No. 92,397. PATENTED JULY 6, 1869.

W. A. SUTTON & E. CROWELL.

RAILWAY.

Fig. 1.

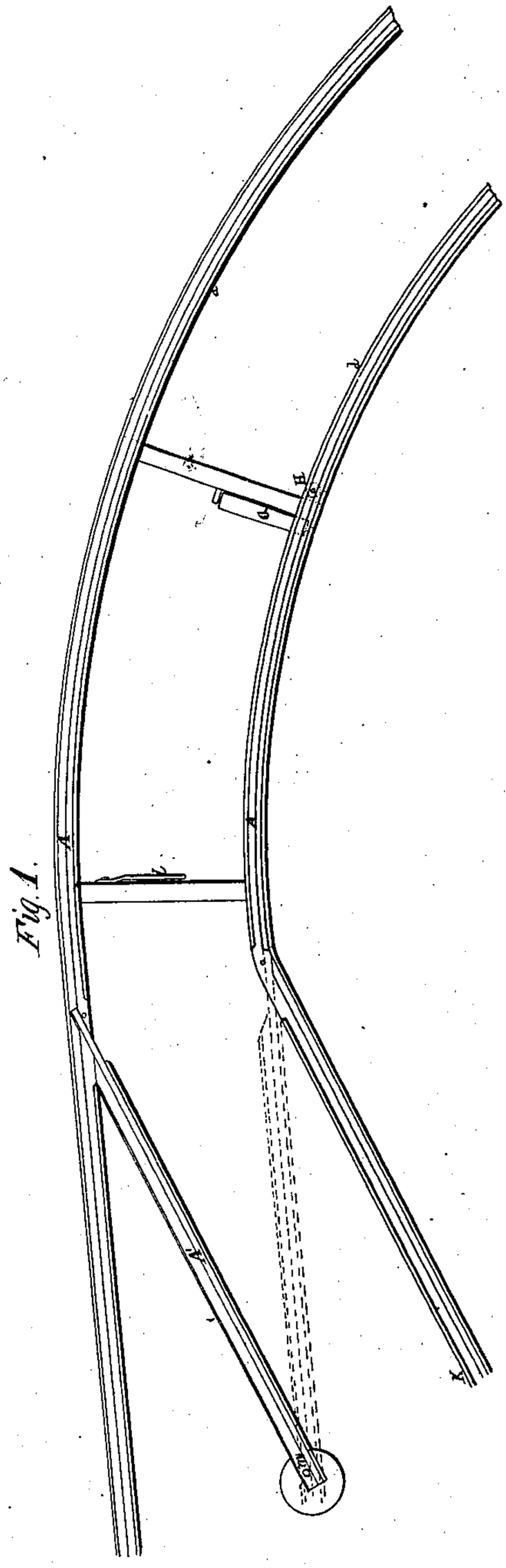

Fig. 3.

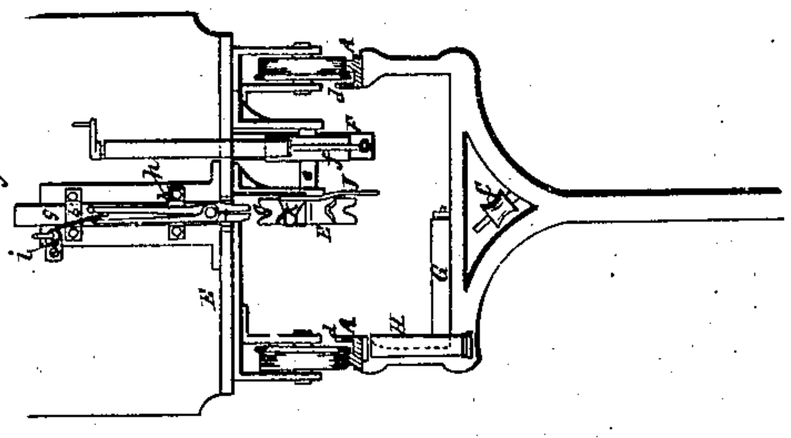

Fig. 2.

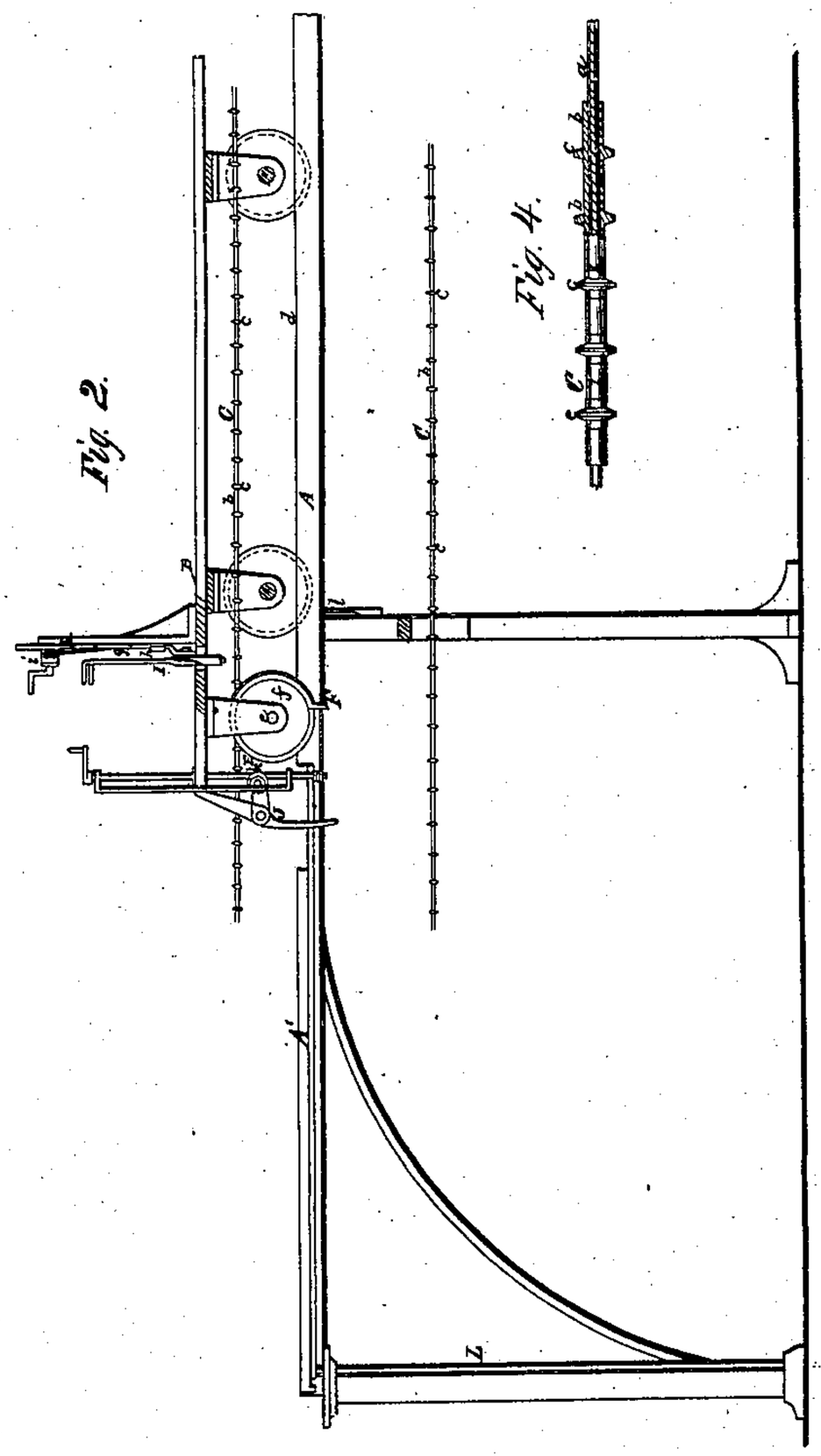

Fig. 4.

Witnesses:
J. M. Coomby
Fred Haynes

Inventors.
William A. Sutton
Eugene Crowell

United States Patent Office.

WILLIAM ALLEN SUTTON, OF NEW YORK, N. Y., AND EUGENE CROWELL, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 92,397, *dated July* 6, 1869.

IMPROVED RAILWAY.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, WILLIAM ALLEN SUTTON, of the city, county, and State of New York, and EUGENE CROWELL, of the city and county of San Francisco, in the State of California, have invented a new and useful Improvement in Elevated and other Railways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a plan of an elevated-railway track in part, as at a curve in the line, with switch-attachment or provision;

Figure 2, a side view of the same, with car arranged thereon;

Figure 3, an end elevation or transverse section thereof; and

Figure 4, a partly-sectional longitudinal view, on a larger scale, of a peculiarly-constructed endless rope for effecting the traction.

Similar letters of reference indicate corresponding parts.

This invention relates to elevated and other railways in which the cars or other vehicles running thereon are drawn by an endless rope or chain set in motion by stationary power.

The invention consists—

First, in a novel construction of endless rope for securing the necessary traction, by encasing the rope with a series of short, closely-fitting tubes or sleeves, provided, at regular and suitable distances apart, with collars or protuberances, for gear with a sprocket-wheel carried by the car or vehicle to be drawn, and whereby a smooth and evenly-pitched rope, of a knotted character, is secured, capable of great flexibility, and possessing the combined advantages of a chain and rope.

Secondly, the invention consists in a combination, with a sprocket-wheel, carried by the car for gear with the endless rope or chain, of a combined griper and depresser to said chain or rope, for grasping and removing the latter from said wheel while at rest, and depressing it to a suitable level in passing around curves, so as to suitably retain it within the track, and whereby its replacement on the sprocket-wheel is facilitated.

Thirdly, the invention includes an automatic take-off or shifter to the endless rope or chain, for disconnecting the same from the car, or displacing it from off the sprocket-wheel, when it is necessary to do so, as, for instance, at the end of a rope or chain-section.

Fourthly, the invention relates to an arrangement for switching the car or cars, and embraces a swinging construction or attachment of a section of one of the rails of the track where it is required to establish a siding, by supporting it on a crane, constructed to uphold and carry the free end or portion of such switching-rail, when swung to connect the main track with the siding, and when returning it to its original position with the main track, and whereby all obstruction within the track during such adjustment is avoided.

Referring to the accompanying drawing—

A A are the rails of an elevated or overhead street-railway, on which a car, B, is supposed to be running, through traction of an endless rope or chain, passing over drums at the ends of a section, and set in motion by any suitable driving-power.

While an endless chain may be used, or, in the place of it, a rope of any suitable knotted character, it is preferred to employ an endless rope, C, made up of a body-portion, *a*, encased by a series of short, closely-fitting metallic tubes or sleeves, *b*, certain of which are formed with collars or protuberances, *c*, on them, arranged, by their uniform or regular disposal along the rope, to give a pitched character to the latter, for gear with a sprocket-wheel carried by the car, and with drums at the ends of a section.

This construction gives a durable, smooth, and evenly-pitched character to the endless rope, free from excessive friction, also having great flexibility, and combining the advantages of both a chain and ordinary or bare rope.

The rails A A it is preferred to construct with guards, *d*, on either side of them, arranged to project above the running surface or level of the rails, for the purpose of preventing accident, in case of the car or other vehicle, or train of vehicles, mounting and running off the latter.

This car B carries a sprocket-wheel, E, hung fast on a horizontal shaft, *e*.

This wheel is pitched to gear with the collars, *c*, on the rope, so that when said wheel, with its shaft, is allowed to freely rotate, and the upper line or length of the rope arranged over such wheel, the collars *c* will fall into pitch or gear with it, and the rope thus be made to revolve said wheel, under which condition of things the car remains stationary.

To establish traction, the wheel E is locked from turning, by means of a brake, F, operated from the platform of the car, and arranged to bite or bear on a wheel, *f*, fast on the shaft *e*, whereby a positive connection, as contradistinguished from a mere frictional one, is established of the rope with the car, through the stationary-held sprocket-wheel carried by the latter.

To keep the endless rope or chain within the track in passing around curves, and to prevent unnecessary rub or wear of the same, we arrange across the bottom of the track, below the rails, at suitable points on the inner sweep of the curve, elongated horizontal or nearly-horizontal rollers, G, and, for operation in connection with these, vertical or nearly-vertical rollers, H, arranged in close proximity to the inner rail of the curve, on the inside of the track.

These combined rollers serve to guide the endless rope or chain, reduce its friction in running, and re-

tain it within the track in passing around curves, and they should be made of such length, or be so arranged, as that they cross each other, as it were, whereby the rope or chain is prevented from cutting or working in between the ends of them.

Connected with or carried by the car is a griper and depresser, I, to the endless chain or rope, for grasping and removing the latter from the sprocket-wheel E while at rest, and lowering it to a suitable level in passing around curves, so as to suitably retain it within the track, and whereby the rope or chain may readily be replaced again on the sprocket-wheel. For this purpose, or these purposes, said griper and depresser is shown as constructed to have a tongs-like action, and capable of a vertically-sliding movement, by means of a stock or bar, *g*, working through guides *h h*.

Said device may be raised or lowered, as required, by means of a windlass, *i*, or other suitable means, and be opened and closed by hand, to gripe and remove the rope or chain from off the sprocket-wheel in passing around a curve, so as to retain it in proper line within the track, and, by again elevating and opening said depresser, to replace it on said wheel, or to put into gear with such wheel the rope or chain of a succeeding working section, after the draught-connection has been broken with a previous section of the line, supposing the latter to be made up of a series of endless-rope or chain sections.

Independently of this device for controlling the draught-connection with the car, we provide the latter with an automatic take-off or shifter, J, to the endless rope or chain, for disconnecting said rope or chain with the car at the end of a section or other fixed point on the line.

This shifter is shown as made up of a bell-cranked lever, carrying a conical roller, *k*, and so arranged, as that when the lower leg of said lever comes in contact with a fixed stop or projection, *l*, on the line, the roller *k* is made to tip or tilt the rope or chain from off the sprocket-wheel E.

To switch the car on to a siding, K, and to run it back therefrom on to the main track, a section, A′, of one of the rails of the main track, is hinged or pivoted, as at *m*, to or over a crane, L, constructed to support such swinging section as well at its free or forward end as in rear thereof, so that said rail-section or switch is carried and upheld by the crane, both during its adjustment, and when adjusted to establish connection with the siding, as shown by full lines in fig. 1, or to re-establish its straight position with the track, as shown by dotted lines in the same figure. In this way, it will be seen that the support to the free end of the switch or swinging section A′ offers no obstruction to or within the main track during the adjustment of such switch, or when adjusted.

Any suitable catches or locking-devices may be used for securing the switch when set as required.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination of the metallic sleeves *b* and collars or protuberances *c* with the rope C, when applied so as to entirely encase said rope without destroying its flexibility, substantially as specified.

2. The combination, with the sprocket-wheel E, of the griper and depresser I, to the endless rope or chain, constructed and arranged for operation substantially as specified.

3. The automatic take-off or shifter J, to the endless rope or chain, for operation in relation to the sprocket-wheel E, essentially as herein set forth.

4. The combination of the switch or swinging-rail section A′ with the crane L, substantially as and for the purposes specified.

WILLIAM A. SUTTON.
EUGENE CROWELL.

Witnesses:
FRED. HAYNES,
A. KINNIER.