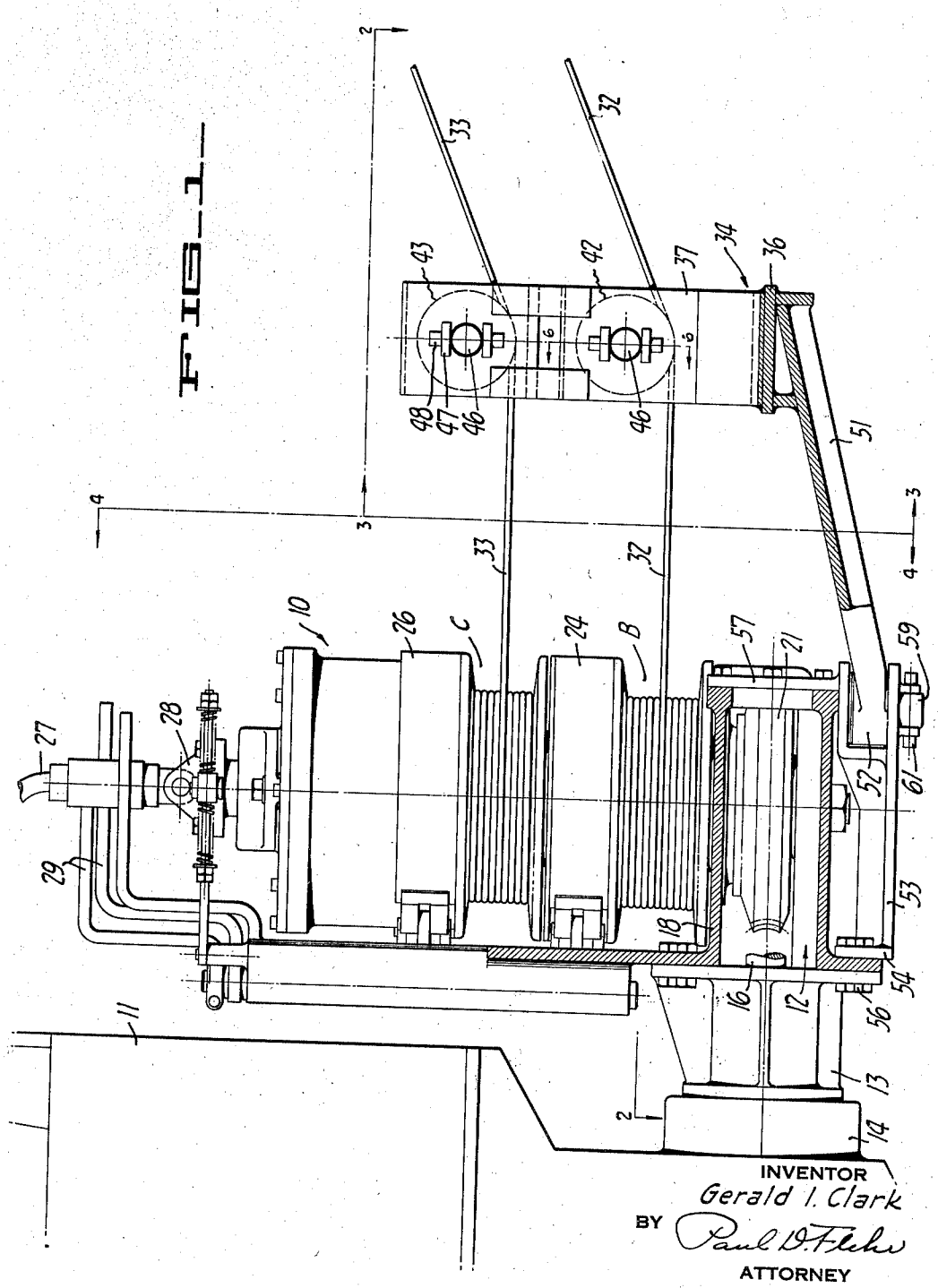
Oct. 1, 1940. G. I. CLARK 2,216,263

FAIR LEAD CONSTRUCTION

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Fig. 1



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FAIR LEAD CONSTRUCTION

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FIG-3-

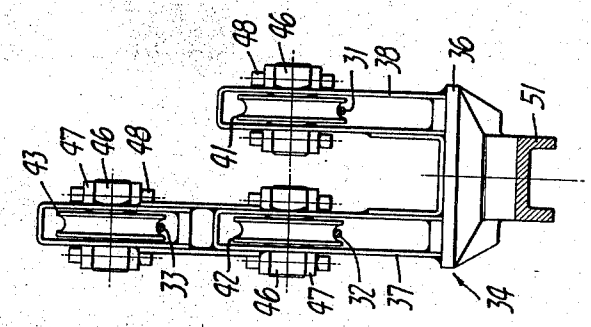
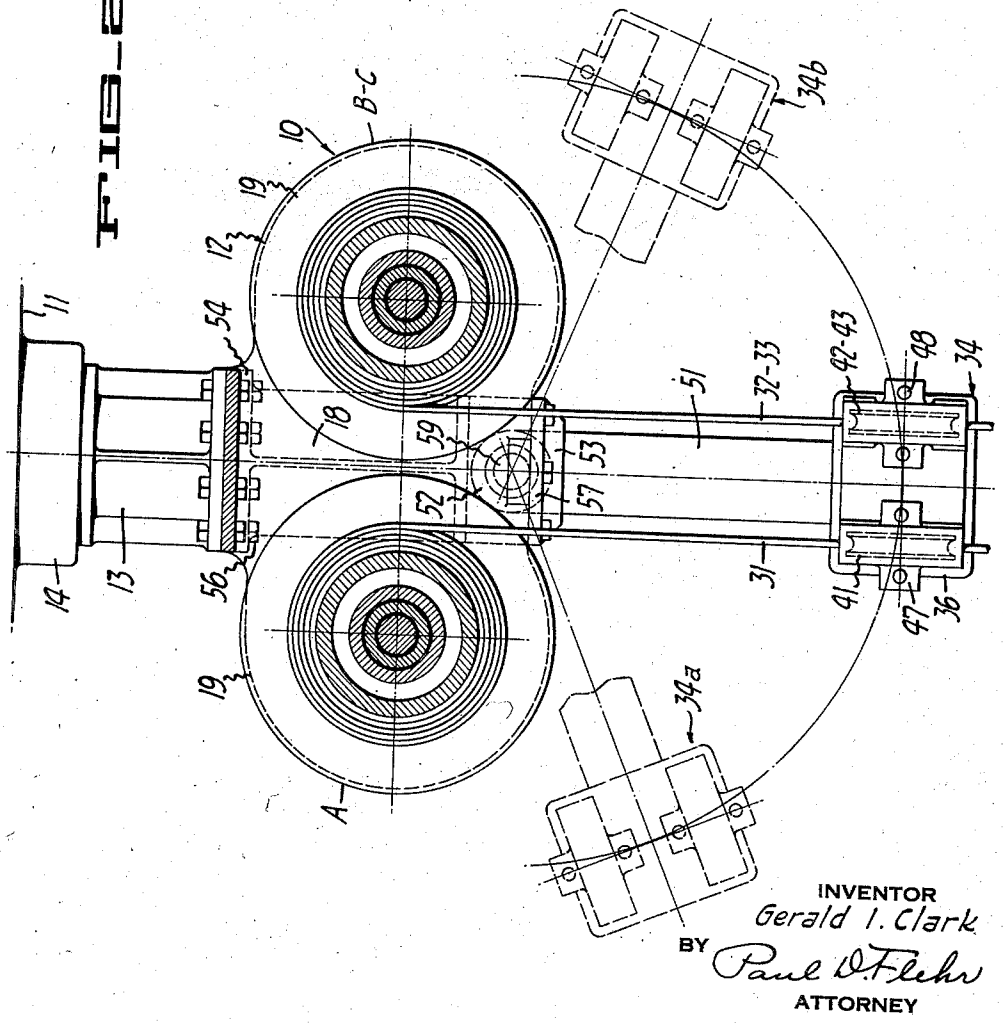


FIG-2-



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FAIR LEAD CONSTRUCTION

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FIG 5

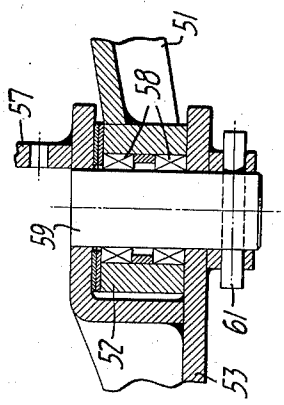


FIG 6

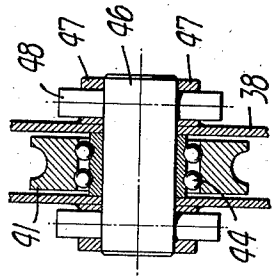
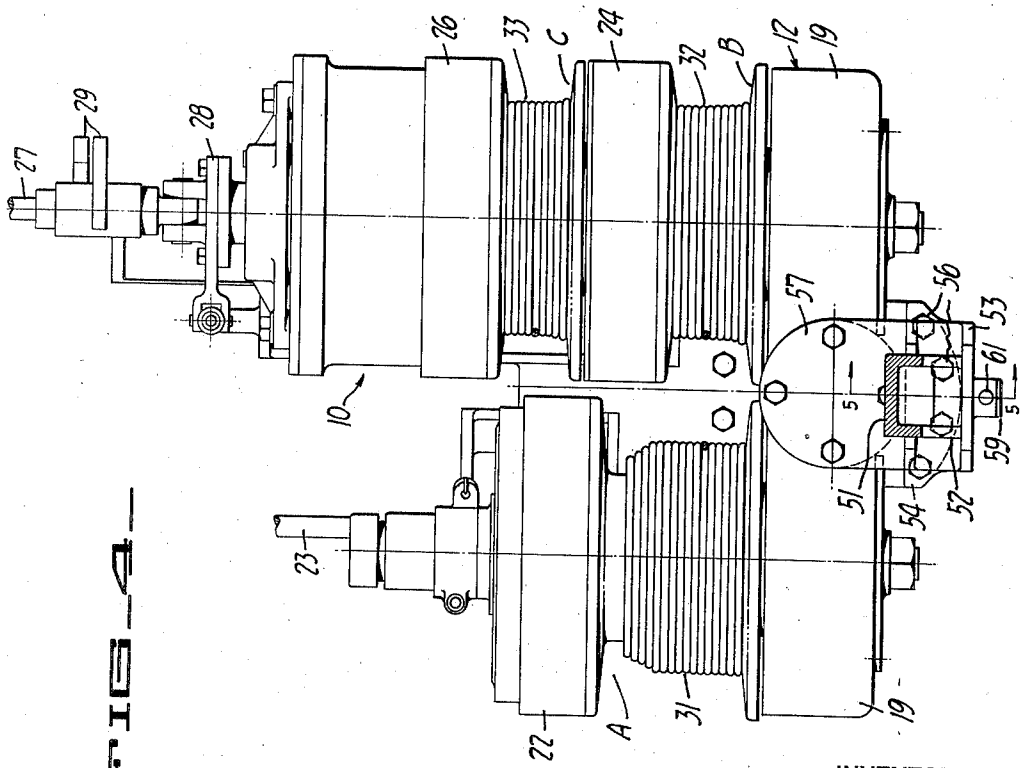


FIG 4



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Patented Oct. 1, 1940 2,216,263

UNITED STATES PATENT OFFICE

2,216,263

FAIR LEAD CONSTRUCTION

Gerald I. Clark, Mountain View, Calif., assignor to Wooldridge Manufacturing Company, Sunnyvale, Calif., a corporation of Nevada

Application January 29, 1940, Serial No. 316,134

6 Claims. (Cl. 254—190)

This invention relates generally to winch units of the type making use of a plurality of parallel drums for winding up or playing out separate ropes or cables. More particularly, the invention relates to an advantageous multiple fair lead construction for multiple drum winch units adapted for attachment to present-day tractors for operation of various equipment such as road making machines, hoists, scrapers, earth movers, and the like.

It is an object of the invention to provide a winch unit having an improved fair lead construction for use with a pair of adjacent winch drums so that relative turning movement between the draft and drawn vehicles and so that the respective cables are maintained substantially in alignment with the respective fair leads.

Another object of the invention is to provide a fair lead construction of the character referred to wherein the fair leads are movable with relation to the winch drums in response to relative turning movements between the tractor and the equipment being drawn thereby.

Another object of the invention is to provide an improved fair lead construction of the type referred to wherein the fair leads for adjacent drums having vertically disposed axes on a draft vehicle are movable together about a pivotal axis located in an optimum position with respect to the axes of the drums to accommodate relative turning movement of the draft and drawn vehicles.

Other objects of the invention will appear from the following description in connection with a preferred embodiment of the invention as shown in the accompanying drawings, in which:

Figure 1 is a side elevational view illustrating a winch construction incorporating the present invention.

Figure 2 is a sectional plan view of the winch construction taken in a plane indicated by the line 2—2 in Figure 1 and illustrating various positions of the fair lead unit.

Figure 3 is a detailed elevational view of the fair lead unit, the view being indicated by the line 3—3 in Figure 1.

Figure 4 is a rear elevational view of the winch unit, the view being taken as indicated by the line 4—4 in Figure 1.

Figure 5 is a sectional detailed view illustrating the pivotal mounting of the fair lead unit, the view being taken in a plane indicated by the line 5—5 in Figure 4.

Figure 6 is a detailed sectional view of a fair lead sheave, the view being taken as indicated in the line 6—6 in Figure 1.

The winch construction illustrated in the drawings is of the general character disclosed and claimed in Hutchins Patent No. 2,171,792, granted September 5, 1939, and entitled "Attachment for tractors and the like," as modified in my copending application Serial No. 305,224, filed November 20, 1939, for "Winch construction." The winch unit disclosed in the present application has two drums controlled from a single lever, and in conjunction with such two drums one or more additional drums can be employed for handling supplemental ropes or cables. The cables are all trained around respective fair leads mounted for swinging movement as a unit with respect to the winch unit.

Referring to Figures 1 and 2, the winch unit is designated generally at 10, and is shown applied as an attachment to a tractor 11. The unit itself includes a housing 12 which carries the winch drums A, B, and C. The housing 12 is bolted to an adapter 13 which is suitably mounted on a portion 14 of the tractor from which a drive shaft 16 extends. The housing 12 can be made of suitable material such as cast steel and includes a central portion 18 and side extensions 19 in which similar worm gears 21 are mounted to be driven by a suitable worm on shaft 16.

Drum A is mounted upon one of the extensions 19 of the housing and is suitably driven from the associated worm gear 21 by clutch mechanism (not shown) and also having brake mechanism indicated generally at 22. Both the clutch and brake mechanisms are controlled by means including an operating lever 23.

Drums B and C are mounted on the other extension 19 of the housing and are also driven through suitable respective clutch mechanisms from the worm gear 21 associated therewith and have brake means 24 and 26 associated therewith. The clutches and brakes for the drums B and C may be selectively controlled by means of operating lever 27 through suitable operating connections 28 and 29. For the purposes of the present invention it is sufficient to understand that by a suitable manipulation of levers 23 and 27 any one of the drums A, B or C may be selectively controlled to either play out or to wind up cable.

As seen in Figures 1 and 4, respective drums A, B, and C have respective cables 31, 32 and 33 wound thereabout. The cables 31, 32 and 33 for the respective drums are trained over respective fair leads of a fair lead unit generally indicated

at 34 in Figures 1 and 3. As will be described later in detail, the fair lead unit is mounted for pivoting movement relative to the winch unit to maintain proper alignment of the cables with the fair lead sheaves during relative turning movement between the tractor and the drawn equipment. As seen in Figure 3 the fair lead unit may comprise a base plate 36 having upstanding U-brackets 37 and 38 secured thereon as by welding to provide journals for the respective fair lead sheaves 41, 42, and 43. Preferably, the lateral spacing of brackets 37 and 38 is in the order of the shortest distance between the mean wound diameter of the respective adjacent drums A and B. In this way an optimum relation is provided for the average wound condition of the drums. A typical sheave construction is illustrated in Figure 6 wherein sheave 41 is shown journalled by bearings 44 upon a stub-shaft 46 having its ends secured in bosses 47 suitably attached to U-bracket 38 and pinned therein by means of locking pins 48.

As seen in Figure 1, the base plate 36 of the fair lead unit may be fabricated and includes a channel-shaped supporting arm 51 having a boss 52 (Figs. 1 and 5) at its forward end which may be pivotally mounted in a supporting bracket 53 suitably secured upon the winch unit. As shown, the bracket 53 is provided at one end with forward upstanding flange 54 which is fastened to the winch unit by means of certain attaching bolts 56 to the adapter 13. The rearward end of bracket 53 has an upstanding plate 57 forming the cover plate for the central portion 18 of the winch unit housing. It will be understood that the method of securing the bracket 53 on the winch unit or upon the tractor is merely illustrative and other means may be employed. At its rearward end the bracket 53 is recessed to receive boss 52 of the supporting arm which is journalled by means of bearings 58 (Fig. 5) on vertically disposed stub-shaft 59 suitably secured in bracket 53 and locked with respect thereto by pin 61.

The pivoting of the fair lead unit 34 by means of shaft 59 provides an axis of pivotal movement thereof which is located in an optimum position to maintain the cables in proper alignment with the respective fair leads. The desirable axis location lies substantially in a plane perpendicular to and bisecting a plane containing the axes of the winch drums A and B. The axis location is also preferably located rearwardly from the plane of axes of the winch drums at a preferred distance to be substantially in a vertical plane tangent to both mean wound diameters of the drums A and B. Thus, even with extreme turning movements up to 150 and 180° of swinging movement of the fair lead unit, the cables will maintain their trained relation with respect to the fair lead sheaves as seen most clearly in Figure 2.

In Figure 2 the straight ahead position of fair lead unit 34 is indicated in full lines while two somewhat extreme turning positions thereof are indicated at 34a and 34b respectively. It is seen that with the axis of pivotal support of the fair lead unit located in the region of the bisecting and tangent planes previously referred to, that the angular displacement of the cables from the central planes of their respective sheaves is slight and well within the limit of angular displacement which would cause disentrainment of a cable from its sheave.

In operation the respective cables 31, 32 and 33 are attached to their drums A, B and C and trained over the associated fair leads and thence to suitable sheave located on the drawn equipment. As the tractor turns the relative turning movement between the tractor and the drawn equipment will cause swinging of the fair lead unit possibly up to 90° in either direction from its straight ahead position. Because of such swinging movement of the fair lead unit about a pivotal axis in the region of the optimum location specified, the cables are maintained on the fair leads and any misalignment of the cables with respect to the fair leads is insufficient to cause disengagement of the cables therefrom. Usually, in the extreme turning position, the cables are not operated although this can be done if desired.

I claim:

1. A winch construction comprising at least two winch drums, means mounting said drums upon parallel vertical axes, cables on said drums, a fair lead for each of said drums, and common mounting means for said fair leads including an arm pivotally mounted on a vertical axis substantially symmetrically disposed with respect to the respective axes of said drums and spaced rearwardly from a plane containing said drum axes a distance substantially equal to the mean wound radius of said drums.

2. A winch construction comprising a housing and at least two winch drums mounted about parallel vertical axes upon said housing, cables on said drums, fair leads for each of said cables, a supporting bracket for said fair leads mounted on a vertical axis symmetrically disposed with respect to the respective axes of said drums and spaced therefrom in the direction of the outward extending portions of said cables a distance in the order of the mean wound radius of said drums.

3. A winch construction comprising at least two winch drums, means mounting said drums on parallel axes, cables on said drums, a fair lead for each of said cables, and common mounting means for said fair leads including an arm pivotally mounted on a vertical axis, said axis being located in the region of the intersection of a plane parallel to and symmetrically related to said drum axes and the tangent plane to the mean wound circumferences of said drums.

4. A winch construction comprising at least two winch drums, means mounting said drums on parallel axes, cables on said drums, a fair lead unit including two parallel fair leads for the cables of said two drums with their central planes spaced apart a distance in the order of the shortest distance between the mean wound circumferences of said drums, and means mounting said fair lead unit for swinging movement about an axis parallel to said drum axes and symmetrically related thereto, said axis of swinging movement being substantially in a plane tangent to the mean wound circumferences of said drums.

5. A winch construction comprising at least two winch drums, means mounting said drums on parallel axes, cables on said drums, a fair lead unit including a bracket and two parallel fair leads for the cables of said two drums mounted on said bracket with their central planes spaced apart a distance in the order of the shortest distance between the mean wound circumferences of said drums, and a supporting arm for said bracket mounted for swinging movement about an axis parallel to said drum axes and symmetrically related thereto, said axis of swinging movement

being substantially in a plane tangent to the mean wound circumferences of said drums.

6. A winch construction comprising a housing and at least two winch drums mounted about parallel vertical axes upon said housing, cables on said drums, a fair lead unit including fair leads for each of said cables, a supporting bracket for said fair lead unit mounted on said housing about a vertical axis symmetrically disposed with respect to the respective axes of said drums and spaced therefrom in the direction of the outward extending portions of said cables a distance in the order of the mean wound radius of said drums.

GERALD I. CLARK.