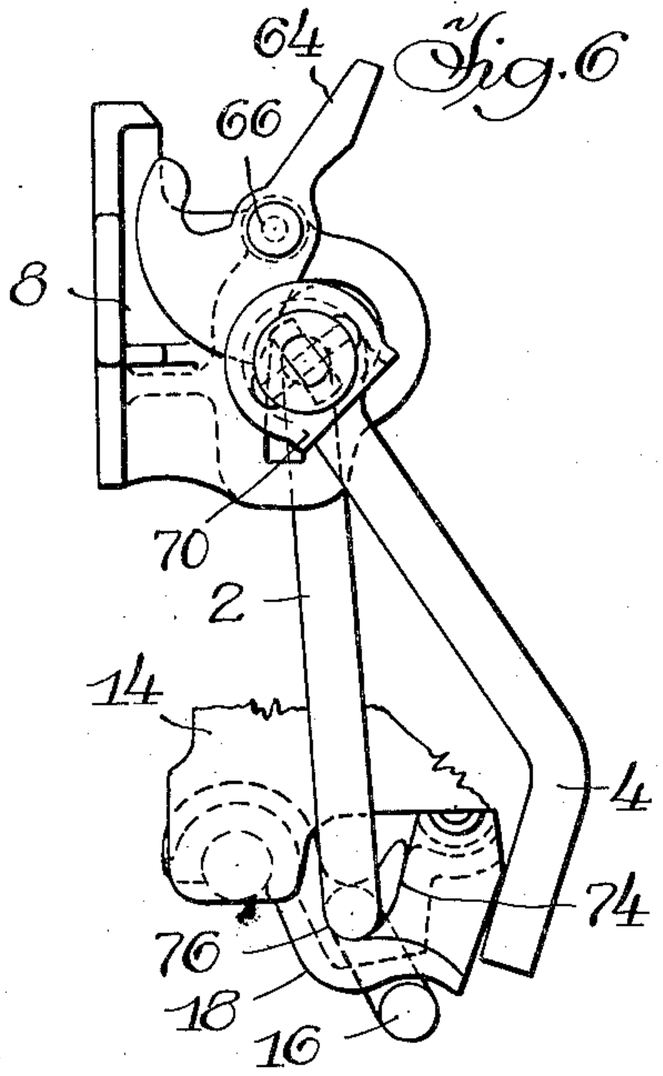

Fig. 6

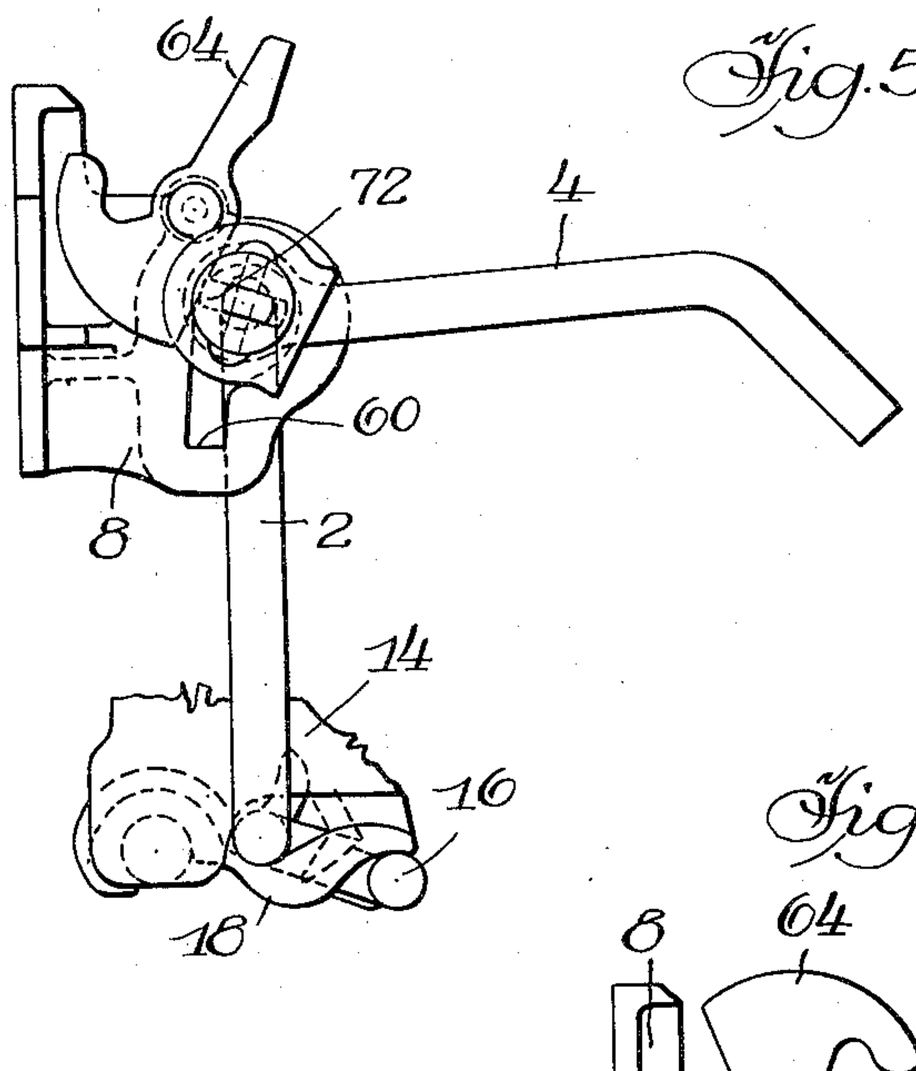

Fig. 5

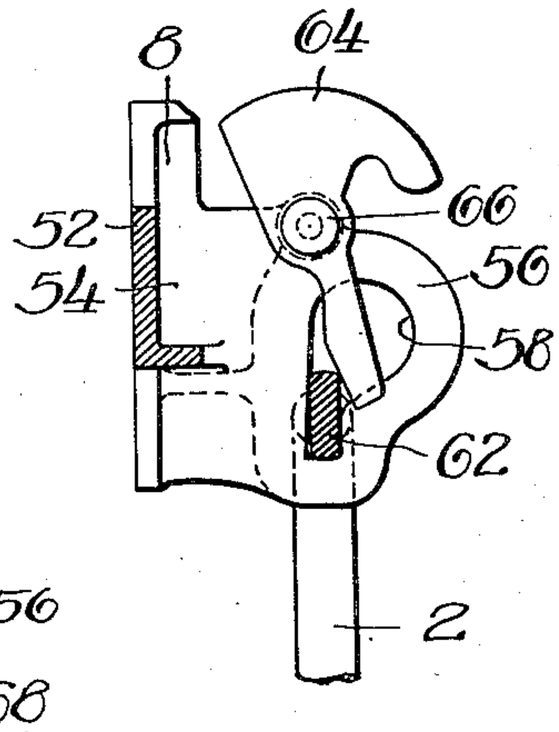

Fig. 8

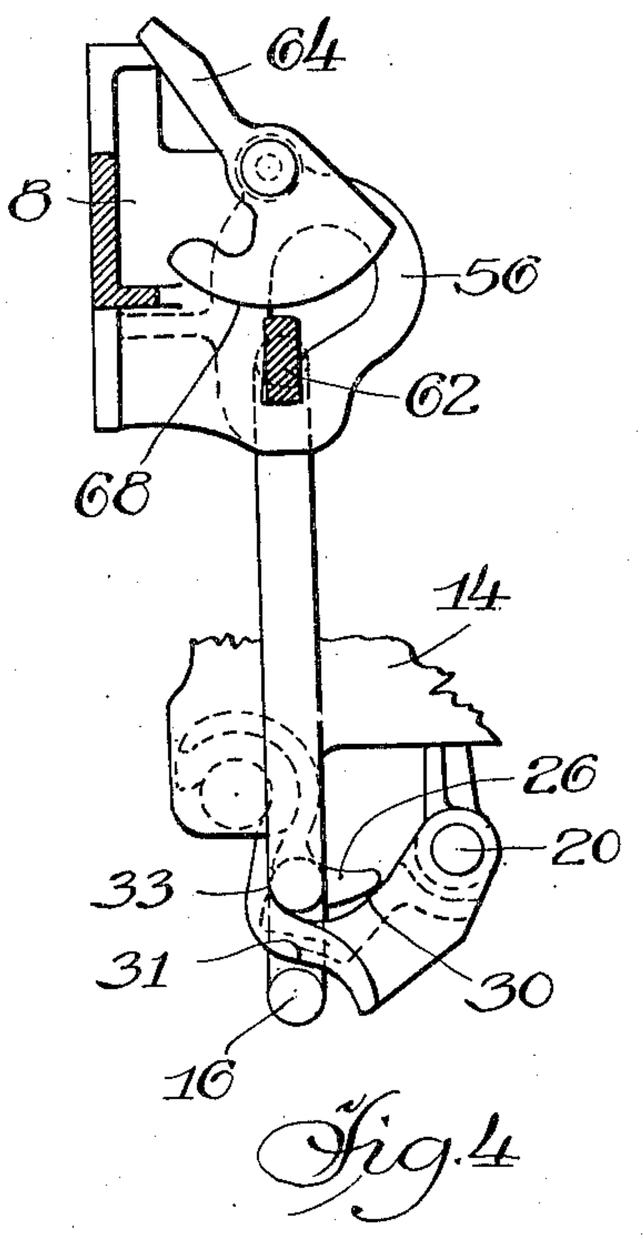

Fig. 4

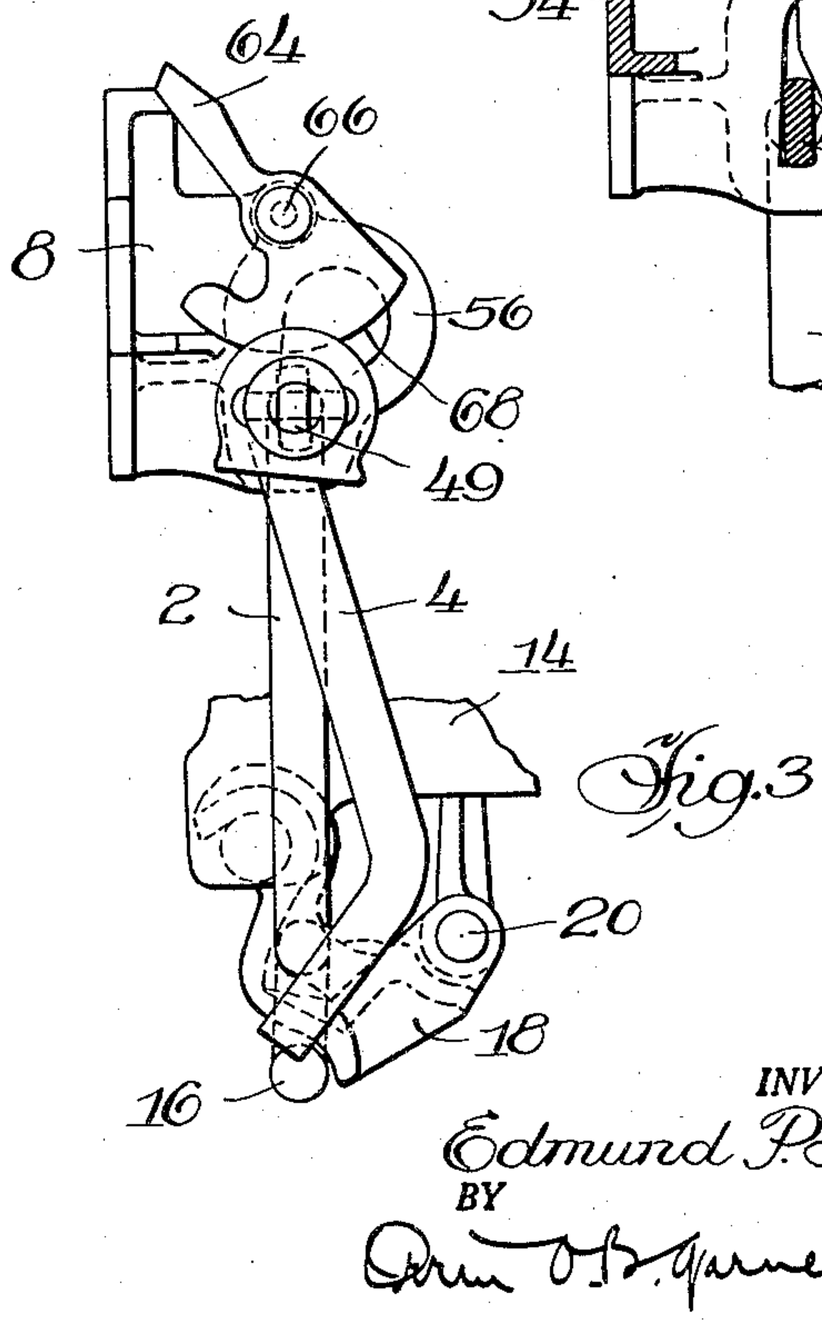

Fig. 3

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COUPLER OPERATING ROD

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Application April 19, 1944, Serial No. 531,719

15 Claims. (Cl. 213—166)

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My invention relates to an operating rod for railway car couplers and more particularly to a rod of a type adapted for use with the Standard E coupler as applied to freight cars.

It is known that the present Standard E coupler is subject to occasional accidental unlockings. It has been determined that such unlockings occur under certain track and service conditions wherein it has appeared that the lock-to-the-lock or anticreep of the rotary operated Standard E coupler is not adequate to prevent such accidental unlocking. It has been observed that such train partings occur particularly when slack runs in and when the inertia effect of the rotor lock lift lever and the operating rod supported therefrom beneath the coupler head causes release of the anticreep, permitting raising of the lock with the swinging of the lever. In some cases this condition is aggravated when the coupler heads are in a somewhat depressed position so that they bounce upwardly when the slack runs in. Such movement may be further augmented by the inertia of the handle of the uncoupling rod, causing it to swing upwardly.

The primary object of my invention is to devise an operating rod arrangement which will prevent such accidental uncouplings as those above-described, my novel arrangement providing at all times positive means for retaining the rotary lock lift lever in its lowermost or normal position. This I accomplish by associating the operating rod with said lever in such manner as to prevent rotation of the lever without corresponding rotation by the operating rod.

More specifically, I have provided a form of operating rod and support means therefor by which the rod is locked against accidental rotation and latched in such locked position, requiring manual positioning of the latch in order to allow the operating rod to be removed from such locked position and permit its rotation for turning of the rotor lock lift lever. At the same time, my novel operating rod is so interconnected with said rotor lift lever that maintenance of the rod in its normal locked position likewise maintains the lever in its normal locked position.

In the drawings,

Figure 1 is a top plan view of my novel form of operating rod as normally attached to one end of a car body and connected to a coupler head supported therefrom. Figure 1A is an enlarged sectional view through the rotor lever engaging end of the operating rod, the section being taken substantially in the vertical plane indicated by the line 1A—1A of Figure 1.

Figure 2 is a front elevation of the structure shown in Figure 1. Figure 2A is a view taken through the lugs on the bottom of the coupler head, looking down upon the rotor lift lever and the end of the operating rod connected thereto, said view being taken substantially in the horizontal plane indicated by the line 2A—A of Figure 2.

Figure 3 is an end view of the structure shown

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in Figures 1 and 2, taken from the left as seen in those figures.

Figure 4 is an end view somewhat similar to that of Figure 3, but taken approximately in the vertical plane indicated by the line 4—4 of Figure 1 for a purpose hereinafter more clearly set forth.

Figure 5 is another end view illustrating the condition of the parts in full knuckle throw position.

Figure 6 is another end view illustrating the condition of the parts upon release of the handle after knuckle throw or lockset.

Figure 7 is a fragmentary view illustrating the relative rotative positions of the main portion of the operating rod under certain operating conditions.

Figure 8 is a view comparable to the upper portion of Figure 4, illustrating one position of the locking latch.

Figures 9, 10 and 11 illustrate in detail my novel form of connecting means for the operating rod handle and the main body of said rod, Figure 9 being a side view thereof in its normal operating position as illustrated in Figure 3, Figure 10 being a front elevation thereof taken from the right as seen in Figure 9, and Figure 11 a top plan view taken from the top as seen in Figure 10.

Describing the structure in detail and referring first to the parts in normal locked position as illustrated in Figures 1 to 3, my novel operating rod is a three-piece structure comprising a main body portion 2, a handle 4 therefor, and a retaining cap 6, serving as connecting means between said handle and said body portion, said three-piece assembly being illustrated as supported adjacent the handle and from a bracket 8 supported as at 10, 10 from the car body, fragmentarily indicated at 12, said car body also supporting in well known manner the coupler head 14. The main body portion 2 of my novel operating rod may have the usual hook end 16 which may be received in the central opening intermediate the ends of the rotary lock lift lever 18, said lever being the standard form used in the present Standard E coupler and having a pivotal connection at one end as at 20 (Figure 3) with locking means of the coupler and being pivotally supported at its opposite end as at 22 from integral trunnion means on the coupler head extending between spaced lugs 24, 24 suspended therefrom. The loop end of my novel operating rod is generally similar to that commonly used except that at the upper turn of the loop a luglike extension 26 is formed, said lug being well illustrated in Figures 1, 1A and 2A. Figure 1A is a sectional view through said lug, showing that the forward extremity thereof is formed with a camlike portion 28 which may bear as at 30 (Figure 4) against the lock-toggle engaging end of the rotary lock lift lever or rotor adjacent the opening therethrough which accommodates the loop end 16. The loop end of the rod 2 may also bear against the lift lever as at 33, so that when

the parts are in normal locked position the weight of the rod end may be supported on the lifter 18 at the points 30 and 33 (Figure 4) with some slight clearance between the bottom of the lifter and the end portion of the loop 16 at 31. Engagement at 31 takes place, of course, as soon as the rod 2 is moved counterclockwise. Thus the loop end of the rod 2 and the lifter have a three point engagement at 30, 31 and 33 which substantially prevents relative rotation therebetween.

The handle 4 of the operating rod has a flattened upper end substantially circular in side elevation, as seen in Figures 3 and 6, and said circular portion may have a central opening within which may be received the trunnion end 32 of the main body portion 2, said handle 4 being designed to rotate upon said trunnion end within the limits permitted by the abutment of the arm 4 against the ledges 34 and 36 (Figure 9) at opposite edges of the retaining cap 6. Said retaining cap 6, shown in detail in Figures 9, 10 and 11, is a one-piece structure of caplike form having an enlarged cylindrical central portion 38 designed to accommodate therewithin the round flattened end of the handle 4. The retaining cap 6 may have at one side of the portion 38 a lug 40, drilled as at 42 to accommodate the end trunnion portion 32 of the rod 2, which may extend within the portion 38 for mounting the handle 4. At the opposite side of said portion 38 said cap 6 may have a lug 44 having the cored opening 46 complementary in form to the flattened end of the rod 2 and serving to fix said cap for rotation with respect to said rod 2. The lug 44 may be drilled as at 48 to accommodate a rivet 50 (Figures 1 and 2) which may extend through an opening in the end of the rod 2 aligned with the openings 48, 48 and said rivet may thus fix said cap for rotation with said rod. At the same time, the handle 4 may be permitted at the pivot point 49 (Figure 3) limited relative rotation with respect to the rod 2, as clearly illustrated in Figures 5 and 6.

The bracket 8 may have a web 52 (Figure 8) serving as a base portion by means of which said bracket may be fixed to the car body, and projecting therefrom at something less than a right angle may be the vertical web 54 having a projecting loop 56 defining in part a keyholelike opening 58 in the web 54, said opening having a circular upper portion converging downwardly into a slot 60 having substantially parallel side walls. The circular upper portion of said opening 58 is eccentrically positioned with respect to the slot 60 therebelow so that one margin of the slot 60 is tangent to said circular portion and a definite slope is formed at the opposite side of the circular portion at 61 (Figure 7) along which the flat portion 62 of the rod may slide into the slot 60. The said side walls may be spaced apart a distance for convenient accommodation of the flattened portion 62 of the rod 2, said flattened portion having a width suitable for accommodation and rotation within the circular upper portion of the opening 58.

When the parts are in the normal locked positions illustrated in Figures 1 to 3, the flattened portion 62 of the rod 2 may be held in its lowermost position in the slot 60 at the bottom of the opening 58 by means of the rotating latch 64 which may be pivoted as at 66 (Figure 3), said latch having a weighted lower end with an arcuate edge 68 overlying the slot 60 within which the rod 2 may thus be confined when the parts are in locked position, as illustrated in Figure 3. When

it is desired to unlock the parts, it is necessary to remove the flattened portion 62 of the rod 2 out of the slot 60. For that purpose the latch 64 may be clockwise rotated to the position shown in Figure 8, a position where the latch's balance will maintain it, pending elevation of the rod 2 by means of the handle 4.

After the latch 64 is moved to the position of Figure 8, the handle 4 may be raised and counterclockwise rotated to the position illustrated in Figure 5, movement of said arm being effective through engagement at the before-mentioned points 31 and 33 (Figure 4) to rotate the rod 2 sufficiently to throw the rotor lock lift lever 18 into the position illustrated in Figure 5, which is effective to unlock and throw the knuckle. Upon release of the handle 4 it may rotate clockwise back to the position illustrated in Figure 6, where its unbalanced weight may be effective to urge it further in a clockwise direction but such movement will be limited by the bearing at 70 (Figure 6) against the shoulder or ledge 34 (Figure 9). At the time the handle 4 is seized to elevate the rod 2 and rotate it into the position shown in Figure 5, the latch 64 will be tripped from the position shown in Figure 8 and will rotate of its own weight to the position shown in Figure 5 where it may bear as at 72 against the adjacent edge of the flattened portion 62 of the rod 2. As the handle 4 is released after knuckle throw or lockset, accomplished by rotation to the position of Figure 5, the parts may return to the position shown in Figure 6 and the relative positions of the rod 2, as illustrated respectively in Figures 5 and 6, are well shown in Figure 7, wherein it clearly appears that the flattened portion 62 is in such position in both cases that it cannot slip downwardly into the slot 60. With the parts in this position, of course, locking cannot be effected since the rod is prevented from entering the locking notch 60 by its bearing as at 74 and 76 (Figure 6) against opposite portions on the rotor lever 18.

If the knuckle is rotated from knuckle throw position to closed position, permitting the lock in the coupler to fall, the rotor lever 18 will be permitted to rotate further in a clockwise direction and the rod 2 and the handle 4 will similarly rotate, permitting the flattened portion 62 of the rod 2 to enter the locking notch 60, whereupon the latch 64 will close over the flattened portion 62, thus returning the parts to the locked position illustrated in Figures 1 to 3.

It will thus be seen that in my novel arrangement, unlocking the coupler becomes impossible unless the latch 64 is manually rotated and then the outer end of the uncoupling rod seized for raising the flattened portion of the rod 2 out of the locking notch 60 into the circular portion of the opening 58, after which the coupler may be lockset or the knuckle thrown, as desired. When the knuckle is in open position for coupling and the lock is in raised position, resting on top of the knuckle, or when the coupler is lockset, the rotor lever 18 cannot be returned to its lowermost position but the handle 4 which is pivoted for limited rotation within the locking cap 6, as already described, may drop back part way to the position illustrated in Figure 6, as already described, and thereafter with the closing of the knuckle the lock and the lever drop to the closed position, while at the same time the rod 2 completes the rotation, dropping into the locking slot 60, as shown in Figure 8.

In my novel arrangement, the uncoupling rod

2 may be disconnected from the rotor lever 18 without disengaging the rod 2 from the bracket 8. This may be accomplished by disconnecting the rotor lever from the lock lifter at 20 and rotating the lever in a backward direction until it may be disengaged from the coupler trunnion at 22, the bracket 8 being so constructed as to permit the handle 4 sufficient clockwise rotation for that purpose. The flattened portion 62 of the rod 2, between the trunnion 32 and the main body thereof, is of such length as to accommodate such lateral angling of the coupler head as may be required within standard limits.

It will thus be observed that my novel operating rod structure is such as to afford positive positioning of the parts thereof under locked conditions in such relationship with the parts of the coupler as positively to prevent accidental unlocking movements thereof.

Although I have shown my novel device as arranged for connection to the rotor lock lift lever of the present Standard E coupler, it will readily be understood that the arrangement is equally applicable to other types of rotor operated couplers.

It is to be understood that I do not wish to be limited by the exact embodiment of the device shown which is merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. A coupler operating arrangement for a rotary actuated coupler mounted on a car body, comprising a rod having an end connected to the rotor of said coupler for actuation thereof, means on said rod adjacent said rotor effective substantially to prevent relative rotative movement of said rotor with respect to said rod, both said rod and said rotor being rotatable only when said rod is free to rotate, and a bracket on said car body having an orifice receiving the opposite end of said rod for support thereof, said rod having a noncircular section positionable against rotation in a complementary portion of said orifice and movable to an enlarged portion of said orifice for rotation therewithin, said rod having outwardly of said bracket a handle mounted for limited rotation thereon, said handle being operable for rotation of said rod in the direction for unlocking and lockset of said coupler, said limited rotation permitting said handle to return toward a vertical position after such operation but being effective to restrain such last-mentioned movement of said handle before it reaches normal rest position, whereby the weight of said handle is effective to urge said rod in the reverse direction for locking said lock, locking of said lock permitting such further rotation of said rotor and said rod as will permit said rod and said handle to come to rest in normal locked position with said noncircular section of said rod secured in said complementary portion.

2. A coupler operating arrangement for a rotary actuated coupler mounted on a car body, comprising a rod having an end connected to the rotor of said coupler for actuation thereof, means on said rod adjacent said rotor effective substantially to prevent relative rotative movement of said rotor with respect to said rod, both said rod and said rotor being rotatable only when said rod is free to rotate, and a bracket on said car body having an orifice receiving the opposite end of said rod for selective support thereof, said rod having a noncircular section positionable against rotation in a complementary portion of said orifice and movable to an enlarged portion of said orifice for rotation therewithin, said rod having outwardly of said bracket a handle mounted for limited rotation thereon, said handle being operable for rotation of said rod in the direction for unlocking and lockset of said coupler, said limited rotation permitting said handle to return toward a vertical position after such operation but being effective to restrain such last-mentioned movement of said handle before it reaches normal rest position, whereby the weight of said handle is effective to urge said rod in the direction for locking said lock.

3. In an operating arrangement for a rotary operated coupler mounted on a car body, a rod having a loop end connected to the rotor of said coupler, means on said rod adjacent said rotor operative to limit relative rotation of said rod and rotor in both directions so that said rotor may have rotative movement only when said rod rotates, a bracket on said car body having an aperture receiving the opposite end of said rod, said opposite end having a noncircular section slidably and nonrotatably receivable within a portion of said aperture, said aperture having an upper enlarged part into which said noncircular section may be elevated for rotation, and gravity-operated latch means associated with said bracket for normally maintaining said rod within said portion.

4. In an operating arrangement for a rotary operated coupler mounted on a car body, a rod having a loop end connected to the rotor of said coupler, means on said rod adjacent said rotor operative to limit relative rotation of said rod and rotor so that said rotor may have rotative movement with said rod when the latter rotates, and a bracket on said car body having an aperture receiving the opposite end of said rod, said opposite end having a noncircular section slidably and nonrotatably receivable within a portion of said aperture, said aperture having an upper enlarged portion into which said noncircular section may be elevated for rotation, said rod having a trunnion portion outwardly of said bracket, a handle mounted on said trunnion portion, and means securing said handle on said trunnion and operable to limit relative rotation of said handle and rod, said limited rotation of said handle with respect to said rod restraining said handle from returning to normal rest position after rotation of said rod in the direction for unlocking said coupler so that the weight of said handle is operative to urge said rod in the reverse direction after such rotation.

5. In an operating arrangement for a rotary operated coupler mounted on a car body, a rod having a loop end connected to the rotor of said coupler, interengaging means on said rod and said rotor operative to limit relative rotation of said rod and rotor in both directions so that said rotor may rotate only with said rod, and a bracket on said car body having an aperture receiving the opposite end of said rod, said opposite end having a noncircular section slidably and nonrotatably receivable within a portion of said aperture, said aperture having an upper enlarged portion into which said noncircular section may be elevated for rotation.

6. In an operating arrangement for a rotary coupler supported on a car body, a rod having

an end connected to the rotor of said coupler, said rod having means in operative engagement with said rotor to limit relative rotation between said rod and rotor in either direction to an amount sufficient to accommodate normal vertical and lateral angling of said coupler, and a bracket on said car having an opening receiving the opposite end of said rod for support thereof, said rod having a noncircular section nonrotatably received in a portion of said opening, said opening having an enlarged portion to which said noncircular section may be shifted for rotation, thus permitting rotation of said rod and corresponding rotation of said rotor.

7. In an operating arrangement for a rotary coupler supported on a car body, a rod having an end connected to the rotor of said coupler, said rod having means in operative engagement with said rotor to limit relative rotation of said rod and rotor in both directions to an amount sufficient to accommodate vertical and lateral angling movements of said coupler, said rod and said rotor thus being rotatable as a unit when said rod is free to rotate, and a bracket on said car having an opening receiving the opposite end of said rod for selective support thereof in a plurality of positions in at least one of which positions it is nonrotatable, said rod being slidable in any position within said opening to accommodate said lateral angling movements.

8. In an operating arrangement for a rotary coupler supported on a car body, a rod having an end connected to said rotor and presenting means engaging said rotor at a plurality of spaced points substantially limiting relative rotation of said rod and said rotor to an amount sufficient to accommodate normal vertical and lateral angling movements of said coupler so that said rotor may rotate only when said rod is free to rotate, and a bracket on said car body having an opening with circular and noncircular portions selectively receiving an opposite end of said rod for rotatable and nonrotatable support thereof, said rod being slidable in said bracket in either position to accommodate said lateral angling movements.

9. An operating arrangement for a coupler mounted on a car body, comprising an operating rod having an end attached to the rotary operating lever of said coupler and engaging said lever at a plurality of points substantially limiting relative rotation between said rod and said lever to an amount sufficient to accommodate normal vertical and lateral angling movements of said coupler, and a bracket on said car body supporting the opposite end of said rod, said bracket having a keyholelike opening with an upper circular portion and a slot eccentrically positioned therebelow, said rod having a flattened portion receivable within said circular portion upon elevation thereinto so that said rotor may rotate only when said rod is free to rotate.

10. An operating arrangement for a coupler mounted on a car body, comprising a rod having an end attached to the rotor of said coupler and engaging said rotor at a plurality of points so that said rotor may rotate only when said rod is free to rotate, a bracket on said car body supporting the opposite end of said rod in a plurality of selective positions for rotation and nonrotation thereof, and a handle on said rod having limited rotation with respect thereto, said handle being operative to urge said rod toward inoperative position after normal rotation thereof in unlocking said coupler.

11. In an operating mechanism for a rotor coupler mounted on a car body, an operating rod having an eye end connected to said rotor, a plurality of interengaging means on said end and said rotor substantially limiting relative rotation between said rod and said lever to an amount sufficient to accommodate normal vertical and lateral angling movements of said coupler, and means on said car body selectively supporting the opposite end of said rod for rotation and nonrotation.

12. In an operating mechanism for a rotor coupler mounted on a car body, an operating rod having an eye end secured to said rotor, a plurality of means on said eye end engaging said rotor at spaced points to prevent relative rotation therebetween, means on said car body selectively supporting the opposite end of said rod for rotation and nonrotation, and means permitting lateral motion of said coupler and said rod with respect to said car body when said rod is in rotatable position.

13. In an operating mechanism for a rotor coupler mounted on a car body, an operating rod having an eye end secured to said rotor, a plurality of means on said eye end engaging said rotor at spaced points to prevent relative rotation therebetween, means on said car body selectively supporting the opposite end of said rod for rotation and nonrotation, and means permitting lateral motion of said coupler and said rod with respect to said car body when said rod is in nonrotatable position.

14. In an operating mechanism for a rotor coupler on a car body, an operating rod having an eye end secured to said rotor, means on said eye engaging said rotor at spaced points to substantially prevent relative rotation therebetween, means on said car body selectively supporting the opposite end of said rod for rotation and nonrotation, and means permitting lateral motion of said coupler and said rod with respect to said car body when said rod is in rotatable position and when said rod is in nonrotatable position.

15. In an operating mechanism for a rotor coupler mounted on a car body, an operating rod having an end portion secured to said rotor and presenting a plurality of means engageable with said rotor at spaced points to prevent relative rotation between said rod and rotor, means on said car body selectively supporting the opposite end of said rod for rotation and nonrotation, and a handle on said rod having limited relative rotational movement with respect thereto, said handle being operative to urge said rod from rotatable position to nonrotatable position after actuation of said rotor by said rod.

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