(No Model.)

A. H. MATHESIUS.

WIRE ROPE GRIP.

No. 287,451. Patented Oct. 30, 1883.

FIG. 1.

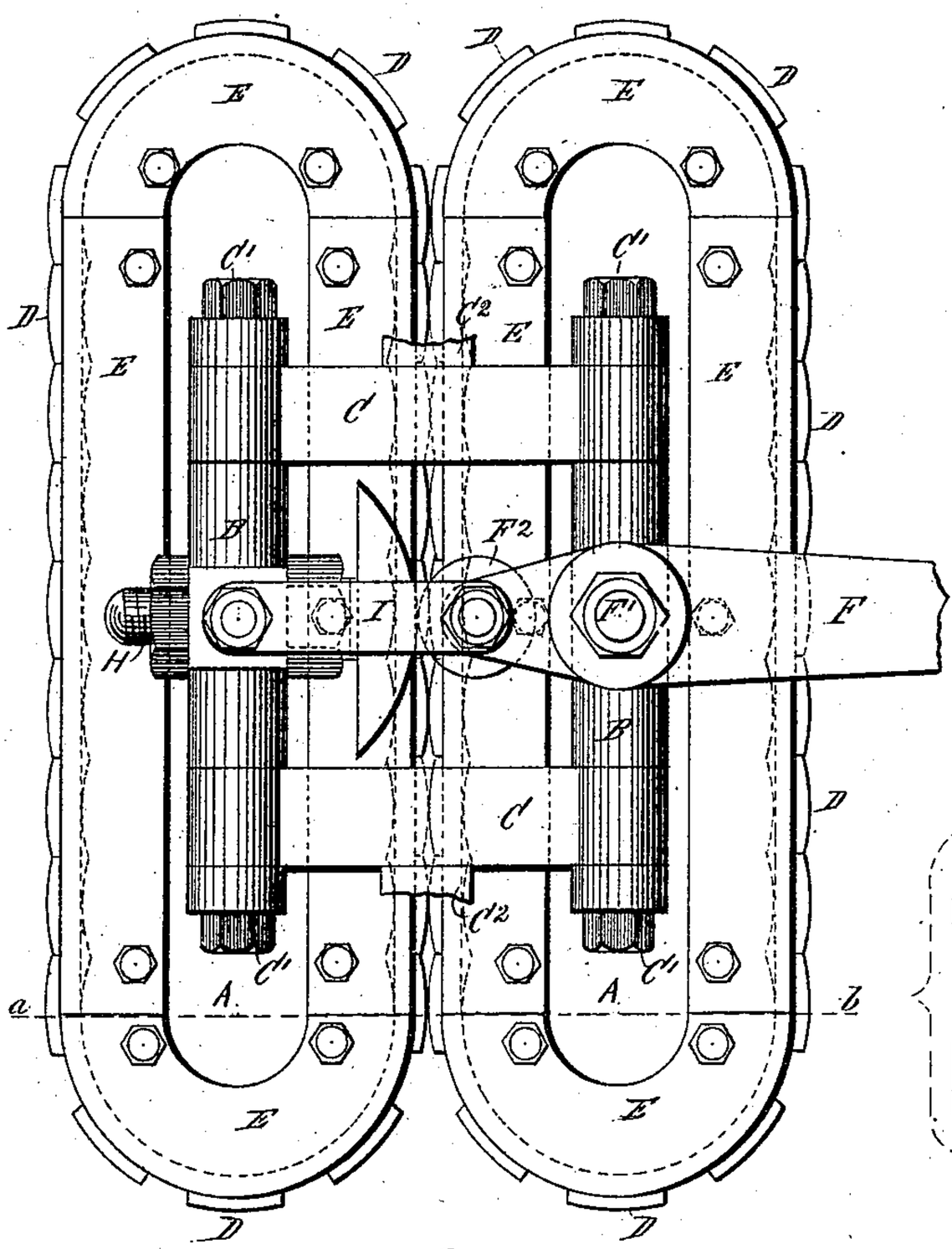


FIG. 3.

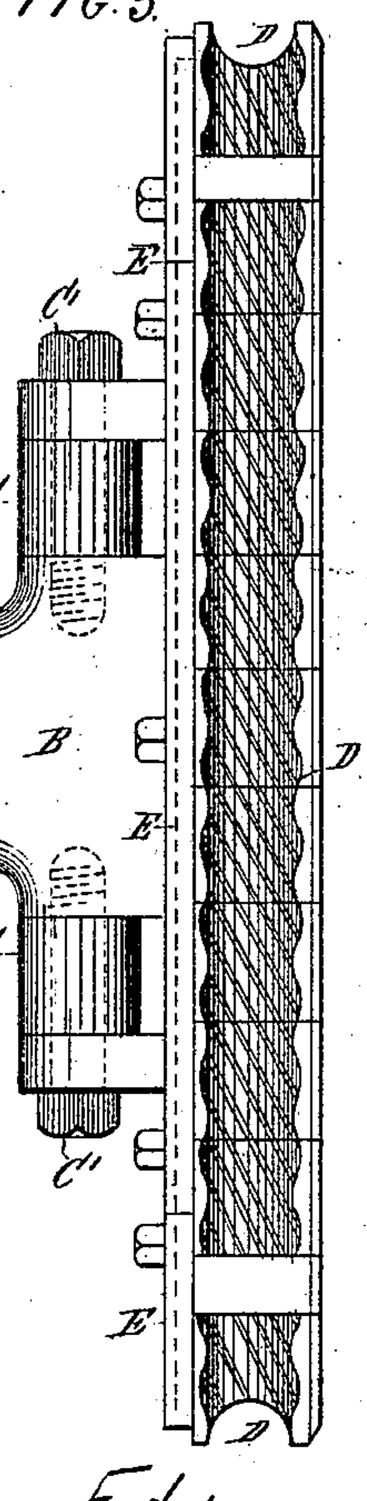


FIG. 4.

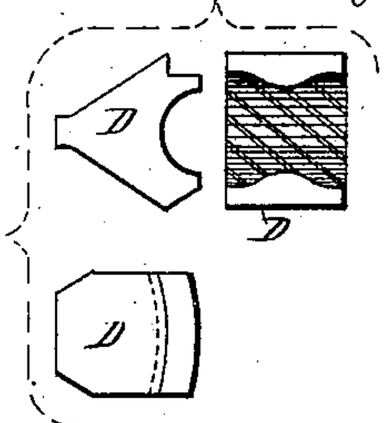


FIG. 2.

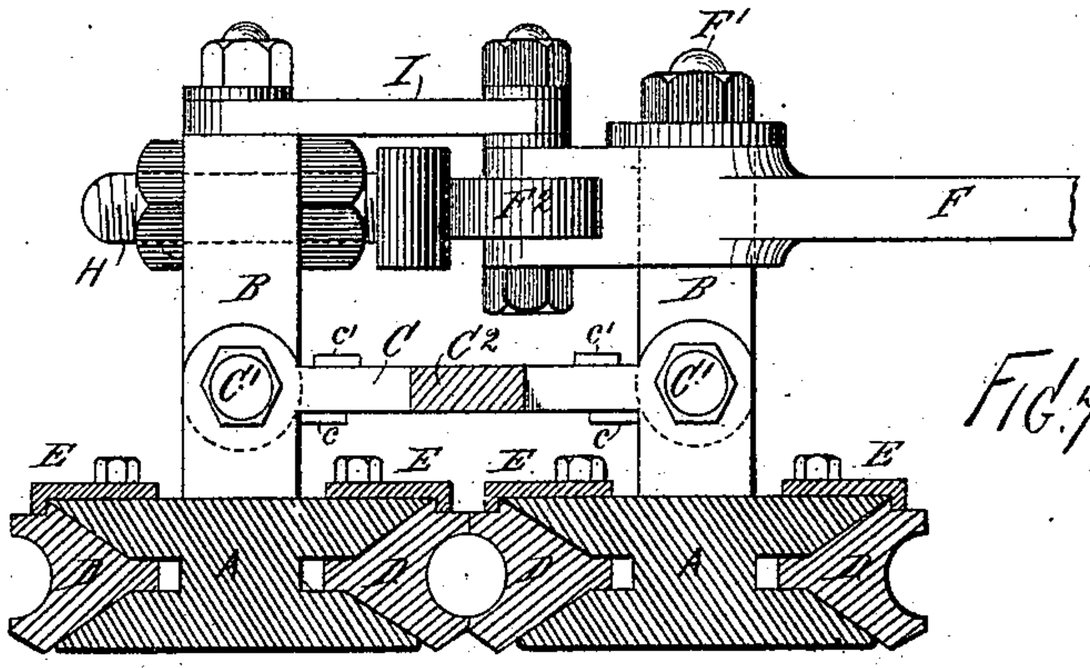


FIG. 5.

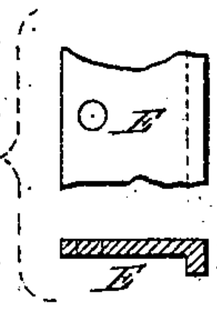


FIG. 7.

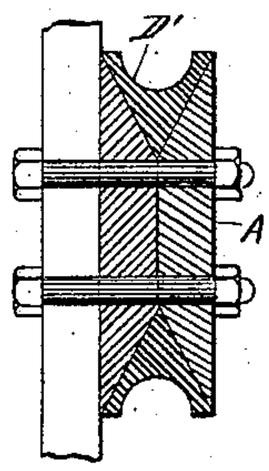
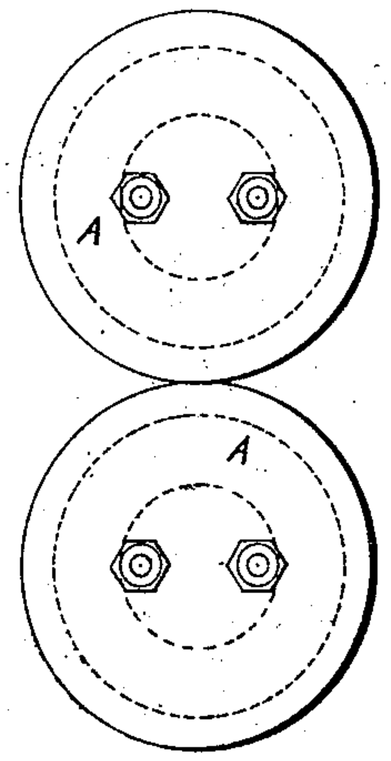


FIG. 6.



Witnesses:
John Buckler,
Henry Siet.

A. H. Mathesius,
Inventor.
By Worth Aygood
Attorney.

UNITED STATES PATENT OFFICE.

ALEXANDER H. MATHESIUS, OF BROOKLYN, NEW YORK.

WIRE-ROPE GRIP.

SPECIFICATION forming part of Letters Patent No. 287,451, dated October 30, 1883.

Application filed September 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER HUGO MATHESIUS, of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Wire-Rope Grips, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention has relation to that class of devices employed for connecting cars with a moving wire rope or cable, by which they are propelled, which devices are known as "wire-rope grips" or "cable-grips."

The object of my invention is to produce a simple, cheap, durable, and effectively-operating grip, by use of which the cable may be clamped without unnecessary wear thereon or on the grip; which will admit all the required variations between the speed of the car and the cable; which will clamp the cable without danger of slipping when running at full speed, and release the cable instantly or gradually, as may be required, without danger of catching, and which, withal, will not be liable to damage or disarrangement of parts. To accomplish all of this my improvements involve certain novel and useful peculiarities of construction, relative arrangements or combinations of parts and principles of operation, all of which will be herein first fully described, and then pointed out in the claims.

In starting a car (which is to be propelled by an endless rope or cable) the rope necessarily slips through the grip a certain distance until the car has attained the same velocity as the rope, and also it is found desirable to run the car slowly in parts of the line—as at crossings—to take on passengers or allow them to alight, as well as to allow vehicles to pass in front of the car, and for various reasons or purposes not necessary to particularize.

Heretofore grips of the character to which my improvements have reference have been of two general classes—the roller-grip and the roller-and-die grip. Practice has demonstrated that in the first of these classes of grips, although the rope therein does not slip except as the brakes of the roller are tightened before there is sufficient pressure on the rope to cause the amount of friction necessary to move the car, the injury done by the roller to the rope is caused by the tendency to roll out the rope, much the same as material is rolled out in a rolling-mill. The injury resulting from use of the second class of grips above named is principally due to abrasion of the die, as well as of the rope, and also to the hardening process to which the outside wires of the rope are subjected, they being drawn through the dies, after the manner of wire-drawing. The rollers in this second class of grips are only employed as guides. These objections I obviate by use of my improved grip.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan or top view of a grip constructed and arranged for operation in accordance with my invention. Fig. 2 is a sectional elevation upon a vertical plane passing through line *a b* of Fig. 1. Fig. 3 is a side elevation. Fig. 4 represents an edge, face, and plan view of one of the dies detached. Fig. 5 represents a plan and section of the guide. Fig. 6 is a plan showing a pair of circular jaws; and Fig. 7 a section through one of said jaws and the annular die mounted thereon, all in accordance with my invention.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

A A are two adjustable jaws, within the ways of which are fitted segments of rings, as D D. The periphery of these segments is cut or otherwise formed, substantially as indicated, so as to fit the circumference of the rope in such a way that the spiral of the rope, which is formed by laying the different strands thereof around the core, will fit into the semicircle, much as a screw fits into its nut.

Upon the jaws A are secured, by screws or otherwise, guides E, which are located in such manner that they allow an easy movement of the segments in their ways, at the same time preventing any displacement or disarrangement thereof.

Upon the upper part of the jaws A are erected suitable extensions, B B, which are connected by links C C. The jaws A swing upon the latter, being connected therewith by suitable hinge-bolts, as C′ C′.

F is the lever by which the jaws are moved, the same being extended, by suitable connections or otherwise, so that it may be conven-

iently operated from the station of the operator. This lever is fulcrumed upon one of the jaws, as at F′, and connected with the other jaw by a link, I, as plainly shown. The perforations through link I should be made slightly oblong, and the holding-nuts therefor should not be turned down too tight, in order that the jaws may move without interference. In the end of the lever F is a friction wheel or roller, F^2, and this is made to bear upon the enlarged head of the thrust-screw H.

The operation of the device is as follows: When the lever F is moved from its central position, (where it is represented in the drawings,) it opens that part of the grip which is below the center line of the links C C by pulling upon link I. The rope or cable, which runs upon sheaves, may be raised to the grip, or the grip may be so mounted as to be capable of being lowered to the rope by suitable arrangements, all of which are now well understood. When the rope and the grip are at proper relative elevations, so that the former may be grasped by the latter, the lever F is moved back toward its central position and closes the jaws A together with a pressure sufficient to produce friction enough upon the inner wedge-shaped (or other shaped) faces of the segments to move the load. The pressure results from crowding a part of the parts of the grip above the center lines of the links C C, which brings the under parts together, and may be gradually produced by moving the lever slowly. The thrust-screw H may be suitably adjusted and set by the nuts with which it is provided, so that the rope shall be clamped to the utmost capability of the grip when the lever is in its central position, thus obviating unnecessary pressure upon the rope as well as on the grip. As soon as the dies or segments are brought into contact with the rope they commence to move around in their ways in the jaws, and are gradually prevented from moving by reason of the friction produced upon their inner bearing-faces. As soon as the dies or rings are prevented from traveling in their ways, of course the grip and the car to which it is applied take up the full speed of the rope.

Instead of making the jaws oblong, as in Figs. 1, 2, and 3, I may make them circular, as indicated in Figs. 6 and 7, in which case the dies D′ are made in annular form and in one or more pieces, as required. The traveling of the dies in their ways is the same in this case as in the case of the oblong jaws; but the oblong jaws are preferred because of the increased number of bearing-points upon the rope which they afford. The annular die, movable in its ways, has an advantage over an ordinary roller or sheave, in that it does not require any separate or independent brake to arrest its movements. The dies in either case are cut or scored, or otherwise formed, so that the cable will fit closely therein, and so that there can be no slipping of the one upon the other, which brings practically all the wear there is upon the inner surfaces or faces of the dies and the parts of the jaws adjacent thereto. If there be any wear upon these parts, it can be readily taken up or compensated by simply adjusting the thrust-screw H to the proper point, and it will in no way interfere with the efficiency of the grip. This formation of the dies, so that their concave faces for contact with the rope shall conform to the surface thereof, and the making of the dies movable in their ways, are two of the most important features of the invention. So far as these features are concerned the jaws or carriers may be operated in any desired way. The abutments *c c* and *c′ c′* upon the faces of links C C are to prevent the jaws from swinging beyond a certain point when being made to approach each other, or when being made to recede from each other, and in the latter movement *c′ c′* insure that when opened to their fullest extent the jaws will be equally distant from the central or vertical axis of the grip.

The grip is suspended in any suitable way and connected with the car from some points on the links C C, as at C^2 C^2. When constructed as shown in the drawings, as the jaws are brought together the outer margins of the dies, either in the form of segments or rings, are made to abut against each other, thus forcing their inner bearing-faces against the walls of the ways without compressing the rope or cable. Of course they could be made so as to be crowded against the walls of their ways by pressing upon the rope, and not upon each other; but I prefer the construction shown, for reason of its obvious advantages.

The ways and the contact-faces of the dies may be flat, circular, or in any other shape; but I prefer to make them wedge-shaped, substantially as shown.

When constructed and arranged for operation substantially in accordance with the foregoing explanations, the improved device will be found to admirably answer the several purposes or objects of the invention as previously set forth, and to obviate numerous disadvantages of grips as heretofore ordinarily constructed.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grip arranged to grasp and release a moving cable, as set forth, the combination, with the adjustable jaws, of segments or dies for contact with the cable, said segments or dies being sustained in suitable ways formed in the jaws, and arranged to travel therein, substantially in the manner and for the purposes set forth.

2. The dies for bearing upon the rope or cable, the same having their concave faces formed, as explained, so as to prevent slipping upon the cable, made movable in ways formed in the jaws, and combined with said jaws, substantially as shown and described.

3. In a grip of the character herein set forth,

the adjustable jaws, the dies made movable in said jaws, and having concave bearing-surfaces made to conform to the surface of the cable, links connecting the jaws, and an adjusting-lever arranged and combined for operation, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

A. H. MATHESIUS.

Witnesses:
JOHN BUCKLER,
WORTH OSGOOD.