(No Model.) 2 Sheets—Sheet 1.

W. B. ROSS.

APPLIANCE FOR TRACTION CABLES.

No. 309,881. Patented Dec. 30, 1884.

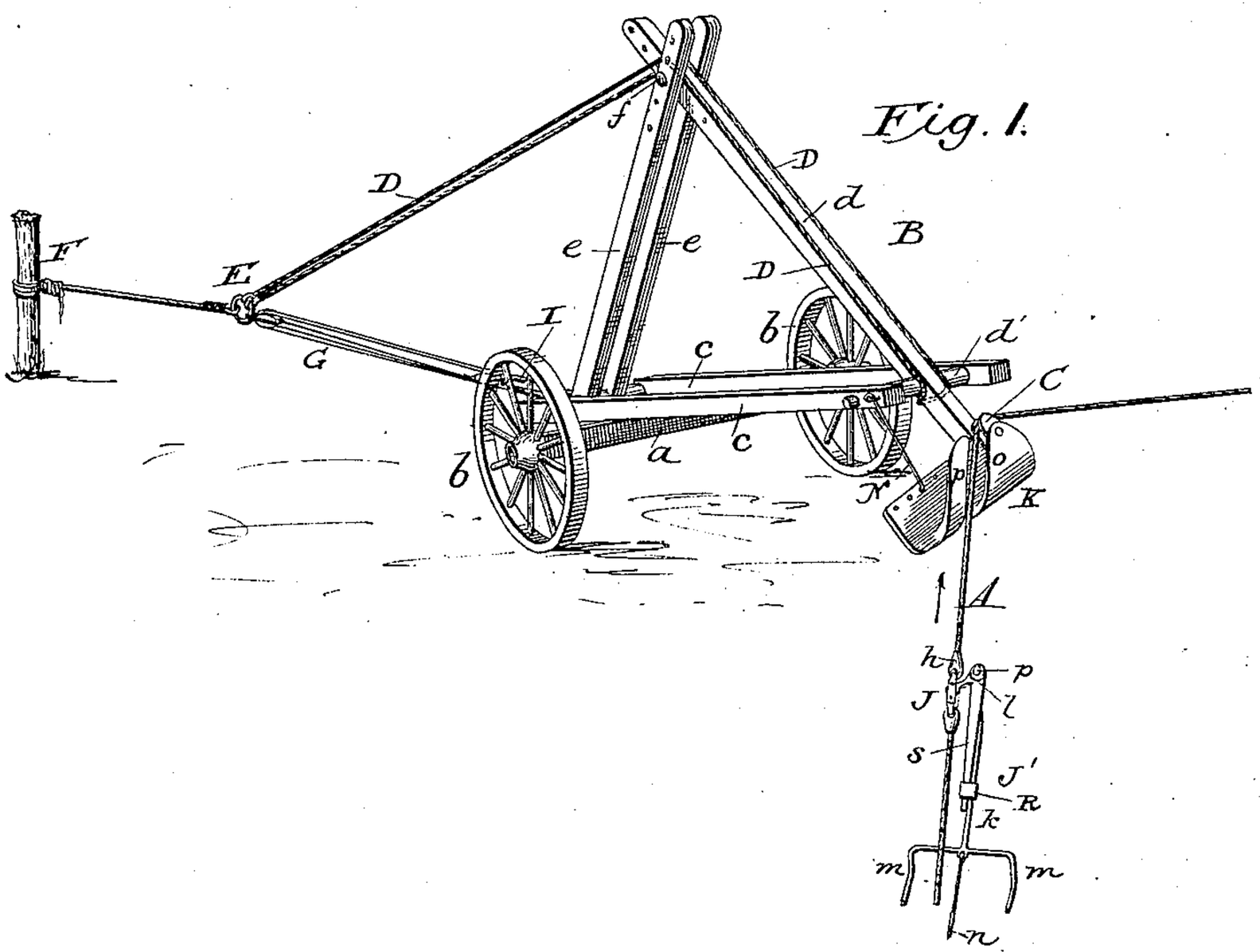
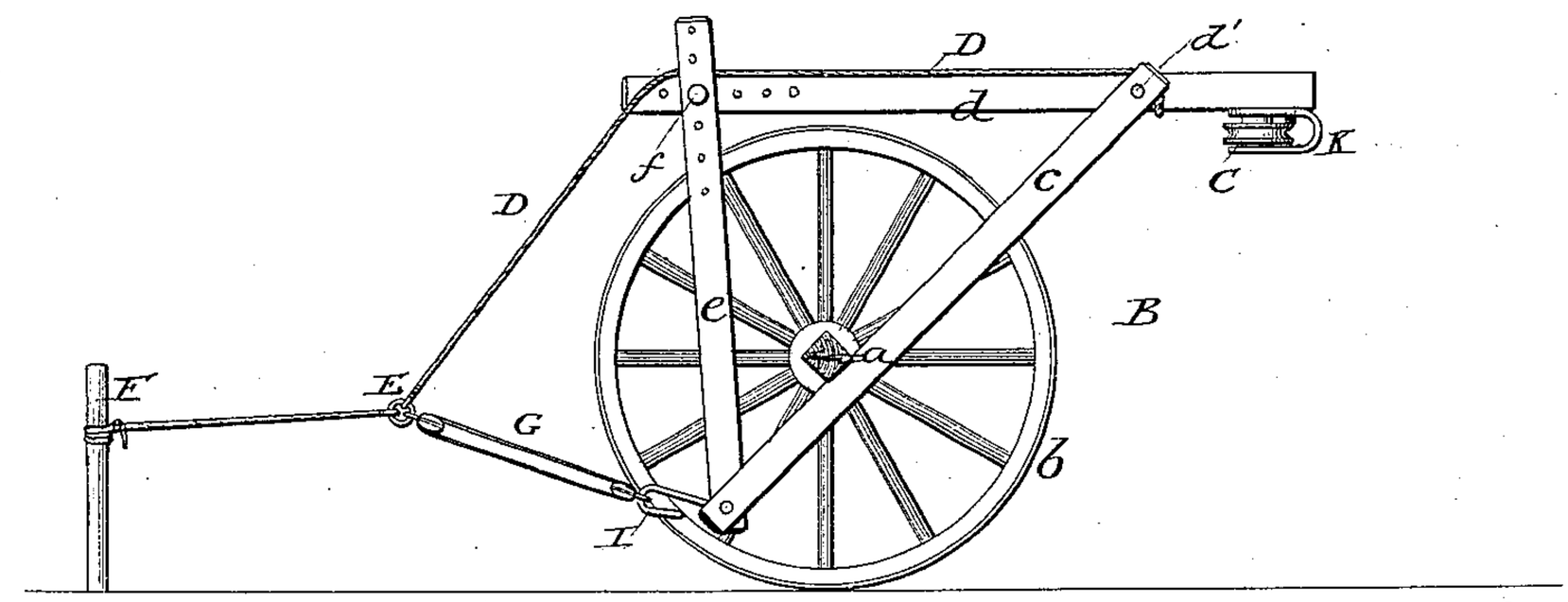


Fig. 1.

Fig. 2.



Attest.

Sidney P. Hollingsworth

Wm H. Shipley

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Philip T. Dodge

(No Model.) 2 Sheets—Sheet 2.

W. B. ROSS.

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Fig. 3.

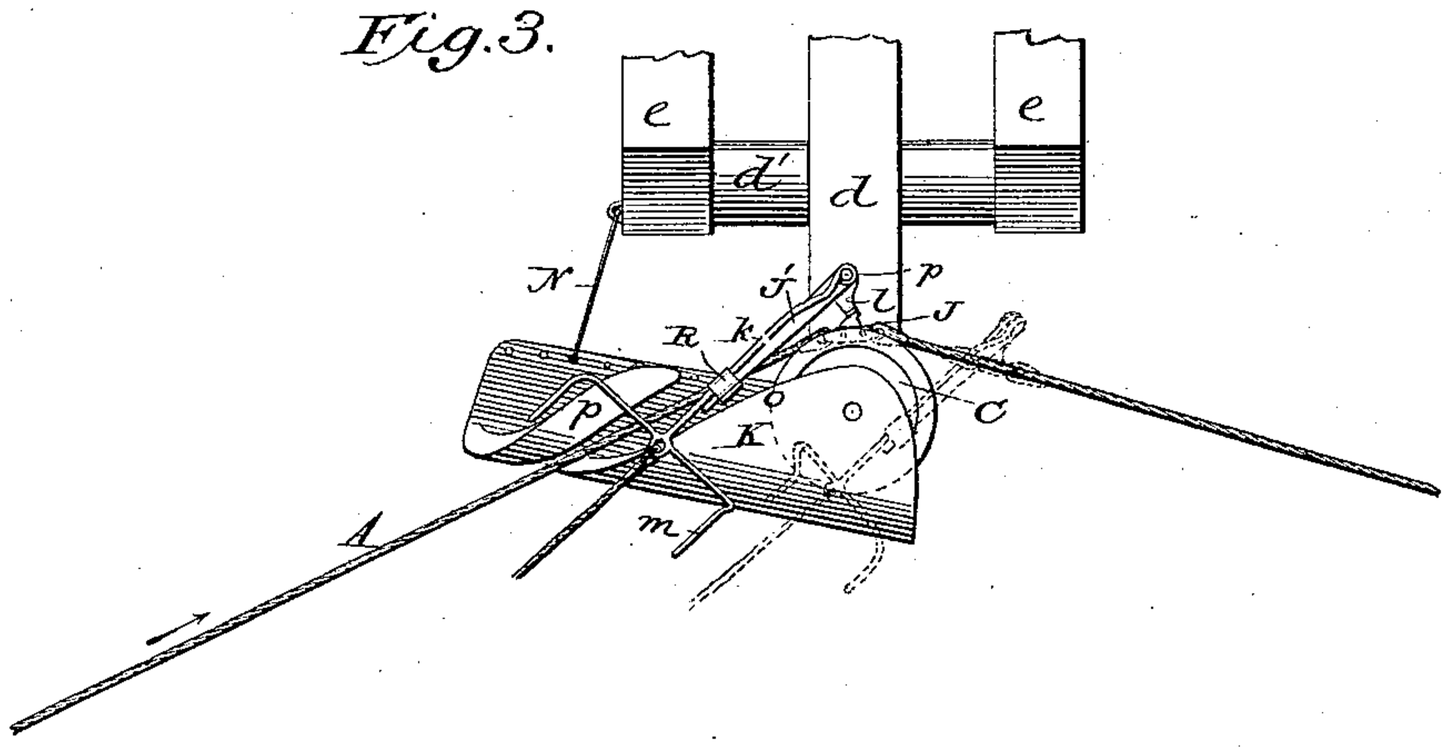


Fig. 4.

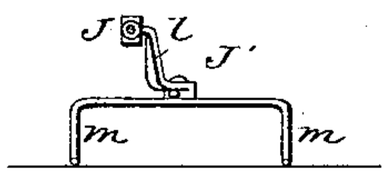


Fig. 5.

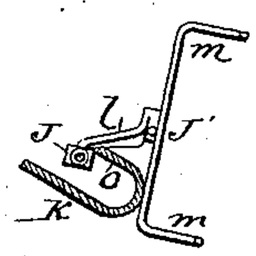


Fig. 6.

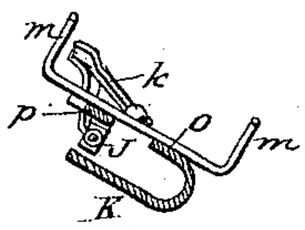


Fig. 7.

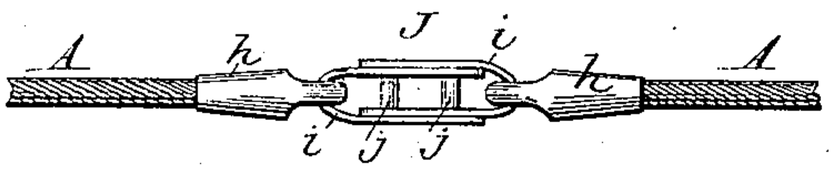


Fig. 8.

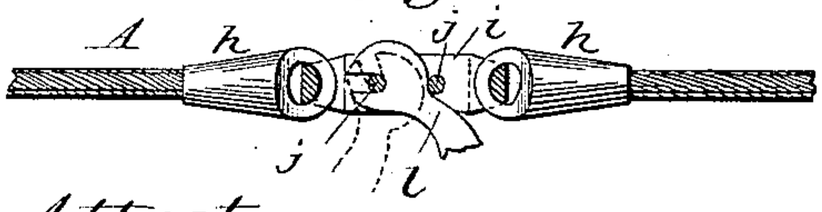
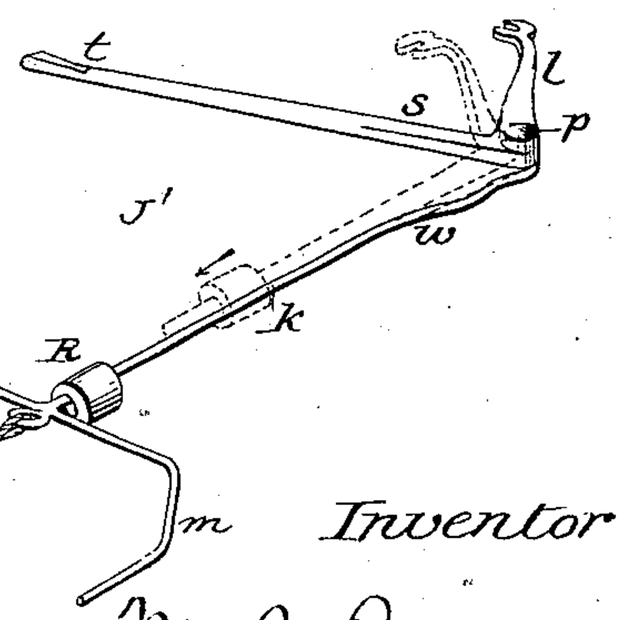


Fig. 9.



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Inventor

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Philip T. Dodge.

UNITED STATES PATENT OFFICE.

WILLIAM B. ROSS, OF NASHVILLE, TENNESSEE.

APPLIANCE FOR TRACTION-CABLES.

SPECIFICATION forming part of Letters Patent No. 309,881, dated December 30, 1884.

Application filed March 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. ROSS, of Nashville, in the State of Tennessee, have invented certain Improvements in Appliances for Traction-Cables, of which the following is a specification.

My invention relates more particularly to appliances for use in connection with those endless traction-cables which are designed to be transported from place to place as occasion may require for operating plows, dredges, cars, and other movable objects, and for imparting motion to stationary machines.

The improvements relate more particularly to the means for supporting and guiding the cable at points where the direction of movement is changed; to improved draft devices for connecting a load therewith and for readily disconnecting said load; to means whereby the draft devices are carried around the guiding-pulleys without being disconnected therefrom, and to features of minor importance.

Referring to the accompanying drawings, Figure 1 represents a perspective view of my portable carriage or guide adjusted in position for use with a cable traveling around the guide-sheave toward the right. Fig. 2 is a side elevation of the same machine as it appears when reversed and adjusted for use with a cable traveling to the left. Fig. 3 is a top plan view of the guide-pulley, cable, and connections during the movement of one of the draft devices past the sheave. Figs. 4, 5, and 6 are diagrams illustrating the manner in which the guides act to carry the draft device past the sheave. Figs. 7 and 8 are respectively a side view and a horizontal section through the coupling of the cable to which the draft devices are connected. Fig. 9 is a perspective view of the draft device, showing the manner in which it is detached from the cable. The full lines show the grapple in position for detaching from the cable. The dotted lines show the position of the parts when the load is being hauled thereby.

In the operation of traction-cables it is frequently necessary to have the same extended in a circuitous or irregular course, and it is in connection with cables thus arranged that my invention is of the greatest importance, although the improvements may in the main be applied to cables which extend back and forth in right lines between two distant points.

Referring to the drawings, A represents the cable, which may be of the ordinary character, and be driven by a motor of any suitable form, my invention having no reference to the means by which the motion is imparted thereto.

In order to maintain and guide the cable, I provide at suitable points in its length, and particularly at each bend or corner—that is to say, at each point where the horizontal direction of the cable is changed—a portable carriage, B, provided with a sheave or pulley, C, to sustain and guide the cable. The construction of the carriage, which constitutes an important feature of my invention, is plainly represented in Figs. 1 and 2. A horizontal axle, *a*, is mounted at its ends in ground-wheels *b*. Near its middle the axle has secured firmly thereon two transverse bars or beams, *c*, lying parallel with each other and extending both in front and in rear of the axle. Between these arms at the forward end I mount upon a horizontal pivot, *d'*, a bar, *d*, on the forward end of which the sheave C is mounted. To the rear ends of the bar *c*, I connect by a horizontal pivot two upright bars, *e*, the upper ends of which are united by a removable bolt, *f*, to the rear end of the bar *d*. The parts united as above constitute in effect a triangular frame.

In order to permit the form of the frame to be varied, so as to sustain the sheave at different heights, the bars *d* and *e* are provided with a series of holes to receive the horizontal pivot, the shifting of which from one hole to another has the effect of modifying the relative position of the various arms. When the cable is to be deflected to the right in the course of its movement, the frame is arranged to support the sheave on the upper side of the bar *d*, as represented in Fig. 1, and as will be hereinafter more fully explained; but when the cable is to be carried to the left the bolt *f* is withdrawn and the bars *c* revolved with the axle until they are brought with the under side uppermost. The bars *d* and *e* are next revolved on their pivots, or turned end for end, and again united by the bolt *f*, as represented in Fig. 2, the axle being at the same time turned end for end and upside down. The

effect of this operation is to reverse the frame, bringing the parts together on the opposite side of the axle, and bringing the sheave or pulley on the under instead of on the upper side of the bar *d*. The same changes may be effected by removing the pivot and turning the bar *d* on its longest dimension as an axis and replacing the pivot in the holes as reversed.

In making use of the frame it is anchored adjustably in position at the point where the bend or flexion of the cable is to occur. A rope or chain, D, preferably in the form of a loop or sling, is secured around the forward end of the bar *d*, extended thence backward over the rear end of said bar, and downward to a ring or shackle, E, which will be connected directly or through a chain or rope to a stationary post or anchor, F. A tackle, G, or other adjustable connection, is also extended from the ring or shackle E to a hook or other connecting device, I, at the lower end of the bar *c*.

It will be observed that the above method of arranging and connecting the frame with the stationary anchor causes the sheave C to be sustained in an elevated position when subjected to the strain.

It will be seen that the frame is connected both at its upper and lower sides with the stationary anchor, and that consequently the strain of the cable at the forward end will cause the same to assume such position as to maintain the guiding-sheave C at a proper elevation.

By lengthening or shortening the tackle G the position of the frame may be modified so as to maintain the sheave and cable at a higher or lower level, as may be demanded. As regards the adjustment of the frame to secure this result, the essential feature of the invention consists in connecting the same at the upper and lower points with a stationary anchor, so that by changing the length of one of the connections the inclination of the frame may be varied.

The cable consists, usually, of a number of lengths or sections of wire or other rope having their ends united by shackles or couplings J, which are constructed in the peculiar manner represented in Figs. 7 and 8 to receive the draft devices. The ends of the respective sections are provided with eye-pieces *h*, through each of which there is inserted a U-shaped piece, *i*, the arms of which are lapped past the arms of the corresponding parts and connected thereto by transverse bolts *j*. It will be observed that the parts *i* are duplicates of each other, and that their arms are lapped past each other in such manner as to leave a central space for the introduction of the draft device.

The draft device (represented at J′) is designed to serve the twofold purpose of connecting the car, plow, or other load with the cable and of preventing the cable when in action from being twisted. To this end it consists, essentially, of a shank or body portion, *k*, fastened by means of a pivot, *p*, to a bent lever, *s*, which is provided at the forward end with an offset-arm, *l*, bent in a rearward direction to engage the coupling of the cable. The shank has arms *m*, which are spread apart laterally and curved downward to form runners to ride on the surface of the ground. These runners hold the shank from turning, and thus prevent that twisting of the cable which is otherwise liable to occur, and which would cause the draft-rope to coil around it, and so prevent the grapple from passing the sheaves properly. The car or other load is connected with the draft device by means of a rope or chain, *n*, or equivalent connection, applied to the rear end of the shank *k*, so that as the draft device is carried with the cable the load is compelled to follow so long as the ring R remains in the position shown by dotted lines in Fig. 9. By moving the ring R in the direction of the arrow, Fig. 9, it will release the end of the shank *k* from the position in which it is shown in the figure, whereupon the draft-rope will be automatically released.

Referring to Fig. 8, it will be seen that the arm *l* of the draft device is made of such form that it may be inserted between the two pins *j* of the coupling, and that it is notched in the rear edge to embrace the after pin. It is inserted in the position indicated by dotted lines in Fig. 8, and being turned backward to the position which it occupies in action, and in which it is retained by the strain on the rear end, its forward edge must bear against the forward pin, *j*. During the continuance of the rearward strain the device is maintained in the condition represented in Fig. 8, and while it remains in this condition it is impossible for a disconnection to occur.

Owing to the fact that the draft device remains in constant connection with the cable, it becomes necessary to provide means for guiding said device around the sheave or pulley C. For this purpose I make use of a fixed shield or guard, K, having an upper curved edge, *o*, and an upturned flange, *p*, arranged with respect to the sheave in the manner represented in Figs. 1 and 3, so that the cable in passing the sheave lies between the edge *o* and the flange *p*. As the draft device approaches the sheave its arm *l* encounters the edge *o*, and being carried forward, and at the same time below the edge *o*, it follows that the edge, acting on the outer portion of the arm *l*, has the effect of turning the same toward an upright position, thus revolving the entire draft device about its longitudinal axis, or, in other words, turning the same upside down. This motion of the draft device is plainly represented in Figs. 3, 4, 5, and 6. The inversion is completed at or before the instant when the arm *l* reaches the sheave, as in Fig. 3, the effect being that the arm overhangs the sheave in such manner as to pass freely around its edge, the runners or rear arms, *m*, of the draft device resting in the meanwhile upon the edge *o* and flange *p* in such manner as to

be supported and guided thereby over the sheave. As the parts leave the sheave the draft device escapes in the manner represented by dotted lines in Fig. 3, and on being carried entirely clear of the sheave immediately turns back to its original position, this action being due partly to the position of the arm *l* and in part to the fact that the arms *m* are curved downward, so that the action of gravity tends to cause them to assume their normal position.

It will of course be understood that although the arms or runners of the draft device travel normally on the surface of the ground, they are lifted clear of the ground during their passage over the sheave. The position of the guide K with respect to the frame will be varied according to the angle formed by the bend in the cable. To permit this adjustment the guide is movable around the pivot of the sheave, and is secured in position by means of a brace, N, one end of which is jointed to the frame, while the opposite end is arranged to engage in the edge of the guide, which is provided, as in Fig. 3, with a series of holes for the purpose.

The foregoing description has reference to the arrangement of the guide when the cable travels around the same toward the right. When the cable travels in the opposite direction, at which time, it will be remembered, the sheave is on the under side of the frame, as in Fig. 2, the guide is generally unnecessary, since the draft devices will then pass beneath instead of above the sheave.

When the apparatus is to be transported from place to place, the bolt *f* is withdrawn and the arms or timbers *d* and *e* folded downward in a flat compact form upon the axle. A series of frames or carriages thus adjusted may be hooked or otherwise connected together end to end and readily transported in a train from one place to another.

It will be readily understood that the terms "right" and "left" are employed herein with reference to the draft devices made with the offset-arm on the side represented in the drawings, and with the cable running in the direction indicated. The draft devices may be constructed with the offset-arm on the opposite side for use with cables running in the opposite direction, the guides and other parts being changed to correspond.

The action of the draft device in disengaging from the cable is shown in Fig. 9. The dotted line shows the position which the bent lever takes after turning on the pivot P, the end of the arm *l* being below the line of the body of the bent lever. The resistance offered by the load tends to turn the lever on the pivot P. This tendency is resisted by the ring R as long as it remains in the position shown in Figs. 7 and 8. The ring R has a conical interior, which bears against the pointed end of the lever *s* at *t*, and prevents it from falling off in the direction of the arrow. The lever and shank touching each other at *w* must be sprung forcibly together to admit of putting on the ring, and the elasticity of the metal holds it on as long as desired, even when there is no load attached to the draft device.

Having thus described my invention, what I claim is—

1. The supporting-sheave for a traction-cable, in combination with the wheeled frame having the arms *c*, *d*, and *e*, substantially as described.

2. The sheave supporting frame consisting of the wheeled axle having the arms *c*, rigidly attached, the arms *d* and *e*, pivotally connected to opposite ends of the arms *c*, and adjustable means, substantially as described, for connecting the arms *c* and *d*, whereby reversal of the parts is permitted.

3. In combination with the wheeled sheave-supporting frame adapted to rock or tilt upon its axle, a stationary anchor, and connections extending therefrom to the upper and lower sides of the frame, respectively, whereby the position of the frame and elevation of the sheave may be modified at will.

4. The sheave C, in combination with the wheeled tilting frame, the anchor F, and connection D, and adjustable connection G.

5. In combination with a sheave, C, the guide provided with the edge or plate *o* and flange *p*, substantially as described.

6. In combination with the sheave C, the guide K, constructed with the edge *o* and flange *p*, and adjustable about the axis of the sheave, substantially as described.

7. In combination with the sheave and cable, the guide K and the draft device J, having at the forward end a lateral arm to engage the cable.

8. In combination with the traction-cable, a draft device adapted, substantially as described, to trail on the ground and prevent the twisting of the cable.

9. The draft device having the lateral arm *l* at the forward end and the arms *m* at the rear.

10. In combination with the cable-coupling having the opening therein, the draft device consisting of the shank *k*, the bent lever *s*, pivoted thereto, and the locking device for said lever, the forward end of the lever being constructed to interlock with the coupling in the manner described and shown, whereby the draft is caused to prevent its disengagement.

11. A traction-cable provided with an eye or opening having pins or bearing-surfaces *j* therein, in combination with a draft device having a laterally and backwardly extended end, *l*, notched and arranged to interlock with the pins *j j*, in the manner described.

12. In combination with the supporting-frame, the sheave, and the cable, the pivoted guide K, constructed substantially as described, and adjustable devices substantially as shown, for locking said guide in different positions.

13. In combination with the traction-cable

and a horizontal sheave supporting the same, a traction device having a laterally-extended arm attached to said cable, and a shield or guard overlying the sheave and adapted to support the draft device while passing thereover.

14. In combination with a draft-cable and a horizontal sheave supporting the same, a draft device having a laterally-extended arm connected to the cable, and a shield overlying the sheave and provided with an edge adapted to act on the arm of the draft device, substantially as described, to effect the inversion of the same while passing the sheave.

15. In combination with the traction-cable, the eye-pieces *h*, the U-shaped brace *i*, constructed in duplicate, and the pins *j* uniting said parts.

16. In a draft device for use in connection with the traction-cable, the combination of the shank or draft-bar, the angular arm pivoted thereto and adapted at one extremity to engage the cable, and means, substantially as described, for locking said arm rigidly to the shank.

17. The shank or draft-bar and the angular arm pivoted at an intermediate point in its length to said draft-bar and adapted at one extremity to engage the cable, in combination with the sliding ring or collar for locking said parts, substantially as described.

WILLIAM B. ROSS.

Witnesses:
D. R. STUBBLEFIELD,
J. C. ROSS.