

(No Model.)

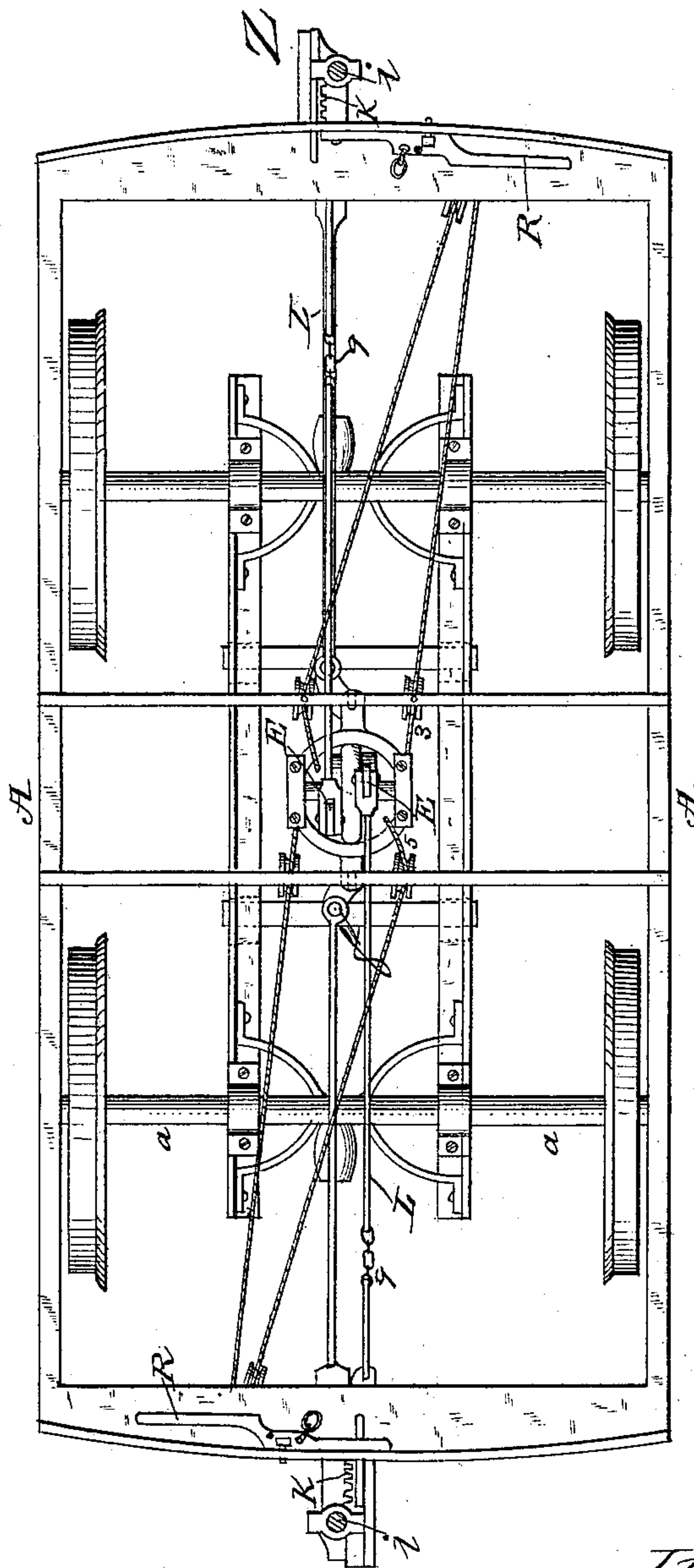
3 Sheets—Sheet 1.

H. CASEBOLT.  
GRIFE APPARATUS FOR CABLE WAYS.

No. 262,640.

Patented Aug. 15, 1882.

*Fig. 1.*



*attest:*  
*J. Walter Fowler,*  
*H. B. Applewhite.*

*Inventor;*  
*Henry Casebolt*  
*per attys*  
*A. H. Evans & Co.*

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3 Sheets—Sheet 2

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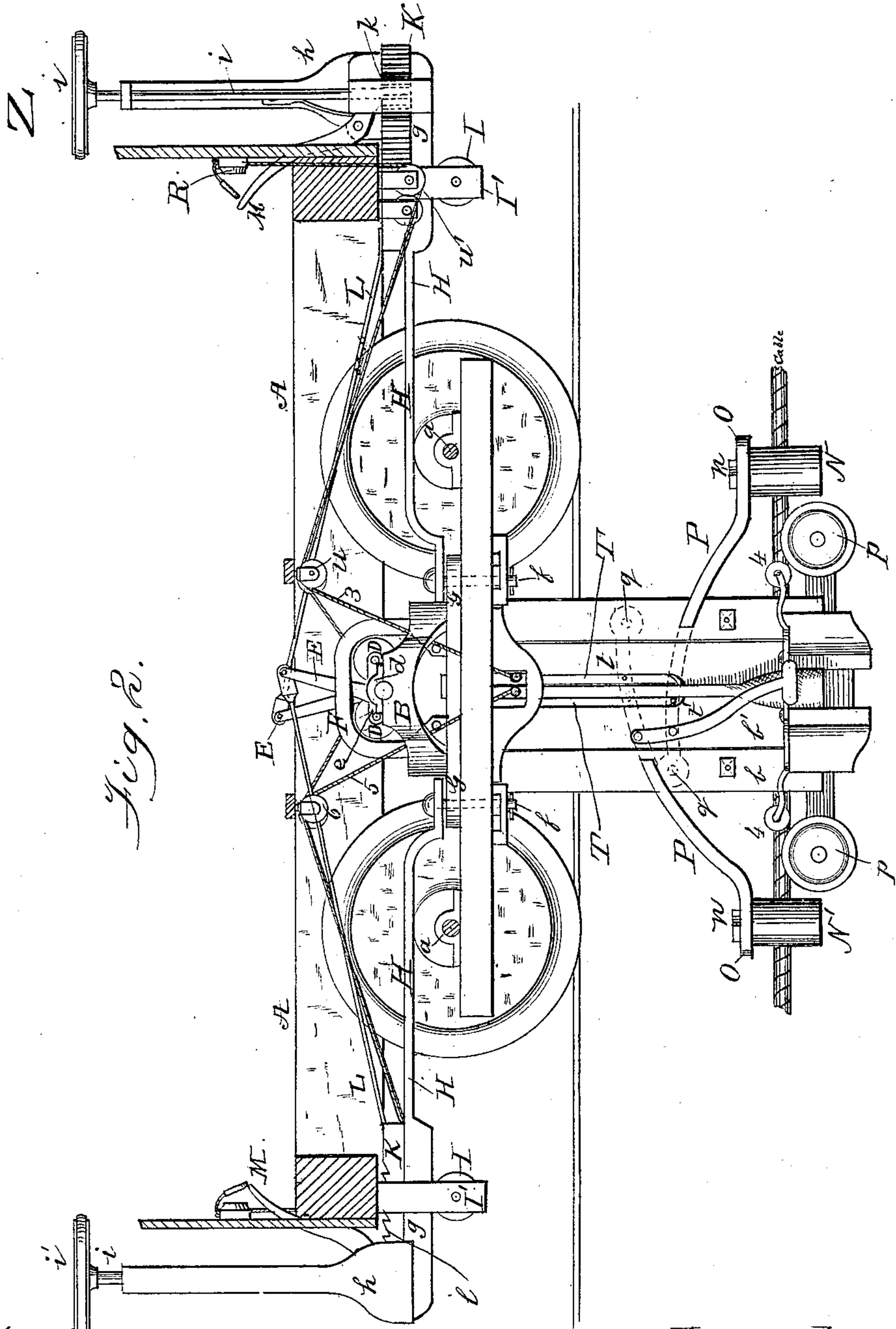


Fig. 2.

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(No Model.)

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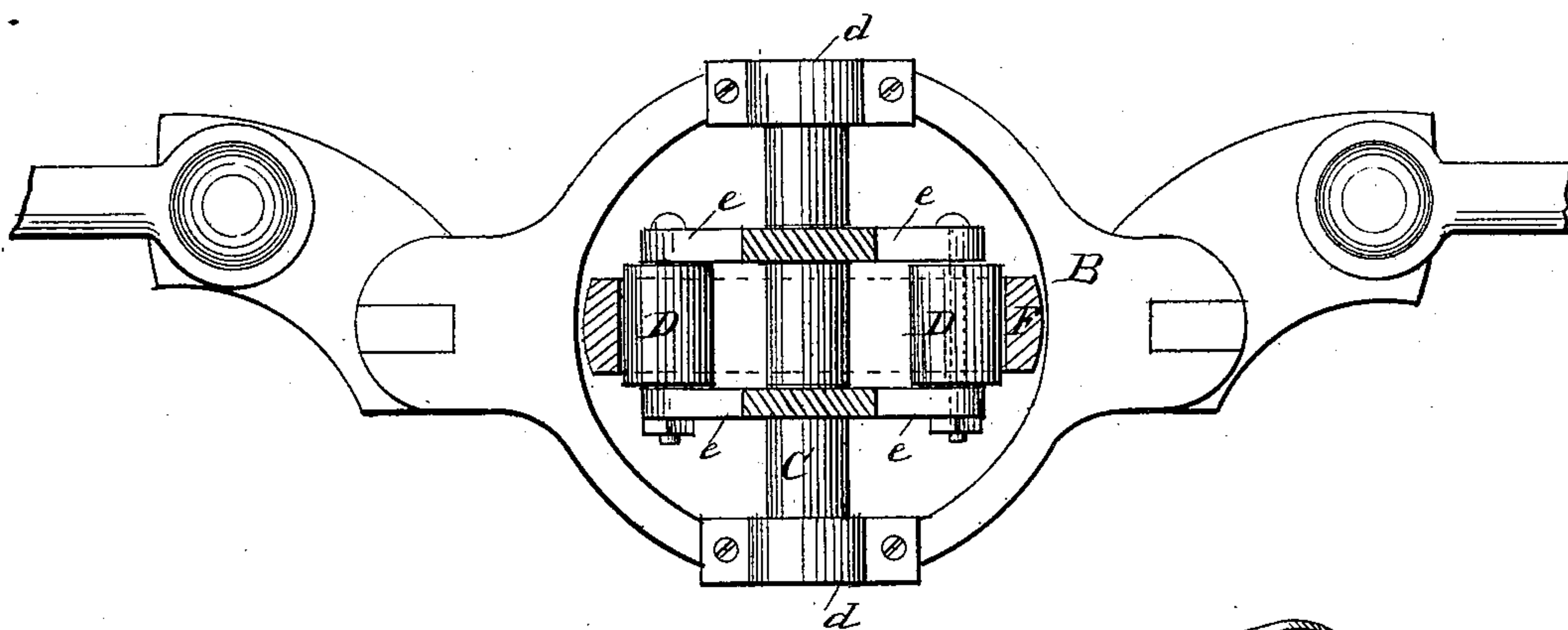
H. CASEBOLT.

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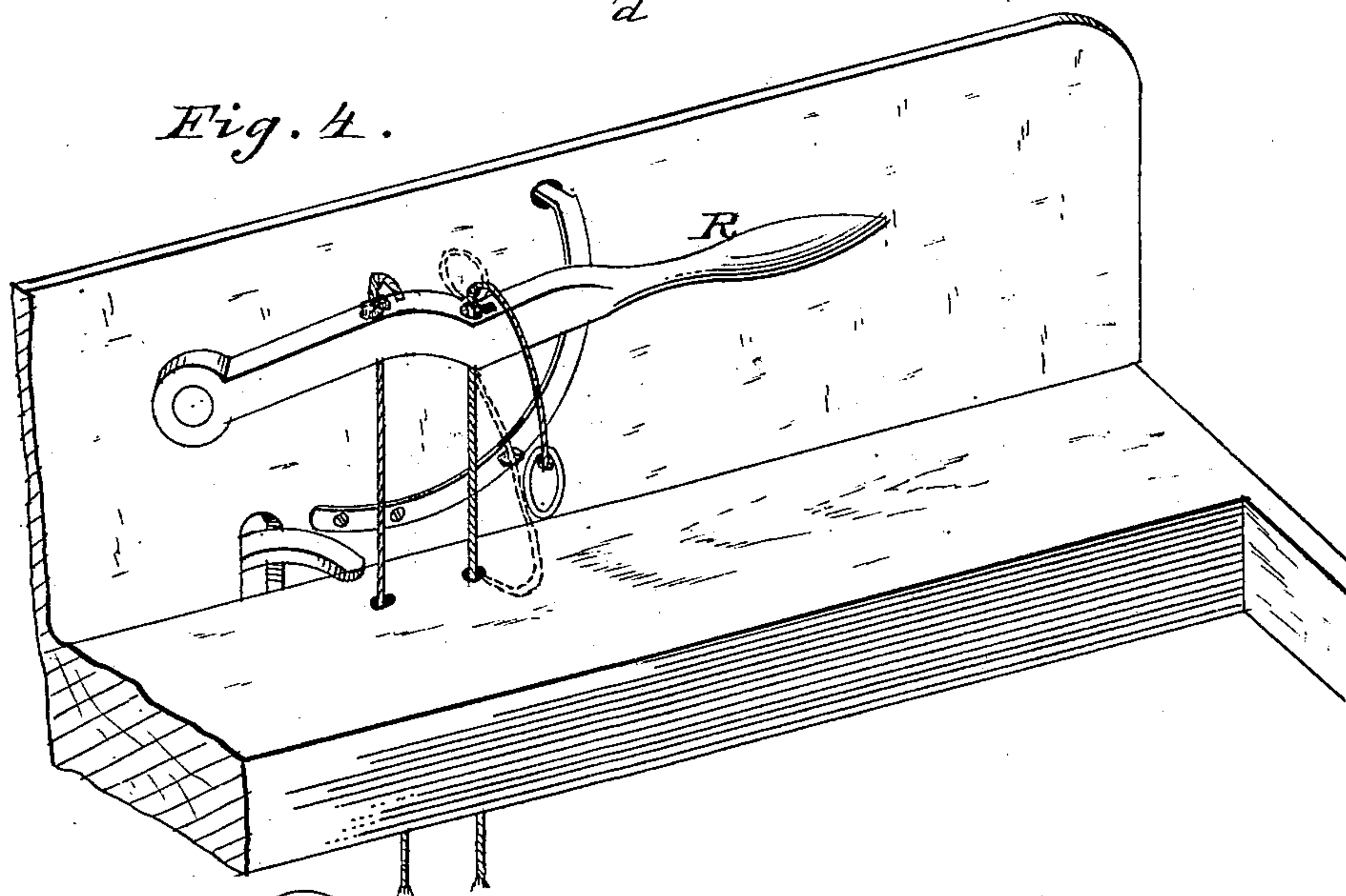
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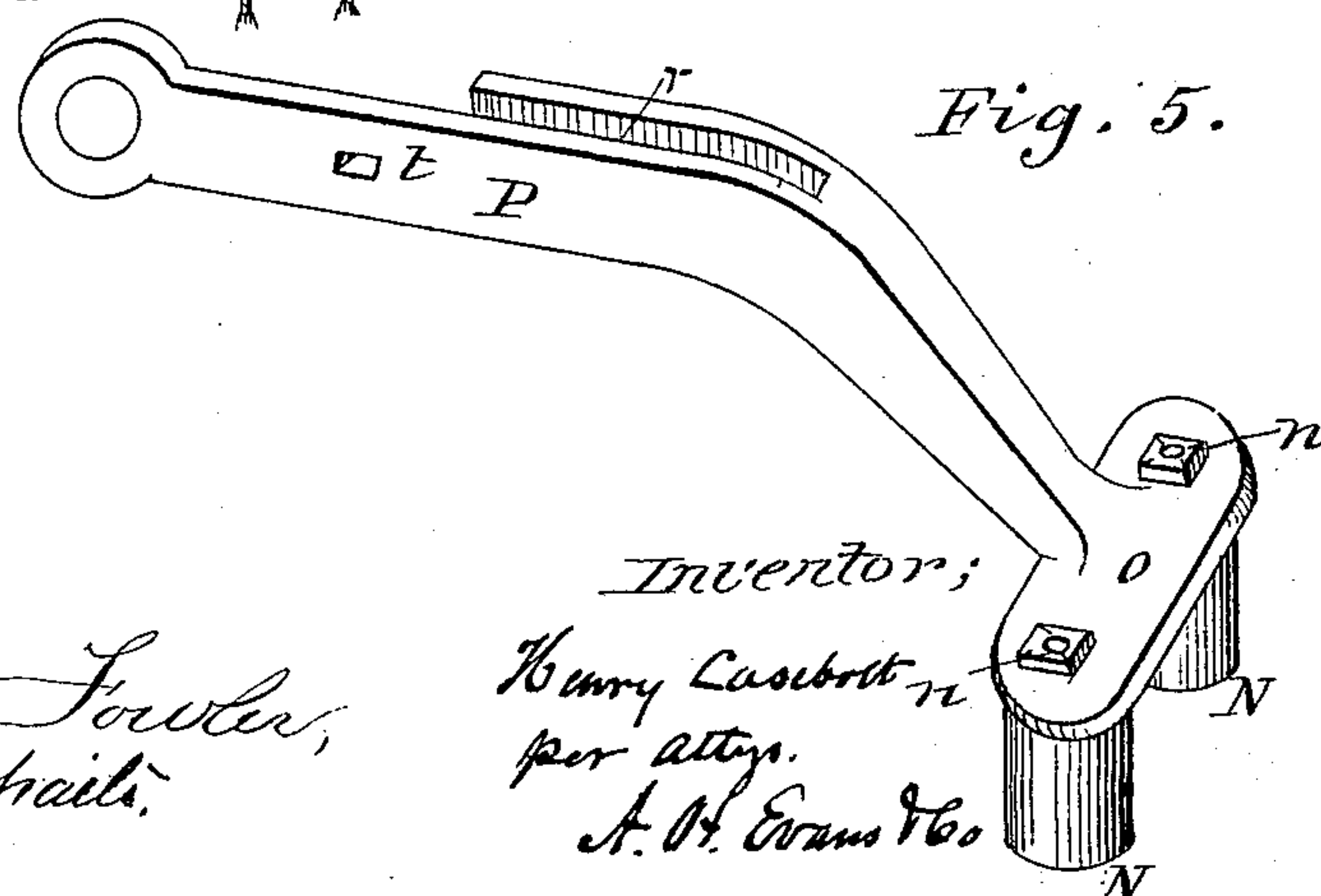
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Attest;  
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# UNITED STATES PATENT OFFICE.

HENRY CASEBOLT, OF SAN FRANCISCO, CALIFORNIA.

## GRIP APPARATUS FOR CABLE-WAYS.

SPECIFICATION forming part of Letters Patent No. 262,640, dated August 15, 1882.

Application filed August 20, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY CASEBOLT, of San Francisco, in the State of California, have invented certain improvements in grip operating mechanism designed for cars propelled by an underground endless cable-way; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making  
10 part of this specification, in which—

Figure 1 is a plan of the car-frame, truck, and my improved grip-operating mechanism. Fig. 2 is a side elevation of the same, the car-frame being in section. Figs. 3, 4, and 5 are  
15 details to be referred to.

My invention relates to that class of cars propelled by an endless cable moving in a slotted tunnel; and it has for its object to operate the gripping device from the platforms  
20 at the ends of the car, and avoid mounting the grip on a supplemental car or dummy.

My invention consists, first, in a grip centrally located between the supporting-wheels of the car, in combination with an operating  
25 device on the end or ends of the car, said grip and its operating mechanism being mounted entirely independently of the car-body, and said grip and its operating mechanism having a longitudinal movement independent of the  
30 car; secondly, in the movable jaw of the grip, provided on its upper end with a yoke, in combination with a rock-shaft having double lifting-cams provided with anti-friction rollers, and operating-levers for operating the movable  
35 jaw in either direction; third, in the grip-operating device at the end of the car, in combination with a support independent of the car-frame, and a rigid connection with the grip-frame; fourth, in a sliding bar adapted  
40 to be moved back and forth at the end of the car, in combination with a connecting-chain, the grip-operating lever, and grip; fifth, in vertical roller-guides swung to the grip by pivoted arms and resting on both sides of the  
45 cable just outside of the supporting-rollers of the movable grip-jaw; sixth, in a lever located at the end of the car, in combination with an arrangement of cords and pulleys for operating the vertical roller-guides and dis-  
50 engaging bosses simultaneously or separately;

seventh, the operating device at the end of the car and the rigid bar connecting it with the grip-frame, in combination with a hanger beneath the car and an anti-friction roller; eighth, the cylindrical collar cast on the upper  
55 end of the fixed jaw of the grip, in combination with the movable jaw cast with a yoke, and an intervening rock-shaft and double-acting cams, whereby the grip is closed by moving the lever in either direction. 60

In order that those skilled in the art may make and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A A is the car-frame, 65 and *a a* the axles of the wheel. The gripping-jaws by the vertical bars *b b'* are constructed as described in Patent No. 237,813, issued to me February 15, 1881, and the grip is shown supported in a frame sustained by  
70 the axle, as described, and claimed in Patent No. 245,785, granted to me August 16, 1881. The upper end of the bars carrying the fixed jaw are provided with a stout collar or cylindrical casting, B, properly secured by bolts or  
75 otherwise to the frame G of the grip, and provided with bearings *d* to receive the ends of a rock-shaft, C, to which are secured two cross-bars, *e e*, of equal length, and between  
80 whose ends are journaled rollers D D, for a purpose hereinafter described. Each cross-bar has forged with it an upwardly-projecting lever, E E, raking at a slight angle in opposite directions. The upper end of the bars  
85 carrying the movable jaw of the grip terminates in a yoke, F, lying directly over the rollers D D, and so proportioned that when the movable jaw is down and the grip open the yoke F rests on the upper surfaces of said  
90 rollers D, their upper surfaces being in line.

From the grip-frame G toward each end of the car extends a rigid bar, H, secured to said grip-frame by king-bolts *f f*. The outer ends of the bars terminate in a broad flat head, *g*  
95 *g*, sustained by an anti-friction roller, I, journaled in a stirrup, I', so the bar can move freely longitudinally without regard to the car. The outer end of the head *g* is provided with a post, *h*, to afford bearings for a vertical  
100 rod, *i*, having on its upper end an operat-



ing-wheel,  $i'$ , and on its lower end a pinion,  $k$ , meshing with a rack-bar,  $K$ , which moves freely on the upper face of the head  $g$ , when actuated by pinion  $k$ . Rods  $L$ , having link-sections  $g$ , connect the inner end of each rack-bar  $K$  with the ends of the levers  $E$  most remote from said rack-bar. The upper edge of the rack-bar is provided with ratchet-teeth  $l$ , in which engage a spring-pawl,  $M$ , to hold the rack-bar in any desired position. Remembering that the weight of the movable jaw always keeps the grip open when no power is applied to close it, the operation is as follows: Supposing the end marked  $Z$ , Fig. 2, to be the forward end of the car, the wheel  $i'$ , at the rear end, is made to throw the rack-bar toward the grip until its operating-rod is slack. This leaves the movements of the rock-shaft  $C$ , lever  $E$ , and rod  $L$  completely under the control of the forward rack-bar, which the conductor moves back and forth by the hand-wheel, and thereby raises or lowers the movable jaw, and holding or dropping the cable at will. When the movement of the car is reversed the operation is simply reversed.

It will be readily seen that in my invention, notwithstanding the grip is operated from the end of the car, the line of the grip-shank will always remain tangent to any curve of the slot, and there will consequently be no interference with its free progress.

It is also obvious that one of the greatest advantages of my invention is that it can be readily applied to street-cars now in general use.

I have found it indispensable in this system of propelling cars to provide some means whereby the cable cannot be cast off the sustaining-pulleys  $p$  of the grip when the car is turning curves. This I accomplish by means of two pairs of vertical rollers,  $N N'$ , pivoted on pins  $n$ , passing through heads  $O$  on the ends of swinging levers  $P P$ , whose ends are pivoted at  $q$ , near each edge of the fixed jaw of the grip, and bifurcated, as seen at  $r$ , Fig. 5, so as to hug the edge of the grip and obtain a secure bearing. Each pair of the rollers is arranged a short distance from the supporting-pulleys  $p$ , and in such a position that the cable passes only freely between each pair at about a central horizontal line, as seen in Fig. 2, whereby they prevent the cable from leaving the grip if the cable be deflected from a line in the plane of the grip. In dropping the cable and picking it up the rollers  $N N'$  must be removed from any interference with it, and this I accomplish by pivoting the levers  $P P$  through slots  $t t$  to a vertically-sliding bar,  $T$ , inserted in an opening in the grip-frame and movable jaw, and securing a cord, 3, to a pin at the upper end of bar  $T$ , and passing said cord through pulleys  $u u'$ , and securing it to a lever,  $R$ , at the end of the car, where it is under the hand of the conductor. When the cord 3 is pulled it raises the sliding bar  $T$  and throws the ends of the levers  $P$ ,

bearing rollers  $N N'$ , up out of the line of travel of the grip, whereupon the cable may be either dropped or picked up.

The operation of the pivoted bosses 4 4, by means of a vertically-sliding rod having a wedge-shaped lower end, is substantially the same as shown and described in my Patent No. 237,813, before mentioned; but instead of using a lever  $I$  operate it by means of a cord, 5, secured to a stud on its upper end, and passing over pulleys 6 6 to the lever  $R$ , where the end is passed through a hole, and is provided with a ring or other stop to prevent it from being withdrawn. A short distance from the end of cord 5 is a knot, 7, which can be brought into a notch, 8, and take up all its slack, so that when lever  $R$  is moved both cords 3 and 5 are drawn on at the same time, and the rollers  $N N'$  are raised simultaneously with the forward movement of the bosses 4 4. When it is desired to operate the rollers  $N N'$  only the knot is thrown out of notch 8 by hand or otherwise, and the slack of cord 5 prevents the bosses from moving.

I am aware that heretofore grips supported between the wheels and operated from the end or ends of the car have been used, and hence I make no broad claim to such devices; but,

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

1. The combination of a car, a grip for seizing a moving cable, and grip-operating mechanism at one or both ends of the car, said grip and operative mechanism mounted independently of the car-body, and both having a longitudinal movement independent of the car when the grip grasps the cable, for the purpose set forth.

2. The fixed jaw-bars of the grip provided with the head  $B$ , in combination with the movable jaw-bar provided with the yoke  $F$ , and the intervening rock-shaft provided with cam-arms  $e D$ , and levers  $E$ , substantially as and for the purpose described.

3. A centrally-located grip and a device on the end of the car for operating the same, in combination with a rigid connecting-rod and a flexible connecting-rod, substantially as set forth.

4. The combination of a central grip and flexible connecting-rod with a sliding rack-bar at the end of the car, substantially as specified.

5. The vertically-movable vertical roller-guides  $N N'$ , arranged on both sides of the cable near the supporting or carrying rollers, for the purpose set forth.

6. The centrally-located grip provided with the vertical roller-guides  $N N'$  and disengaging-bosses 4 4, in combination with the cords 3 and 5 and the lever  $R$ , whereby the roller-guides and bosses may be operated simultaneously or separately, substantially as described.

7. The centrally-located grip, its operating device at the end of the car, and the rigid rod



H, in combination with the hanger I', provided with the anti-friction roller I, for the purpose set forth.

5 8. The collar B, cast on the upper end of the fixed jaw-bar of the grip, and the movable jaw-bar provided with the yoke F, in combination with an intervening double-acting cam, e D, and a lever, whereby the movable jaw is raised by moving the lever in either direction,  
10 substantially as described.

9. The vertical roller-guides N N', in combination with the pivoted supporting-levers P

and the central movable bar, T, located in the grip-shank, substantially as and for the purpose set forth.

10. The levers P for supporting the roller-guides N N', provided with a bifurcation, in combination with and inclosing the edge of the grip-shank, as described. 15

HENRY CASEBOLT.

Witnesses:

H. B. APPLEWHAITE,  
WARREN PARSONS.