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(54) IMPROVEMENTS IN OR RELATING TO HITCHES

(71) We, MASSEY FERGUSON-PERKINS LIMITED, 33 Davies Street, London, W.1. a British Company do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to hitch assemblies and to an adaptor for use in hitch assemblies. In particular the invention is for an improved hitch assembly whereby towing and towed vehicles may be connected together.

The invention has particular reference to agricultural tractors which are fitted with attachment hooks and which sometimes require to be attached to towed vehicles fitted with draw tongues intended for attachment to a clevis. For this purpose the invention provides the means whereby the hook on the tractor can be connected to the towed vehicle using a simple adaptor.

According to a first aspect of the invention a hitch assembly for connecting together towing and towed vehicles comprises a towing hook for mounting on one vehicle, and an adaptor having a clevis at one end for attachment to a draw tongue on the other vehicle, an opening at the other end of the adaptor, the opening being dimensioned to receive part of the towing hook, and attachment pin means engageable in apertures in said adaptor and the root of the hook for releasably attaching the end of the adaptor remote from the clevis to the root of the hook, the opening having walls profiled to co-operate with the hook so that when the attachment pin means is engaged in said apertures said adaptor is retained in a desired operating position on the hook.

Conveniently said profiled walls of the opening have mutually inclined portions located adjacent similarly disposed surfaces of the hook to inhibit movement of the

adaptor about the hook in a vertical plane.

According to a second aspect of the invention there is provided a towing hook adaptor for converting a towing hook into a clevis, said adaptor having a clevis at one end, an opening at the other end, the opening being dimensioned to receive part of the towing hook, and attachment pin means engageable in apertures in said adaptor and root of the hook for releasably attaching the end of the adaptor remote from the clevis to the root of the hook, the opening being dimensioned to receive part of the towing hook and attachment pin means engageable in apertures in said adaptor and the root of the hook for releasably attaching the end of the adaptor remote from the clevis to the root of the hook, the opening having walls profiled to co-operate with the hook so that when the attachment means is engaged in said apertures said adaptor is retained in a desired operating position on the hook.

Further features of the invention will appear from the following description of an embodiment of the invention given by way of example only and with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation of a tractor fitted with the assembly of the invention,

Fig. 2 is a side elevation of the assembly,

Fig. 3 is a plan view of the assembly of Fig. 2,

Fig. 4 is a side elevation of the assembly of Figs. 2 and 3 with the adaptor in an inverted position, and

Figs. 5a and 5b are side elevations showing how the adaptor is fitted to a draw bar hook.

Referring to the drawings and firstly to Figs. 1, 2 and 3 a tractor 30 is of the kind having a draw bar towing hook 32 carried on the end of a draw bar rigidly attached to the tractor frame. The draw bar hook 32 is generally of conventional form having a hooked end of which the free end 33 tapers

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upwardly. To enable the hook 32 to be attached to the draw tongue 34 of a trailer or other towed vehicle (not shown) an adaptor 36 is interposed between the hook 32 and the tongue 34 to provide a rigid connection between the hook and tongue.

The adaptor 36 is formed with a clevis having two horizontal spaced arms 37 and 38 with aligned apertures 39 through which a pin 54 is inserted after aligning an aperture 40 in the tongue 34 with the apertures 39.

Integral arms 42 and 44 of the adaptor 36 extend generally horizontally in vertical planes to define an opening 45 between them for receiving the hook 32. The arms 42/44 are shaped to provide a wider opening near their junction than towards their free ends where the inside faces of the arms are closer together. At the junction of the arms 42/44 there are formed transverse surfaces 46 and 47 which are mutually inclined with respect to one another and are symmetrical about a centre line X-X passing through the arms. The surfaces 46 and 47 are inclined at such an angle as to engage the co-operating surfaces of the hook 32 as seen in Fig. 2. It will be seen that to provide for the surfaces 46 and 47 to be of sufficient length for their purpose projections 48 and 49 respectively are provided on the adaptor 36.

The free ends of the arms 42 are formed with horizontal aligned apertures 50 corresponding in size to an aperture 51 formed in the root of the hook 32 so that, when in the position shown in Fig. 2, an attachment pin 53 can be located through the aligned apertures 50 and 51 to attach the adaptor 36 to the hook 32. With the adaptor 36 in the position as shown in Fig. 2 and with the pin 53 in position it will be appreciated that the adaptor 36 is fixed relatively rigidly in position with respect to the hook 32, vertical movement being prevented by engagement of the surfaces 46, 47 of the adaptor with the hook and displacement in the horizontal direction being prevented by engagement of the hook with the sides of the arms 42.

Referring now to Fig. 4, it will be appreciated that since the surfaces 46 and 47 are symmetrical the adaptor 36 can be located on the hook 32 in an inverted position relative to that shown in Fig. 2 and this position is illustrated in Fig. 4. It will be seen that the centre line Y-Y of the tongue 34 lies at a higher level in the position of Fig. 4 than in the position of Fig. 2. Thus by inverting the adaptor 36 the location of the tongue 34 can be raised or lowered. This is due to the centre line of the clevis not being symmetrical with the centre line of the arms 42.

Reference is now made to Figs. 5a and 5b to explain how the adaptor 36 is fitted to the hook 32. It will be appreciated that the

widened part of the opening 45 is to accommodate the greater width of the hooked end of the hook 32 so that the hooked end has to be inserted into the opening 45 by relative oblique movement between the adaptor 36 and the hook 32 as indicated by the arrows in Fig. 5a until the surfaces 46 and 47 of the adaptor co-operate with the corresponding surfaces of the hook. It is then simple to align the apertures 50 and 51 so that the pin 53 can be inserted to attach the adaptor 36 to the hook 32. This final movement is obtained after the hook and adaptor have reached a position shown in Fig. 5b. It will be seen, therefore, that attachment of the adaptor to the hook is a simple operation and release of the adaptor is achieved just as easily after removing the pin 53.

As will be appreciated the adaptor provides a simple but efficient means whereby a towing hook can be connected to a tongue.

Attention is drawn to co-pending U.K. patent application number 2266/76 (Serial No. 1574435) which discloses and claims a similar form of hitch assembly and adaptor.

WHAT WE CLAIM IS:

1. A hitch assembly for connecting together towing and towed vehicles, said assembly comprising a towing hook for mounting on one vehicle, and an adaptor having a clevis at one end for attachment to a draw tongue on the other vehicle, an opening at the other end of the adaptor, the opening being dimensioned to receive part of the towing hook, and attachment pin means engageable in apertures in said adaptor and the root of the hook for releasably attaching the end of the adaptor remote from the clevis to the root of the hook, the opening having walls profiled to co-operate with the hook so that when the attachment pin means is engaged in said apertures said adaptor is retained in a desired operating position on the hook.

2. An assembly according to claim 1 wherein said profiled walls of the opening have mutually inclined portions located adjacent similarly disposed surfaces of the hook to inhibit movement of the adaptor about the hook in a vertical plane.

3. An assembly according to claim 1 or 2 wherein the opening is defined between two arms, the hook and its root being arranged to lie between said arms when the adaptor is attached in said desired operating position.

4. An assembly according to claim 3 wherein the free ends of the arms are formed with said apertures for receiving said attachment pin means.

5. An assembly according to claim 3 or 4 wherein the arms are shaped to be closer

together towards their free ends than along the remainder of their length to accommodate the hook.

- 5 6. An assembly according to any one of claims 3, 4 or 5 wherein the profiled walls are located adjacent the junction of the two arms and extend transversely of the adaptor.
- 10 7. An assembly according to any one of the preceding claims wherein the adaptor is arranged to be attachable to the hook in two positions one of which is inverted relative to the other, and in one of said positions the tongue is at a lower level in relation to the hook than in the other position.
- 15 8. A towing hook adaptor for converting a towing hook into a clevis, said adaptor having a clevis at one end, an opening at the other end, the opening being dimensioned to receive part of the towing hook, and attachment pin means engageable in apertures in said adaptor and root of the hook for releasably attaching the end of the adaptor remote from the clevis to the root of the hook, the opening being dimensioned to receive part of the towing hook, and attachment pin means engageable in apertures in said adaptor and the root of the hook for releasably attaching the end of the adaptor remote from the clevis to the root of the hook, the opening having walls profiled to co-operate with the hook so that when the attachment pin means is engaged

in said apertures said adaptor is retained in a desired operating position on the hook.

9. An adaptor according to claim 8 35 wherein the opening is defined between two arms and said profiled walls are at the junction of the arms and are transverse to the adaptor.

10. An adaptor according to claim 8 or 40 claim 9 wherein the side walls are mutually inclined to one another.

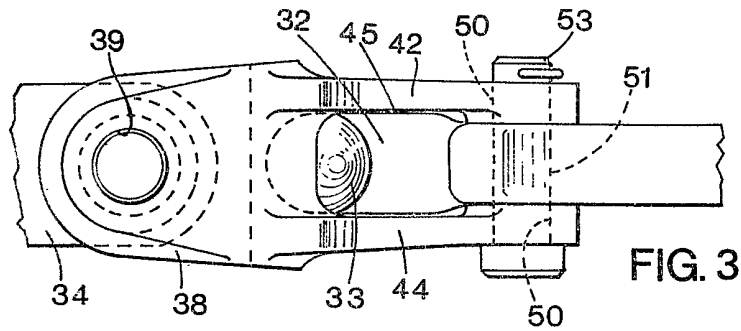
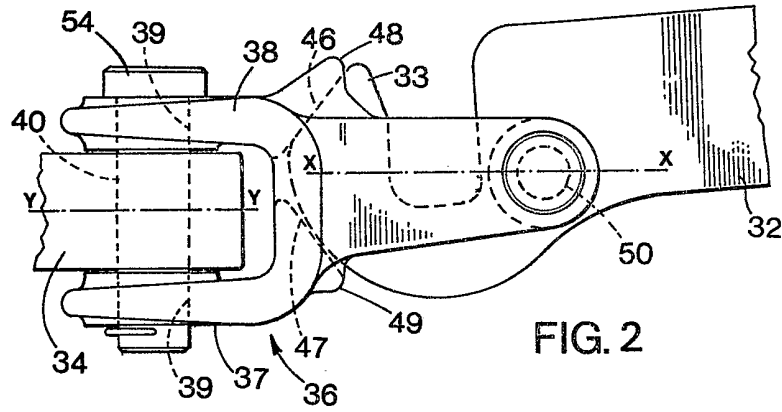
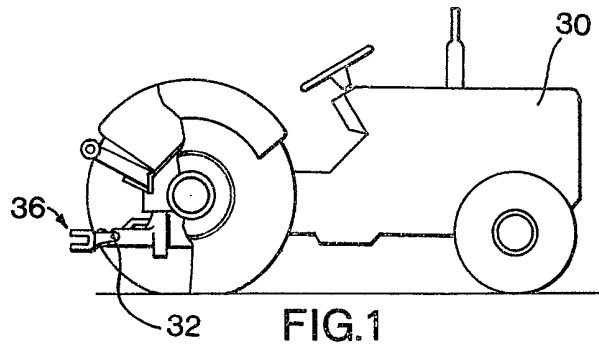
11. An adaptor according to claim 9 wherein the arms have aligned apertures at their free ends for receiving the attachment 45 pin means.

12. An adaptor according to claim 9 or 50 11 wherein the arms are spaced closer together towards their free ends than at their other ends.

13. A hitch assembly for connecting together towing and towed vehicles said assembly being constructed and arranged substantially as hereinbefore described with reference and as shown in the accompanying 55 drawings.

14. A towing hook adaptor for converting a towing hook into a clevis, said adaptor being constructed and arranged substantially as hereinbefore described with reference to 60 and as shown in the accompanying drawings.

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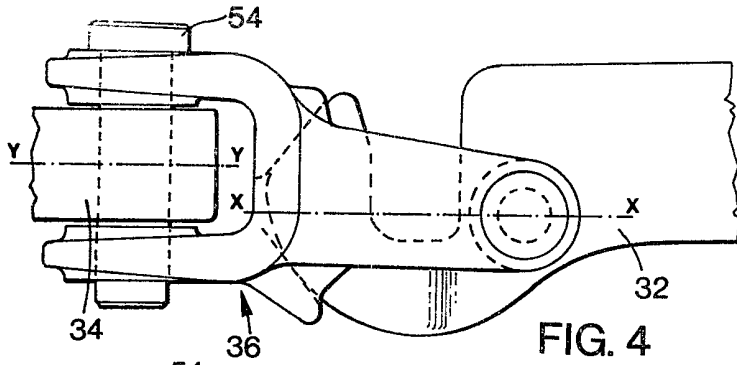


FIG. 4

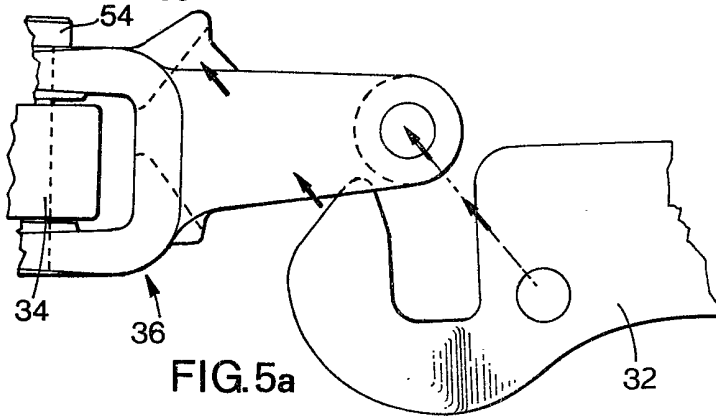


FIG. 5a

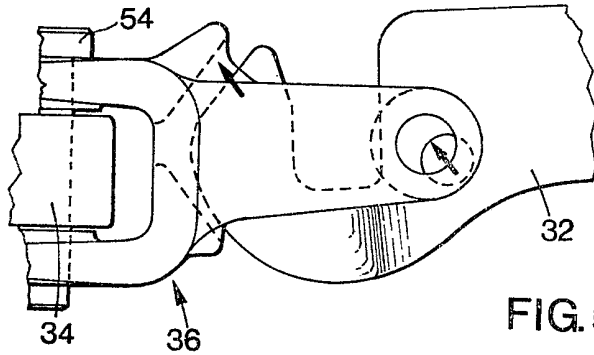


FIG. 5b