Sept. 7, 1926. 1,598,802

R. L. BROWN

FAIR LEAD

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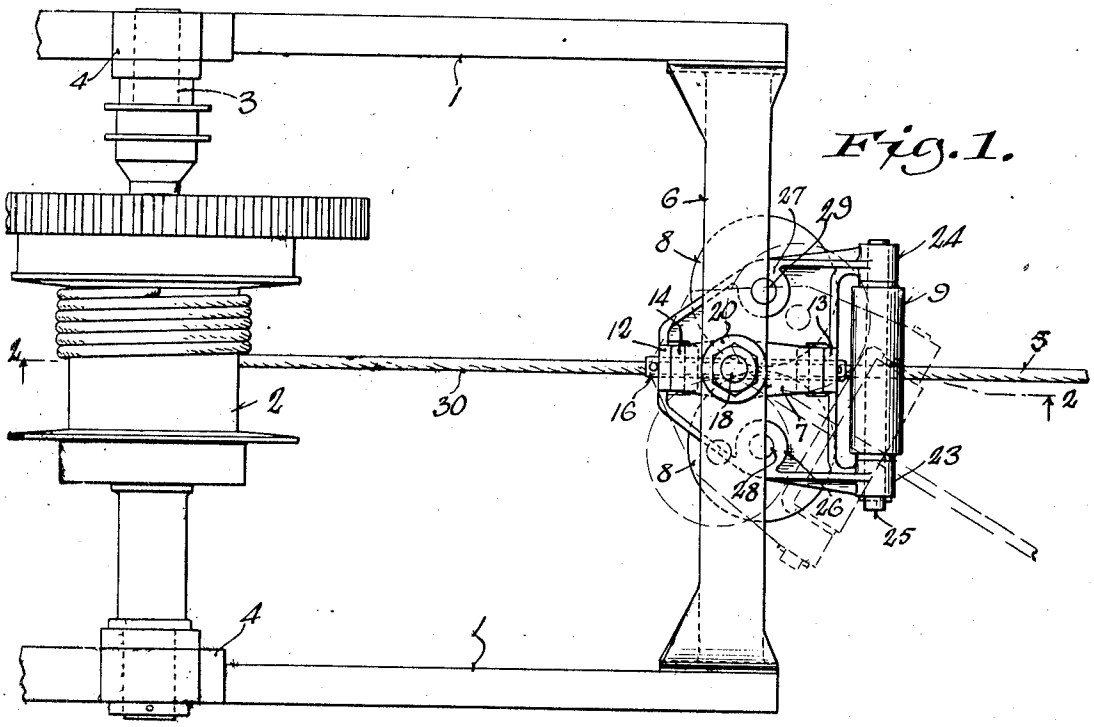


Fig. 1.

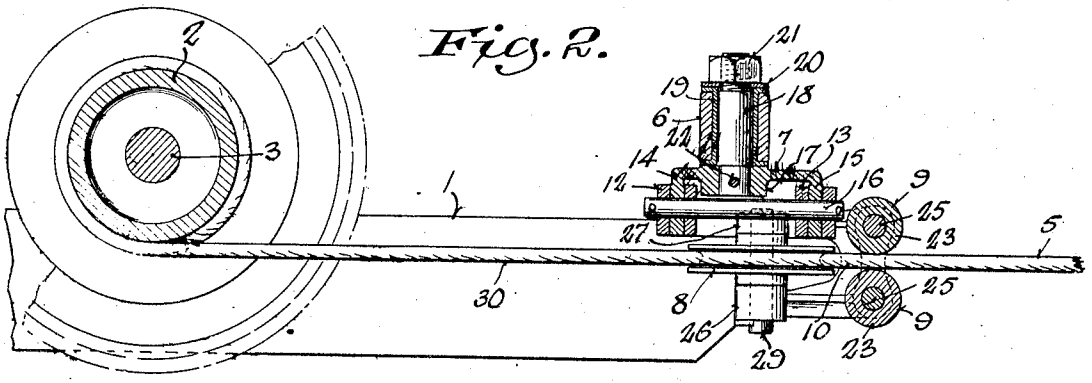


Fig. 2.

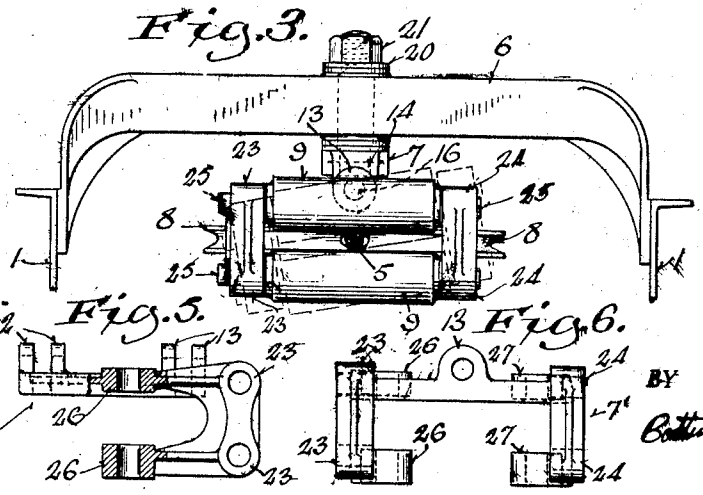


Fig. 3.

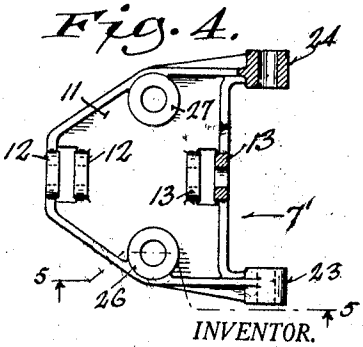


Fig. 4.

Fig. 5.

Fig. 6.

INVENTOR.

ROBERT L. BROWN

BY

Bottum, Hudnall, Locher & McNamara.

ATTORNEYS.

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UNITED STATES PATENT OFFICE.

ROBERT L. BROWN, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO HARNISCHFEGER CORPORATION, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

FAIR LEAD.

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This invention relates to improvements in cable guides and more particularly to cable leading or guiding devices of the type generally known as fairleads used to eliminate cable wear.

These cable guides or fairleads are particularly useful in connection with excavators comprising, in general, a suitable tractor upon which the various cable drums and operating mechanism are mounted, a boom for supporting the excavating equipment, and tackle comprising a cable and pulleys arranged to properly guide the same, one end of the cable being secured to one of the drums for the purpose of pulling the cable in or paying it out. On account of the many different positions which the boom and cable may assume, it has been found advantageous to provide a cable leading or guiding device supported adjacent said drum and adapted to maintain that portion of the cable adjacent the drum in substantially a fixed position with respect thereto so that proper winding and unwinding of the cable upon and from the drum will be assured regardless of the position of the boom or the direction of pull upon the cable between the device and the drag-line scraper, drag-line bucket, or other excavator implement.

An object of the invention therefore is to provide an improved cable guiding device which will change its position in accordance with changes in position of the cable, and at the same time maintain that portion of the cable adjacent the drum in proper alignment therewith.

Another object is to provide an improved cable guiding device which shall possess advantages in both construction and operation over those heretofore used and which shall be simple in construction, durable and efficient.

Other objects and advantages will hereinafter appear.

For the purpose of illustrating the invention, an embodiment thereof is shown in the drawings, in which:

Figure 1 is a plan view;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is an end elevation, looking toward the left in Fig. 2;

Fig. 4 is a detail plan view, partly in section;

Fig. 5 is a front elevation, partly in section, of Fig. 4; and

Fig. 6 is an end elevation, looking toward the left in Fig. 4.

Referring more particularly to Figs. 1 and 2, a portion of an excavator of the type used in handling drag-line buckets or scrapers is shown as comprising side frame members 1 between which the cable drum 2 is rotatably mounted on a suitable shaft 3 journaled in bearings 4, the cable 5 having one end thereof connected to the drum and the other end to the drag-line bucket or scrapers (not shown). A cable guiding device made in accordance with the present invention may comprise a bracket 6 extending between frame members 1 and secured thereto in any suitable manner, a yoke 7 pivotally connected to the bracket for rotation in a horizontal plane, a carrier or member 7′ pivotally connected to the yoke for rocking movement or rotation in a vertical plane, and a pair of sheaves or pulleys 8 carried by said member and arranged in spaced relation to receive and guide cable 5, a pair of rotary members or rollers 9 also supported by member 7′ and arranged to maintain that part 10 of the cable at the pulleys 8 in the plane of rotation thereof.

The member 7′ may be cast in one piece and comprises a plate 11 provided with spaced lugs 12 and 13 between which the ends 14 and 15, respectively, of yoke 7 fit, these ends and the lugs being provided with registering openings to receive a pin 16 for pivotally connecting the member to the yoke for rocking movement or rotation in a vertical plane with respect thereto. Yoke 7 is provided with a boss 17 to receive the lower end of the pin 18 which fits loosely in a suitable bearing sleeve 19 in bracket 6, the pin being held in position by means of a suitable washer 20 and a nut 21 screwed upon the upper end of the pin, the lower end of the pin being fixed in boss 17 by any suitable means such as a rivet 22 extending through the boss and the pin. The lugs 12 and 13 and boss 17 are arranged so that the axis of pin 18 extended will intersect the axis of pin 16. From the foregoing it will be seen that member 7′ is connected to bracket 6 for movement with respect thereto about intersecting vertical and horizontal axes.

Member 7′ is further provided with bearings 23 and 24 adapted and arranged to receive spindles 25 for supporting rotary members or rollers 9 in spaced relation for rotation about parallel axes transverse to pin 16, the rollers thereby being supported for rocking or rotary movement about pin 16 in a vertical plane or in the plane of the parallel axes of spindles 25. The member 7′ is also provided with bearings 26 and 27 adapted and arranged to receive suitable spindles 28 and 29, respectively, for supporting pulleys 8 at either side of pin 16 for rotation about axes transverse thereto.

The pulleys 8 maintain that portion 30 of the cable between the device and drum 2 in proper alignment therewith and against movement in horizontal or vertical planes except of course the movement occasioned by the end of the cable at the drum as the cable winds upon and unwinds from the latter. The rollers 9 maintain that portion 10 of the cable at pulleys 8 in the plane of rotation thereof to prevent the cable from leaving the pulleys.

If the direction of pull of cable 5 in the horizontal plane changes, the cable guiding device will move about the vertical axis or pin 18 to a position such as shown in dotted lines in Fig. 1. If the direction of pull of cable 5 changes in a vertical plane, member 7′ and rollers 9 supported thereby will adjust themselves accordingly and rock or rotate about the horizontal axis or pin 16 to a position such as shown in dotted lines in Fig. 3. The cable guiding device thus has a universal movement with respect to bracket 6 so that the device adjusts itself to correspond with any change in the direction of pull of the cable and maintains that portion 30 of the cable in proper alignment with drum 2. The sheaves or pulleys 8 and rollers 9 eliminate rubbing friction of the cable and thus prevent excessive wear. An embodiment of the invention has been shown in connection with a machine for manipulating drag-line buckets and scrapers, but of course cable guiding devices made in accordance with the present invention as defined by the claims are of much broader adaptation and may be used in various other connections. Many changes in the size, shape and arrangement of the parts may be adopted without departing from the spirit of the invention or the scope of the claims.

The invention claimed is:

1. In a device of the character described, the combination of a bracket, a member connected to said bracket for movement with respect thereto about a vertical axis and for rotary movement in a plane parallel to said vertical axis, a pair of pulleys carried by said member and arranged to guide a cable, and means adapted to maintain the part of said cable at said pulleys in the plane of rotation thereof.

2. In a device of the character described, a bracket, a substantially vertical pin extending through said bracket and being provided with means for holding the same against downward axial movement with respect to said bracket, a member secured to the lower end of said pin and supported entirely thereby for rotary movement about the longitudinal axis thereof, a pair of pulleys carried by said member and arranged to guide a cable, said pulleys being supported for rotation in a plane transverse to said pin, and means adapted to maintain the part of said cable at said pulleys in the plane of rotation thereof.

3. In a device of the character described, the combination of a bracket, a yoke connected to said bracket for pivotal movement with respect thereto about a vertical axis, a member pivotally connected to said yoke, a pair of pulleys carried by said member and arranged to guide a cable, and means adapted to maintain the part of said cable at said pulleys in the plane of rotation thereof.

4. In a device of the character described, the combination of a bracket, a yoke connected to said bracket for pivotal movement with respect thereto about a vertical axis, a member pivotally connected to said yoke, a pair of pulleys carried by said member and arranged to guide a cable, and a pair of rotary members carried by said member and arranged to maintain the part of said cable at said pulleys in the plane of rotation thereof.

5. In a device of the character described, the combination of a bracket, a yoke connected to said bracket for pivotal movement with respect thereto about a vertical axis, a member connected to said yoke for movement with respect thereto about an axis intersecting said vertical axis, a pair of pulleys carried by said member and arranged to guide a cable, and a pair of rotary members carried by said member and arranged to maintain the part of said cable at said pulleys in the plane of rotation thereof.

6. In a device of the character described, the combination of a bracket, a yoke, a pin pivotally connecting said yoke to said bracket for rotation in a horizontal plane, a member provided with lugs arranged to fit against the ends of said yoke, a second pin passing through said lugs and said ends for pivotally connecting said member to said yoke, a pair of pulleys carried by said member and arranged to guide a cable, and a pair of rotary members carried by said member and arranged to maintain the part of said cable at said pulleys in the plane of rotation thereof.

7. In a device of the character described, the combination of a bracket, a yoke, a pin

pivotally connecting said yoke to said bracket for rotation in a horizontal plane, a member provided with lugs arranged to fit against the ends of said yoke, a second pin passing through said lugs and said ends and the axis of rotation of said first-mentioned pin for pivotally connecting said member to said yoke, a pair of pulleys carried by said member and arranged to guide a cable, and means adapted to maintain the part of said cable at said pulleys in the plane of rotation thereof.

8. In a device of the character described, the combination of a bracket, a member connected to said bracket for movement with respect thereto about intersecting axes disposed at right angles to each other, a pair of pulleys carried by said member and arranged to guide a cable, and means adapted to maintain the part of said cable at said pulleys in the plane of rotation thereof.

9. In a device of the character described, the combination of a bracket, a member connected to said bracket for movement with respect thereto about intersecting axes disposed at right angles to each other, a pair of pulleys carried by said member and arranged to guide a cable, and a pair of rotary members carried by said member and arranged to maintain the part of said cable at said pulleys in the plane of rotation thereof.

10. A device of the character described comprising a member provided with lugs adapted to receive a pin for pivotally supporting said member, said member being further provided with bearings adapted and arranged to support rotary members in spaced relation and for rotation about parallel axes transverse to said pin and with other bearings adapted and arranged to support pulleys at either side of said pin and for rotation about axes transverse thereto.

11. In a device of the character described, a bracket, a substantially vertical pin extending through said bracket and below the same, a member secured to the lower end of said pin and being entirely supported thereby for rotary movement about the longitudinal axis thereof, and cable-guiding means associated with said member and supported thereby for tilting movement with respect to the same.

In witness whereof I hereto affix my signature.

ROBERT L. BROWN.