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LOCKING MECHANISM FOR BULLDOZER BLADES

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FIG. 1.

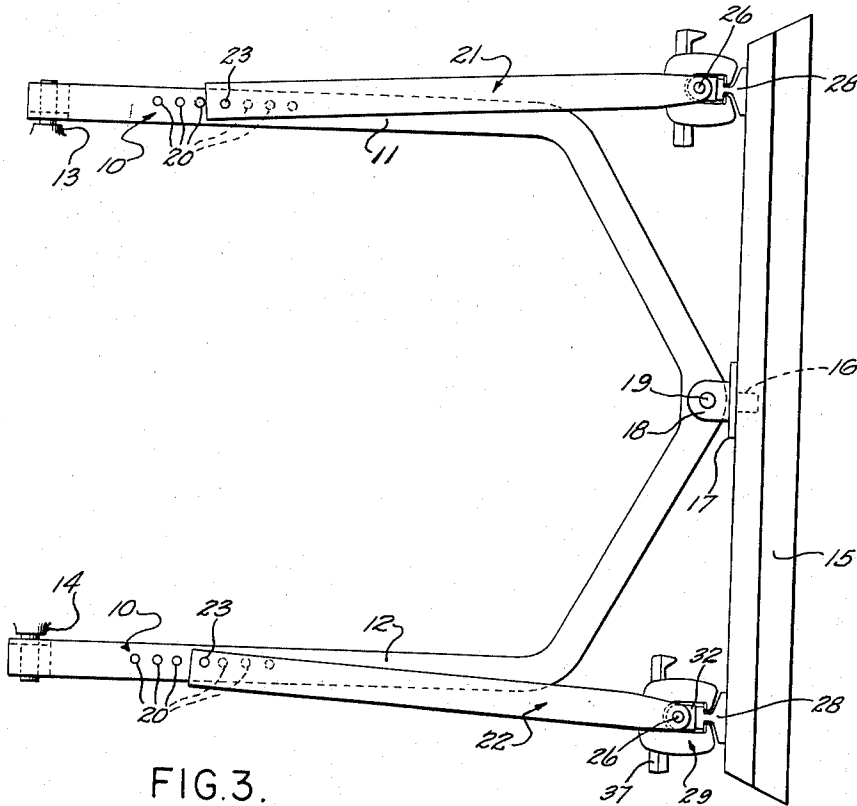


FIG. 3.

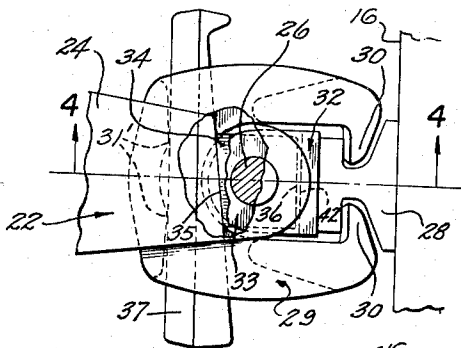


FIG. 2.

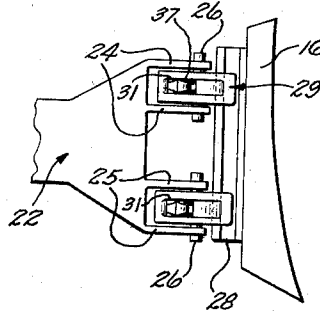
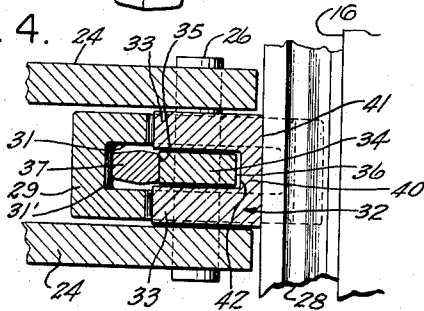


FIG. 4.



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LOCKING MECHANISM FOR BULLDOZER BLADES

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10 Claims. (Cl. 287—20)

This invention relates to improvements in locking mechanisms for bulldozer blades.

Varying working conditions require that the mounting of bulldozer blades be such as to permit tilting on a horizontal axis as well as on a vertical axis. To accomplish this it has been common practice to connect a central portion of the bulldozer blade to the front end of a tractor-mounted supporting frame through a swivel joint so disposed as to permit the required tilting movement. To retain the blade in a selected position the end portions of the blade have heretofore been provided with vertical rails with which the landsides of the supporting frame are adjustably connected by means of a wedge type lock. Release of this lock permits tilting of the blade and corresponding sliding adjustment of the position of the locking wedge on the blade rails. In this type of construction the blade is locked in selected position by forcibly driving the wedge into place.

Wedge locking mechanisms as heretofore developed have not been entirely satisfactory because the wedges rapidly become worn and the rails become damaged, all of the working force being commonly transmitted to the blade through the wedges. When excessive wear on the wedges occurs, the latter tend to slip out easily and release the blade. The above may bring about the necessity of making costly repairs or replacement.

With the above in mind, it is a principal object of the present invention to provide an improved bulldozer blade locking mechanism of the wedge type which is constructed to firmly clamp the blade rail and hold the blade in any selected position, the construction minimizing the possibility of accidental release of the locking wedge during use.

A further object of the invention is to provide an improved locking mechanism of the class described wherein the forwardly acting forces are transmitted to the blade through an improved thrust block and not through the locking wedge. Thus the locking wedge is not subjected to excessive wear of the type which might cause accidental release.

A further object of the invention is to provide an improved locking mechanism of the class described in which the possibility of damage to the blade rails as a result of normal use is minimized. Thus frequent repair or replacement is not required.

A further object of the invention is to provide an improved locking mechanism of the class described which is strong and durable, easy to manufacture, and otherwise well adapted for the purposes described.

With the above and other objects in view, the invention consists of the improved locking mechanism for bulldozer blades and all of its parts and combinations, as set forth in the claims, and all equivalents thereof.

In the drawing accompanying and forming a part of this specification, wherein is shown one complete embodiment of the preferred form of the invention, and wherein like characters of reference indicate the same parts in all of the views:

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Fig. 1 is a plan view of a bulldozer having the improved locking mechanism embodied therein;

Fig. 2 is a fragmentary side elevational view of the bulldozer of Fig. 1;

Fig. 3 is an enlarged fragmentary plan view of one of the improved locking mechanisms; and

Fig. 4 is a vertical sectional view taken along the line 4—4 of Fig. 3.

Referring more particularly to Fig. 1 of the drawing, the numeral 10 indicates a generally U-shaped frame for supporting a bulldozer blade, the rear ends of the arms 11 and 12 being pivotally connected to the sides of a tractor (not shown) as at 13 and 14. Suitable means (not shown) is also provided for raising and lowering the frame 10 about the pivots 13 and 14.

Pivotally mounted at the forward end of frame 10 on a horizontal swivel pin 16 for tilting movement in a vertical plane about the longitudinal axis of the tractor is a bulldozer blade 15. Fixed to the swivel pin 16 is a vertical plate 17 on which a pair of rearwardly directed, spaced, apertured, horizontal ears 18 are formed. The ears 18 are positioned above and below the forward end of the frame 10 and are pivotally connected thereto by a vertical king pin 19. The blade 15 can be swung in a normally horizontal plane about the axis of the king pin 19.

The rear end portions of the arms 11 and 12 have spaced vertical apertures 20 and the rear ends of channel members or landsides 21 and 22 removably carry pins 23 which are receivable in selected holes 20. Referring to Fig. 2, the forward end of each landside is equipped with two vertically spaced pairs 24 and 25 of forwardly directed horizontal ears, there also being vertical pins 26.

As shown in Fig. 1, the back of blade 15 has fixed thereto near each end a vertical T- or I-shaped rail 28. The bulldozer blade 15 is retained in a selected tilted position in a vertical plane by the improved adjustable locking mechanism which connects the forward ends of the landsides 21 and 22 to the rails 28. There are two such locking mechanisms on each landside, as shown in Fig. 2, and all of said mechanisms may be substantially identical. Only one of the improved locking mechanisms will be described in detail.

As shown in Figs. 3 and 4 of the drawing, a clamping block 29, which is C-shaped in plan view, is positioned between the upper pair of ears 24 of landside 22. The block 29 embraces the pin 26 and has intumed vertical front edge flanges 30 positioned in engagement with the vertical front surfaces of the head of rail 28. The block 29 has a transverse horizontal aperture 31 extending therethrough rearwardly of the pin 26 providing transverse vertical wall portions 31' spaced rearwardly from said pin. A thrust block 32 which is U-shaped in vertical section has a vertical wall 40 having a forward face 41 which is in abutment with the vertical rear surface of the head of rail 28 and having a rear face 42. The thrust block 32 has vertically spaced, rearwardly directed horizontal flanges 33 which are apertured to receive the pin 26. The block 32 is positioned between the flanges 24 as is clearly shown in Fig. 4.

Positioned between the flanges 33 of the thrust block 32 is a block 34 which is substantially rectangular except that its vertical rear edge surface 35 is angled with respect to the vertical front edge surface 36 thereof. The block 34 is vertically apertured to receive the pin 26, and the edge surface 36 is spaced from the vertical rear face 42 of the thrust block 32 as shown. An elongated wedge 37 extends horizontally through the aperture 31 of clamping block 29, engaging the rear wall of said aperture and also engaging the angled rear wall 35 of the block 34.

In use of the improved locking mechanism, the bulldozer blade 15 is tilted vertically to a selected position,

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with the wedges 37 relatively loosely positioned in apertures 31 between blocks 34 and wall portions 31'. This loose fit permits the heads of rails 28 to slide vertically within the clamping blocks. When the blade is in a selected position the wedges 37 are driven home to tightly clamp the heads of rails 28 between the clamping block flanges 30 and the thrust blocks 32. This action is due to the fact that the wedges force the clamping blocks rearwardly and thus cause the latter to pull the rail heads against the forward faces of the thrust blocks 32.

Substantially all of the useful work performed by a bulldozer blade is accomplished when the latter is pushed forwardly. During such an operation the pushing force is transmitted from the landsides to the blade through ears 24, pins 26, and thrust blocks 32. None of the pushing force is transmitted through the wedges 37. Since the forward wall of a thrust block is wider than the head of rail 28 and has a substantial vertical dimension, the thrust is transmitted over a relatively large surface and no damage to the rails results from the pushing stresses thereon. Inasmuch as the wedges are not subjected to any of the pushing stresses, they are not subject to rapid wear, and do not tend to work loose.

Various changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What I claim is:

1. A thrust transmitting locking mechanism for connecting a supporting member having a supporting pivot pin to a supported member wherein the latter has an outer surface facing said supporting member and has an inner surface facing away from said supporting member, comprising: a clamping member having oppositely disposed legs embracing said pivot pin with said pin located intermediate the length of said clamping member legs and said clamping member having a shoulder which is engageable with the inner surface of the supported member, said clamping member also having a wall portion which is spaced from said pivot pin on the side of the latter which is opposite the side on which said supported member is located; a thrust member pivotally carried by said pin and having a face normally positioned for abutment with the outer surface of said supported member; and wedge means positioned to act between said pin and wall portion of the clamping member for urging said wall portion away from said pin to thereby clamp the supported member between said thrust member and the shoulder of said clamping member.

2. A thrust transmitting locking mechanism for connecting a supporting member having a supporting pivot pin to a supported member wherein the latter has an outer surface facing said supporting member and has an inner surface facing away from said supporting member, comprising: a clamping member located adjacent and embracing said supporting pin and having a shoulder which is engageable with the inner surface of the supported member, said clamping member also having a wall portion which is spaced from said pivot pin on the side of the latter which is opposite the side on which said supported member is located; a thrust member pivotally carried by said pin and having a face normally positioned for abutment with the outer surface of said supported member; a block carried by said pin; and a wedge positioned between and engaging said block and said wall portion of the clamping member for urging said wall portion away from said block to thereby clamp the supported member between said thrust member and the shoulder of said clamping member.

3. A thrust transmitting locking mechanism for connecting a supporting member having a supporting pivot pin to a supported member wherein the latter has an outer surface facing said supporting member and has an inner surface facing away from said supporting member, comprising: a C-shaped clamping member having legs em-

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bracing said pin with said pivot pin located intermediate the length of said legs and said clamping member having shoulders engaging the inner surface of the supported member, said clamping member having a transverse wall portion which is spaced from said pivot pin on the side of the latter which is opposite the side on which said supported member is located; a thrust member pivotally carried by said pin and having a face normally positioned for abutment with the outer surface of said supported member; and wedge means positioned to act between said pin and transverse wall portion of the clamping member for urging said wall portion away from said pin to thereby clamp the supported member between said thrust member and the shoulder of said clamping member.

4. A thrust transmitting locking mechanism for connecting a supporting member having a supporting pivot pin to a rail or the like wherein said rail has a head provided with a pair of inner surface portions and with an outer surface, comprising: a clamping member having oppositely disposed legs embracing said pivot pin with said pin located intermediate the length of said clamping member legs and said clamping member having spaced shoulders engageable with the inner surfaces of said rail head, said clamping member also having a transverse wall portion which is spaced from said pivot pin on the side of the latter which is opposite the side on which said rail is located; a thrust member pivotally carried by said pin and having a face normally positioned for abutment with the outer surface of said rail head; and wedge means positioned to act between said pin and wall portion of the clamping member for urging said wall portion away from said pin to thereby clamp the rail head between the thrust member and the shoulders of said clamping member.

5. A thrust transmitting locking mechanism for connecting a supporting member having a supporting pivot pin to a rail or the like wherein said rail has a head provided with a pair of inner surface portions and with an outer surface, comprising: a C-shaped clamping member having legs embracing said pin with said pivot pin located intermediate the length of said legs and said clamping member having spaced shoulders engageable with the inner surfaces of said rail head, said clamping member also having a transverse wall portion which is spaced from said pivot pin on the side of the latter which is opposite the side on which said rail is located; a thrust member pivotally carried by said pin and having a face normally positioned for abutment with the outer surface of said rail head; and wedge means positioned to act between said pin and wall portion of the clamping member for urging said wall portion away from said pin to thereby clamp the rail head between the thrust member and the shoulders of said clamping member.

6. A thrust transmitting locking mechanism for connecting a supporting member having a supporting pivot pin to a rail or the like wherein said rail has a head provided with a pair of inner surface portions and with an outer surface, comprising: a C-shaped clamping member embracing said pin and having spaced shoulders engageable with the inner surfaces of said rail head, said clamping member also having a transverse wall portion which is spaced from said pivot pin on the side of the latter which is opposite the side on which said rail is located; a thrust member pivotally carried by said pin and having a face normally positioned for abutment with the outer surface of said rail head; a block pivotally carried by said pin; and a wedge positioned between said block and the transverse wall portion of the clamping member for urging said wall portion away from said block to thereby clamp the rail head between the thrust member and the shoulders of said clamping member.

7. A thrust transmitting locking mechanism for connecting a supporting member having a supporting pivot pin to a rail or the like wherein said rail has a head provided with a pair of inner surface portions and with an outer surface, comprising: a C-shaped clamping member having

legs embracing said pin with said pin located intermediate the length of said legs and said clamping member having spaced inwardly directed flanges engageable with the inner surfaces of said rail head, said clamping member also having a transverse wall portion which is spaced from said pivot pin on the side of the latter which is opposite the side on which said rail is located; a thrust member pivotally carried by said pin and having a face normally positioned for abutment with the outer surface of said rail head; and wedge means positioned to act between said pin and said wall portion of the clamping member for urging said wall portion away from said pin to thereby clamp the rail head between the thrust member and the flanges of said clamping member.

8. A thrust transmitting locking mechanism for connecting a supporting member having a supporting pivot pin to a rail or the like wherein said rail has a head provided with a pair of inner surface portions and with an outer surface, comprising: a C-shaped clamping member embracing said pin and having spaced inwardly directed flanges engageable with the inner surfaces of said rail head, said clamping member also having a transverse wall portion which is spaced from said pivot pin on the side of the latter which is opposite the side on which said rail is located; a thrust member pivotally carried by said pin and having a face normally positioned for abutment with the outer surface of said rail head; a block pivotally carried by said pin; and a wedge positioned between said block and said wall portion of the clamping member for urging said wall portion away from said block to thereby clamp the rail head between the thrust member and the flanges of said clamping member.

9. A thrust transmitting locking mechanism for connecting a supporting member having a pin to a rail which is generally parallel to said pin and which has a head provided with a pair of spaced inner surfaces and with an outer surface, comprising: a clamping member which is C-shaped in outline and which embraces said pin and has spaced inwardly directed flanges engageable with the inner surfaces of said rail head, said clamping member having an opening therethrough normal to said pin on the side of said pin which is opposite said rail to provide a wall portion spaced from said pin; a thrust member which is generally U-shaped in outline surrounded by said clamping member and having spaced flanges normal to

said pin and apertured to receive the latter and having a face parallel with and normally positioned for abutment with the outer surface of said rail head; a block positioned between the flanges of said thrust member, said block being apertured to receive said pin, said block having a surface which is spaced from and faces said clamping member wall portion; and a wedge positioned in the opening of said clamping member between said surface of said block and the wall portion of said clamping member for urging said wall portion away from said block to thereby clamp the rail head between the thrust member and the flanges of said clamping member.

10. A thrust transmitting locking mechanism for connecting a normally vertical pin to a generally vertical rail which latter has a rearwardly directed head provided with a pair of spaced front surfaces and a rear surface, comprising: a clamping member which is C-shaped in plan view embracing said pin and having spaced inwardly directed flanges engageable with the front surfaces of said rail head, said clamping member having a horizontal transverse opening therethrough rearwardly of said pin to provide a vertical wall portion which is spaced rearwardly from said pin; a thrust member which is generally U-shaped in side elevation surrounded by said clamping member and having rearwardly directed spaced horizontal flanges which are apertured to receive said pin and having a vertical front face normally positioned for abutment with the rear surface of said rail head; a block positioned between the flanges of said thrust member, said block being apertured to receive said pin and having a vertical rear surface spaced from and facing said vertical wall portion of the clamping member; and a horizontal wedge positioned in the transverse opening of said clamping member between the rear surface of said block and the vertical wall portion of said clamping member for urging said wall portion rearwardly to thereby clamp the rail head between the thrust member and the flanges of said clamping member.

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