Oct. 20, 1953 H. H. WASHBOND 2,655,742

CABLE MOUNTING FOR SCRAPERS OR GRADERS

Original Filed April 21, 1945 2 Sheets-Sheet 1

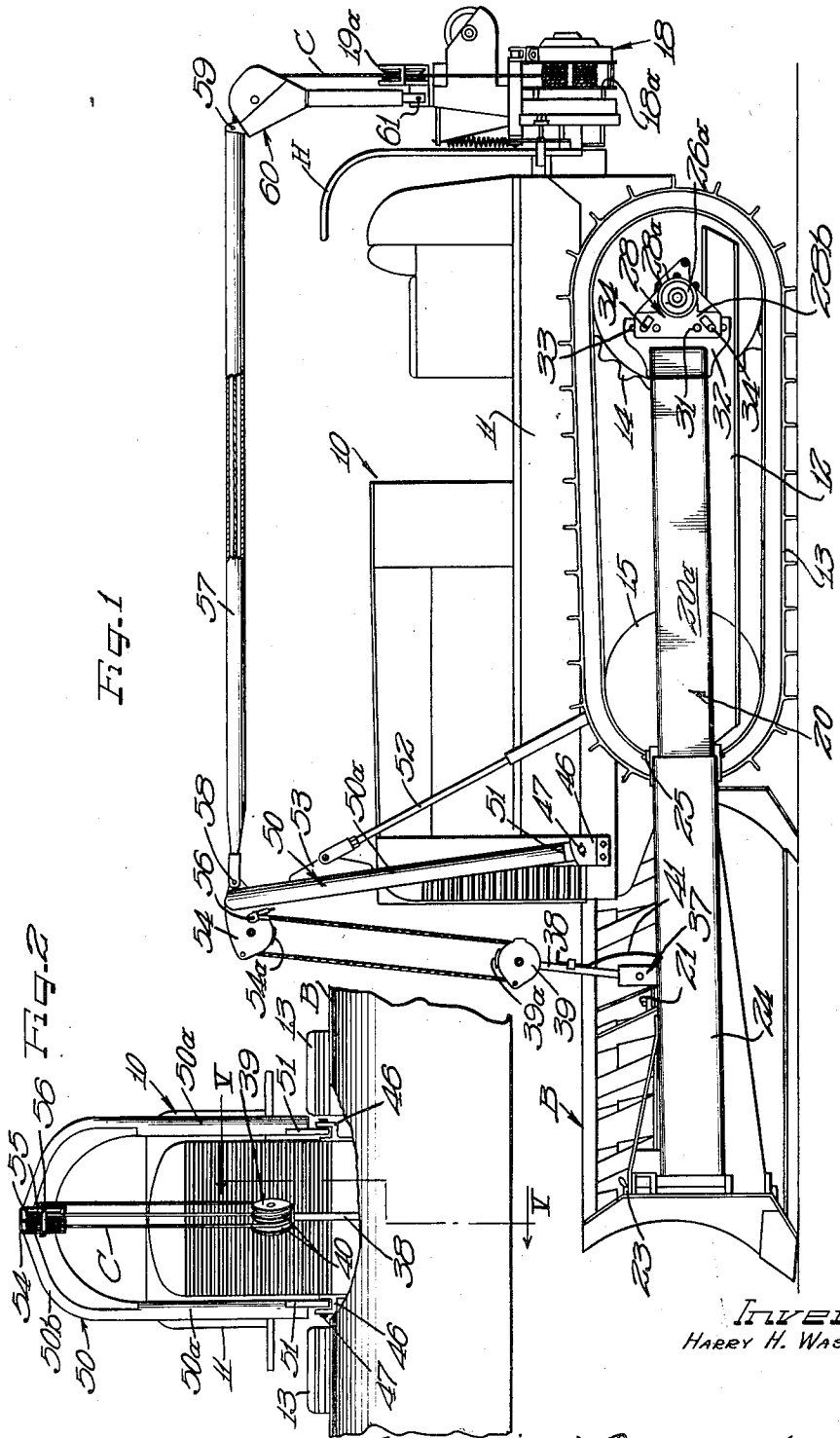


Fig. 1

Fig. 2

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Fig. 3

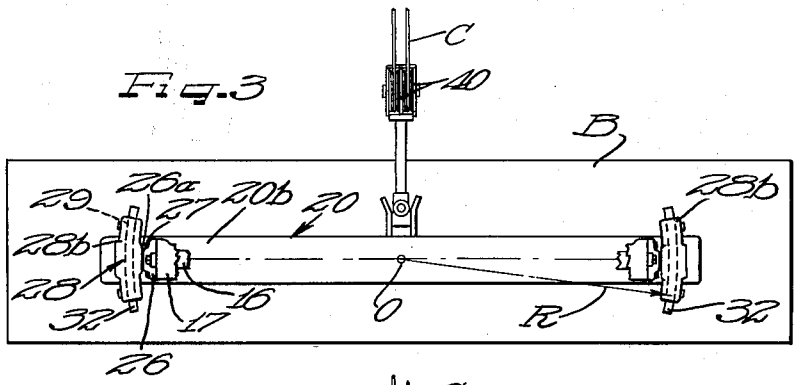


Fig. 4

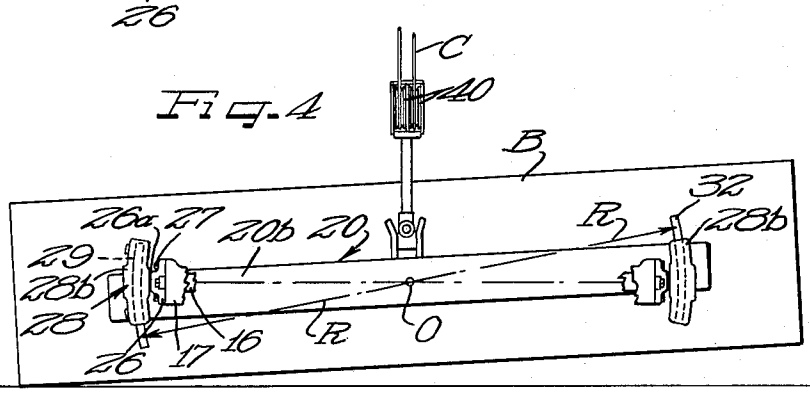


Fig. 5

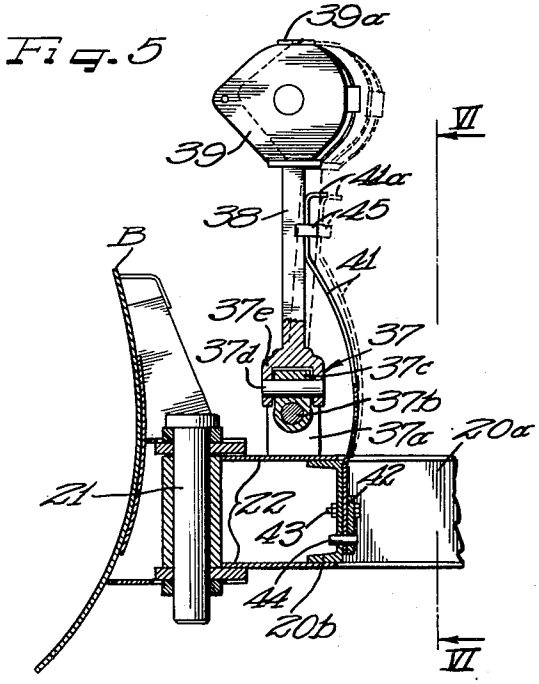
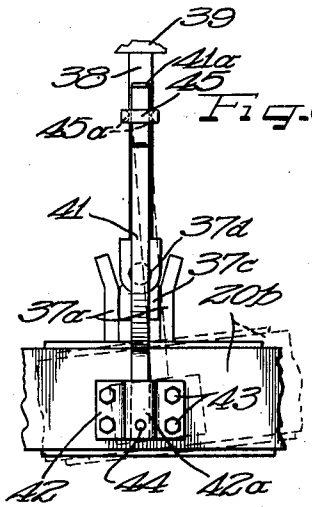


Fig. 6



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CABLE MOUNTING FOR SCRAPERS OR GRADERS

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Original application April 21, 1945, Serial No. 589,592. Divided and this application October 6, 1949, Serial No. 119,869

6 Claims. (Cl. 37—144)

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This invention relates to a cable mounting for implement blade-equipped machines, such as bulldozers, angledozers, snowplows and the like.

Specifically, this invention relates to a cable sheave mounting on an implement blade that is so arranged as to guide the cable for exerting a direct pull to raise and lower the blade.

This application is a division of my copending application entitled "Scraper or Grader," Serial No. 589,592, filed April 21, 1945 now Patent No. 2,503,929, issued April 11, 1950.

Because of the disclosure in the parent application, Serial No. 589,592, this invention will be hereinafter specifically described as embodied in an angledozer, but it should be understood that the principles of this invention are generally applicable to cable sheave mountings for any desired usage. In accordance with the preferred embodiment of this invention, the blade frame of an angledozer is raised and lowered relative to the tractor on which it is mounted by means of a winch-actuated cable. A winch is mounted on the rear end of the tractor and a cable passes from the winch through a tube overlying the tractor and supported at its rear end by an upright frame and at its front end by a saddle or frame. The saddle at the front end carries a sheave receiving the cable from the tube. The blade frame has a cross beam in the front of the tractor carrying a universal joint midway between the push beams of the frame. A rigid sheave-carrying bar has one end thereof supported by a universal joint and the other end thereof rotatably carrying a sheave for receiving the cable. The end of the cable is anchored to the front saddle. A leaf spring is provided for urging the bar into upright position so that the sheave on the bar will not become fouled when the cable is slack. The bar carries the sheave at a level above the top of the blade, so that this sheave can be brought into contact with the saddle-carried sheave when the blade is in maximum elevated position. The universal joint permits the bar-carried sheave to swing so that the sheave thereon will always be in direct alignment with the saddle-carried sheave.

It is, then, an object of this invention to provide a universal joint-carried sheave arrangement for a cable-actuated scraper blade that provides for a direct pull on the blade frame in all positions of the frame.

A further object of the invention is to provide a sheave arrangement for cable-operated implements on tractors or the like including a self-aligning sheave that eliminates possible fouling of the cable.

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A specific object of the invention is to provide the implement frame of a tractor-mounted dozer or the like with a cable-receiving sheave connected thereto through the media of a universal joint and having spring means urging the sheave in an upright position relative to the frame.

Another object of the invention is to provide a dozer frame with a cable-connecting means that can swing independently of the blade frame and control the position of the cable for a direct pull on the frame.

Other and further objects of the invention will be apparent to those skilled in the art from the following detailed description of the annexed sheets of drawings which, by way of a preferred example, illustrate one embodiment of the invention.

On the drawings:

Figure 1 is a side elevational view, with a part broken away and shown in vertical cross section, of a cable-actuated angledozer embodying a cable mounting in accordance with this invention.

Figure 2 is a fragmentary front end elevational view of the angledozer shown in Figure 1, with a part of the blade broken away to show underlying parts.

Figure 3 is a fragmentary, somewhat diagrammatic, rear end elevational view of the tilting blade mounting illustrating the blade in horizontal or uncocked position, and the self-aligning sheave in vertical position.

Figure 4 is a view similar to Figure 3 but illustrating the blade in cocked position, and showing how the self-aligning sheave remains in vertical position.

Figure 5 is a vertical cross-sectional view, with parts in elevation, taken substantially along the line V—V of Figure 2.

Figure 6 is a fragmentary rear elevational view taken substantially along the line VI—VI of Figure 5.

As shown on the drawings:

In Figures 1 and 2, the reference numeral 10 designates generally a tractor having a main body portion 11, a tractor track frame 12 on each side of the body 11, and track laying belts 13 trained between driven rear sprockets 14 and front idler wheels 15. As shown in Figures 3 and 4, the tractor has an axle 16 surrounded by an axle bracket 17. The track frame 12 is secured to this axle bracket and the track frames thereby oscillate about the axle 16.

A winch 18 is mounted on the rear end of the tractor body 11 and has a winder drum 18a thereon. Handles, such as H, operate clutches

and brakes (not shown) for selectively driving and braking the winder drum. A sheave 19a is rotatably mounted above the drum 18a to receive a cable C from the drum.

A U-shaped blade carrying frame 20 is provided for the angledozer blade B. This frame has side push beam arms 20a and a cross arm 20b. The side arms 20a straddle tracks 13 and the cross arm 20b extends across the front of the tractor body 11.

The blade B is pivotally mounted midway between its ends on a vertical pin 21 which, as best shown in Figure 5, is carried by a bracket 22 on the cross arm 20b. The blade B can thus be swung about a vertical axis into selected angledoze and bulldoze positions.

The ends of the blade B are pivotally connected on vertical pivot pins 23 to struts 24 which are adjustably anchored on the side push beam arms 20a along the lengths of these arms by means of anchor pins 25. The struts hold the blades B in adjusted position on the center pivot 21.

The axle brackets 17 of the tractor, as shown in Figure 3, have stub shaft brackets 26 bolted thereon by means of bolts 27. Each stub shaft bracket 26 has a stub shaft portion 26a projecting outwardly from the tractor in line with the axle 16.

Push beam brackets 28 each have a cylindrical bearing portion 28a pivotally mounted on each stub shaft 26a together with an arcuate upstanding flange portion 28b struck from a radius R centered about the axle midpoint O of the tractor axles 16 as best shown in Figures 3 and 4. The upstanding arcuate flange 28b has an arcuate open ended groove 29 struck from a radius centered on the same center O and this arcuate groove is closed at its inner end by an abutment wall. The upstanding arcuate portion 28b also has a plurality of holes 31 therethrough spaced along the length thereof and intersecting the groove 29.

The push beam arms 20a have upstanding arcuate flanges 32 integrally affixed on the rear ends thereof and these flanges are struck from the same radius as the groove 29 and are adapted to project into the groove to be fully bottomed on the abutment wall end thereof. The flanges 32 are longer than the flanges 28b of the push beam brackets 28 but the open ends of the groove permit the ends of the flanges to project from the groove. The flanges 32 have holes 33 therein adapted to register with the holes 31 and locking pins 34 project through the aligned holes for adjustably carrying the flanges in the grooves.

The frame 20, as illustrated in Figures 3 and 4, is tilted through a relatively wide range by selectively securing the flanges 32 of the push beams in the brackets 28. This tilting or cocking of the frame, in carrying the struts 24 and pivot pin 21 therewith, of course, tilts the blade B throughout the same range. Since the tractor track frames 12 oscillate about the axle 16, and since the push beam brackets are pivoted coaxially with this axle, the frame is not subjected to any warping strains during independent oscillation of the tractor track frames, as when the tracks move over the uneven ground. At the same time, however, the frame 20 can be carried in the selected cocked or tilted position, and will remain in this position relative to the axle 16. Thus the frame 20 is adjustably cocked or tilted relative to the axis of the axle of the tractor but, when so adjusted, the frame remains in the same angular relation relative to the axle and will carry the blade in response to the positions assumed by the axle in operation of the tractor.

As best shown in Figure 5, the bracket 22 on the cross beam 20b of the frame 20 carries a universal joint 37 composed of upstanding ears 37a on the bracket 22, a first pin 37b pivoted on the ears 37a and pivotally carrying a joint member 37c which is pivoted by a second pin 37d to ears 37e on the lower end of a bar 38. The bar 38 can thus tilt in all directions relative to the frame 20 but is held against rotation relative to the frame.

A sheave frame 39 is secured on the upper end of the bar 38 and a pair of sheaves 40 is rotatably mounted in the frame 39 in side by side relation as shown in Figures 2 to 4.

A leaf spring 41, best shown in Figures 5 and 6, is pivotally mounted for limited sidewise swinging movement on the cross beam 20b. The leaf spring 41 has a bottom end portion held against the vertical wall of the beam 20b by means of a bracket 42 bolted on the beam by means of bolts 43 and carrying a pivot pin 44 which projects through the spring and beam. The pin 44 is welded to the bracket 42. The bracket 42 has an offset portion 42a receiving the spring 41 therein and accommodating limited swinging movement of the spring.

The upper end of the spring 41 is embraced by a strap 45 secured on the bar 38 and having inner rocking faces 45a to accommodate rocking movements of the leaf spring relative to the bar 38. The leaf spring 41 is slidable through the strap 45 and has a flange 41a on the free end thereof to prevent withdrawal of the spring from the strap.

As illustrated in Figure 5, the spring 41 urges the bar 38 into upright position toward the blade B but permits rearward swinging of the bar as shown in dotted lines. As shown in Figure 6, the pivotal mounting of the spring and the arcuate rocking faces 45a of the strap 45 permits the frame beam 20b to tilt without tilting the bar 38.

The bar 38 carries the sheaves 40 above the top of the blade B for a purpose to be hereinafter described. The top of the sheave frame 39 has an abutment block 39a secured thereon for a purpose to be more fully hereinafter described.

As best shown in Figures 1 and 2, the sides of the body 11 have brackets 46 secured thereon near the front end of the body. These brackets carry pins 47. A U-shaped frame or saddle 50 has side arms 50a straddling the tractor body and a cross arm 50b overlying the tractor body. The bottom ends of the arms 50a have flanges 51 secured thereon extending into the brackets 46 and pivotally carried by the pins 47. Braces such as 52 are pivotally secured to the brackets such as 53 on the side arms 50a and are anchored on the body 11 rearwardly from the brackets 46 to hold the saddle frame 50 in upright forwardly inclined position.

A sheave block or frame 54 is fixedly carried by the cross arm 50b of the saddle frame 50 and projects forwardly of the tractor body as best shown in Figure 1. This sheave frame 54 rotatably supports a pair of sheaves 55 (Figure 2) in side by side relation. An abutment block 54a is provided at the bottom of the frame 54 for opposing the block 39a of the frame 39.

The cable C has the free end thereof anchored to a clamp 56 on the side of the sheave frame 54. The cable is trained from this anchor 56 around the first sheave 40 in the frame 39, thence around the first sheave 55 in the frame 54, next around

the second sheave 40 in the frame 39, and thence around the second sheave 55 in the frame 54.

A tube 57 is pivoted at 58 to the cross arm 50b of the saddle frame 50 immediately behind the sheave frame 54 for receiving the cable from the second sheave 55. The rear end of the tube 57 is pivoted at 59 to a frame 60 which is pivoted at 61 to the winch 18.

The cable C is directed around a sheave carried by the frame 60 and thence through the tube 57 to the second sheave 55 in the frame 54.

The bar 38 carrying the sheave frame 39 can tilt on its universal joint support so that the sheaves 40 will always be aligned with the sheaves 55 and the cable runs between these sheaves 40 and 55 cannot become fouled. The abutment blocks 39a and 54a likewise will always be aligned and, in the event that the blade is raised to its maximum height, no damage will be done to the sheaves because the abutment blocks will be the first members to come together.

The sheaves 40 will not get fouled behind the blade B because the bar 38 carries these sheaves at a level above the top of the blade. When the cable is slack, the spring 41 will hold the bar 38 in upright position to prevent fouling of the cable runs. The spring, however, will flex to permit fore and aft movement of the sheave frame 39 such as occurs during raising and lowering of the frame 20.

From the above descriptions it will be understood that this invention provides a cable mounting for a cable actuated scraper blade assembly on a tractor or the like wherein the blade can be cocked relative to the tractor without straining any of the parts and wherein the cable is so guided as to have a direct pull on the blade.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In a cable actuated implement frame for a tractor or the like, a universal joint carried by said frame, a rigid bar carried by said joint, a sheave frame on said bar, a leaf spring having one end pivotally carried by said frame and the other end acting on said bar, a strap anchored on said bar embracing the other end of the leaf spring, said leaf spring urging said bar into upright position, and said universal joint allowing swinging movement of the sheave frame relative to the implement frame to provide for a direct pull of the cable irrespective of the tilted position of the implement frame.

2. In a tractor mounted cable operated dozer assembly including a tiltable blade frame, a cable for raising and lowering said frame, a cable guide on the tractor for said cable, and means for cocking the blade frame transversely of the tractor, the improvements of a bar mounted on the blade frame and projecting thereabove, a cable guide on said bar receiving the cable from the cable guide on the tractor, and a joint between the bar and blade frame accommodating tilting movements to maintain the bar mounted

cable guide aligned with the cable guide on the tractor irrespective of the tilted or cocked position of the frame on the tractor, said joint including a joint member pivotally mounted on said frame for movement about a generally horizontal axis, and means on said joint member pivotally mounting the bar for movement about an axis transverse to said horizontal axis and transverse to the longitudinal axis of the bar.

3. A cable mounting for a blade frame which comprises a bar, means pivoting the bar on the upper end of the frame and limiting rotation of the bar about its longitudinal axis, a sleeve rotatably mounted on the free end of the bar, and resilient means urging the bar into an upright position to maintain the sheave above the blade while accommodating relative tilting of the blade frame and bar.

4. A cable mounting for a blade frame, comprising, a bar, means pivoting the bar on the frame and limiting rotation of the bar about its longitudinal axis, a sheave rotatably mounted on the free end of the bar, and a leaf spring having one end connected to the frame, the other end thereof urging the bar into an upright position to maintain the sheave above the blade while accommodating relative tilting of the blade frame and bar.

5. A cable mounting for elevating and lowering of a tractor blade frame or the like movable about two transversely related generally horizonal axes, comprising: a joint member pivotally mounted on the frame for movement about an axis parallel to one of said axes, a bar pivotally mounted at one end on said joint member for movement about an axis parallel to the other of said axes, a sheave mounted on the other end of said bar, and resilient means urging said bar into an upright position.

6. A cable mounting for a tractor blade frame or the like mounted for elevating and lowering movement about one horizontal axis and for limited movement about a second horizontal axis transverse to said one horizontal axis, comprising: a sheave universally mounted on said frame, a leaf spring upstanding from said frame, means connected to said sheave and embracing said leaf spring for resiliently resisting rotation of said sheave about an axis parallel to said one horizontal axis, and means mounting said leaf spring on said frame for limited pivotal movement of said sheave about an axis parallel to said second horizontal axis.

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