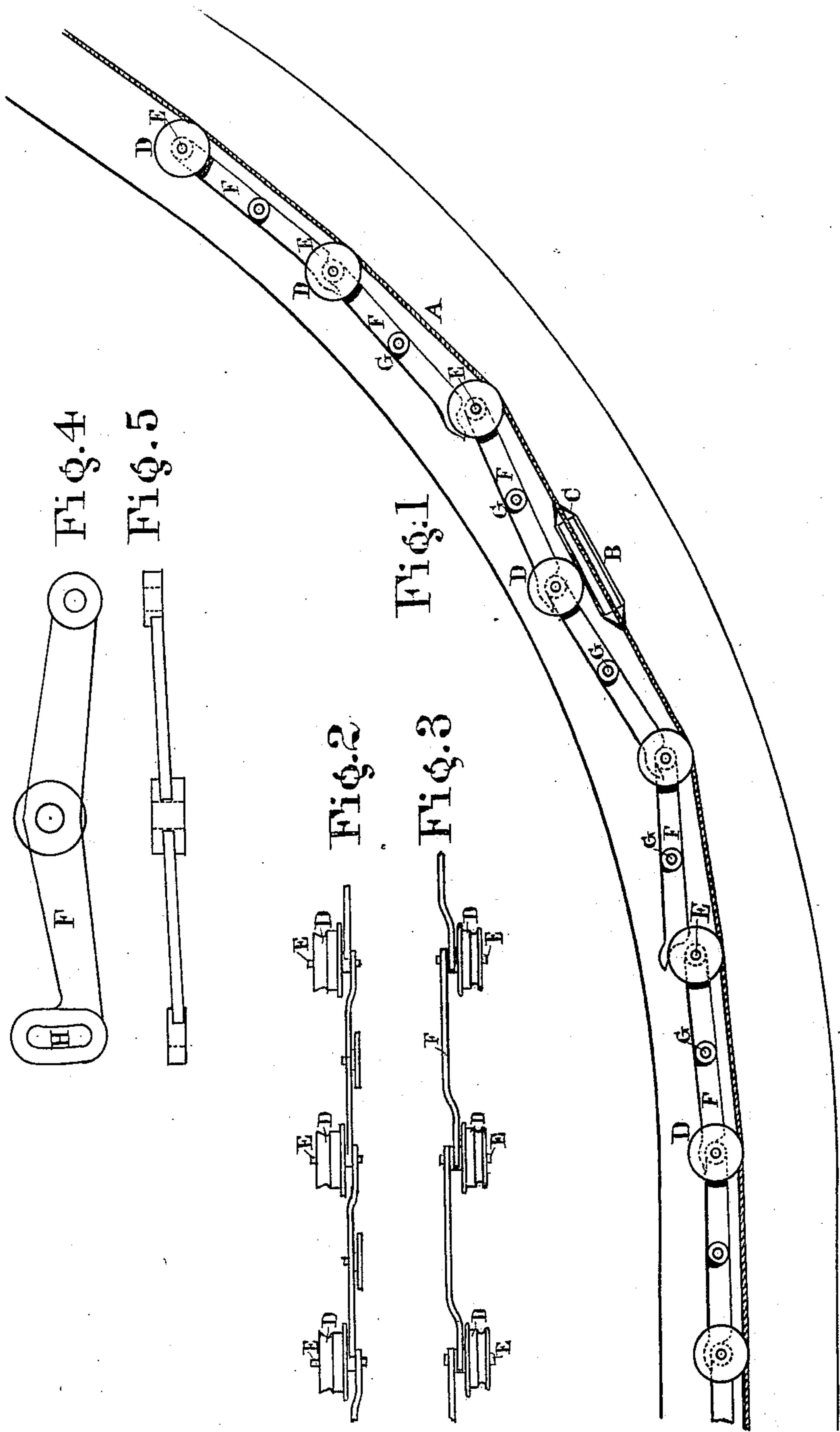


(No Model.)

A. K. GRIM.  
ROPE RAILWAY.

No. 245,626.

Patented Aug. 16, 1881.



Witnesses

Robert Münch.

Alvin C. Austin

Inventor

Abraham K. Grim

by George Pardy  
Atty.

# UNITED STATES PATENT OFFICE.

ABRAHAM K. GRIM, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO JOEL B. LOW, OF SAME PLACE.

## ROPE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 245,626, dated August 16, 1881.

Application filed March 14, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, ABRAHAM K. GRIM, of San Francisco, California, have invented a new and useful Improvement in Rope Railways, of which the following is a specification.

My invention relates to the guide-pulleys and swinging bars used for the purpose of guiding the rope around a horizontal curve; and it consists in the novel way in which I construct the swinging bars and combine them with the pulleys and with themselves in sets or series, by which combination certain advantages of operation are obtained, as will be hereinafter more fully set forth.

In accompanying drawings, Figure 1 is a plan, showing a rope guided around a curve by my improved guide-pulleys. Fig. 2 is an edge view of a section of a set (amply illustrating the whole) in which the pulleys are shown resting upon the bars. Fig. 3 is a similar edge view, in which the pulleys are shown hanging from below the bars. Fig. 4 is a plan to a larger scale of one of my bars, slightly differing in form from those shown in previous figures, Fig. 5 being an edge view of same.

In all the figures of the drawings similar letters of reference refer to like parts.

In Fig. 1, A is the rope, upon which a gripping device of any suitable kind is attached. It is unnecessary that I should show a complete gripping device, as it will serve as sufficient illustration for me to show its position. This I have done at B. This gripe is provided with a bevel-ended shoe or plate, C, in a convenient place, so that this shoe will make contact with the guide-pulleys instead of the gripe itself, and with a gradual easy approach, so that there may be no sudden shock.

D D, &c., are the guide-pulleys, which carry the rope upon an approximate curved line. They revolve upon vertical pins E E, &c., projecting (upward, as in Figs. 1 and 2, and downward, as in Fig. 3) from one end (it is immaterial which) of each of the swinging bars F F, &c. These swinging bars vibrate on the fulcrum-pins G G, &c. Each bar F, as in Fig. 1, projects (at that end opposite the one on which its guide-pulley is secured) behind the pin E, carrying the next guide-wheel on the next bar

in advance, if there be one, in such a manner as that when the guide-pulley on one end of a bar is pressed back the other end of a bar to which it is attached will push forward the guide-pulley secured to this bar next in advance; and, again, if there be a bar and pulley next behind, a similar effect will be produced. Of course, as at each end of the curve there is a first bar or last bar, there can be no double action by these end bars. The result of the combined action of these swinging bars is such that the wheels always hold the rope perfectly straight and in line with the gripe-jaws between supports or guides—that is to say, it is always insured that the rope will not be bent at an angle immediately before and after passing through the gripe-jaws—a matter which is important, as it is very injurious to wire ropes running on this class of railways to cause them to continually pass sharp angles or bends.

By my system there is also the further advantage of avoiding side or torsional strain upon the gripe and consequent friction of the gripe-shank against the side of the slot when my invention is applied in underground tubes, because, the rope being held at all times parallel with a chord of the arc through which the gripe is traveling, the strain is necessarily directly within line of travel, or as nearly so as the succession of short chords approaches the true curve. If it were otherwise and the rope were permitted to pull at various angles to the actual line of travel, it will be readily understood that the passage of the gripe around the curve would be attended with a very great friction of the shank on the side of the slot in those cases where the gripe moves in an underground slotted tube.

I also find that with my plan of combining the swinging bars the rope is not subjected to any extra strain as the gripe passes the guide-pulleys, the action being such that, as nearly as may be, a compensation occurs as the pulleys swing in or out, which insures the same length of rope sufficing to encompass the curve, whether the gripe be passing through or not.

I show in Figs. 4 and 5 a plan and edge view of a swinging bar which is a little different from that shown in Fig. 1, inasmuch as I have



made a slotted end at H to receive the pins E of the bar adjoining, thus more securely connecting all the swinging bars together.

What I claim as my invention, and desire to  
5 secure by Letters Patent, is as follows:

The combination of three or more swinging bars, F F F, (vibrating on fulcrum-pins G G G,) having each a guide-pulley, D, on one end, and engaging with the bar or bars adjoining  
10 in such manner as that when the guide-pulley

attached to each bar is pushed back by the passing gripe the guide-pulleys in front and rear (one or both) will be correspondingly set forward, so as to maintain the rope in a straight line between alternate pulleys when the gripe  
15 is between, substantially as described.

ABRAHAM K. GRIM.

Witnesses:

GEORGE PARDY,  
JOHN PARDY.