(No Model.)

W. B. ROSS.

ENDLESS CABLE GEARING.

No. 286,228. Patented Oct. 9, 1883.

Fig. 1.

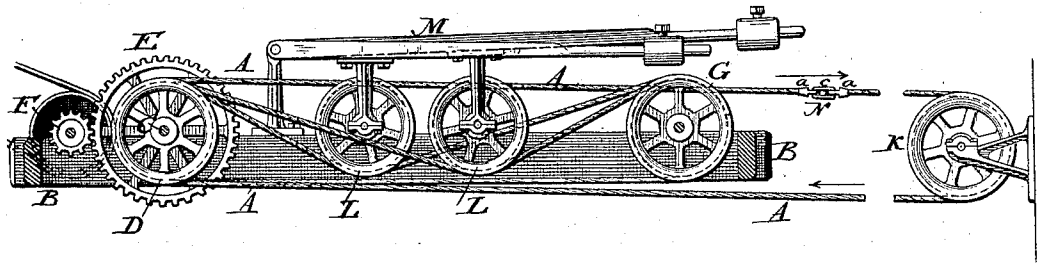


Fig. 2.

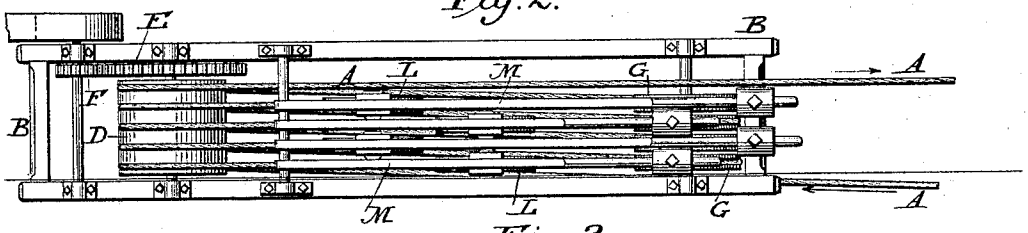


Fig. 3.

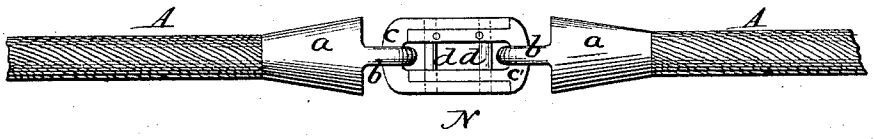


Fig. 4

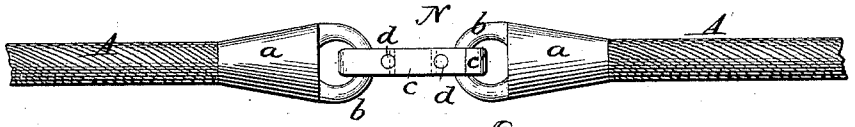
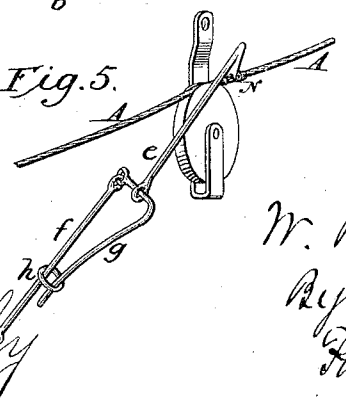


Fig. 5.



Attest.

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ENDLESS-CABLE GEARING.

SPECIFICATION forming part of Letters Patent No. 286,228, dated October 9, 1883.

Application filed March 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, W. B. ROSS, of Lyons, in the county of Wayne and State of New York, have invented certain Improvements in Mechanical Movements, of which the following is a specification.

This invention has reference to means for operating and controlling endless traction cables or ropes to be employed for various purposes, such as operating plows, dredging-machines, hoisting-machines, railway-cars, and other movable or stationary machines.

It is the special aim of the invention to effect the driving of the cable, or to transmit motion therefrom, or both, in a positive manner, without exposing the same to a destructive wear, or to excessive flexion, and also to facilitate the coupling and uncoupling of the ends of the cable, and to admit of the coupling passing readily around the drums and sheaves without shock or strain; also, to compensate automatically for variations in the length of the cable, which may occur from changes of temperature or other causes when the cable is of great length.

With these ends in view the invention consists in the peculiar construction and arrangement of driving-drums with guiding and yielding take-up pulleys or sheaves, and in couplings and devices for connection therewith, all constructed in the peculiar manner as hereinafter explained.

Referring to the accompanying drawings, Figure 1 is a vertical longitudinal section through my improved mechanism. Fig. 2 is a top plan view of the same. Figs. 3 and 4 are side elevations of the couplings. Fig. 5 is a view of the devices for connection with the coupling.

Referring to the drawings, A represents the endless cable, usually composed of wire, but which may be a rope, strap, chain, or any known equivalent therefor. This cable may be made of any desired length, and disposed or arranged to traverse any circuitous route required around suitable guiding-sheaves, provided only it starts from and returns to the driving mechanism, which will be presently described.

B represents a stationary frame, designed to support the operative parts of the driving mechanism. In one end it supports a horizontal shaft, C, upon which there are keyed firmly a series of grooved driving drums or pulleys, D; or, as an equivalent, a single drum of suitable length, with or without a series of peripheral grooves therein, may be employed. The drum is preferably driven by means of a gear-wheel, E, and pinion F, the latter connected by pulleys and belts or other ordinary appliances with a steam-engine or other motor, by which a uniform motion will be communicated to the drum or series of drums.

G G represent a series of independent sheaves or pulleys mounted, preferably, upon a common axis at some distance from the driving-drums D. The cable A is passed, as shown in the drawings, back and forth between and around the driving-drums D and guiding-sheaves G. This arrangement, giving the cable an extended contact with the driving-surfaces of the drum or drums, insures the communication of a positive motion thereto, it being, of course, understood that the cable will be extended around suitably-disposed pulleys K, by which it will be extended and maintained in position. For the purpose of maintaining the proper tension of the cable and compensating for expansion and contraction, I subject the same to the action of a series of yielding pulleys or idlers, L, located between the driving-drums and the guiding-sheaves G, as shown. These intermediate pulleys may be sustained and urged transversely against the cable in a suitable manner. It is preferred, however, as shown in the drawings, to mount each one upon an independent lever, M, joined to the main frame, or to a standard thereon at one end, and provided at the opposite end with adjustable weights, as represented in Fig. 1. It will be observed that under this arrangement the elongation and contraction of the belt is permitted at a number of points, and that the sum of these represents the total elongation and contraction of the cable. If preferred, springs may be used, instead of weights, to operate the levers. Instead of levers, any other suitable appliances may be employed to urge the take-up pulleys or sheaves against the cable, the only requirement being that they shall be movable in relation thereto. The employment of the take-up pulleys be-

tween the driving-drum and the guiding-pulleys G is also advantageous in that they cause the cable to sag down beneath them, and thus encircle the driving-drums to a great extent.

In practice it is found desirable to have the cable severed and connected by suitable connections at one or more points in its length. This coupling I construct in the manner represented in Figs. 3 and 4. The two ends of the cable are each provided with a conical thimble or head, *a*, secured thereto in any suitable manner, with its larger or outer end provided with an eye or loop, *b*. The loops of the thimbles are connected by means of a separable coupling composed of the two U-shaped parts *c* and *c'*, which are passed through the respective eyes, lapped together at their ends, and united by means of removable cross-pins *d*.

The couplings N may be shaped as shown in Figs. 3 and 4, and fastened by rivet-pins *f*, fitting in peripheral grooves in the cross-pins *d'*. It will be observed that the coupling has an open eye or center, and that the pins *d* extend transversely across the same, the pins thus applied serving the twofold purpose of uniting the parts of the coupling and of affording a bearing for the grappling-hook or draft device. This draft device *e* is preferably constructed, as shown in Fig. 5, in the form of a bar, having at one end an eye or loop and at the other a hook or claw adapted to engage with the pins in the couplings. For the purpose of connecting this draw-bar or grapple with the machine or body to be moved, I prefer to employ a shackle (shown in Fig. 5) consisting of a bar or rod, *f*, provided with a hinged angular arm, *g*, and with a sliding ring, *h*. The eye of the draft-hook or grapple *e* is slipped over the arm *g*, and the latter subsequently secured in place by means of the ring, as shown in Fig. 5. This connection may be quickly made and the parts quickly disconnected at will.

It is found in practical operation with the apparatus that the arrangement of drums, guiding-pulleys, and take-up devices. as before described, secures the movement of the coupling in a steady and positive manner, that they effectually compensate for variations in its length, and that they admit of the coupling-heads passing around the driving and guiding surfaces without undue shock or strain.

I also make use of the mechanism shown in Figs. 1 and 2 to transmit motion from a positively-driven cable, A, to the gear-wheel E, or a pulley keyed on the shaft *c*, for the purpose of connecting with and driving other machinery.

The present invention is restricted to those matters and things which are hereinafter claimed, and as to all other matters which are described or shown, but which are not claimed, the right is reserved to make the same the subject of a separate application.

Having thus described my invention, what I claim is—

1. In combination with the series of positively-driven pulleys, the series of loose guide-pulleys, the independent yielding idlers or take-up pulleys, and the endless cable.

2. The combination of the series of connected driving pulleys or drums, the cable, the series of independent guide-pulleys, and the intermediate take-up pulleys carried by independent levers.

3. The driving-shaft provided with the series of pulleys or driving-surfaces, the independent pulleys B, the pulleys C, weighted independent pulleys D, the guide pulley or sheave E, and the endless cable provided with coupling-heads, substantially as described.

4. In combination with the cable, the coupling-head consisting of the two-part frame with an open center, and the pins uniting said parts, substantially as described and shown.

5. In combination with the cable, the separable two-part coupling, as described, and the caps or heads, of conical form, as described.

6. In combination with the endless cable, the coupling having the open center and transverse pin therein, and the grapple or draft hook adapted, as described, to engage therewith.

7. In combination with the cable, the open coupling, the draft-hook, and the detachable shackle I, as shown.

WILLIAM B. ROSS.

Witnesses:
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SMITH H. GARWAY.