June 28, 1955 E. E. KUHARY ET AL 2,711,679

QUICK ATTACHABLE TRACTOR-IMPLEMENT LINKAGE

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FIG. 1

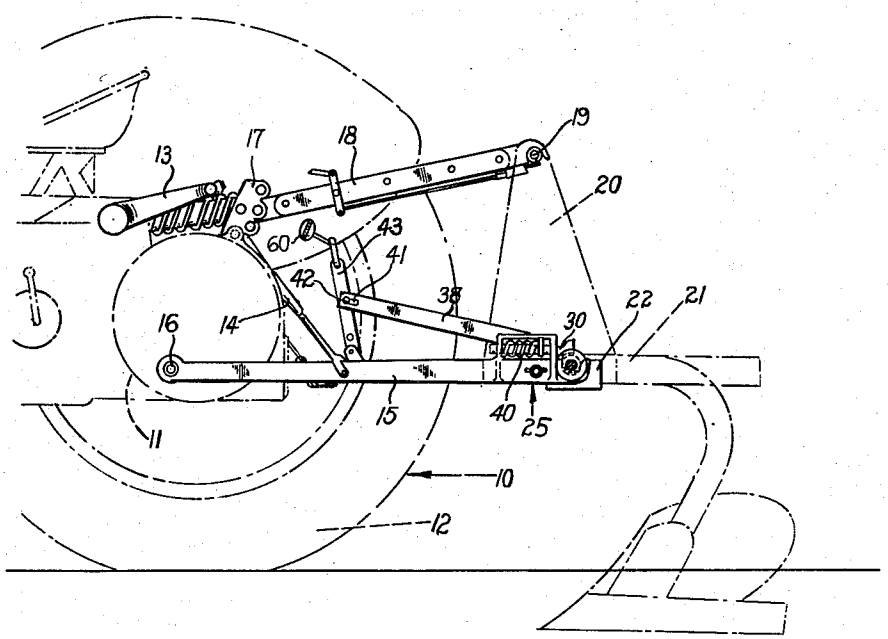


FIG. 5

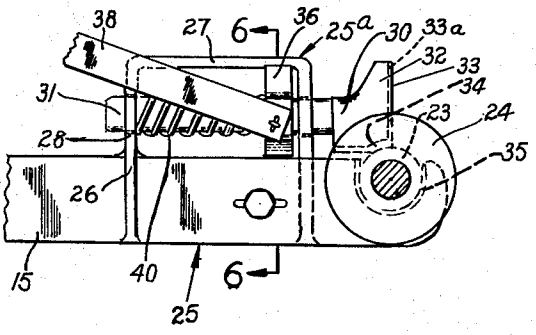
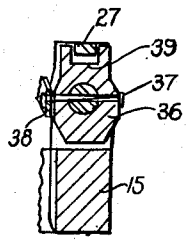


FIG. 6

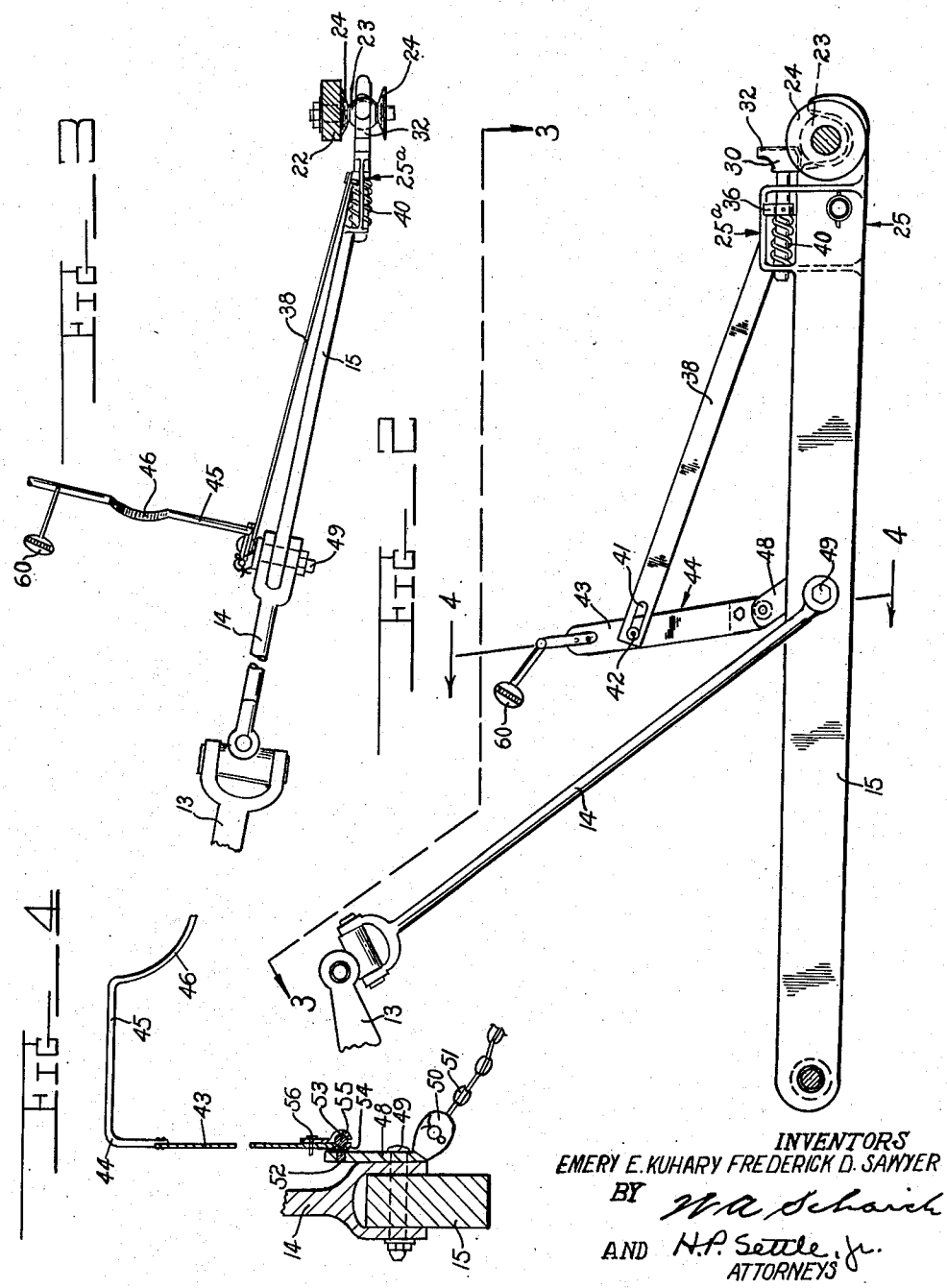


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QUICK ATTACHABLE TRACTOR-IMPLEMENT LINKAGE

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QUICK ATTACHABLE TRACTOR-IMPLEMENT LINKAGE

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4 Claims. (Cl. 97—47.14)

The present invention relates to quick attaching tractor-implement linkage and, more particularly, to such a linkage having coupling means for attachment to an implement without the necessity of manual manipulation of the linkage at the implement attachment points.

The present invention constitutes a continuation-in-part of our earlier filed pending applications, Serial No. 248,058, filed September 24, 1951, now Patent No. 2,691,932, and Serial No. 276,928, filed March 17, 1952, each of said applications being assigned to the assignee of the present invention.

In our earlier applications, we have disclosed coupling means positioned at the trailing ends of tractor-mounted draft links for attaching an implement to a tractor without the necessity of manually inserting linch pins or the like at the implement attachment points. In our later filed application, Serial No. 276,928, we proposed the use of an arched bail connecting the trailing draft links to retain the links in proper laterally spaced relationship to an implement. The present invention relates to this same type of tractor-implement connection but provided with means further facilitating the actual attachment procedure.

The present invention utilizes a bail joining the lower draft links of a tractor, but in the present invention, the bail accommodates concurrent swinging movement of the links so as to retain the link spacing while permitting simultaneous lateral movement of the links to align the same with the implement attachment points. In addition, the present invention provides an improved form of latching mechanism for effecting the actual tractor-implement connection.

It is, therefore, an important object of the present invention to provide an improved tractor-implement linkage having lower laterally spaced draft links joined by means retaining the links in spaced relation while accommodating concurrent lateral swinging movement thereof.

Another important object of the present invention is the provision of a tractor-mounted linkage wherein a pair of individually swingable draft links are connected for concurrent swinging movement by an arched bail extending therebetween and effective to laterally swing the links in constantly spaced relation.

It is a further object to provide an improved latching mechanism for a linkage whereby the linkage may be attached to a plurality of attachment points by either simultaneous or concurrent actuation of the attachment means.

Yet another object of the present invention is the provision of a tractor-implement connecting linkage having a bail connecting a pair of individually swingable draft links for concurrent swinging movement and effective to accommodate independent latching movement of attachment means at the link rear ends while being capable of simultaneously actuating the latching means for disengaging the implement.

The specific nature of this invention, as well as other objects and advantages thereof, will become apparent to those skilled in the art from the following detailed description, taken in conjunction with the attached sheets of drawings on which, by way of preferred example only, is illustrated one embodiment of this invention.

On the drawings:

Figure 1 is a side elevational view of a tractor and implement connected by a linkage of the present invention;

Figure 2 is a greatly enlarged side elevational view of the linkage alone;

Figure 3 is a sectional view taken along the plane 3—3 of Figure 2;

Figure 4 is a sectional view taken along the plane 4—4 of Figure 2;

Figure 5 is a greatly enlarged fragmentary view of the link latching mechanism; and

Figure 6 is a sectional view, with parts shown in elevation, taken along the plane 6—6 of Figure 5.

As shown on the drawings:

In Figure 1, reference numeral 10 refers generally to a tractor, such as the Ford tractor, having a rear axle housing 11 joining the rear driving wheels 12 thereof. The rear axle housing 11 is surrounded by a pair of rock arms 13 adapted to be actuated by the conventional tractor hydraulic mechanism and effective through lift arms 14 to elevate or lower draft links 15 pivoted to the tractor rear axle housing for universal movement, as at 16. Atop the rear axle housing, there is also provided a top link bracket 17 pivoted to the housing and carrying a rearwardly projecting tractor top link 18.

The top link 18 is effective to join the tractor 10 to an attachment point 19 located in the upper extremity of the A-frame 20 of an implement 21, such as the illustrated moldboard plow. The plow A-frame 20 is also provided with a cross shaft 22 carrying at its lateral extremities spherical attachment bearings 23 (Figure 5) interposed between generally frusto-conical guide plates 24.

The links 15 carry at their trailing ends a latching mechanism indicated generally by reference numeral 25, and best illustrated in Figures 2, 3, and 5. More particularly, the latching mechanism comprises a guide frame 25*a* having vertical legs 26 rigidly secured to the associated link and joined at their upper ends by longitudinally extending rigidifying guide strap 27. The legs 26 are provided with aligned and registering apertures 28 slidably journaling a reciprocable latch element 30 having a stem portion 31 projecting through the apertures 28. The latching element 30 is also provided with a terminal upstanding boss 32 having a rear vertical face 33 provided with a concave guiding recess 33*a* and with a lower recessed corner 34 of concave configuration for a purpose to be hereinafter more fully described.

The latching member 30 is provided for reciprocation to selectively overlie or expose the open side of an upwardly opening notch 35 formed at the free end of the associated link 15. The notch 35 is provided with an interior concave surface matingly engageable with the exterior surface of one of the balls 23. As will be seen from the Figures 1 and 5, when the ball is positioned within the notch 35 and the latching member 30 is in its rearmost position, the ball cannot escape and the link 15 is securely attached to the implement attachment point. The ball and socket connection provides for free relative pivoting movement of the link and the implement A-frame.

To control movement of the latch elements 30, the stems 31 carry slide blocks or elements 36 secured to the stems by laterally extending pins 37 extending into registering apertures in the associated pins and slide members 36. Each of the pins 37 is secured to an actuating arm 38 to be hereinafter more fully described. The slide 36 is provided with an upper recess 39 slidably receiving the guide strap 27 to guide the stem for reciprocating movement and to prevent rotation of the stem. A coil com-

pression spring 40 is interposed between the forward one of legs 26 and the slide 36, so that the stem 31 and the entire latching element 30 are constantly urged rearwardly by the spring 40 to the position illustrated in Figure 5.

The actuating arms 38 project forwardly from the slides 36 toward the tractor and are provided at their forward ends with longitudinally extending slots 41, each receiving therethrough a bolt or pivot pin 42 projecting laterally from one of the upstanding legs 43 of an actuating bail 44. The bail 44 serves to join the links 15 and also to provide means for actuating the latch mechanisms 24 of the links. The bail 44 comprises the two upstanding legs 43 and a joining member 45 rigidly secured to the legs 43 and extending therebetween. The joining member 45 provided with a central downwardly deformed portion 46 vertically aligned with the top link 18 to clear the top link when the draft links 15 are elevated to a transport position by actuation of the rock arms 13. The bail 44 is secured to each of the links through an attachment bracket 48 which in turn is secured to the links by means of the laterally extending pin 49 (Figure 4) utilized to connect the bifurcated lower extremities of the lift arms 14 to the legs. Each bracket 48 is provided with a downwardly and forwardly projecting ear 50 to which is attached a limit chain 51 to limit swinging movement of the links 15, the other ends of the chains 51 being connected to the tractor rear axle housing. An upstanding arm of the bracket 48 is provided with a laterally extending attachment pin 52 rigidly secured to the bracket and terminating in a substantially parallel spherical ball end 53. The free lower end of the bail leg 43 is provided with a dished-substantially hemispherical socket 54 which is vertically slotted to receive the pin 52 therethrough to accommodate mounting of the socket upon the ball end 53. The ball is retained within the socket 54 by an attachment plate 55 having a socket mating with the ball 53, the plate 55 being secured to the bail leg 43 by suitable means, as by screw 56.

Operation

The operation of the hitch of the present invention is adapted for manipulation from the tractor seat so that it is not necessary to dismount from the tractor in order to attach or detach an implement. To attach an implement to the tractor, it is only necessary to vertically align the concave end surface 33 of the latching elements 30 with the balls 23 by manipulation of the hydraulic system control to actuate the rock arms 13 and the lower links 15 and to laterally align the trailing ends of the links 15 with the implement attachment bearings 23. This lateral adjustment may be easily accomplished by swinging the links laterally, as by grasping the operating handle 60 rigidly mounted on the bail joining member 45, and laterally moving the handle.

This lateral adjustment of the links constitutes one of the primary advantages of the present invention. The bail member 45 retains the links in constant laterally spaced relationship, while the ball and socket connection 53—55 accommodates pivoting movement of the links relative to the bail. The bail, by turning upon the balls 53, thus accommodates lateral shifting of the links 15, but this shifting does not effect materially the spacing between the links, as determined by the length of the member 45. The links are thus concurrently adjusted laterally without effecting substantially the spacing of the links and also without actuating the latch members 25.

After the link rear ends have been aligned both laterally and vertically with the attachment bearings 23, the tractor may be backed toward the implement, with contact between the implement bearings 23 and the large surfaces 33 causing movement of the latching member 30 forwardly, i. e. toward the tractor, against the force of the spring 40 to open the notches 35. When the hydraulic system of the tractor is now actuated to elevate the links 15, the bearings will enter the notches 35 with the surfaces 33 and 34 of the element 30 guiding such relative

movement of the links and the bearings. When the bearings 23 are positioned with the notches 35 beneath the level of the elements 30, the springs 40 will then urge the latching members 30 rearwardly to overlie the notches and to retain the bearings therein.

To detach the lower links from the implement, it is only necessary to pull forwardly on the handle 60, thus pivoting the bail 44 forwardly to pull the actuating arms 38 in the same direction and pulling the slide 36 forwardly to move the latching member 30 from its position overlying the notches 35. The links 15 may then be lowered by the tractor hydraulic mechanism to remove the links from the implement.

The slots 41 are provided at the forward ends of the actuating arms 38 to accommodate individual opening movement of the latch elements 30 independently of the bail 43. In this maner it is possible to latch one of the spaced implement attachment bearings 23 to the associated link without opening the other latch, since the bale is not moved during such opening movement.

After the lower links have been attached to the implement, the top link may be attached thereto as described in our pending application, Serial No. 248,058. It will be noted that the top link may be manually actuated without leaving the tractor seat.

Thus, it will be appreciated that the present invention provides a new and novel type of implement-tractor linkage whereby a three-point connection may be effected without the necessity of manual manipulation of the connecting means at the implement attachment points.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

We claim:

1. In a tractor-implement linkage, a pair of laterally spaced trailing draft links adapted for universal pivoted attachment to a tractor at the link forward ends, an open sided recess at the rear ends of said links, respectively, a guide element on each of said links adjacent each of said recesses and having a guide surface longitudinally aligned with the associated recess, a sliding latch member guided by each of said guide elements to overlie the associated recess, a guide slide movable with each of said latch members and engaging said guide surface, resilient means urging said latch members to a position overlying said recesses, and means joining the slides of said links to one another and bringing said links for simultaneously actuating said latch members and for laterally spacing said links through a desired distance.

2. In a tractor-implement linkage, a pair of laterally spaced trailing draft links adapted for pivoted attachment to a tractor at the link forward ends, an open-topped notch at the trailing ends of each of said links, a guide strap spaced from each of said links adjacent to and in longitudinal alignment with the link notches, respectively, a guide block engageable with each of said straps and slidable therealong toward and away from the associated notch, and a latching element fixedly secured to and movable with each of said guide blocks to and from a latching position overlying said notches, said latching elements each having an upstanding abutment projection and being retained against turning movement by the inter-engagement of the associated guide block with its corresponding strap.

3. In a tractor-implement linkage, a pair of laterally spaced trailing draft links adapted for pivoted attachment to a tractor at the link forward ends, an arched bail extending laterally between said links and pivotally attached to a medial portion of each of said links, actuating arms joined to said bail and projecting rearwardly therefrom, a guide block pivotally attached to the trailing ends of each of said arms, respectively, means carried by each link guiding said blocks for longitudinal movement toward and away from the trailing end of each of said links, and

latch means secured to said blocks for movement therewith.

4. In a tractor-implement linkage, attachment means for securing a tractor-mounting link to an implement attachment point comprising a guide bracket secured to said link adjacent the trailing end thereof, said bracket having a guide surface and a pair of aligned apertures at the extremities of said surface, a guide block slidable along said surface and having a central aperture aligned with said pair of apertures, a latching element having a guiding extension extending through said pair of apertures and through the aperture of said block, a locking pin extending through said block and the portion of said element extension positioned in the block aperture to secure said element to said block for co-movement, said pin projecting

beyond said block, spring means interposed between said block and said bracket to urge said block and said element toward the trailing end of said link, and an actuating arm pivotally secured to that portion of said pin projecting beyond said block for actuating said block against the action of said spring means.

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