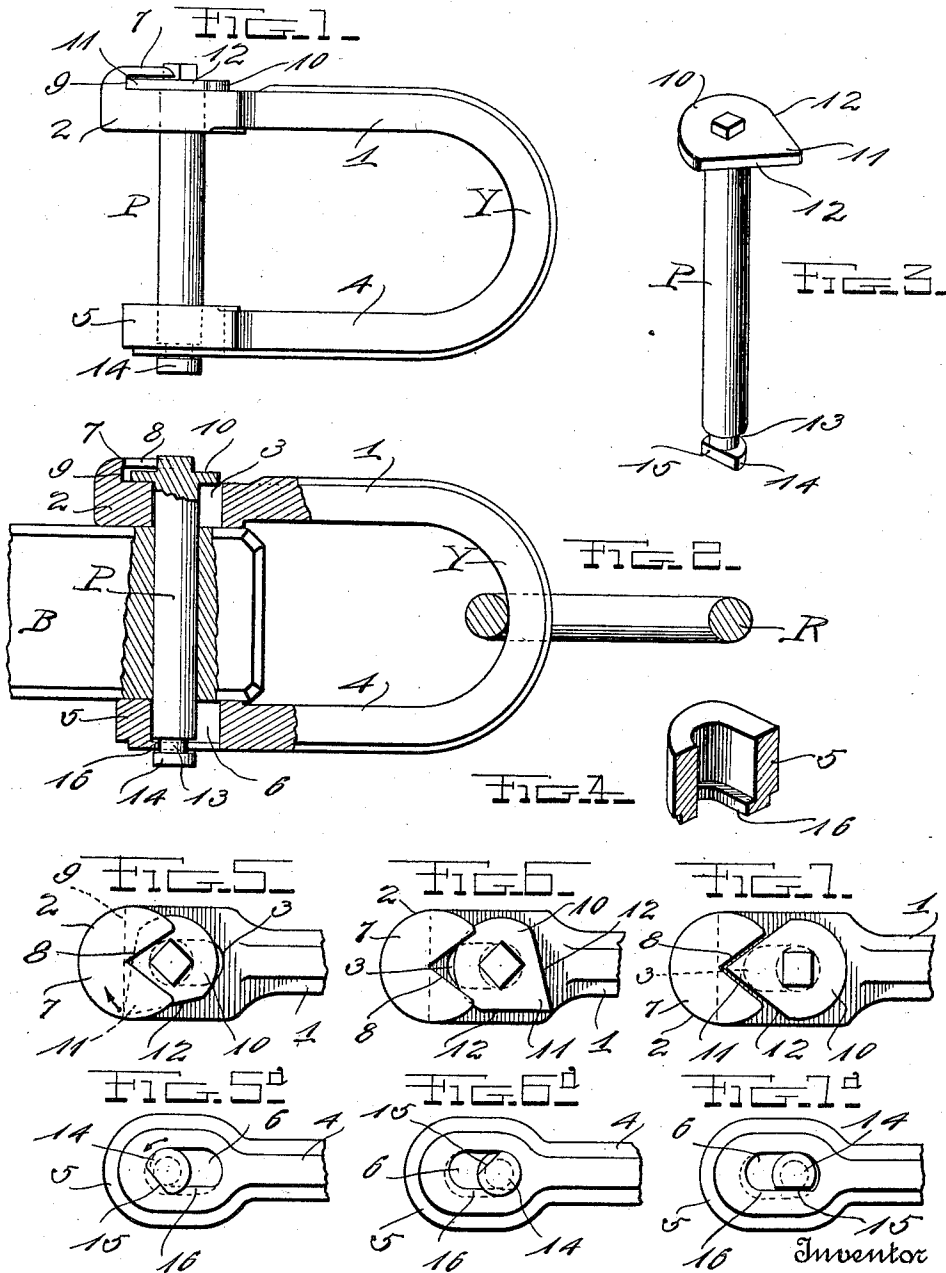


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CLEVIS LOCK.

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CLEVIS-LOCK.

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To all whom it may concern:

Be it known that I, MILFORD A. NELSON, a citizen of the United States, residing at Fowler, in the county of Otero and State of Colorado, have invented certain new and useful Improvements in Clevis-Locks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to clevises, and more especially to the pins thereof; and the object of the same is to produce an improved lock for preventing the accidental dislodgment and loss of said pin.

A further object is to prevent the spreading apart of the arms of the yoke when excessive strain is thrown upon the clevis.

These and other objects are accomplished by the construction hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a side elevation of this improved device with its parts in their working position, and Fig. 2 is a central vertical longitudinal section, showing a plow beam or the like exerting strain on the clevis. Fig. 3 is a perspective detail of the pin. Fig. 4 is an enlarged perspective detail of the extremity of the lower yoke-arm, severed from the remainder thereof to show the shape of the hole therethrough. Figs. 5, 6, and 7 are plan views of the extremity of the upper yoke-arm with the pin therein and its head in several different positions as will be explained below; and Figs. 5^a, 6^a and 7^a are bottom plan views of the extremity of the lower yoke-arm showing the lower end of the pin in the opening therein and in relatively the same respective positions.

The yoke member Y of this clevis is substantially U-shaped in side elevation and is preferably made of wrought iron although in some instances it may be cast, its bend receiving a ring R by which draft is applied to the clevis and its extremities being pierced with eyes through which removably passes a pin P which intermediately connects the clevis with a plow beam B or other object to which the draft is to be connected. The strain on these clevises is often considerable, and the draft may be applied in such a manner that the yoke swings from side to side around the point of attachment

to the beam. In such swinging, the eyes in the yoke-arms usually turn on the pin while the latter remains fixed in the hole through the beam, for the reason that there is a greater bearing surface therethrough than between the pin and the walls of the eyes; and furthermore the pin sometimes fits rather closely in the hole through the beam, whereas it must fit through the eyes with sufficient looseness to permit it to be manually inserted and withdrawn. The result is that continuous use produces wear on those walls of the eyes which are adjacent the extremities of the yoke-arms and on the pin at points where it makes contact with such walls, and in time the pin becomes so loose in the eyes that it is liable to accidental displacement with disastrous results. The object of the present invention is, then, to permit the slight oscillation of the yoke upon the pin, to make provision for the wear which invariably occurs, and yet at all times to distribute the strain to both arms of the yoke and to prevent the pin from accidental dislocation and loss excepting under certain conditions when it is purposely turned to a peculiar position for the purpose of removing it.

Coming now more particularly to the present invention, the body of the yoke is by preference made rigid rather than yielding as is the case with some forms of clevises, and the eyes through its arms are elongated longitudinally into slots, or, more accurately speaking, are formed in the shape of oblong holes with rounded ends, their shortest diameters being about equal to diameter of the round pin P and their longest diameters being slightly greater than the same so as to permit the pin to have a slight longitudinal movement when in place. The upper arm 1 is by preference slightly enlarged at its extremity into a head 2 and the elongated eye 3 formed through this head has plain upright walls. The lower arm 4 has a similar head 5, and through the same is an elongated eye 6 disposed directly beneath the plain eye 3 and of exactly the same size and shape excepting for a flange which will be described below. Rising from the head 2 in rear of its eye 3 is a lip 7 overhanging and spaced from the head and provided in its bill with a V-shaped notch 8, and under the lip is formed a transverse shoulder 9 extending straight across the upper face of the head.

Coacting with the yoke is the pin P best seen detached in Fig. 3, its body being cylindrical and of a size to fit rather closely within the width of the eyes 3 and 6 but to have a slight movement therein longitudinally of the yoke by reason of their elongation. The upper end of this pin has a head made rather flat so that it may pass under the lip 7, and in plan view this head comprises a circular flange 10 extending a little over half way around the axis of the pin, a tongue 11 projecting radially from said axis diametrically opposite the center of said flange and to a slightly greater degree than the width of the flange, and beveled edges 12 leading from the tip of the tongue to the extremities of the arcuate periphery of the flange.

The eye 6 through the lower arm 4 of the yoke is of course as deep as the thickness of said arm, and throughout most of its depth it is plain like the upper eye 3. But around its lower end its wall is formed with an internal flange 16 extending along one of the sides of said eye and around one end thereof, the width and thickness of this flange being about that proportionately shown in Fig. 4. Coacting with this flange in the lower eye, the lower end of the pin P is formed near its extremity with an annular groove 13, producing a button 14 at the lower end of the pin below the groove, and one side of this button is cut off on a chord 15 which intersects said groove as shown. Viewed from beneath, the lower end of the pin is therefore D-shaped as seen in Figs. 5^a, 6^a, and 7^a, and its dimensions are such relative to the lower extremity of the eye 6 (partly restricted by the flange 16) that it may be withdrawn therefrom when the pin is set in one certain position as will be explained. Finally the distance between the groove 13 and the lower face of the head of the pin is just such that when the latter rests upon the head 2 of the upper arm 1 and may turn beneath the lip 7 the groove is in position to engage the flange 16.

The parts being connected as best seen in Fig. 3, when strain is applied to the ring the yoke Y is drawn forward against the load thrown on the beam B, and the pin P is moved to the rear ends of the eyes 3 and 6 so that the parts then stand as seen in this view and also in Figs. 1, 5 and 5^a. The last two views are diagrammatic and illustrate respectively the position of the head of the pin in the upper yoke-arm and the simultaneous position of the lower end of the pin in the lower yoke-arm, and in similar manner Figs. 6 and 6^a illustrate the simultaneous position of the same parts at another time, and Figs. 7 and 7^a their simultaneous position at still a third time. Normally, however, one of the beveled edges 12 of the head is drawn nearly into contact

with the shoulder 9 by the strain which moves the pin into the rear end of the eye 3; and so long as the strain exists or the pin retains this position, the tongue 11 cannot turn in the direction of the arrow in Fig. 5 which it must do to permit the button 14 at the lower end of the pin to turn in the direction of the arrow in Fig. 5^a so that the flattened cord 15 may pass by the flange 16 and beneath the pin. It follows that, even if the pin should rotate in the opposite direction until the tongue had made almost a complete revolution and stood against the other end of the shoulder 9, at no point could the button disengage the lower eye 6. In Figs. 6 and 6^a is shown what occurs when the draft on the ring is released and the entire pin moves to the front ends of the eyes 3 and 6. The tongue 11 is now not in contact with the shoulder 9 at any point, but it will be observed that the flange 10 underlies the tip of the split lip 7 (as in fact it did to a greater extent in Fig. 5) and therefore at no point during the revolution of the pin while this condition remains, can it become displaced.

In Figs. 7 and 7^a is shown the position the parts must assume when the pin is to be removed. Here the body of the pin is moved to the front ends of the eyes 3 and 6 and rotated on its axis until the tip of the tongue 11 stands within the V-shaped notch 8 so that the longest diameter of the head at the upper end of the pin aligns with the longitudinal plane of the yoke Y; at this moment the chord 15 on the button 14 registers with the side edge of the flange 16 (see Fig. 7^a) and of course the entire pin can be moved out of place. But it will be observed that even when the parts stand in this position, if the lower end of the pin should be swung to the rear the groove therein will engage the rear end of the flange 16, and if the tip of the tongue be turned aside ever so slightly in either direction it will pass under one part of the lip 7—either contingency presenting a condition which will prevent the withdrawal of the pin. Therefore the operator must know exactly how to set the parts so as to remove the pin. Obviously it is reinserted by a reversal of the operation. In the use of a clevis, even when handled ever so roughly and after its parts have become considerably worn, it will rarely happen that the precise conditions which have been described as necessary for the removal and insertion of the pin will all come about simultaneously by accident.

I have found by experiment that a clevis pin lock of this character is exceedingly efficient in retaining the pin in place in the eyes in the yoke; and, although I have described details with considerable minuteness, I reserve the right to make changes therein such as come within the spirit of my inven-

tion. For instance, while I have described the yoke Y as made of one piece and stated that it is preferably rigid, in case it is otherwise made or if its arms should spring under the strain brought to bear upon it, the use of fastening means between both ends of the pin and the two arms of the yoke will be of advantage as is apparent. The simultaneous engagement of these two fastening means serves not only to lock the pin in place and prevent its loss but also to prevent the arms of the yoke from spreading, and if they should spring apart a little under the tendency to spread they would only the more tightly lock the pin.

The effect of wear on the parts as occasioned by long and heavy usage will now be apparent. If the wear occur at the upper end of the pin or in the rear end of the upper eye, the flange 10 soon comes in contact with the shoulder 9 and affords an additional bearing surface. In any event, wear at this point will not permit the loss of the pin or prevent its removal in the manner above described. Such wear as occurs at the lower end of the pin and in the rear end of the lower eye also will not increase the chances for loss of the pin nor prevent its removal, and when the flange 16 reaches the bottom of the groove 13 an additional bearing surface is provided and the function of these parts is not interrupted.

What is claimed as new is:

1. In a clevis, the combination with a yoke whose arms have registering elongated

eyes, a flange across part of the lower eye, and a transverse shoulder on the upper arm; of a pin rotatably mounted in said eyes and having a button at its lower extremity shaped to pass said flange only when the pin is turned axially to a certain position, and a head on the pin shaped to strike said shoulder when the pin is moved into one end of the upper eye and turn and move the pin out of said certain position.

2. In a clevis, the combination with a yoke whose arms have registering eyes elongated in the direction of their length, a flange along one side and across the rear end of the lower eye, and a transverse shoulder on the upper arm and crossing it in rear of the upper eye; of a round pin rotatably and removably mounted in said eyes and having a groove around its body producing a button at its lower extremity shaped to pass said flange only when the pin is moved forward in the lower eye and turned to a certain position, and a head on the pin resting on the upper arm and having at one side a tongue with converging edges whose point is adapted to strike said shoulder when the clevis is put under tension and turn and hold the pin out of said certain position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MILFORD A. NELSON.

Witnesses:

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GEO. I. BOYD.