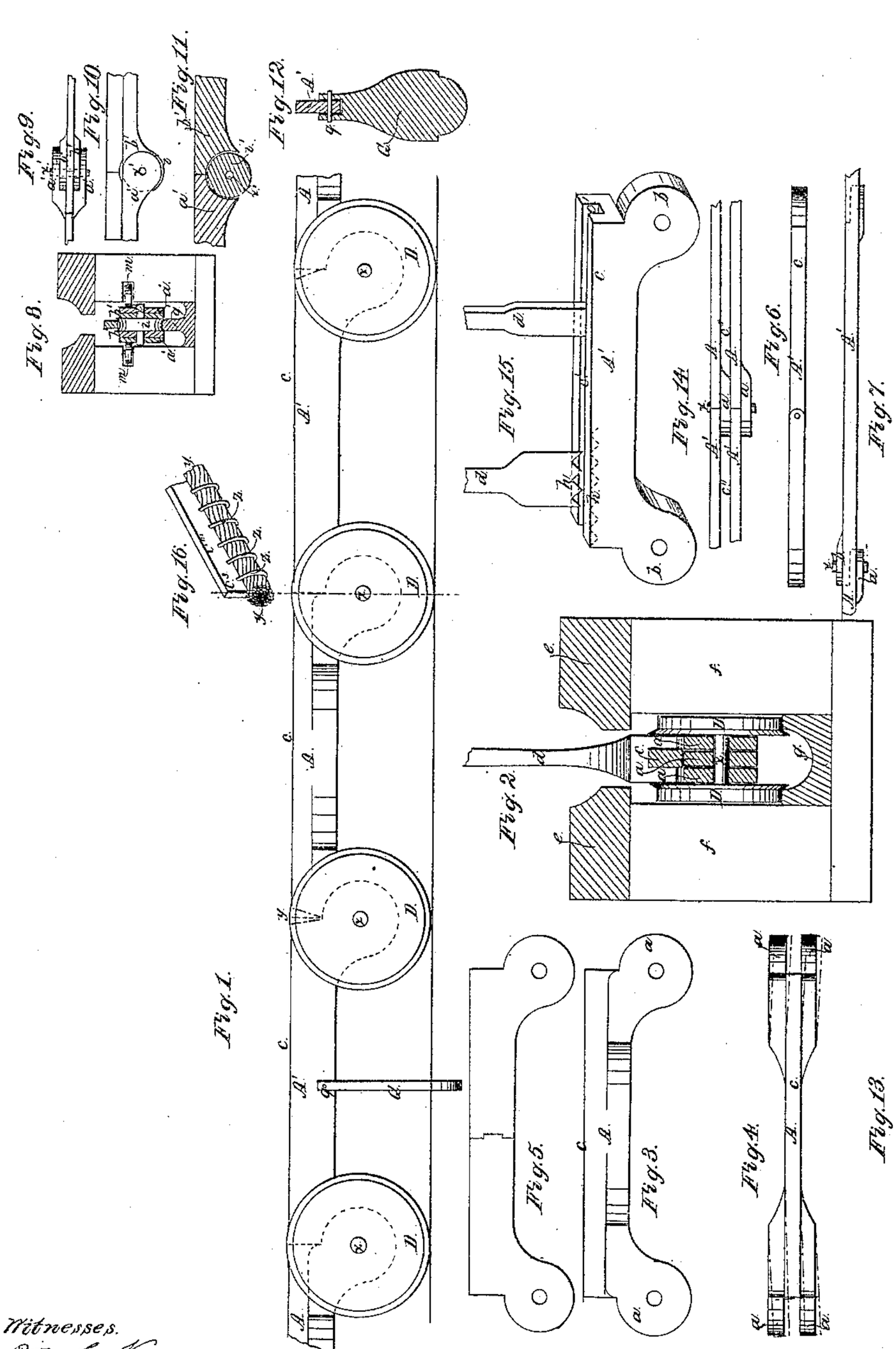
A. E. BEACH.

DRAFT CABLE FOR RAILROAD.

No. 49,696. Patented Sept. 5. 1865.



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IMPROVEMENT IN DRAFT-CABLES FOR RAILROADS.

Specification forming part of Letters Patent No. **49,696,** dated September 5, 1865.

To all whom it may concern:

Be it known that I, A. ELY BEACH, of Stratford, Fairfield county, and State of Connecticut, have invented a new and useful Improvement in Draught-Cables for Railroads and other Purposes; and I do hereby declare that the following is a full and exact description of my invention, which will enable any person skilled in the art to make and use the same, reference being had to the accompanying drawings, in which the same letters indicate similar parts in all the figures, and in which—

Figure 1 is a side elevation of my improvement. Fig. 2 is an end sectional elevation. Fig. 3 is an elevation of one of the links of the cable, having double heads or lips or ears. Fig. 4 is a plan view of the same. Fig. 5 is a side elevation of one of the single links of the cable, and Fig. 6 is a plan view of the same, and the remaining figures are modifications of my improvements.

My improvement is chiefly intended for use in the propulsion of railroad passenger-cars in cities; but it may also be employed for every species of traction, or wherever a moving cable is required.

My improved cable is composed of a series of horizontal links of iron or steel, A A′, connected at their extremities by what is known as the "rule-joint." The extremities of one of the links, A, are made with rounded projecting lips *a a*, between which lips the rounded extremity *b* of the next succeeding link, A′, is fitted. The sides of the link A′ are on the same plane, or, in other words, the thickness of the link is the same throughout; but the links A are thickened at their ends, in order that the lips *a a* may be formed thereon. The links A A′ are connected together by means of a pin, *x*, passing through a suitable aperture in their extremities. It will be observed that the links, when made and connected as here shown, form a cable the upper surface of which presents an unbroken horizontal back or ridge or comb, *c*. (See Figs. 1 and 2.)

When the cable is to be used for the propulsion of railroad-cars the pins *x*, by which the links are connected, are provided at their ends with small friction rollers or wheels D, which run upon a suitable track arranged below the surface of the street in a groove sunk in the street or in the rails of the railroad. Attached to the vehicle to be propelled there is an arm or rod or clamp, or other device, which, on being thrust down far enough, will come into contact with the ridge or back C of the cable, and when the said arm or device is made to clamp or grasp the said cable the said car or vehicle will move with the said cable. The red lines in Fig. 2 indicate the parts just mentioned, *d* being the instrument projecting from the car; *e e*, the ordinary rails of a street-railroad; *f f*, the supporting-sleepers; *g*, the rail on which the cable-wheels run.

In passing around the corners of streets the links composing the cable will bend to accommodate themselves to the curve which they are compelled to traverse, the central part of the cable-links A being made elastic and thin for that purpose, as shown in Fig. 4, in which the red lines indicate the deflection of the link from a straight line in passing a circle or corner. The natural elasticity of the metal composing the links A A′ will be sufficient to cause them to return to their straight position after the curves or corners have been passed.

The cable is propelled by means of steam-engines and suitable drums at each end of the railroad-route or other location, and the cable being connected so as to form an endless belt passes over said suitable drums or wheels, one half of the cable being thus made to move in one direction, while the other half moves in the contrary direction.

The lateral flexibility of the links of the cable will be found advantageous in changing the direction of the motion of the cable at its passage over the driving-drums, because the said drums will be so made as not only to give motion to the cable, but also to deflect or bend the cable, so as to cause it to pass from one railroad-track to another.

In some cases it may be found desirable, instead of depending upon the natural flexibility of the cable for lateral bending, to have each link jointed at the middle between the friction-wheels. In Figs. 5 and 6 the red lines indicate such a joint, by means of which any desired degree of lateral curvature in the links may be obtained, still preserving the even back or comb *c* before described.

The use of the friction-wheels upon the cable I do not deem absolutely essential. Where short cables are used the said wheels may be omitted, in which case the cable will rest upon its extremities or wholly upon its bottom part,

and will run in a groove so made as to preserve or maintain the cable in an upright form for the due action upon it of the car-connecting device.

In some cases the upper part or back of the cable *c* may be made with a groove, *c'*, as shown in Figs. 13, 15; or the cable may be composed of double links so made as to form a space, *c''*, between them, as shown in Fig. 14. In either of these cases the lower extremity of the connecting device will be made to fit into the groove or space, so that by a slight turn of said device the car and cable will be more or less firmly connected together, the connection being established by the binding of the edges of the connecting device with or against the surfaces of the groove or links. The form of the lower part of the connecting device thus used will be that of a simple blade, as shown by *d* in Fig. 15. This form of cable-back permits the seizure of the cable at any part of the line thereof, and will be useful where the groove of the track is required to be very narrow.

The back of the cable and the bottom of the connecting device may, if found desirable, be serrated. The red lines in Fig. 15, *h h*, indicate these parts. In using these parts it will only be necessary to cause the serrated surface of the device *d* to descend upon the serrated back or comb of the cable A A', when the car will be moved. I however prefer to use a smooth-backed cable, for it permits the more gentle or easy starting of the car, inasmuch as the grasp of the car-connecting device upon the cable may be rendered more or less firm at will, and thus the cable will be allowed to slip slowly through the car-connecting device until the inertia of the car has been overcome, when the connecting device may be tightened, and the same speed which the cable has will be imparted to the car.

Instead of providing the cable with friction-rollers at the junction of the links, the said wheels may be attached at any other desired points by means of ears and orifices attached to the cable.

The joint between the links may be made in the form shown in Fig. 7, if preferable, in which each link is provided with an ear, *a b*, and when both ears are fitted together the continuous comb or back will be formed, as shown.

The employment of two friction-wheels, or wheels in pairs, is not essential. Single friction-wheels may be employed to advantage in some cases.

A method of using single friction-wheels upon which to support the cable is shown in Figs. 8, 9, 10, 11, in which *i* shows the single wheel arranged at the joint of the cable-links, each end of the links having ears *a' b'*, by which they are connected, and the wheel being located between the two central ears below the cable, a single bolt, *x'*, being arranged to unite all the ears and the friction-wheel. These single wheels will run upon a single rail, *g'*, as shown in red, Fig. 8. *g'* indicates the rail. The upper part of a cable thus arranged will be supported laterally by the sides of the tube through which it passes, and friction-rollers *m m* may be arranged in the sides of the tube to receive and sustain the friction of the upper part of the cable, as shown in Fig. 8.

When it is desired to have the cable made to bend upward above a horizontal line the extremities of the links at *y* must be cut inclined, as shown in red, Fig. 1.

In some cases, when desired, a wire or rope cable may be made with a comb or combs or backs to receive the connecting device, the back being attached to the rope in sections arranged successively, as shown in red, Fig. 16, in which *v* indicates the rope, and *c* the comb or back; *c'*, the groove or double back.

Attached to the cable by a pivot *q*, and pendent therefrom at any suitable place or places upon the line of the cable, I have a series of scrapers, G, consisting of suitable plates of metal so formed, constructed, and arranged to operate that when the cable moves these scrapers will carry before them any dirt or other obstructions that may have accumulated in the groove or channel in which the cable runs. At suitable intervals in the line of the groove or channel, openings therein will be made, and receiving-boxes under the openings will be placed, into which the said dirt or obstructions will be swept by the scrapers G. (See Figs. 1 and 12.)

It will readily be understood that in lieu of the scrapers G any other suitable cleaning or sweeping device may be attached to the cable.

In some cases it may be desirable to employ the ordinary wire traction-cable, with a comb or back thereto attached. One form of such cable and attachment is shown in Fig. 16, in which *y* shows the cable; *z*, binding-wires passing around the cable and through the comb or back c^3, which is made separate from the cable, as shown.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The construction of the links of a draft-cable, substantially as herein described.
2. The combination of the friction-wheels with said links, substantially as herein described.
3. The serrated comb or back, constructed and employed as herein set forth.
4. The combination, with a draft-cable, of a scraper, substantially as described.

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