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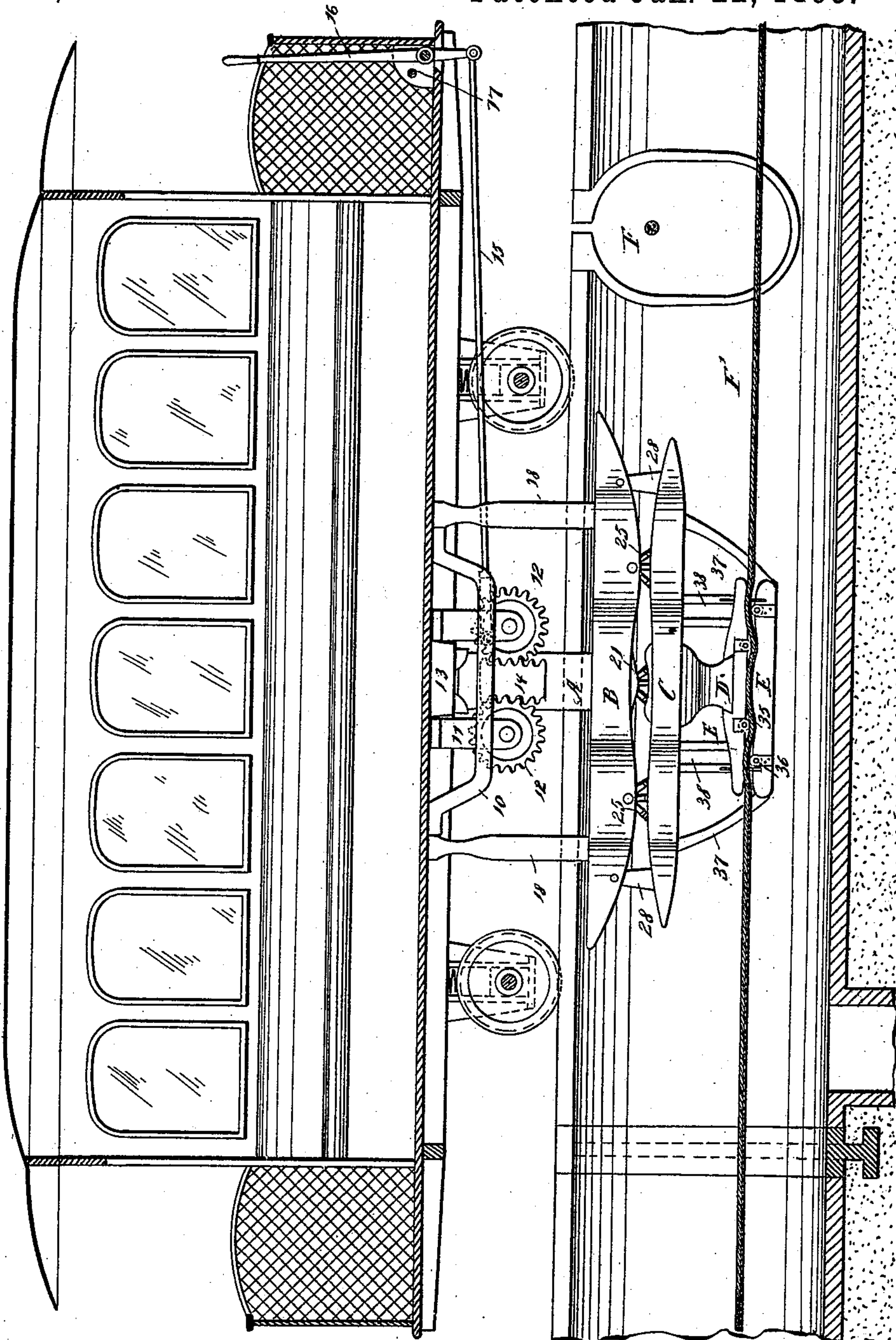
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M. F. ROBINSON.
CABLE GRIP.

No. 533,020.

Patented Jan. 22, 1895.

Fig. 1



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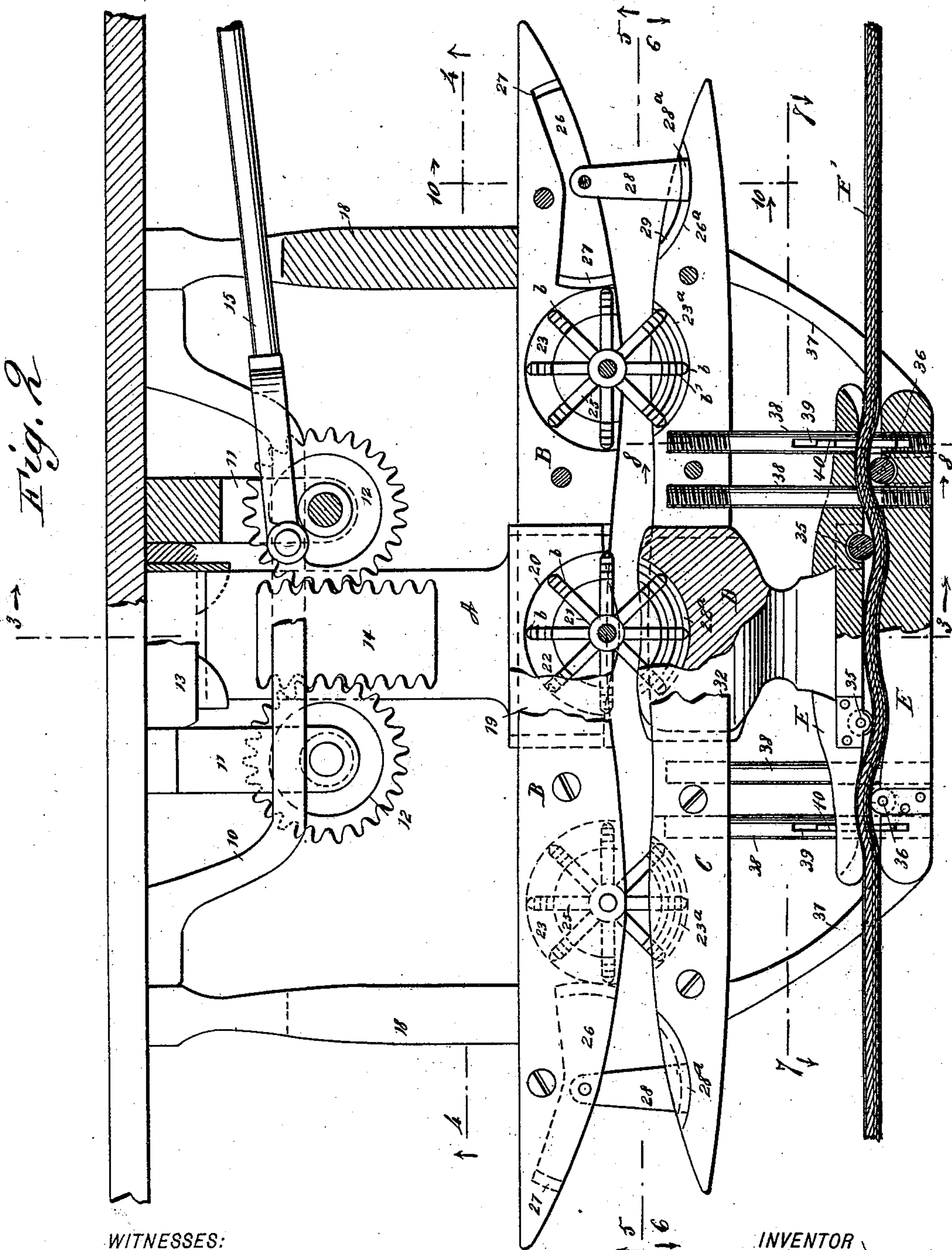
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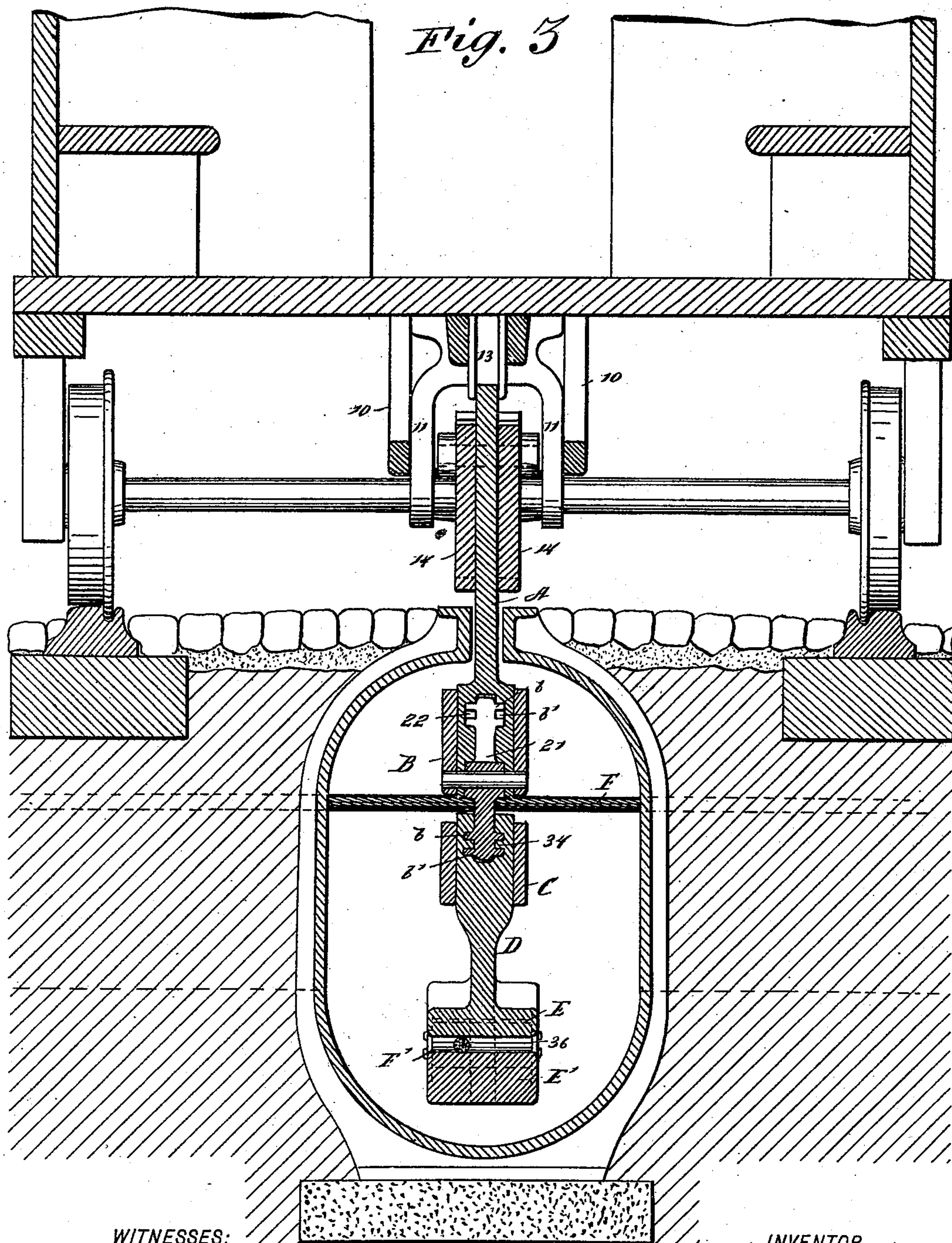
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Fig. 4

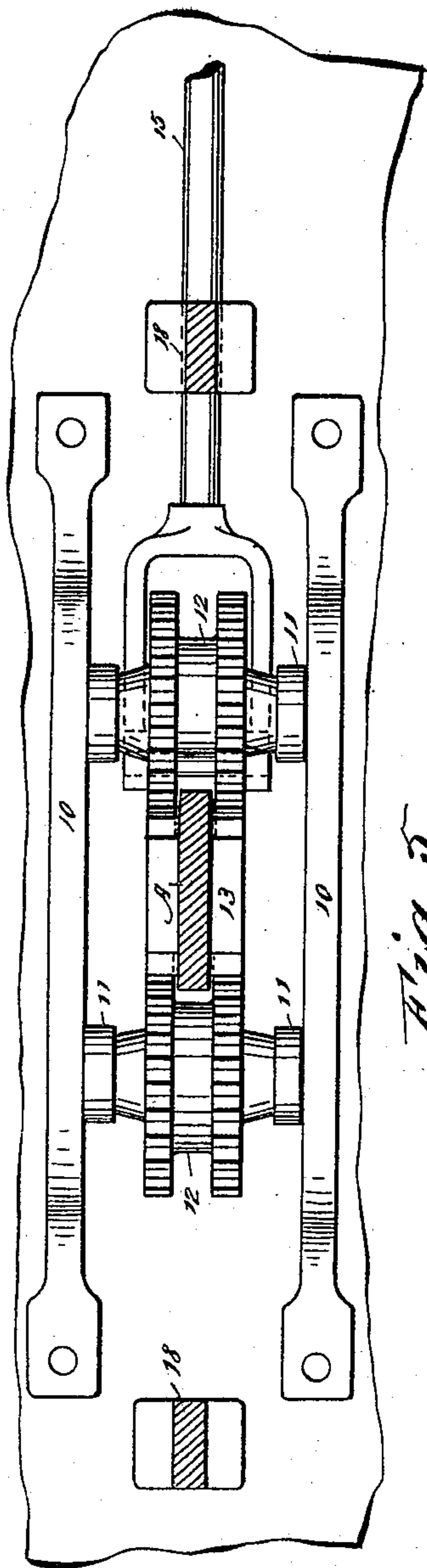


Fig. 5

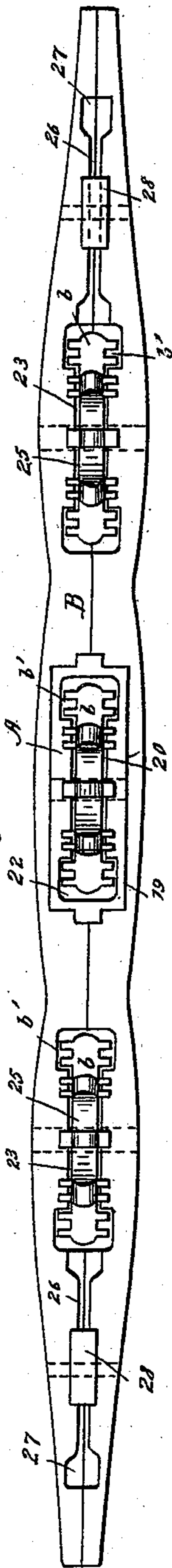


Fig. 6

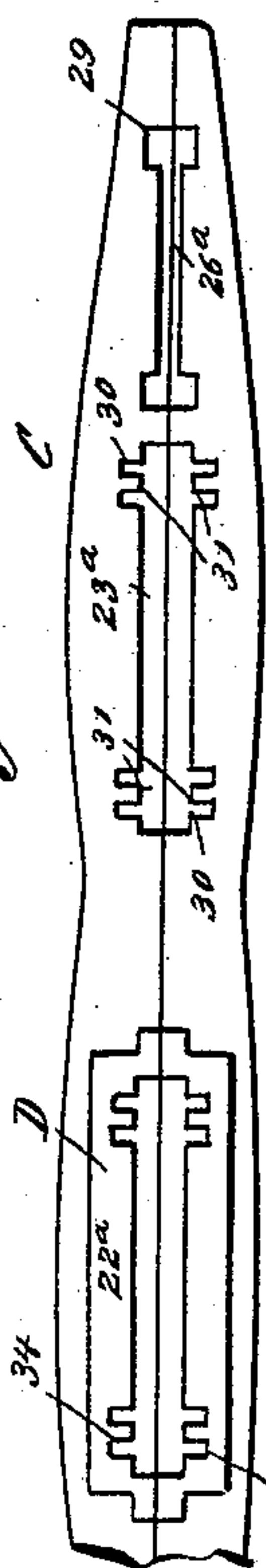


Fig. 7

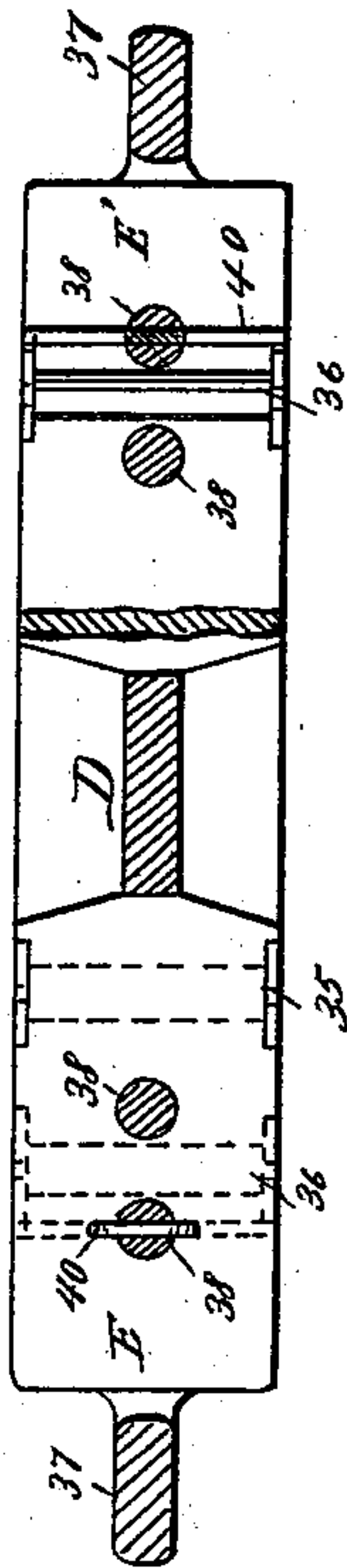
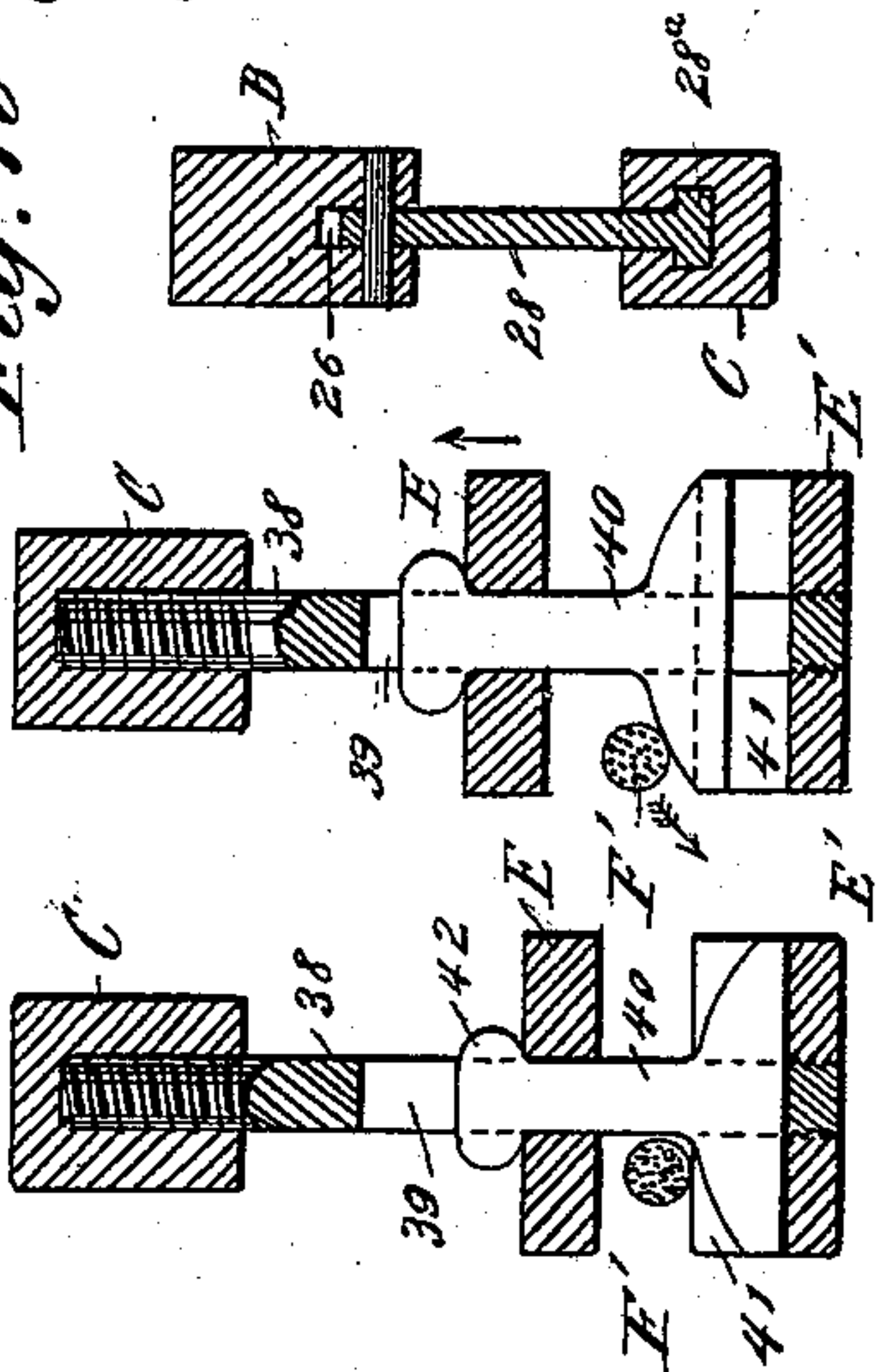


Fig. 8

Fig. 9



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UNITED STATES PATENT OFFICE.

MICHAEL F. ROBINSON, OF NEW YORK, N. Y., ASSIGNOR OF ONE-THIRD TO
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CABLE-GRIP.

SPECIFICATION forming part of Letters Patent No. 533,020, dated January 22, 1895.

Application filed August 22, 1894. Serial No. 520,959. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL F. ROBINSON, of New York city, in the county and State of New York, have invented a new and Improved Cable-Grip, of which the following is a full, clear, and exact description.

My invention relates to a cable grip, and it has for its object to provide a grip which will be exceedingly simple, durable and economic and capable of being conveniently applied to any cable car.

Another object of the invention is to so construct the cable grip that a cross cable may pass through the carriage of the grip without in the least interfering with or checking the progress of the car to which the grip is applied, and whereby further the passage of the cross cable will be effected without detracting from the support which the carriage should give to the grip, and the connection between the carriage and the car.

A further object of the invention is to provide a grip in which the jaws will have a substantially serpentine bite; and the cable will be held by compression.

Another object of the invention is to provide a means whereby the jaws may be opened or closed from the platform of the car by the gripman in a convenient manner, and whereby through the medium of the same shifting device the cable may be thrown from or released from the grip, the gripping device being so arranged that the movements necessary to produce the two above-named results cannot possibly be mistaken one for the other.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal section through a cable car, likewise a longitudinal section through the cable conduit, illustrating the entrance of a cross cable, and a side elevation of the cable grip, its carriage and the device by means of which it is connected with the car. Fig. 2 is an enlarged partial side eleva-

tion and partial sectional view of the complete grip. Fig. 3 is a vertical section taken through the complete grip, on the line 3—3 of Fig. 2, a partial transverse section of a car, and a transverse section through the cable conduit, illustrating the grip in the act of passing a cross cable. Fig. 4 is a horizontal section taken essentially on the line 4—4 of Fig. 2. Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 2, looking upward. Fig. 6 is a plan view of a portion of the shoe. Fig. 7 is a horizontal section taken below the section shown in Fig. 6 and on the line 7—7 of Fig. 2. Fig. 8 is a detail vertical section on the line 8—8 of Fig. 2, illustrating the device by means of which the cable is released from the grip. Fig. 9 is a section similar to Fig. 8, illustrating said device in the act of releasing the cable; and Fig. 10 is a detail vertical section taken substantially on the line 10—10 of Fig. 2.

In carrying out the invention truss braces 10 are usually secured to the bottom of the car, pendent therefrom, and located one near each side of the car proper; and these truss braces are usually attached to hangers 11, located, for example, one at each side of the center of the car, and each hanger has pivoted therein a double or twin pinion 12, each twin pinion, as shown in Fig. 4, being provided with a supporting hub.

A lift bar A, has vertical sliding movement between the pinions 12, as shown likewise in Fig. 4, and the upper end of the said lift bar is made to enter and to move in a cap or socket 13 constructed upon the bottom of the car. The lift bar A is further provided with a double rack 14 upon each of its side faces, the teeth of the rack being engaged by the pinions 12. The lift bar is raised and lowered ordinarily through the medium of a link 15, bifurcated for attachment to one of the pinions 12, the said link at its opposite end being pivotally attached to a hand lever 16 located upon the platform of the car and to be operated by the gripman, and the play of the said lever is limited by means of the stop pin 17 removable from its bearings. When the stop pin is in position, as shown in Fig. 1, the lever can only be moved to properly raise and lower the movable jaw of the grip, but when the stop pin is removed the movable jaw may be

carried farther upward and will act upon a device to be hereinafter described by means of which the cable is entirely discharged from the grip.

5 A cross head B, is supported preferably from the bottom of the car by means of a hanger 18 secured to the cross head near its ends, and ordinarily the cross head is made in two longitudinal sections bolted or secured together
10 in any approved manner. The cross head B has an opening 19 made in its center, extending through from top to bottom, and in this opening the lower end of the lift bar A, which is usually enlarged, has guided and vertical
15 movement.

The enlarged lower end of the lift bar A, is provided with a chamber 20, preferably of a semi-circular shape, the said chamber being open at the bottom. Within this chamber a
20 wheel 21 is fulcrumed in a manner which will enable about one-half of its surface to extend out from the said chamber or pocket. The spokes of the wheel are provided with enlarged or T-shaped heads *b*, and in the end
25 of each head a transverse groove *b'* is made. Therefore the side walls of the chamber or pocket 20 are provided with a semi-circular groove or channel 22, to receive the projecting heads of the spokes, as is best shown in
30 Fig. 5. Similar channels or pockets 23 are produced in the cross head, one at each side of the opening through which the lift bar passes, and similar wheels 25 are in like manner mounted to revolve in each of the said
35 pockets or chambers 23, as is shown in both Figs. 2 and 5.

In the under face of the cross head, at or near each end, a longitudinal or elongated pocket or channel 26 is made, deepened at
40 each of its extremities by vertical grooves 27 being made in its side walls. In the central portion of each end pocket or chamber 26, one end of a gravity latch 28 is pivoted. These latches normally hang vertically downward
45 from the cross head, being heaviest at their lower ends, and their lower ends are made somewhat segmental, or are convexed and provided with side flanges 28^a, as illustrated in Figs. 2 and 10.

50 A shoe C, of substantially similar construction to that of the cross head is located immediately below the latter, yet held spaced a predetermined distance therefrom, as shown in Figs. 1 and 2. The attachment between the
55 shoe and the cross head is effected through the medium of the wheels 25 and the latches 28. This connection is made by producing in the upper edge of the shoe pockets or chambers 23^a corresponding in position to the
60 chambers or pockets 23 in the cross head and jointly with the latter pockets or chambers, forming a circle in which the wheels 25 will revolve; and further by producing likewise in the upper end portions of the shoe segmental pockets 26^a, registering substantially
65 with the pockets 26 of the cross head, and being adapted to receive the lower ends of the

latches 28. The end pockets or chambers 26^a in the shoe, are provided with segmental grooves in their side walls to receive the
70 flanges of the latches. Therefore, when the latches gravitate into the pockets or chambers 26^a of the shoe, which they naturally do, they support the said shoe from the cross head, and the wheels 25 will enter the pockets
75 23^a as heretofore stated, in the shoe, the said pockets being provided in their side walls with segmental grooves 30, and in each of the said grooves a similarly shaped rib 31 is made. Consequently, as the spokes of the
80 wheel are passed through the chambers 23^a the ribs 31 will enter the grooves *b'* in the heads of the spokes, and the wheels will therefore serve as an additional tie between the shoe and the cross head. The formation of
85 the pockets in the shoe is best shown in Fig. 6.

The central wheel 21, carried by the lower portion of the lift bar, enters a pocket or chamber 22^a formed in the upper portion of the shank D of the upper movable jaw E of
90 the grip, the lower or stationary jaw of the grip being designated as E'. The upper end of the shank D has sliding movement in the opening 32 made in the central portion of the shoe, as shown in Fig. 2, and the pocket or
95 chamber 22 in the shank, as illustrated in Fig. 6, is likewise provided with semi-circular or segmental grooves 33 in its side walls, and ribs 34 of similar shape in said grooves, adapted to enter the grooves *b'* in the heads
100 of the spokes of the wheel 21. Therefore this center wheel establishes a connection between the lift bar and the movable jaw E of the grip.

The object of the connection just described between the grip carriage and the grip, since
105 the cross head B and lift bar A may be termed a carriage for the grip, is to enable a cross cable F, shown in Figs. 1 and 3, to pass between the carriage and grip without in any manner interfering with the cable F' held by
110 the grip, or the connection between the grip and its carriage. The opposing ends of the shoe and the cross head are made to flare in opposite directions in order that whether the cross cable be high or low it will be guided to
115 the space between these two parts, and the opposing longitudinal faces of the shoe and the cross head are preferably made more or less undulating, as shown in Fig. 2.

In the event the cable F' is engaged by the
120 grip and the cross cable F is encountered, the said cable will strike the forward latch 28, carrying it upward and past said latch, the latch immediately returning to its supporting engagement with the shoe of the grip. The
125 cross cable will next strike the foremost wheel 25, revolving the same, and as the wheel is revolved the cable will pass this wheel, it being evident that the wheel does not lose its supporting engagement with the shoe at any
130 time during its revolution, since at least two of the spokes will always be held in engagement with the shoe. The cable will next strike the intermediate wheel 21, acting upon

and passing it in the same manner as the first wheel. The rearmost wheel will next be met and passed in a similar way, and finally, the latch 28 at the rear will be thrown upward, and the cross cable will have passed entirely through the improved grip device without in the slightest manner detracting from its rigidity or interfering with the movement of the car, or necessitating in the least a release from the cable F' which it had gripped; and it is likewise evident that when the wheels are being acted upon both latches are in locking engagement with the shoe and at least two of the wheels, in addition to sundry of the spokes of the wheels in contact with the cross cable, and that when one latch is being acted upon the other is in holding position and likewise all of the wheels.

The movable jaw E and likewise the fixed jaw E' of the grip are made quite long, and the opposing surfaces of both of these jaws are made undulating or serpentine, and opposite each depression in the lower or rigid jaw a friction roller 35 is journaled in the under face of the movable jaw, and opposite each depression in the movable jaw a roller 36 is journaled in the upper face of the fixed jaw, as shown in Fig. 2; and usually the concaved surfaces of the jaws are roughened in order that they may the better grip the cable.

The fixed jaw E', is supported through the medium of arms 37 connected with its ends and with the shoe C. Guide rods or pins 38 are secured in the fixed jaw, two near each end, and these rods are passed loosely through suitable apertures in the upper or movable jaw, and are then secured in the shoe C.

Each outer guide rod 38, is provided with a longitudinal slot 39 therein, as best shown in Figs. 2, 8 and 9, and in each of these slots 39 a shifting plate or bar 40 is held to slide, and each plate or bar 40 is preferably shaped substantially as an inverted T, the head thereof being normally located in a slot 41 produced transversely in the lower jaw, while the upper end of the shank of the shifting bar or plate is provided with an enlargement 42, adapted to be engaged by the upper jaw E when the latter is moved a predetermined distance upward. When these shifting bars or plates 40 are in their normal position, as shown in Fig. 8, the cable F will lie firmly upon the lower jaw, being clamped by the upper one; and the cable may be released to a greater or less extent by shifting the lever 16, the pin 17 being in place, and thereby raising the lift bar A and the shank of the upper jaw. In the event, however, that it is necessary to entirely discharge or discard the cable, it may be quickly and conveniently done by simply removing the pin 17 from the path of the shifting lever 16, giving said lever greater throw, whereupon the upper jaw E will be carried such a distance upward, as shown in Fig. 9, as to carry upward with it the shifting bar or plate 40, the upper edges of the heads of which are beveled or con-

vexed; and these edges will be carried above the upper surface of the lower jaw at each end of the latter, and consequently the cable will be received by these beveled or rounded edges, and will roll off therefrom clear of the jaws.

This cable grip, as heretofore stated, is exceedingly simple, durable and economic, and it is thoroughly reliable and effective in operation. Not only will it pass a cross cable, receiving and discharging the same automatically, but the jaws may be operated from a single lever to simply release the cable gripped, or to entirely discharge the cable.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a cable grip, the combination with an apertured shoe, and a fixed jaw suspended therefrom, of an apertured cross head supported from the car above the shoe, rotary supports connecting the shoe and cross head, guide rods secured to the shoe and to the fixed jaw, a removable jaw apertured to receive the guide rods and having its shank working in the aperture of the shoe, a lift bar working in the aperture of the cross head, a rotary support connecting the shank of the movable shoe and the lift bar, and means for operating the lift bar, substantially as described.

2. In a cable grip, the combination with an apertured shoe provided with grooved chambers, and the fixed jaw suspended from the shoe, of an apertured cross head supported from the car above the shoe, wheels having side flanges mounted in the cross head and working in the grooved chambers of the shoe, guide rods secured to the fixed jaw and to the shoe, a movable jaw apertured to receive the guide rods and provided with a shank working in the aperture of the shoe, said shank having a grooved chamber in its upper end, a lift bar working in the aperture of the cross head, a wheel having side flanges mounted in the lower end of the lift bar and working in the chamber of the shank of the movable shoe, and means for operating the lift bar, substantially as described.

3. In a cable grip, the combination, with a grip provided with a series of wheels held to revolve therein and having grooves in their sides, and flanged gravity latches located at the ends of the carriage, the wheels being between the latches, of a shoe and jaws supported by the shoe, the said shoe being provided with pockets or chambers adapted to receive the flanged portions of the latches and the grooved wheels of the carriage, the wheel-receiving pockets being provided with ribs entering the grooves in the wheels, and the latch-receiving pockets being provided with grooves to receive the latches, as and for the purpose set forth.

4. In a cable grip, the combination with a fixed and movable jaw, of a lift bar provided with a double rack on each side, a connection

between the lift bar and the movable jaw, twin pinions mounted in supports on the under side of the car and engaging the said racks, an operating lever, and a link connected
5 to the pinions and to the operating lever, substantially as described.

5. In a cable grip, gripping jaws adapted to move to and from one another, and having the faces of their fixed portions undulating,
10 each jaw being provided with a friction roller opposite the depressed surface of the opposing jaw, as and for the purpose set forth.

6. In a cable grip, the combination, with a shoe and a fixed jaw, of a movable jaw, guide
15 rods secured to the shoe and to the fixed jaw and passing through apertures in the movable jaw, preventing its lateral movement, and means, substantially as described, for raising and lowering the movable jaw, as and for the
20 purpose specified.

7. In a cable grip, the combination with the fixed and movable jaws, the movable jaws be-

ing apertured and the fixed jaw provided with a transverse recess or slot, of an inverted T shaped shifting plate fitting loosely in the
25 aperture of the movable jaw and provided with an enlargement at its upper end adapted to rest upon the upper surface of the said jaw when the jaw is raised, the lower end of the
30 said plate projecting into the slot or recess of the fixed jaws when the said jaws are closed, substantially as described.

8. In a cable grip, the combination with a shoe and a fixed jaw carried by the shoe and provided with transverse slots, of guide rods
35 secured to the shoe and fixed jaw, one of said rods being slotted, and an inverted T-shaped shifting plate held to slide in the slot of the said guide rod and engaged by the movable jaw, substantially as described.

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