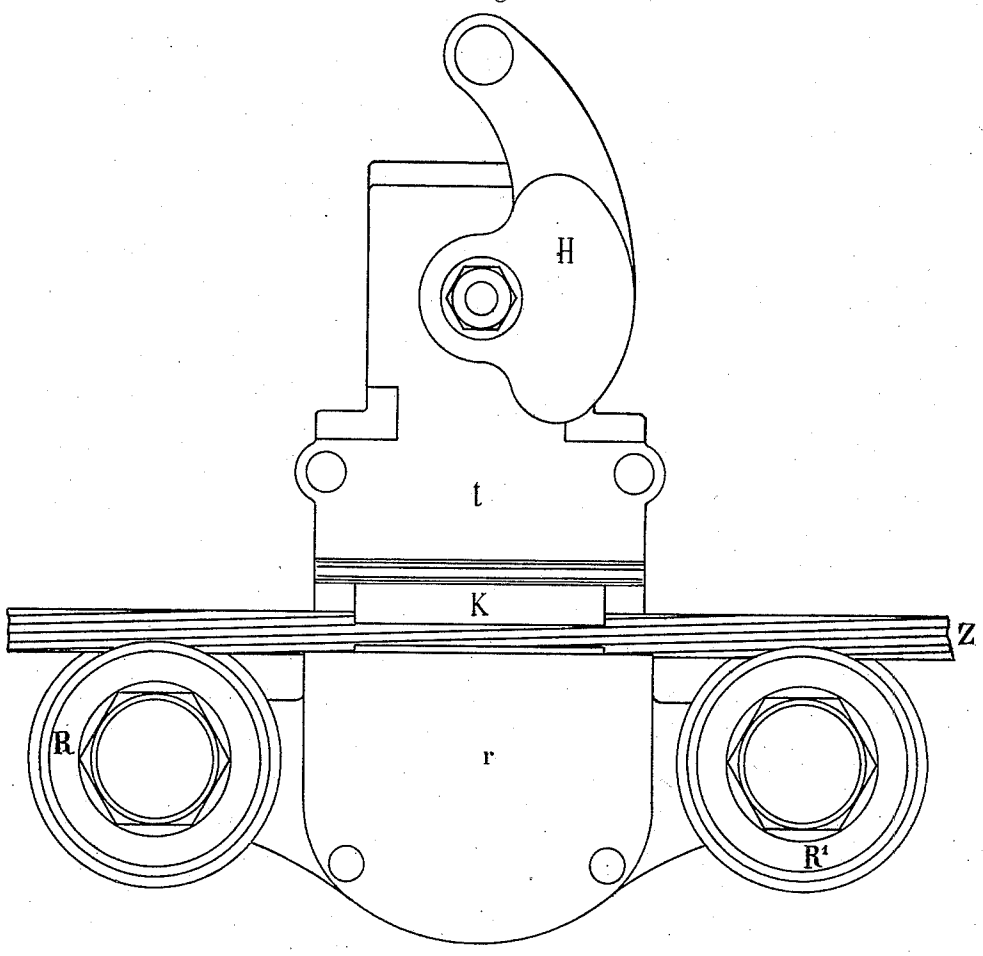
(No Model.) 16 Sheets—Sheet 1.

A. BLEICHERT.

GRIP FOR ELEVATED WIRE ROPE LINES.

No. 380,982. Patented Apr. 10, 1888.

Fig. 1.



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(No Model.) 16 Sheets—Sheet 2.

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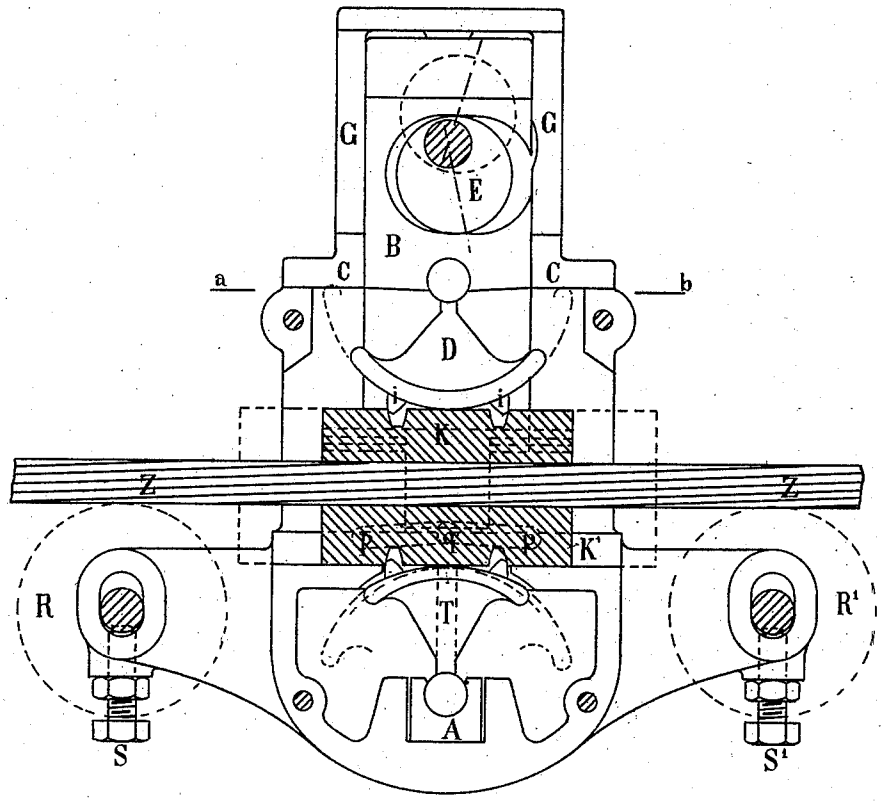
Fig. 2



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16 Sheets—Sheet 3.

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Fig. 3.

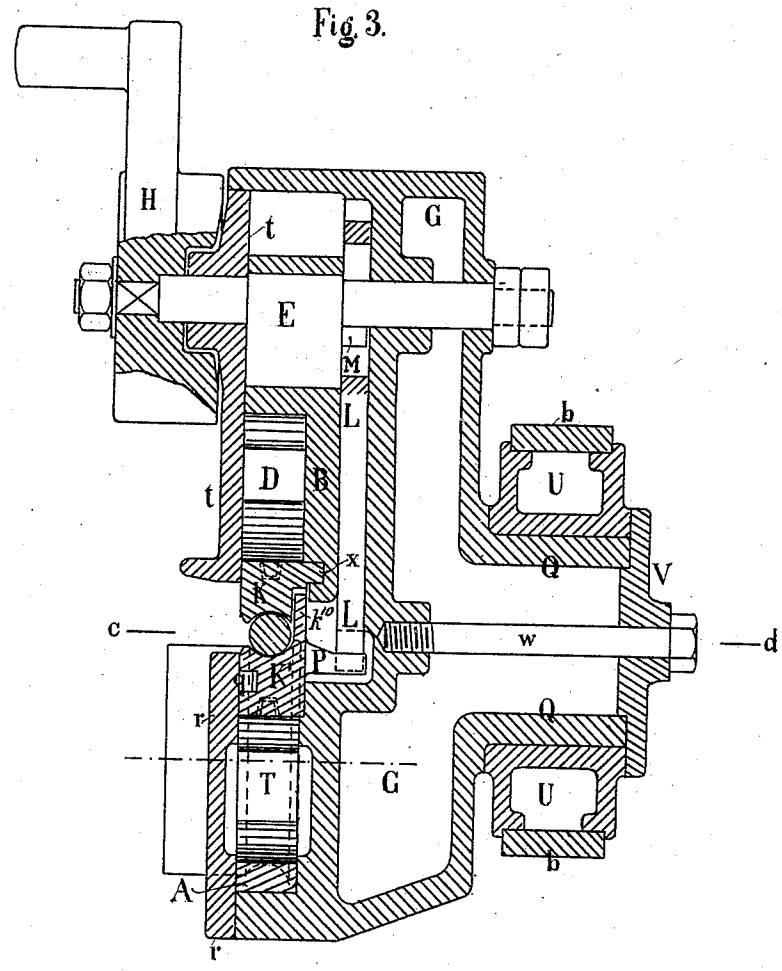

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Fig. 4.

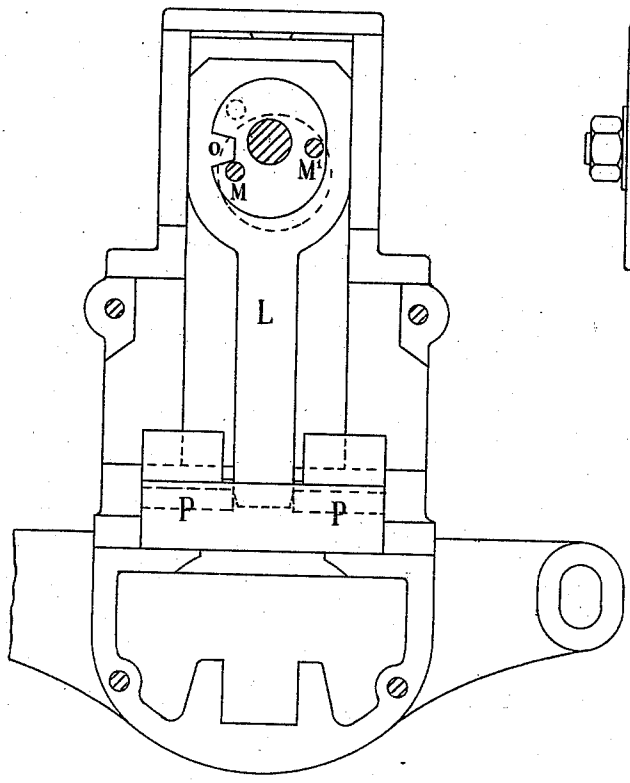

Fig. 5.

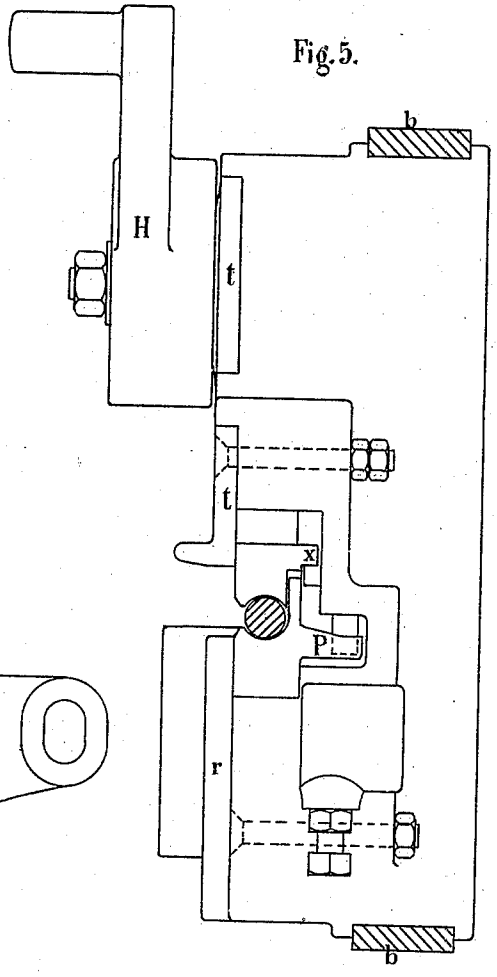

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Fig. 6.

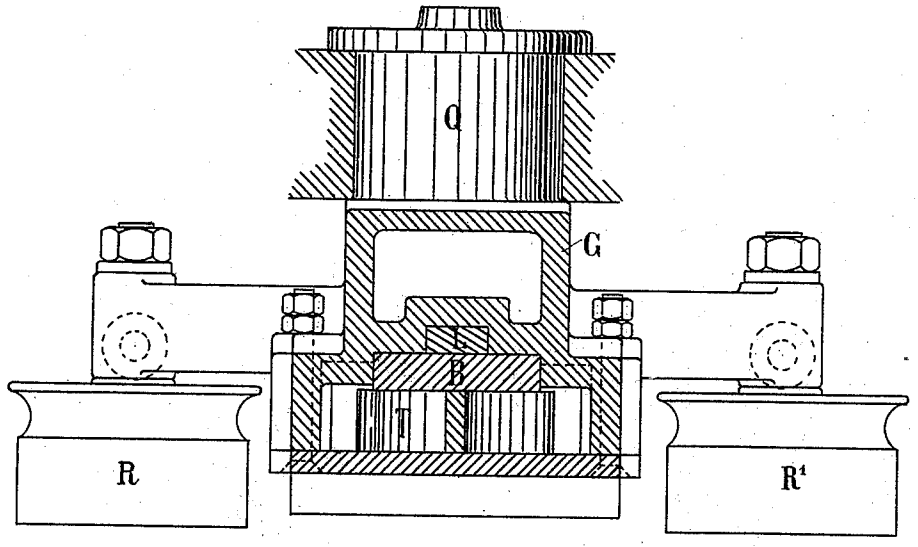
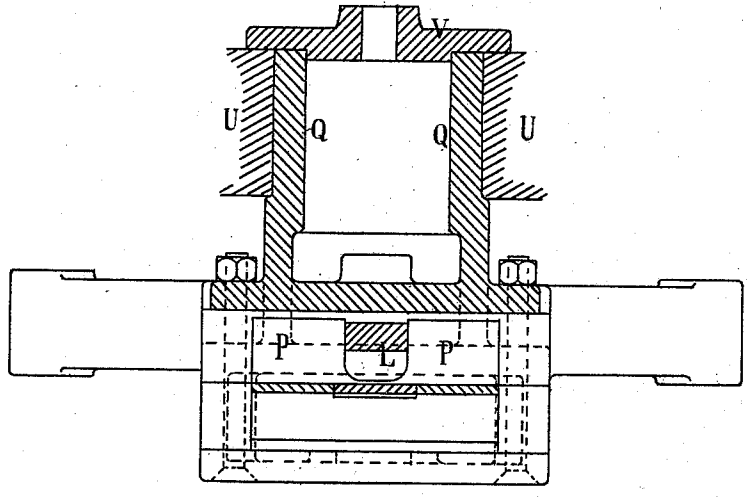


Fig. 7.



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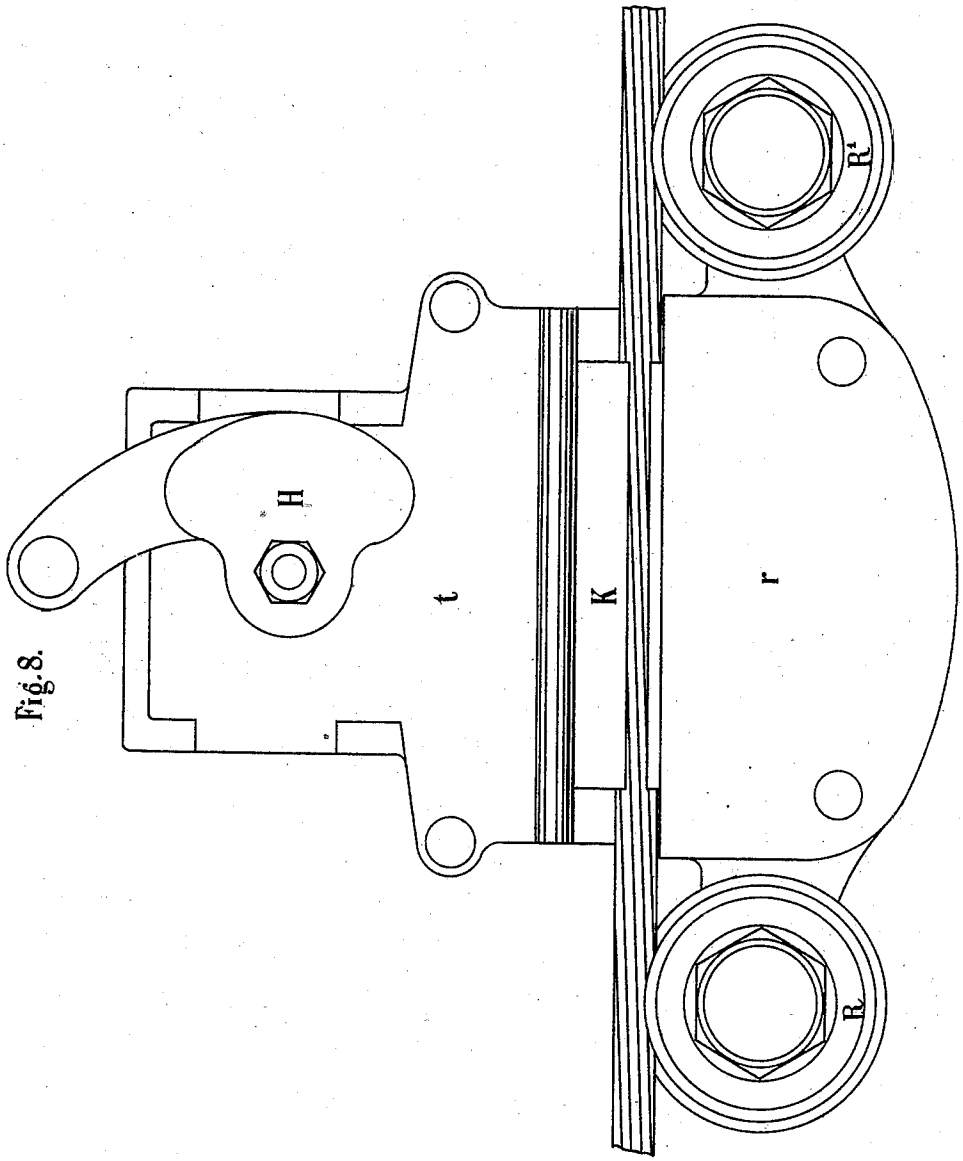

Fig. 8.

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Fig. 9.

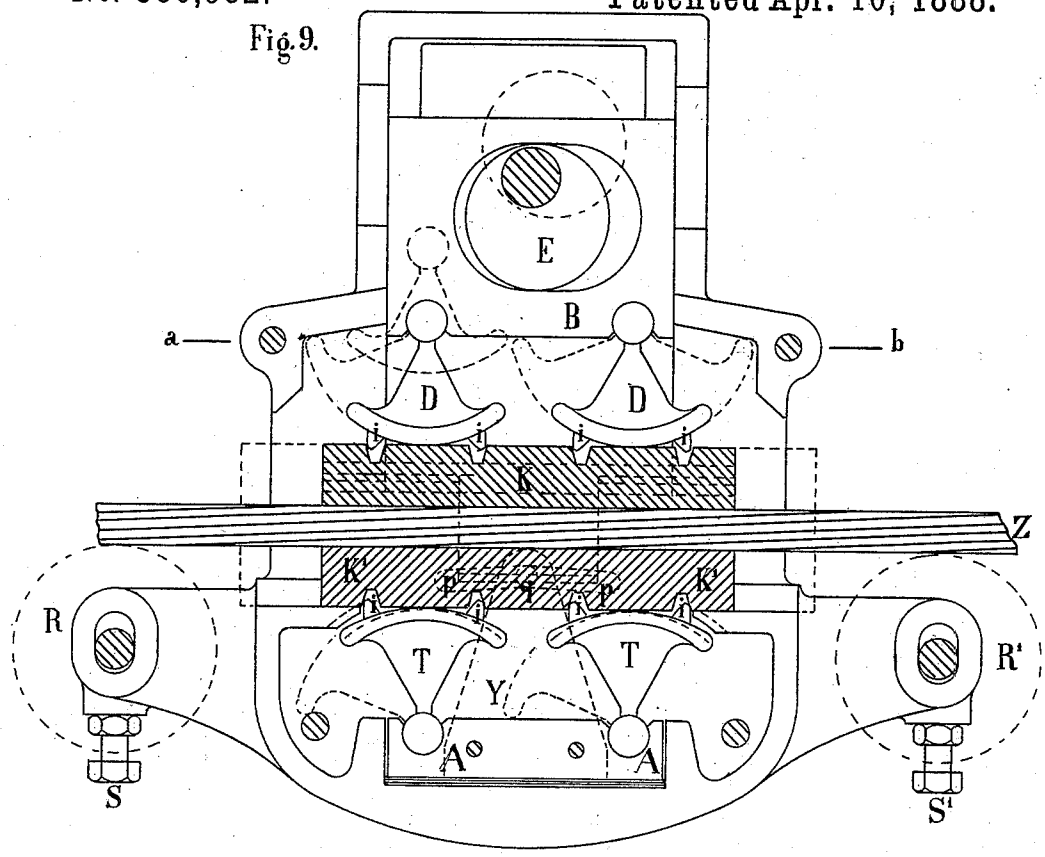
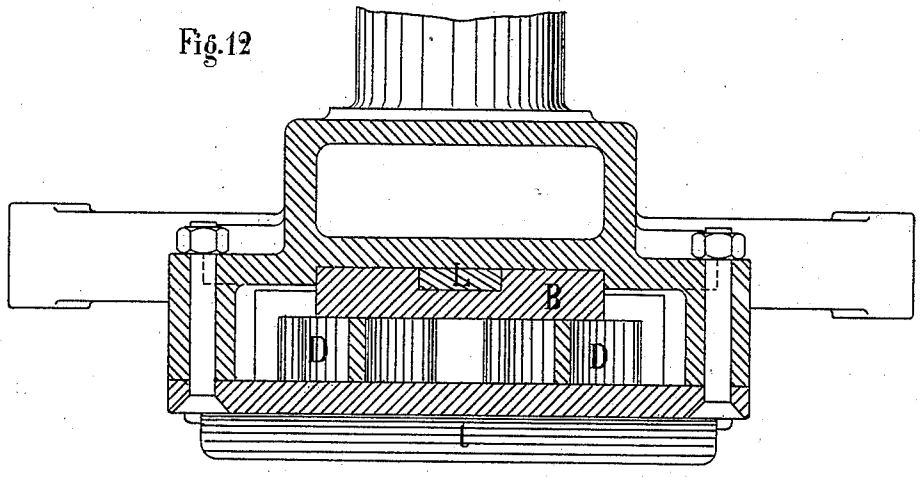


Fig. 12



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GRIP FOR ELEVATED WIRE ROPE LINES.

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Fig.10.

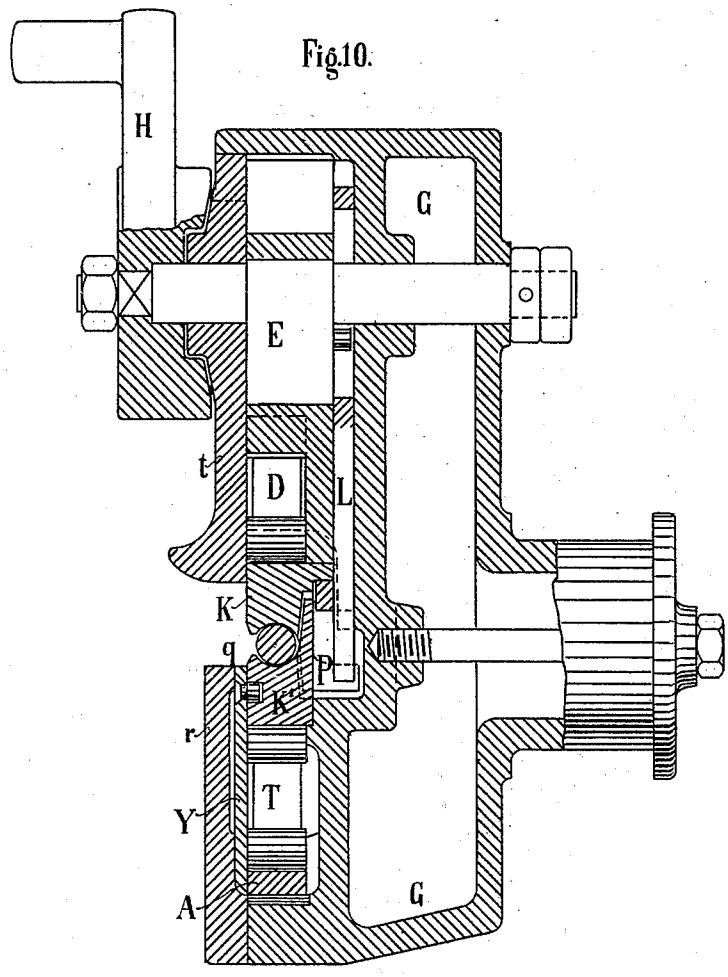

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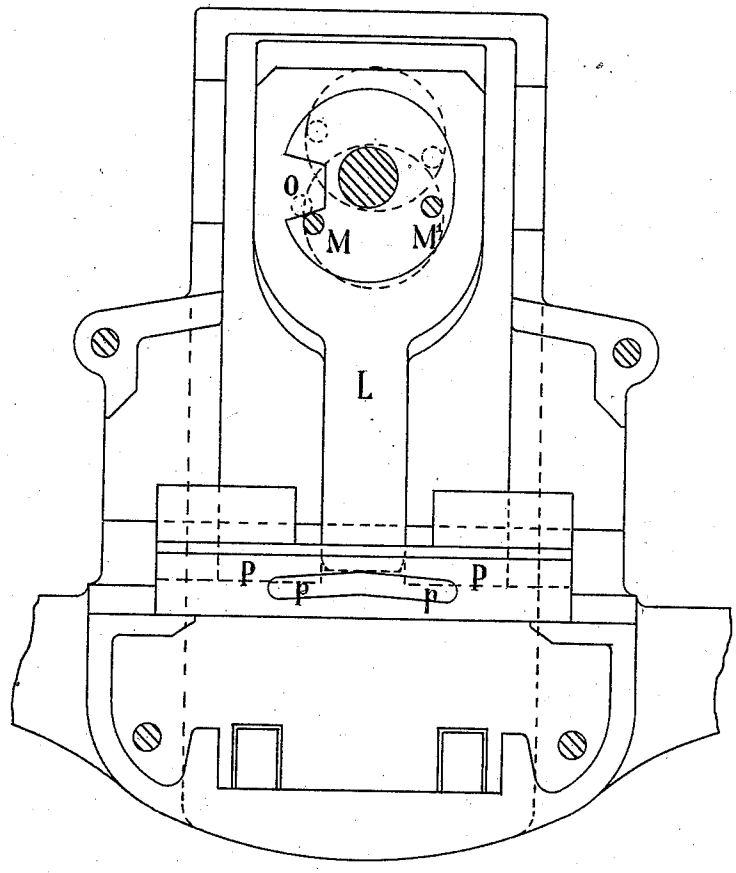
Fig. 11.



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16 Sheets—Sheet 10.

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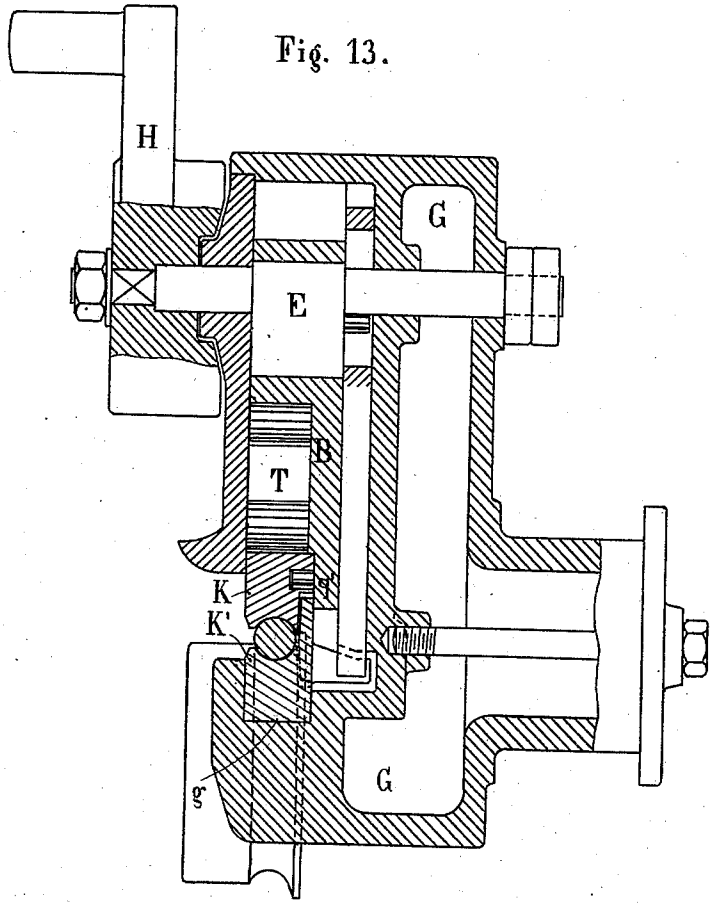
GRIP FOR ELEVATED WIRE ROPE LINES.

No. 380,982. Patented Apr. 10, 1888.

Fig. 13.



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GRIP FOR ELEVATED WIRE ROPE LINES.

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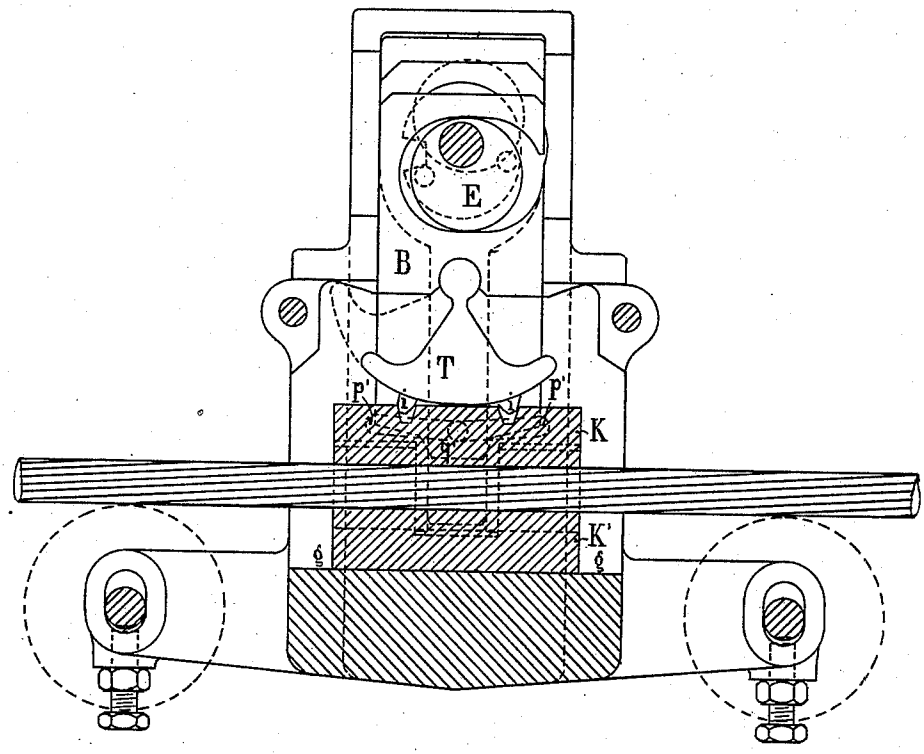
Fig. 14.



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GRIP FOR ELEVATED WIRE ROPE LINES.

No. 380,982. Patented Apr. 10, 1888.

Fig. 15.

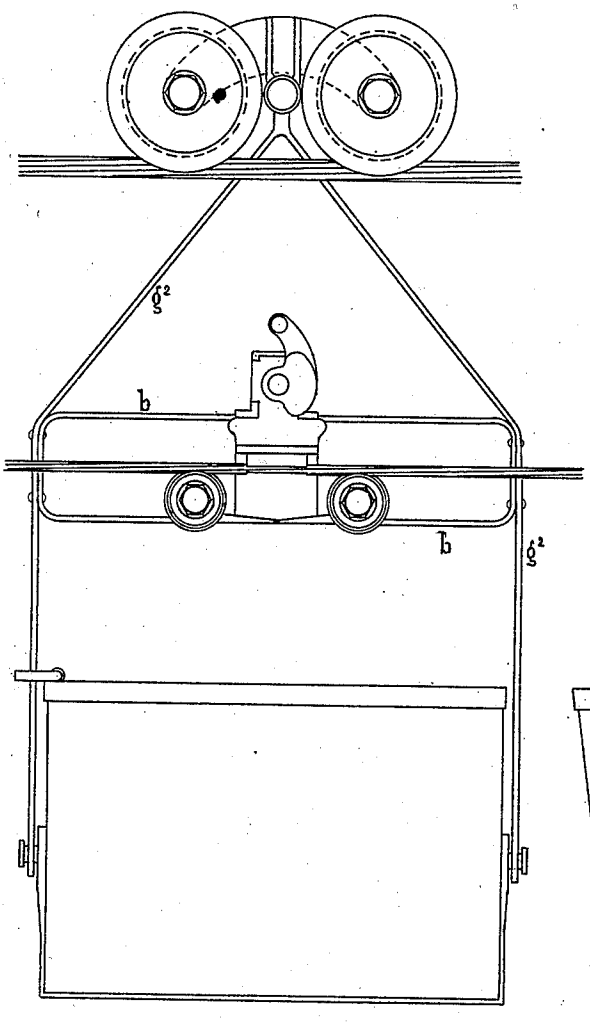
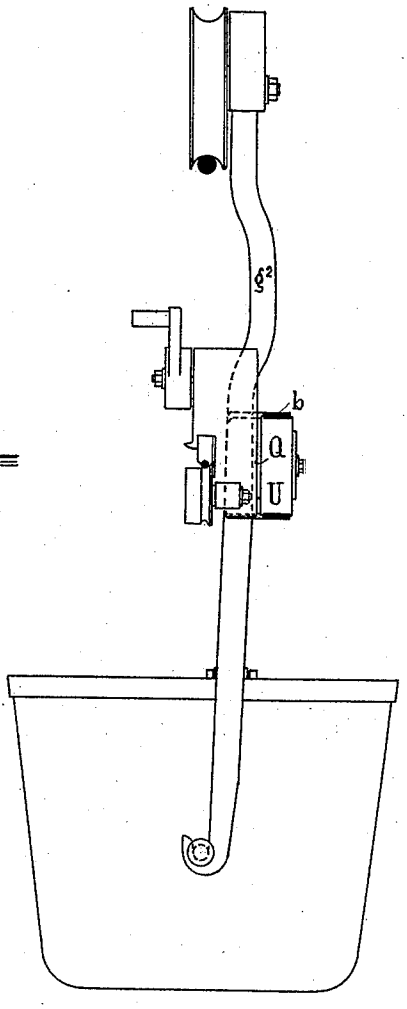


Fig. 16.



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GRIP FOR ELEVATED WIRE ROPE LINES.

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Fig. 17.

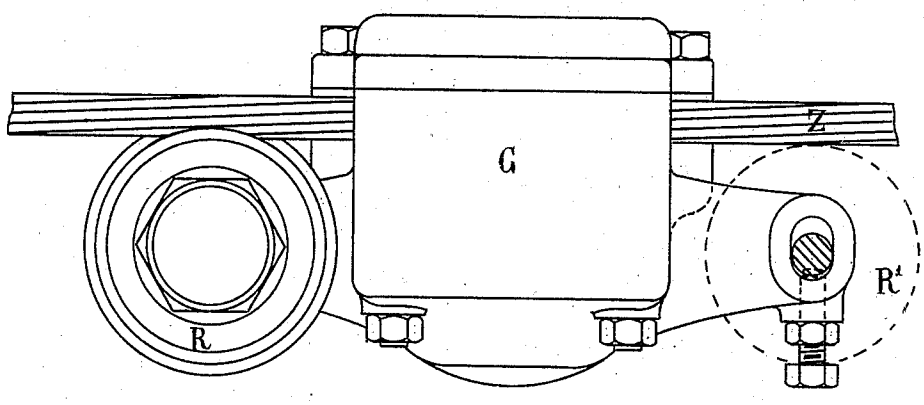


Fig. 20.

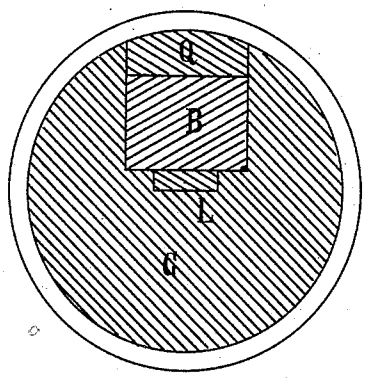
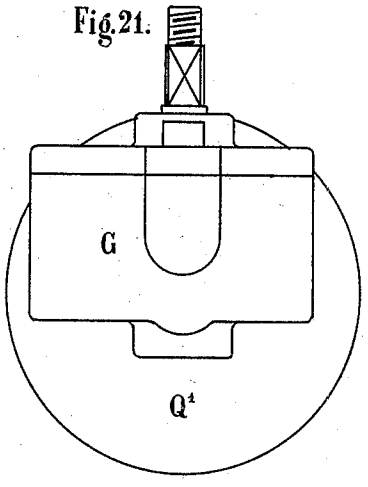


Fig. 21.



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GRIP FOR ELEVATED WIRE ROPE LINES.

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Fig. 18.

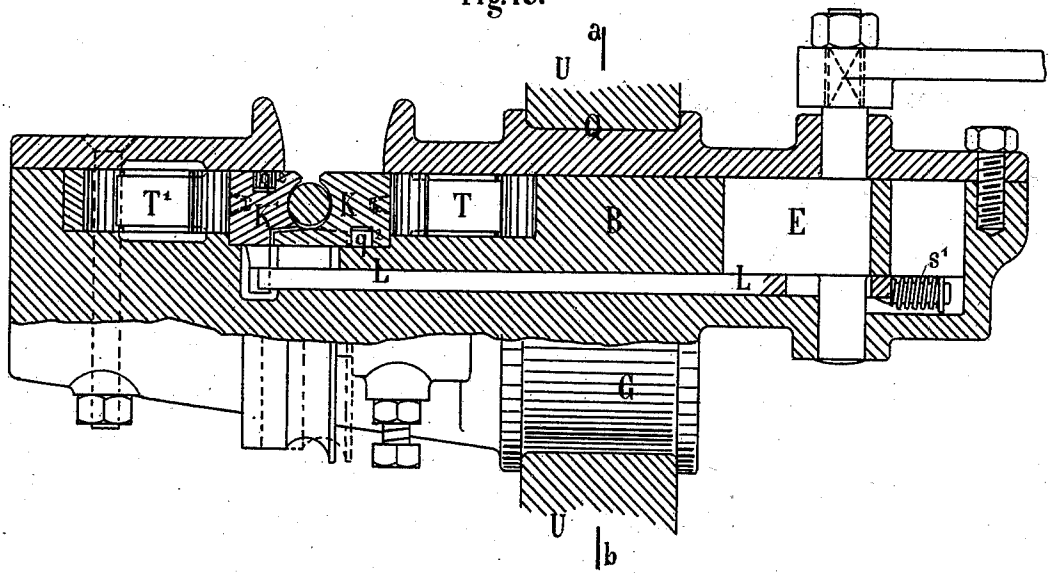
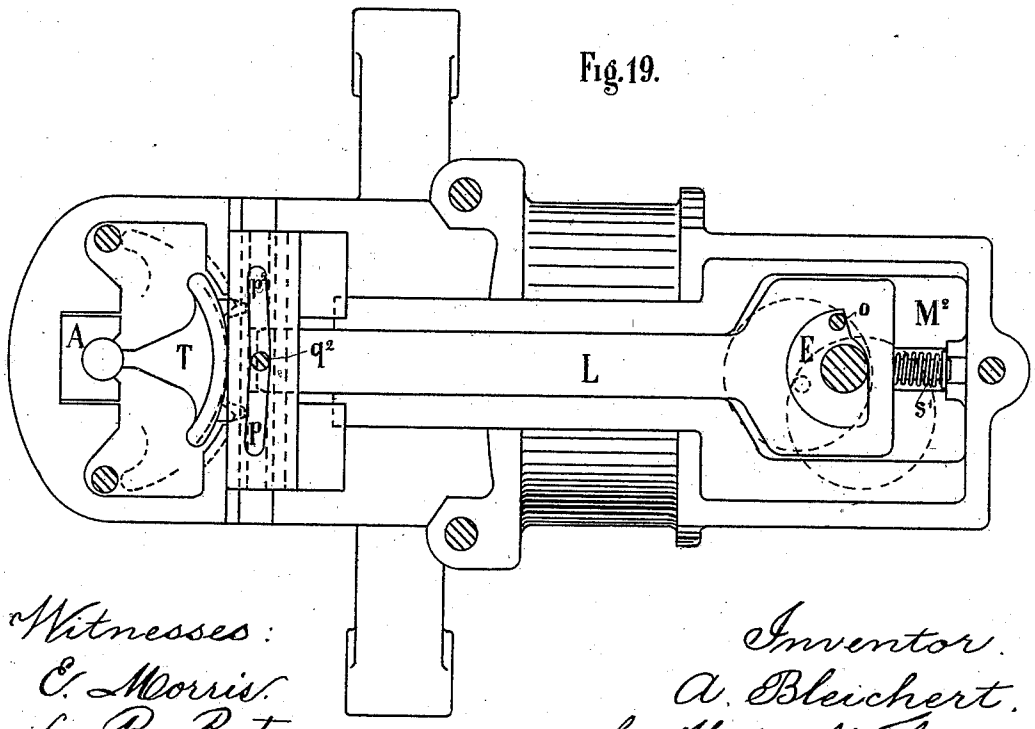


Fig. 19.



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GRIP FOR ELEVATED WIRE ROPE LINES.

No. 380,982. Patented Apr. 10, 1888.

Fig. 22.

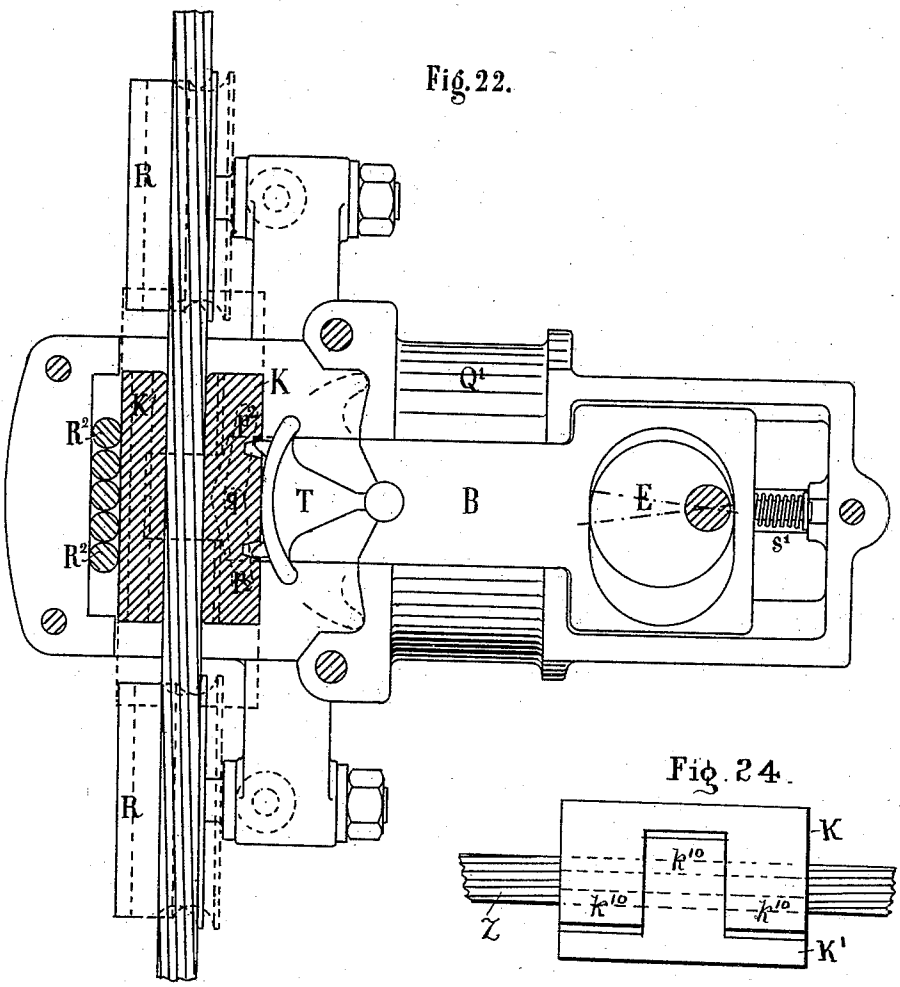

Fig. 24.

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16 Sheets—Sheet 16.

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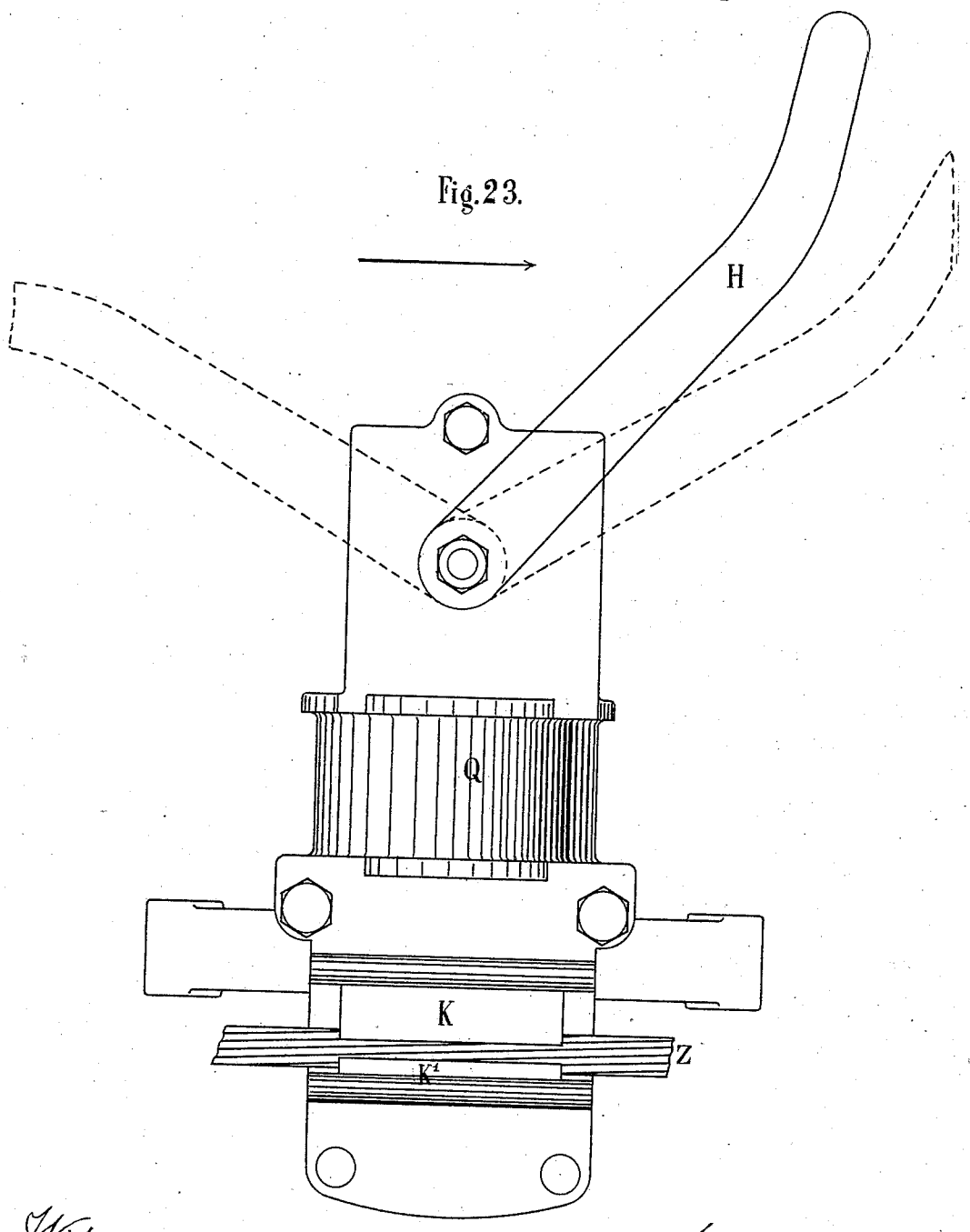
GRIP FOR ELEVATED WIRE ROPE LINES.

No. 380,982. Patented Apr. 10, 1888.

Fig. 23.



Witnesses:
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UNITED STATES PATENT OFFICE.

ADOLF BLEICHERT, OF GOHLIS, NEAR LEIPSIC, SAXONY, GERMANY, ASSIGNOR TO ADOLF BLEICHERT & CO., OF SAME PLACE.

GRIP FOR ELEVATED WIRE-ROPE LINES.

SPECIFICATION forming part of Letters Patent No. 380,982, dated April 10, 1888.

Application filed April 25, 1887. Serial No. 236,672. (No model.) Patented in Germany February 27, 1887, No. 41,441; in Belgium April 4, 1887, No. 76,968, and in Austria-Hungary August 16, 1887, No. 13,829 and No. 34,232.

To all whom it may concern:

Be it known that I, ADOLF BLEICHERT, residing at Gohlis, in the Kingdom of Saxony, Germany, have invented certain new and useful Improvements in Grip Mechanisms for Overhead Wire-Rope Lines, of which the following is a specification.

Foreign patents have been issued for this invention as follows: Germany, No. 41,441, dated February 27, 1887; Belgium, No. 76,968, dated April 4, 1887, and Austria-Hungary, No. 13,829 and No. 34,232, dated August 16, 1887.

This invention relates to the grip mechanism by which the suspended cars running upon a stationary rope or rod are connected to a continuously-moving traction-rope.

This invention consists in the novel construction and combination of the parts, as hereinafter fully described and claimed.

In the drawings, Figure 1 is a front view of the grip. Fig. 2 is also a front view, but with the cover-plates of the case removed and showing the grip-jaws in longitudinal section. Fig. 3 is a central cross section through the grip. Fig. 4 is also a front view of the grip-casing with the covers and the actuating portions of the grip tightening mechanism removed. Fig. 5 is a side view of the grip. Figs. 6 and 7 are horizontal sectional plan views taken on lines *a b* and *c d* in Figs. 2 and 3, respectively. Figs. 8 to 12 represent a modification in which the devices for moving the grip-jaws are duplicated. Figs. 8, 9, and 11 are front views. Fig. 10 is a central cross-section, and Fig. 12 is a sectional plan on line *a b* in Fig. 9. Figs. 13 and 14 show, respectively, a central cross-section and a front view, partly in section, of a simple grip having only one vertically-moving grip-jaw. Figs. 15 and 16 show, respectively, a front and a side view of a car having the grip applied to it. Figs. 17 to 23 represent modifications in which the grip-jaws are made to reciprocate horizontally. Fig. 17 is a front view when the grip is applied to the car. Fig. 18 is a central cross-section, and Fig. 19 is a plan view, partly in section, of a modification in which both grip-jaws have mechanism for moving them toward each other. Figs. 22 and 23 are plan views of horizontally-arranged grips having reciprocating mechanism applied to one jaw only. Fig. 20 is a cross-section on line *a b* in Fig. 18. Fig. 21 is a side view of Fig. 17. Fig. 24 is a rear side view of the gripping-jaws, showing how they interlock.

G is the case which incloses the grip mechanism, and Z is the traction-rope.

R R′ are grooved guide-rollers for the rope, which run loose upon pins projecting from elongated holes in the case.

S S′ are screws for adjusting the position of the rollers by setting up the pins upon which they run, thus preventing the rope from bearing hard upon the lower grip-jaw when the upper jaw is raised.

K is the upper and K′ the lower grip-jaw when the device operates vertically. The case is provided with the upper cover, *t*, and the lower cover, *r*, both of which are removable. The grip-jaws have extensions at the rear, which interlock, so that any longitudinal movement of one jaw is communicated to the other. These projections k^{10} are shown in Figs. 3 and 24. Those on the upper jaw are shown on each side of the one on the lower jaw; but their arrangement may be reversed, if desired. The upper jaw, K, has a projection, *x*, which slides in a groove in the block B, which receives a vertical reciprocating movement from the eccentric E, the spindle of which is journaled in the case and provided with the hand-lever H for operating it.

D is a radial segment pivoted in the block B and bearing against the upper jaw, K.

i are teeth upon the segment D, which engage with notches in the jaw.

C are stops upon the case, against which the ends of segment D strike when the block B is raised, so that the segment is restored to its central position, as shown in Fig. 2, but at a higher level than shown in said figure, and corresponding to the position the block would be raised to fill if the eccentric E were turned to the position indicated by the dotted circle in said Fig. 2, the dotted lines indicating how the segment strikes against each stop before being restored to its central position, and as the pull of the cable is in one direction or the other.

T is a segment having its curved surface formed of portions of two eccentrics, and pro-

vided with teeth engaging with notches in the jaw K′. The curved surface of segment D may also be formed similar to that of segment T, if desired. The segment T is pivoted in the block A, which is placed loosely in a recess in the case, so that it may be vertically adjusted by inserting thin pieces of metal beneath it, as shown in Fig. 9.

When in its central position, the jaw K′ rests between the two eccentric surfaces of segment T, as shown in Fig. 2. The upper jaw is pressed upon the cable by means of the hand-lever H and eccentric E, and as soon as the jaws bear upon the moving cable they are carried with it longitudinally out of their central position with regard to the case, and the segments D and T are turned upon their pivots. The eccentric surfaces of segment T then operate and cause the jaws to bear hard upon the rope, according to the direction of motion, and in proportion to the amount of tractive force required to propel the car. This pressure is automatically increased and reduced to meet the varying requirements of grade, the hand-lever serving only to throw the jaws in and out of gear with the rope at the ends of the line. The projection or pin *x* supports the jaw K when the jaw is raised clear of the rope. When disengaged altogether from the rope, and when the jaw K is fully raised, both jaws are replaced in their central position with regard to the case by the pressure of one or the other end of segment D against a stop C, as previously described, and the jaws are kept in that central position while the jaw K is approaching the rope by the bolt L. This bolt L is guided vertically in the case behind the block B, and receives a reciprocating movement from the pins M and M′, which project rearwardly from the eccentric E, and which strike against the projection O on the bolt L. The pin M is for raising and the pin M′ is for lowering the bolt; but in some cases a spring may be used instead of pin M′, as will be more fully described hereinafter. The lower end of bolt L enters between the two projections P on the back of jaw K′, as clearly shown in Fig. 7.

The operation of the device is as follows: When a car arrives at its end station, the lever H strikes against a suitable fixed stop and turns the eccentric E, whereby the jaw K is raised, and is restored to its central position by the end of the segment D striking against one of the stops C. Just before the lever H reaches its lowest position, the pin M′ pushes against the projection O and forces the bolt L downward between the projections P on the back of jaw K′. As the two jaws have interlocking projections k^{10}, they are both retained in their central position until they are again caused to bear upon the rope. This is accomplished by turning the lever H by hand, and just before it reaches its highest position the pin M withdraws the bolt L from between the projections P, so that the jaws may be drawn out of their central position by the rope as soon as they touch it. The guide-pin *q*, which projects from the cover *r* of the case, engages with the sloping slot *p* in the lower jaw, K′, so that the lower jaw does not depend upon its contact with the segment T to be guided in its horizontal movements.

The grip mechanism may be rigidly attached to the car by a flat iron strap, *b b*, as shown in Fig. 5, or the case may be pivoted to the strap, as shown in Figs. 3, 15, and 16. This latter form of connection is preferable when there are steep inclines to be ascended. An annular trunnion, Q, is formed on the case in line with the center of the rope. This trunnion oscillates in the bearing U, secured to the strap *b b*, and is held in position by the bolt *w* and the disk V, as shown.

The modification shown in Figs. 8 to 12 is similar to that before described; but the segments for moving the grip-jaws are duplicated and the guide-pin *q* is shown projecting from a separate plate, Y, which is attached to the block A by screws, so that the block A and the lower jaw are always kept at the same distance apart. When the pin projects from the case-cover, the cover has to be raised slightly when the block A is set up.

In Figs. 13 and 14 a simple form of grip is shown, in which the lower eccentric segment, T, takes the place of the upper, which is omitted altogether. The devices for raising the upper jaw are similar to those before described, and the upper jaw, K, is pivoted to the block B by the pin *q′*, which engages with the sloping slot *p′* in the jaw, which slot permits the jaw to have its desired horizontal movement.

The remaining figures of the drawings show modifications of the device, in which the jaws are arranged to operate horizontally upon the cable instead of vertically.

In Figs. 18 and 19 the segments T T′ have both double eccentric surfaces, so that both jaws are caused to approach the rope or cable, and both jaws are provided with sloping slots, the slot p^2 in jaw K engaging with the pin q^2, projecting from the block B.

In Fig. 22 only one segment, T, is used, and rollers R^2 are inserted behind block K′ to make it slide freely. The spiral spring S′ is used to thrust the bolt L between the projections P instead of the pin M′, as before described, the said bolt being raised by the pin projecting from the eccentric E, which presses against the projection O on the bolt, the same as before described.

What I claim is—

1. The combination of the two longitudinal sliding cable-grip jaws having interlocking projections, a sliding block connected to one of the grip-jaws for raising it clear of the cable, and an eccentric segment, whereby the pressure of the grip-jaws upon the cable is automatically increased in proportion to the longitudinal displacement of the jaws by frictional contact with the cable.

2. The combination of the two longitudinal

sliding cable-grip jaws having interlocking projections, a sliding block connected to one of the grip-jaws for raising it clear of the cable, an eccentric segment whereby the pressure of the grip-jaws upon the cable is automatically increased in proportion to the longitudinal displacement of the jaws by frictional contact with the cable, and a stop upon the grip case against which the end of the segment may strike when raised by the block, thereby restoring the grip-jaws to their normal position.

3. The combination of two cable-grip jaws having interlocking projections and sliding longitudinally with the cable, a sliding block connected to one of the grip-jaws for raising it clear of the cable, an eccentric segment, a stop upon the grip-case for the end of the segment to strike against, and a bolt engaging with one of the grip-jaws and preventing both of them from sliding longitudinally until they are pressed upon the cable, substantially as and for the purpose set forth.

4. The combination of two longitudinally-sliding cable-grip jaws having interlocking projections, a sliding block connected to one of the grip-jaws for raising it clear of the cable, and two segments pivotally supported by the said sliding block and by the grip-case, respectively, and bearing against the grip-jaws, one of said segments being eccentric, whereby the pressure of the grip-jaws upon the cable will be automatically increased in proportion to their longitudinal displacement by the cable, substantially as set forth.

5. The combination of two longitudinally-sliding cable-grip jaws having interlocking projections, a sliding block connected to one of the grip-jaws for raising it clear of the cable, an eccentric journaled in the grip-case for operating the sliding block, a hand-lever for turning the eccentric, and two segments pivotally supported by the said sliding block and by the grip-case, respectively, and bearing against the grip-jaws, one of said segments being eccentric, whereby the pressure of the grip-jaws upon the cable will be automatically increased in proportion to their longitudinal displacement by the cable, substantially as set forth.

6. The combination of the upper and lower interlocking grip-jaws, a sliding block for raising the upper jaw, two segments pivoted in the said block and bearing against the upper jaw, a vertically-adjustable stationary block in the lower part of the case, two eccentric segments pivoted in said stationary block and bearing against the lower jaw, and a plate secured to said stationary block and provided with a projecting pin engaging with a slot in the lower grip-jaw, substantially as and for the purpose set forth.

7. The combination of the upper and lower interlocking grip-jaws, a sliding block for raising the upper jaw, a segment pivoted to the sliding block and bearing against the upper jaw, an eccentric segment pivotally supported in the lower part of the case and bearing against the lower jaw, the stops upon the case for restoring the jaws to their normal position when the upper jaw is raised, and a bolt engaging with one of the grip-jaws and preventing them both from sliding longitudinally until they are pressed upon the cable, substantially as and for the purpose set forth.

8. The combination of the upper and lower interlocking grip-jaws, a sliding block for raising the upper jaw, a segment pivoted to the sliding block and bearing against the upper jaw, an eccentric segment pivotally supported in the lower part of the case and bearing against the lower jaw, the stops upon the case for restoring the jaws to their normal position when the upper jaw is raised, a bolt engaging with one of the grip-jaws and preventing them both from sliding longitudinally until they are pressed upon the cable, an eccentric journaled in the case for operating the sliding block, and a pin projecting from the said eccentric for withdrawing the said bolt from engagement with the grip-jaw just before it touches the cable, substantially as and for the purpose set forth.

9. The combination of the upper and lower interlocking cable-grip jaws, a sliding block connected to the upper grip-jaw for raising it clear of the cable, a segment pivoted to the said block and bearing against the said upper grip-jaw, an eccentric journaled in the case for operating the sliding block, a bolt engaging with the lower grip-jaw and preventing both jaws from sliding longitudinally until they are pressed upon the cable, and the two separate pins projecting from the said eccentric for reciprocating the said bolt in and out of engagement with the lower jaw, substantially as and for the purpose set forth.

10. The combination, with a stationary overhead line, a car running on the line, and a continuously-moving cable, of a grip secured to the car-frame and provided with grip-jaws, a hand-lever for throwing the jaws in and out of gear with the cable, and with an eccentric segment which automatically increases and decreases the grip of the jaws in proportion to the amount of tractive force required to move the car over the varying grades of the line.

11. The combination, with a stationary overhead line, a car traveling on the line, and a continuously-moving cable, of a bearing secured to the car-frame, a grip provided with a trunnion projecting from its case in line with the center of the cable and at right angles to its longitudinal axis, and a bolt and a disk for holding the said trunnion pivoted in position in the said bearing, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADOLF BLEICHERT.

Witnesses:

CARL BORNGRAEBER,

ALFRED A. WHITMAN.