Dec. 5, 1950 R. W. WESTFALL 2,532,828

TAGLINE DEVICE

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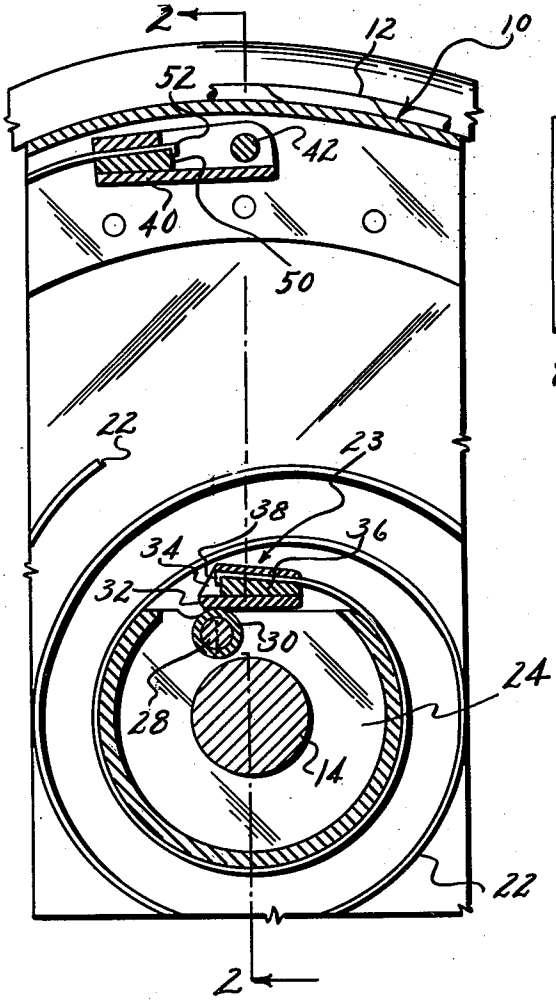

Fig. 1

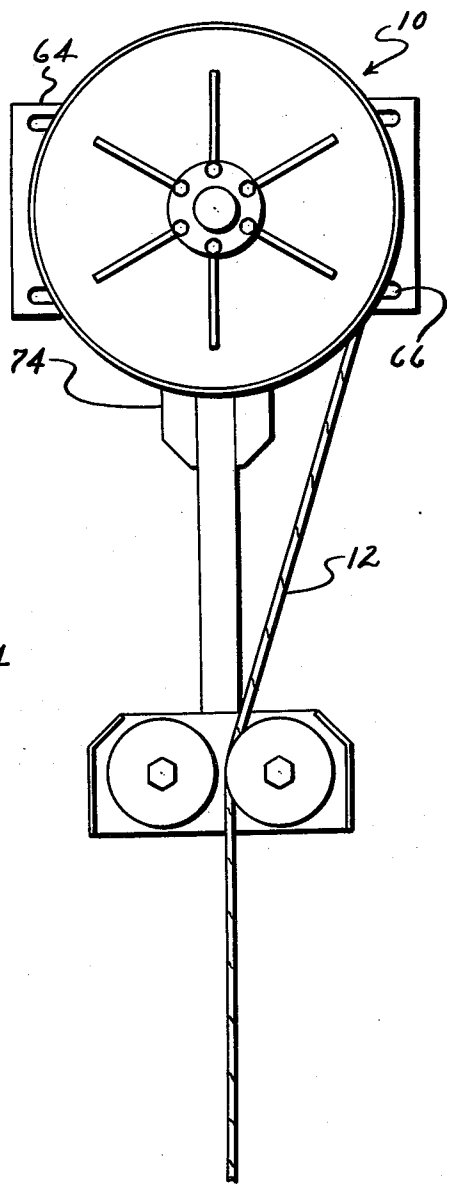

Fig. 4

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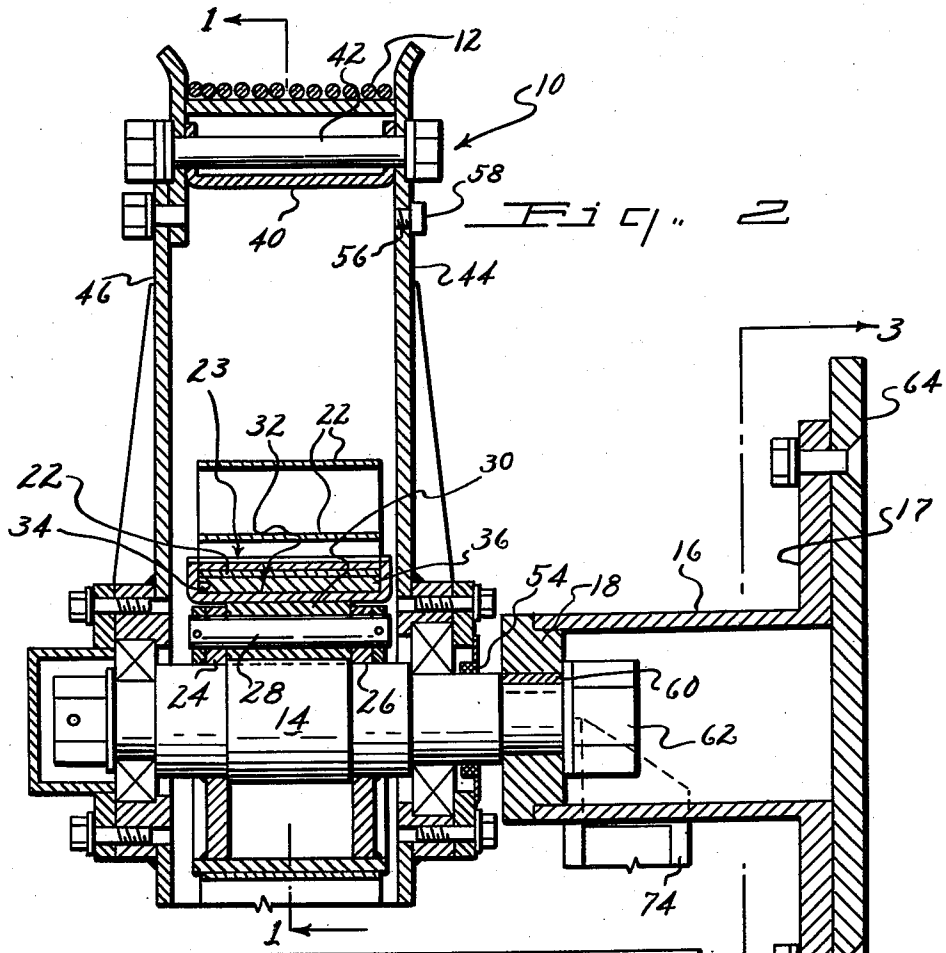

Fig. 2

Fig. 3

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UNITED STATES PATENT OFFICE

2,532,828

TAGLINE DEVICE

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3 Claims. (Cl. 242—107)

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My invention relates to equipment of the type used to move materials, such as earth in excavating operations, or materials from the holds of ships.

Such equipment usually is provided with a boom from which a grab bucket or other material handling device is worked by a hoisting cable. The loads carried may be very considerable and means are usually provided to reduce the swinging of the bucket or other device, such as a line wound on a drum mounted on the boom and connected at its free end to the bucket, the line being maintained under spring tension.

The invention particularly relates to control means for such lines, which are known as "taglines." It has for its general object the provision of an improved construction of the drum and mounting thereof disclosed in my prior Patent No. 2,367,912, although it will be understood that the constructions hereinafter disclosed are not necessarily limited in their use to taglines.

In the drum of my earlier patent use is made of a flat spiral spring connected at its inner end to a stationary hub and at its outer end to the inner periphery of the drum. Springs of this type are difficult to secure, for if holes are drilled through the ends of the spring for the passage of securing bolts or pins, the spring is weakened at the point of greatest stress concentration.

It is an object of the invention to provide securing means for springs by which the ends of the springs are retained in position without drilling them and by which the ends are free to take up a position in line with the adjacent coils of the spring.

A further object of the invention is to provide improved means for adjustably mounting the drum on the boom.

Another object of the invention is to arrange the drum in which the spring is mounted as a grease or oil container, thereby improving the action of the spring.

Still further objects and features of the invention will hereinafter appear from the following description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a fragmentary section on the line 1—1 of Fig. 2, showing the means for anchoring the ends of a flat spring used to apply tension to the tagline drum;

Fig. 2 is a longitudinal section, with parts broken away, taken through the drum and its mounting means on which the tagline is wound, the view being taken on line 2—2 of Fig. 1;

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Fig. 3 is a section on the line 3—3 of Fig. 2, showing the mounting plate by which the drum is attached to the boom; and

Fig. 4 is a side elevation showing the drum and a fairlead associated therewith for guiding the tagline onto the drum.

Referring now to the drawings, the drum is indicated by the numeral 10, the tagline wound thereon being shown at 12. The drum is mounted for rotation on a stationary spindle 14 which is rigidly secured in a tubular abutment or bracket 16 formed integral with a plate 17, the plate itself being adjustably secured to a mounting plate 64 which is attached to the boom (not shown).

A flat coiled spring 22 is arranged within the drum, the inner end being secured to the shaft 14 in the manner hereinafter described and to the outer end of the drum near the outer periphery thereof, in the manner to be described.

The inner periphery of the spring is secured in an abutment or cage 23 pivoted between flanges 24 and 26 welded to the spindle 14, by a pin 28 passing through a bored lug 30 depending from the body 32 of the abutment. This body is formed to provide a wedge-shaped recess or socket 34 in which a wedge 36 is adapted to fit. The inner end of the spring is annealed and sharply bent, as shown at 38, over the thicker end of the wedge, the end of the spring being gripped between the wedge 36 and the outer wall of the wedge-shaped recess on the wedge being driven into position.

At its outer end the spring 22 is held by a pivoted abutment or cage 40 mounted on a pin 42 passing through the side plates 44, 46 of the drum and through the abutment. A wedge-shaped recess or socket is provided in the abutment adapted to receive a wedge 50. The outer end of the spring is bent inwardly as indicated at 52 over the thicker end of the wedge and is firmly gripped in the abutment when the wedge 50 is driven into position. By this construction it will be noted that the ends of the spring are secured without in any way reducing the strength of the material at the ends, and are so secured that the ends of the spring may take up a position in line with the contiguous length of the spring. It is evident that when the spring is tightly coiled, the outer end of the spring will be inclined sharply away from the outer periphery of the drum, whereas when the spring is in uncoiled position the outer coil of the spring may lie against the inner periphery of the drum, while the inner end of the spring may flex outwardly

from the position shown in Fig. 1, which movement is provided for by the pivotal mounting above described.

In order to improve the functioning of the spring, I form the drum as an oil or grease container. It will be noted from Fig. 2 that the outer side of the drum is completely enclosed, while at the hub of the drum, through which the spindle 14 projects, grease retaining packing 54 is provided. The drum may be filled with oil or grease through a tapped hole 56 filled by a removable plug 58.

The tubular mount 16 for the spindle 14 is provided with a heavy end plate 18 bored to receive the spindle and a key 60 is fitted in a keyway formed partly in the surface of the bore through the end plate and partly in the spindle. The spindle is held in position in the abutment by a nut 62.

Booms of the type with which the tagline is adapted to be used are generally formed of latticed girders and booms may be of different lengths and sizes. In order to provide a means of mounting the tagline drum on booms of different sizes and construction, I provide mounting plate 64 provided with a number of slots 66 (Fig. 3). By using threaded bolts with hooked ends, the plate may be secured to the lattice bracing members of a boom in the most effective position.

The plate 17 carrying the abutment 16 is adjustably secured to the mounting plate 64 by means of bolts 68 passing through the mounting plate and through arcuate slots 70 in plate 18 and nuts 72 mounted on the bolts acting to clamp the plates 18 and 64 together. It will be evident that by slacking back the nuts on the mounting bolts and rotating the drum, as permitted by the arcuate slots, proper positioning of the drum may be secured relatively to the mounted plate 64.

It is necessary to provide a fairlead or guide element in order to lead the tagline properly onto the drum and the supporting arms 74 for the fairlead are welded to the tubular abutment 16.

In the case of very large cranes and similar equipment it may be necessary to provide a stronger spring than can be fitted in a drum of the construction illustrated in the drawings. This can be readily taken care of by providing an additional drum fastened to the winding drum and mounted therewith on a spindle of sufficient length, the mounting means and other constructional features previously described being retained. A second spring is mounted in the additional drum to provide the greater spring tension required by the greater load, the spring being secured similarly to spring 22 to the spindle and drum.

The invention is herein described and illustrated in a preferred form, but it is to be understood that the scope of the invention is not in any way limited by this illustrative showing but only as indicated by the scope of the appended claims.

I claim:

1. In a device of the class described, a body, a spindle member secured to the body, a drum member mounted for rotation about the spindle, a flat spiral spring cooperating with said members to permit limited rotative movement of the drum member in one direction and to rotate said member in the opposite direction and means pivotally connecting the respective ends of the spring to said respective members to permit swinging movement of the spring about an axis parallel with the axis of rotation of the rotor member, said last named means comprising a pair of cages each providing a tapered socket into which an end of the spring projects, one of said cages being pivotally secured to the interior of the drum member and the other cage being pivotally secured to the spindle member for swinging movement about axes parallel with the axis of rotation of the rotor member and a free wedge in each socket adapted to hold the end of said spring.

2. Mounting means for adjustably securing a tagline device including a drum about which the tagline can be wound, and a stationary spindle on which the drum is rotatably supported on the boom of a crane or the like comprising a mounting plate adapted to be secured to the boom, and a tubular bracket mounted on said plate, said bracket having an apertured end wall adapted to receive the end of said spindle, a retaining means on the end of said spindle inwardly of said end wall, and means for adjustably mounting said bracket on said plate rotatively about the axis of said spindle.

3. Mounting means for adjustably securing a tagline device including a drum about which the tagline can be wound, and a stationary spindle on which the drum is rotatably supported on the boom of a crane or the like comprising a mounting plate adapted to be secured to the boom, a bracket including a plate portion and an outstanding tubular portion having an apertured end wall, said plate portion including arcuate slots concentric with the axis of the aperture in the end wall of the tubular portion, and nut and bolt means extending through said slots and mounted in said mounting plate for adjustably securing said bracket to said mounting plate.

ROBERT W. WESTFALL.

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