

(No Model.)

2 Sheets—Sheet 1.

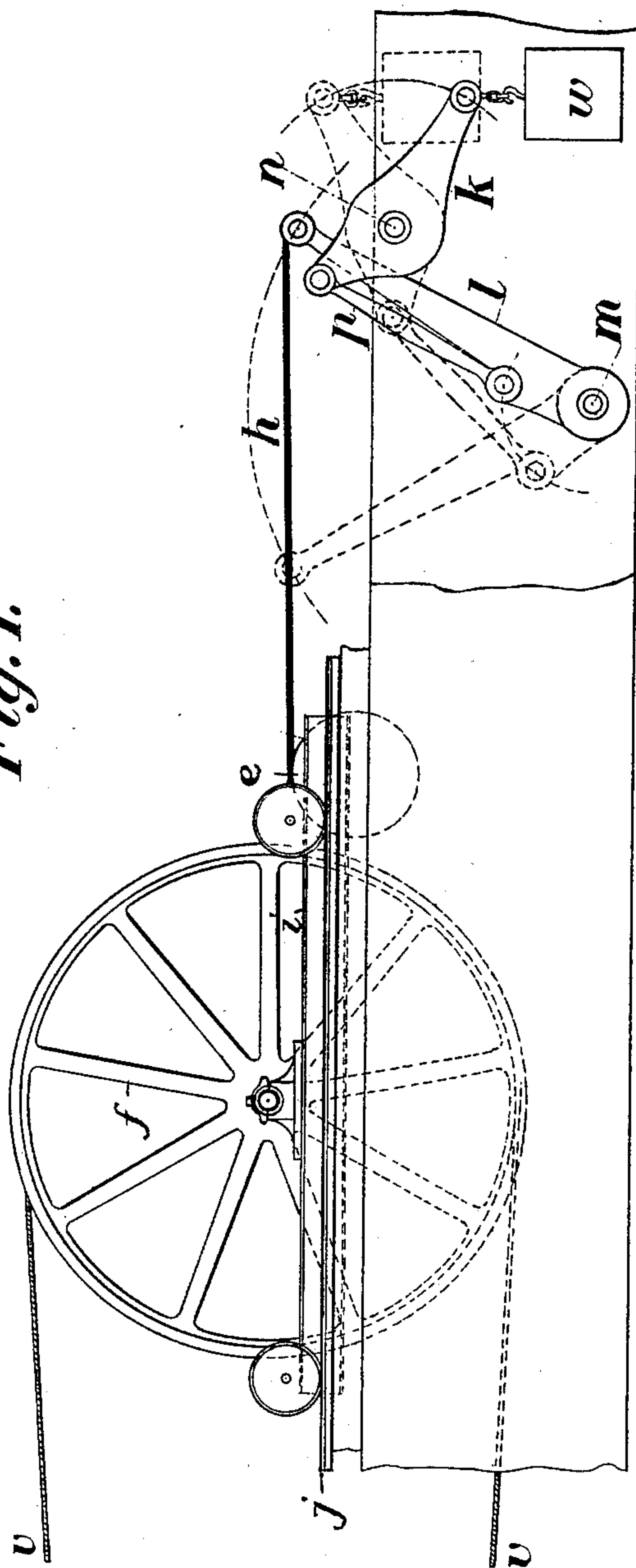
D. J. MILLER.

TRACTION ROPE RAILWAY.

No. 325,004.

Patented Aug. 25, 1885.

Fig. 1.



Witnesses:

C. Lundquist

N. A. Zeh

Inventor:

D. J. Miller

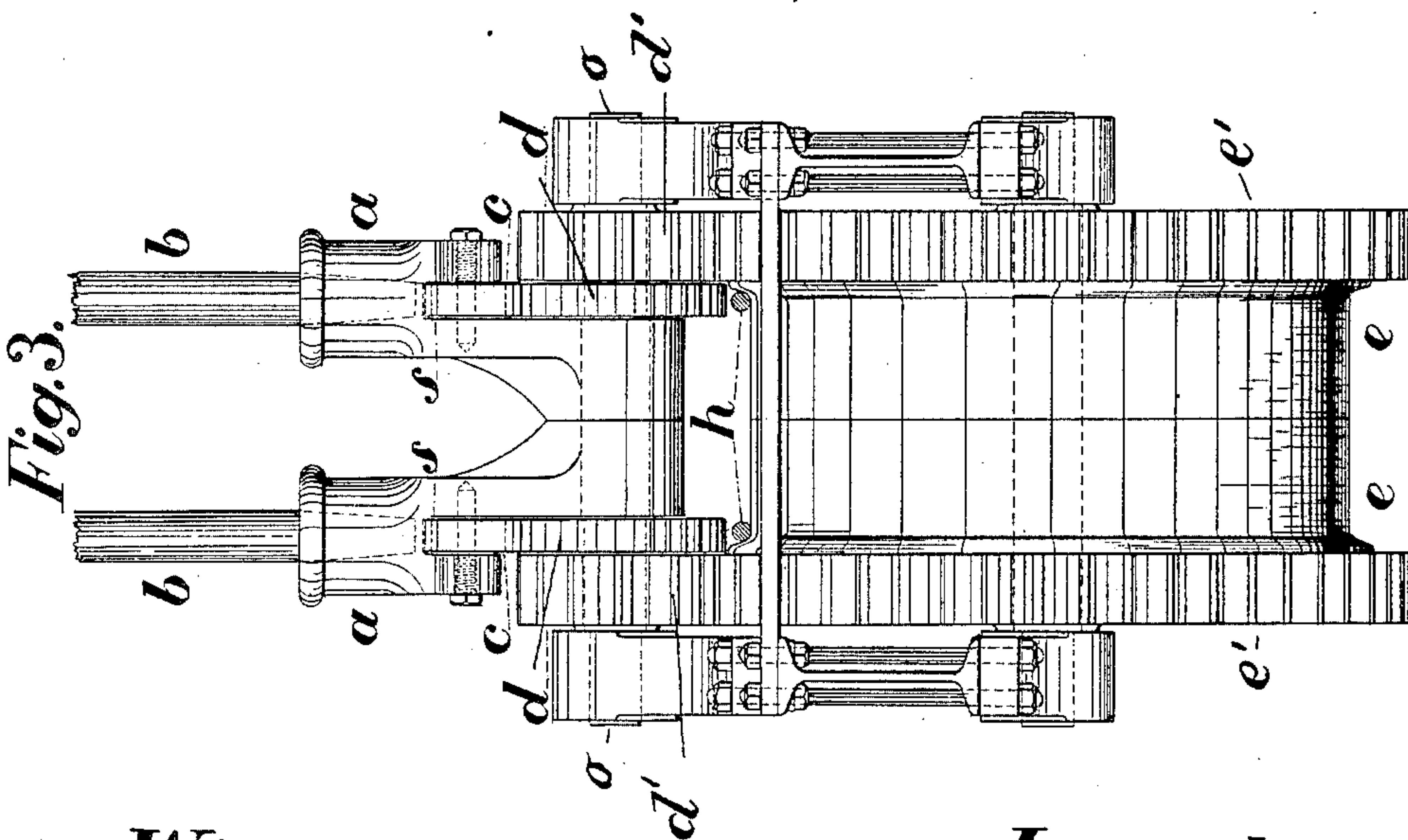
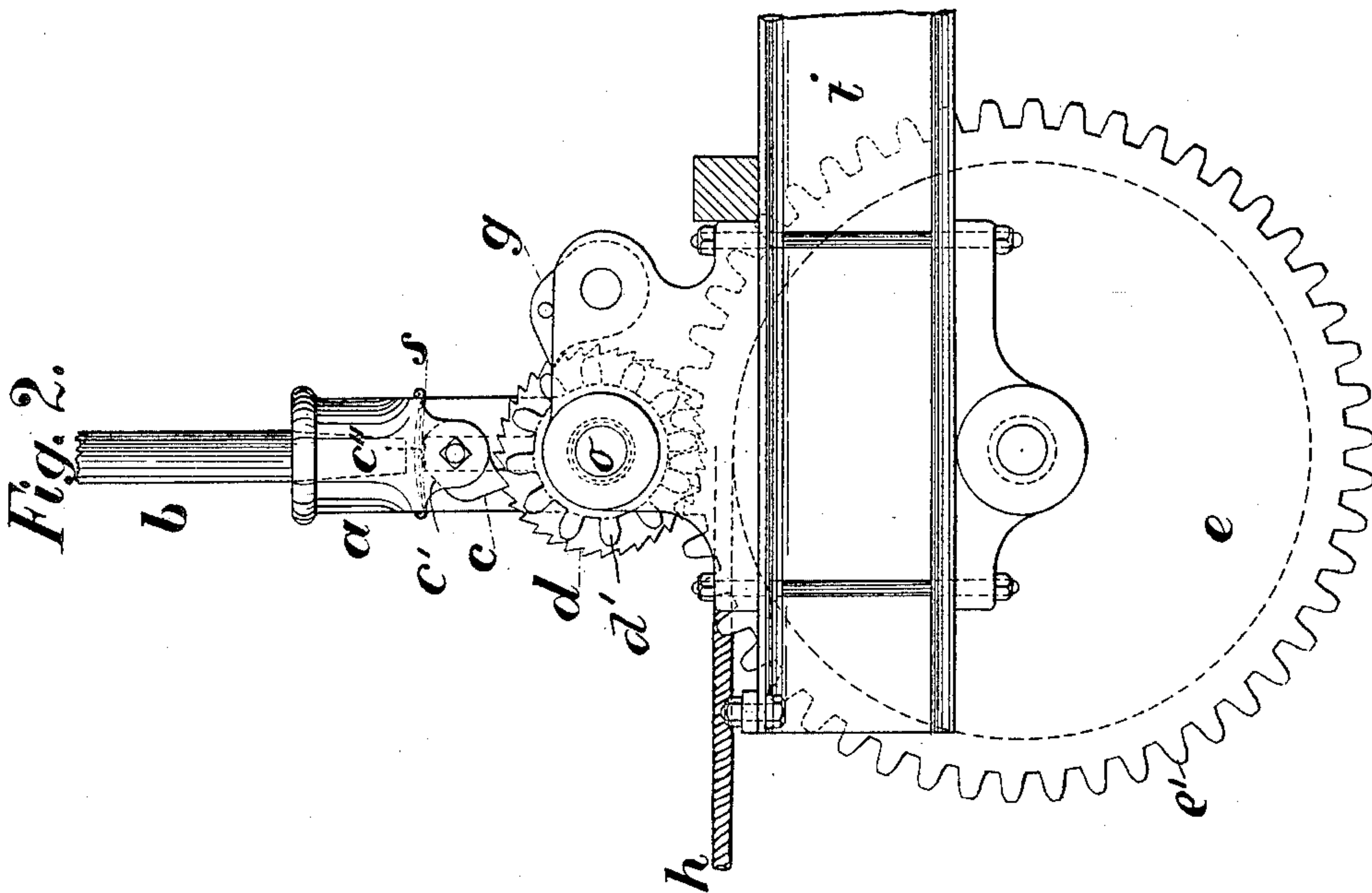
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2 Sheets—Sheet 2.

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No. 325,004.

Patented Aug. 25, 1885.



Witnesses:

O. Lundquist.

N. A. Zeh.

Inventor:

D. J. Miller

UNITED STATES PATENT OFFICE.

DANIEL J. MILLER, OF CHICAGO, ILLINOIS.

TRACTION-ROPE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 325,004, dated August 25, 1885.

Application filed November 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, DANIEL J. MILLER, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Traction-Rope Railways, of which the following is a specification.

In cable railways it is usual to pass the main or operating cable around a sheave carried by and journaled upon what is known as a "tension-car" for the purpose of keeping said cable taut. These cars generally consist of a truck supported on a suitable track or way, and carrying the tension-sheave, around which the operating-cable of the road passes, said cable being held taut either by the weight of the car itself, when resting upon an inclined track, or by weights suspended from a supplemental cable, which passes over suitable anti-friction sheaves, and is attached at its other extremity to the tension-car. With these devices it is apparent that the tension is constant and at all times equal, and this is not the result it is desired to accomplish, as where long ropes are used the motion is liable to be very unsteady, causing considerable movement to the tension-car.

The object of my present invention is to provide a device whereby the strain produced by the tension-car will be gradually reduced as the slack in the operating-cable is taken up and increased as said slack is paid out. To this end the weight which is employed to produce the tension is connected with the tension-car through the medium of a system of differential equalizing-levers, means being provided for enabling the manipulation of the weights to vary the tension by a single individual, all of which will be hereinafter fully described with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the tension-car, its track or way, the weight employed to produce the tension, and the differential equalizing-levers located in the line of connection between said weight and car. Fig. 2 is a side, and Fig. 3 an end elevation, of a winding mechanism designed to regulate the tension of the weight.

v represents the main or operating cable of a cable railway, which is passed around a

sheave, *f*, journaled in a truck, *i*, whose wheels rest upon a track or way, *j*, all of which may be of any ordinary construction.

w is the weight which produces the tension upon the cable *v*, said weight being connected with the truck of the tension-car through the medium of the following devices, which constitute an equalizing device. It is suspended from the extremity of the longer arm of a beam, *k*, which is mounted and oscillates upon a shaft, *n*, the shorter arm of said beam being connected through the medium of a link, *p*, with a lever, *l*, which is fulcrumed at its lower extremity to a shaft, *m*, and connected at its upper extremity through the medium of a supplemental cable or cables, *h*, with the truck *i* of the tension-car. With this system of levers it will be seen that the weight *w* will exert its greatest strain when the parts occupy the positions shown by the dotted lines, which strain will gradually decrease as the parts assume the positions shown in full lines in Fig. 1. I do not, however, desire to limit myself to a system of equalizing-levers of any particular construction, as it is obvious that there are many by which the same result can be accomplished.

e is a drum, which is journaled in boxes secured to the frame of the truck *i*, and has the extremity of the supplemental rope *h* connected thereto, as shown. This drum is provided at one end with a pinion, *e'*, which is engaged by a similar pinion, *d'*, keyed to a shaft, *o*, which is also journaled in boxes secured to the frame of the truck *i*. This shaft has also keyed to it a ratchet, *d*, which is engaged by a pawl, *c*, carried by a lever, *a b*, whose extremity is fulcrumed upon the same shaft to which said ratchet is secured. The lower portion, *a*, of this lever is formed of metal, and formed with a socket for the reception of the end of a wooden or other staff, *b*, which may be of any desired or necessary length.

g is a second pawl, pivoted to a fixed part of the frame, and engaging with the ratchet *d* to prevent its retrograde movement.

The pawl *c* is formed with two flat sides, *c'* and *c''*, as represented by dotted lines in Fig. 2, either of which may be engaged by a spring, *s*, for holding said pawl in or out of engage-

ment, as may be desired. By this arrangement the supplemental cable *h* may be wound upon or unwound from the drum *e* with ease by a single individual, and the weight accordingly raised or lowered, thus producing a corresponding increase or decrease in the counterbalancing strain, as may be desired.

The supplemental cable *h* and the winding mechanism just described, to which it is secured, are all duplicated, as represented in Fig. 3, so that should it become necessary to replace one of said cables or other part the mechanism would not be rendered inoperative, but might be used with the parts not disabled.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a cable railway, the combination, with the cable and the tension-car, of a weight and a system of differential levers incorporated in the line of connection between said car and weight, as explained.

2. In a cable railway, the combination, with a cable and a tension-car, of a weight, a supplemental cable, and a system of differential levers for connecting said weight and car, as explained.

3. The combination, with a tension-car, a weight, and a supplemental cable connecting said weight and car, of a winding-drum to

which said supplemental cable is secured, as explained.

4. A tension-car and weight, in combination with a system of differential levers and a supplemental cable connecting said car and weight, and a winding-drum to which said supplemental cable is attached, journaled to and carried by said car, as and for the purpose set forth.

5. A tension-car and a weight, in combination with a system of differential levers and supplemental cable for connecting them, and a take-up or winding mechanism for regulating the length of said supplemental cable and consequently the strain exerted by the weight.

6. In combination, a tension-car, a weight, a pair of cables supporting said weight, and a pair of winding-drums to which said cables are secured, journaled to and carried by said car, as and for the purposes set forth.

7. In a cable railway, in combination, the tension-car, the winding-drum *e*, journaled thereon, the supplemental cable *h*, secured to said drum, lever *l*, link *p*, beam *k*, and weight *w*, all constructed and arranged to operate substantially as set forth.

D. J. MILLER.

Witnesses:

O. LUNDQUIST,
N. A. ZEH.