

(No Model.)

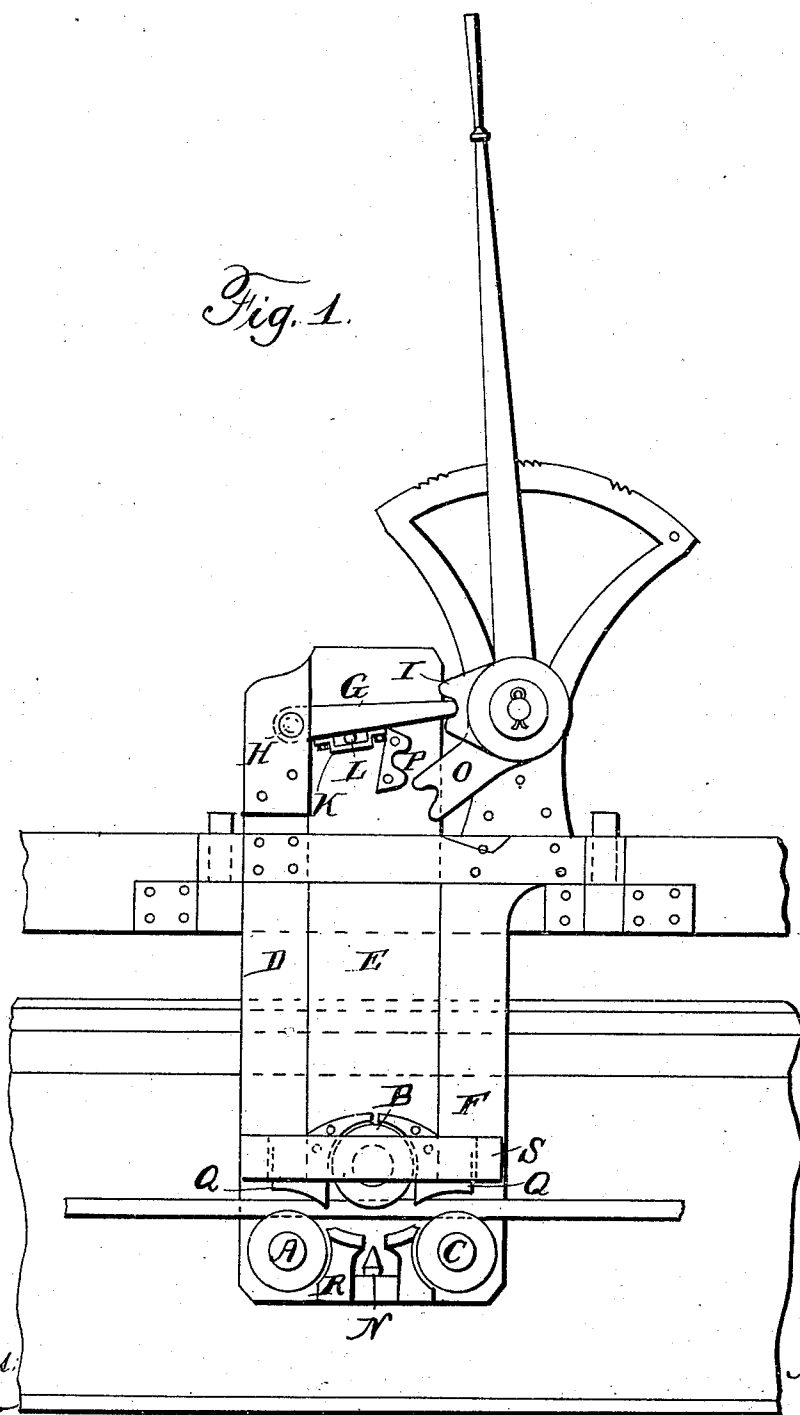
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G. S. EVANS.
CABLE GRIPPER.

No. 553,233.

Patented Jan. 21, 1896.

Fig. 1.



Witnesses:

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B. Northrup

Inventor.

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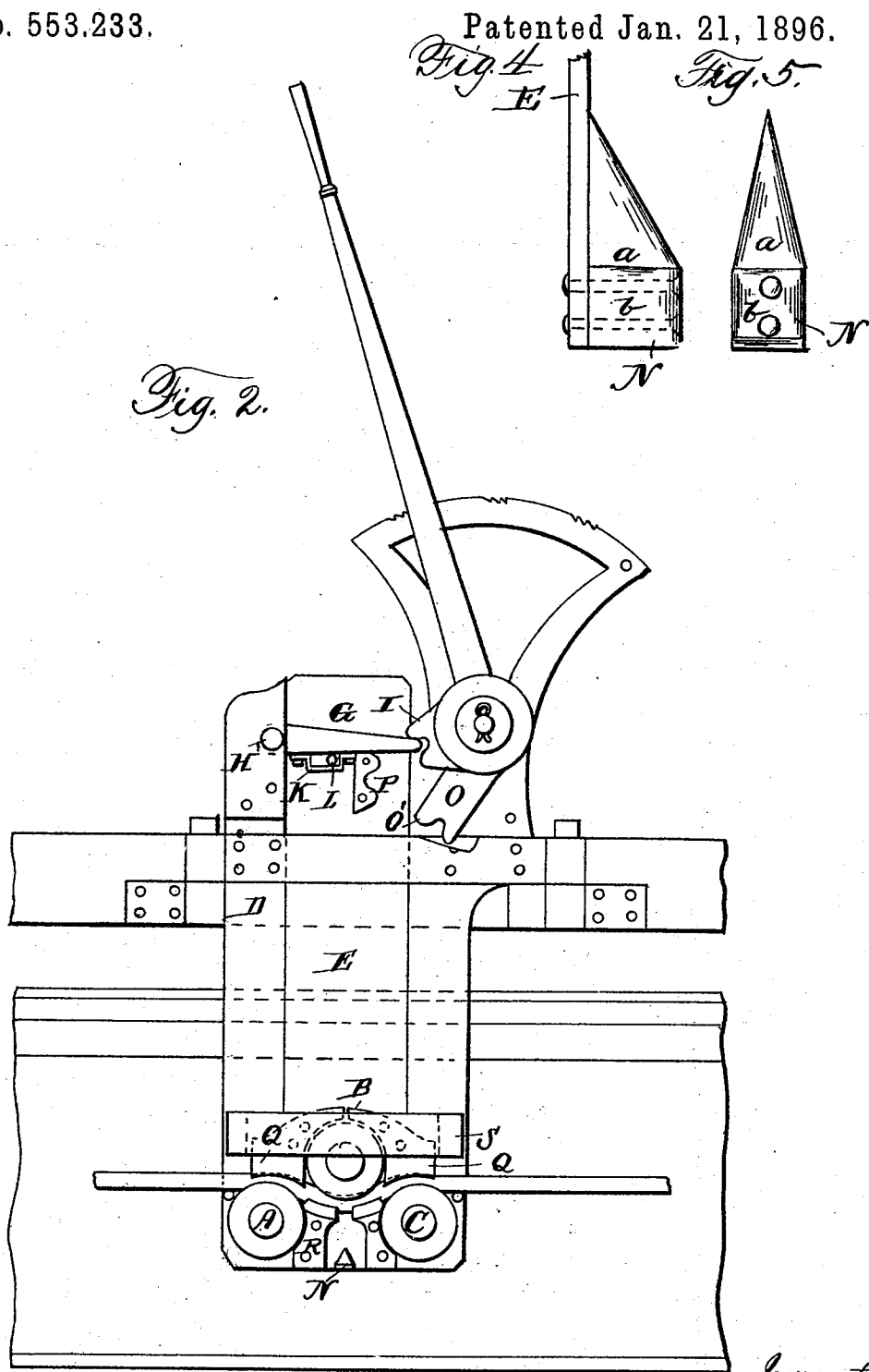
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G. S. EVANS.
CABLE GRIPPER.

No. 553,233.

Patented Jan. 21, 1896.



Witnesses:

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(No Model.)

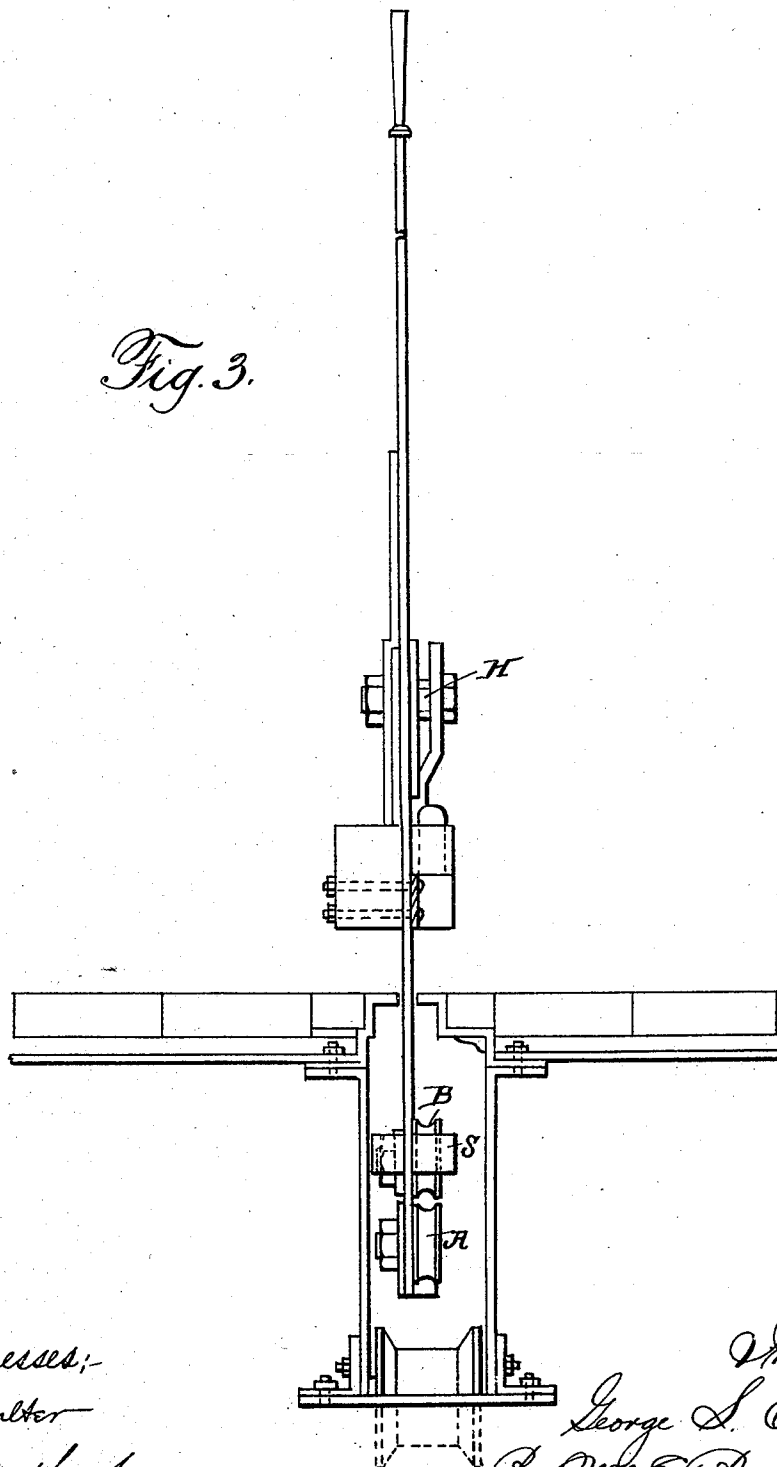
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No. 553,233.

Patented Jan. 21, 1896.

Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE SEXTON EVANS, OF ELSTERNWICK, VICTORIA.

CABLE-GRIPPER.

SPECIFICATION forming part of Letters Patent No. 553,233, dated January 21, 1896.

Application filed September 5, 1894. Serial No. 522,215. (No model.) Patented in New South Wales August 29, 1892, No. 3,943; in Victoria September 1, 1892, No. 9,920; in New Zealand May 30, 1893, No. 6,210, and in Queensland December 29, 1893, No. 2,344.

To all whom it may concern:

Be it known that I, GEORGE SEXTON EVANS, civil engineer, a subject of the Queen of Great Britain, residing at North Road, Elsternwick, in the British Colony of Victoria, have invented new and useful Improvements in Grippers for Vehicles Propelled by Rope Traction, (for which I have obtained patents in the following British Colonies, viz: Victoria, September 1, 1892, No. 9,920; New South Wales, August 29, 1892, No. 3,943; New Zealand, May 30, 1893, No. 6,210, and Queensland, December 29, 1893, No. 2,344,) of which the following is a specification.

In propelling vehicles by rope traction by means of grippers fixed to the vehicles which seize the traveling rope, it has heretofore been necessary to make the traction-rope much larger and heavier than is actually required for affording the necessary strength for haulage, on account of the considerable wear to which the rope is subjected by the different forms of grippers at present employed, these being so constructed that in order to start the vehicle without detrimental jerk or strain on the rope it is necessary to allow the traveling rope to slide with considerable and gradually-increasing friction between the rough surfaces of the gradually-closing jaws of the gripper until the vehicle has attained the same speed as the rope, or nearly so. The damage thus done to the rope also leads to many other serious evils, such as the bunching of the strands, choking of the grippers, &c., resulting in stoppage of the traffic and accidents of various kinds. According to my present invention I obviate these several defects by a construction of gripper which will permit of the vehicle being brought gradually from a state of rest to a speed equal to that of the rope, practically without causing any friction between the gripper and the rope.

In the drawings, Figures 1 and 2 are side views, and Fig. 3 a front view, of the apparatus. Fig. 4 is a detail side view showing the inclined stud N, and Fig. 5 is a front view of said stud.

The fixed framing D F of the gripper carries two grooved rollers A C, whose horizontal axes are situated in one and the same plane in such a position that the traction-rope passes

along over the top of the grooves of both rollers. Between these rollers is a third grooved roller B, mounted on a bar E, sliding in vertical guides on the gripper-frame and provided with suitable gearing within the vehicle, such as a lever G, pivoted at one end upon the framing of the gripper, as shown at H, and having its other end arranged to project into a recess between two teeth I upon the boss of the main operating-lever.

A slot or guide K is provided underneath the lever G, in which works a pin L, projecting from the central sliding bar E, so that the roller B can either be raised above the two fixed rollers A C, as in Fig. 1, or be forced down more or less between them, as shown in Fig. 2. Thus when the middle roller B is in the raised position, as shown in Fig. 1, the traction-cable passes freely through the gripper, leaving this and the vehicle stationary. When the vehicle has to be started the middle roller B is gradually forced down onto the rope so as to bend it down between the two fixed rollers A C, so that the rope in thus meeting a gradually-increasing resistance to its passage through the rollers will commence to drag the gripper and vehicle along with it at a slow initial speed, while at the same time the rope in passing between the rollers at a greater speed will cause these to rotate on their axes so that only rolling friction will occur between them. As the middle roller is forced farther down, so as to increase the bend of the rope, the resistance to its passage through the gripper will increase in proportion until such resistance equals the force required for hauling the vehicle along at the same speed as the rope.

When it is desired to stop the vehicle the middle roller is raised again so as to free the rope from the hold of the gripper, whereupon the vehicle is stopped by the brakes in the usual manner.

The above-described rollers are mounted on pins projecting from one side of the gripper-frame and sliding bar E, and the latter carries at a certain distance below its pulley a projection or inclined stud N, which, when the bar is sufficiently raised for the purpose, will lift the rope out of the grooves of the fixed pulleys, so as to throw it off the gripper

where required at crossings, &c. The stud N is merely a half-section of a solid composed of a cone *a* and cylinder *b*, as clearly shown in Figs. 4 and 5. To effect this movement a projecting lug O is also fitted upon the boss of the main operating hand-lever and its end is formed with teeth O', as shown, adapted to engage with corresponding teeth P on the central sliding bar E of the gripper.

10 In operation the teeth I and lever G enable sufficient pressure to be put upon the rope by reason of the leverage gained, and they also serve to raise the upper pulley sufficiently high to clear the cable, as shown in Fig. 1. Should it be required to throw the cable out of the gripper altogether it is only necessary to move the operating hand-lever farther over, when the teeth on the lug O will gear into the teeth P on the central bar E and will lift it more quickly until the inclined stud N on the lower end of said bar comes in contact with the cable and throws it out of the gripper.

If it should be thought that sufficient gripping-power is not obtainable with the three rollers only a shoe or pair of shoes Q may be secured to the central sliding bar E above the cable and other shoes R to the fixed part of the framing below the cable, said shoes being so arranged that when the cable has been bent and gripped by the rollers to a certain extent they will come into operation and serve to grip it more firmly, so as to admit of heavy loads being drawn up steep inclines if required. Under ordinary circumstances, however, these shoes do not come into operation at all.

A rubbing-block S, in the form of a bridge-piece extends from front to back on each side of the gripper to take the wear caused by rubbing against the sides of the tunnel when traveling around curves.

With the above-described construction, the additional advantages are gained that, as the gripper occupies very little space in the rope-tunnel as compared with ordinary grippers, very sharp curves can be employed, and the rope-tunnel can be made comparatively small, so that it can be readily constructed as a box-girder of limited dimensions.

50 Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a device of the character described,

the combination with two grooved rollers 55 mounted in the same horizontal plane, of an intermediate grooved roller mounted in a horizontal plane above that of the lower rollers, and shoes arranged above and below the traveling rope, said upper roller being adapted 60 to be depressed to bind the rope between it and the lower rollers, and said shoes being also adapted to grip the said rope when a certain degree of pressure has been put upon the rollers, as and for the purpose specified. 65

2. In a device of the character described, the combination with a main operating lever, teeth upon the boss of said lever, a pivoted lever adapted to engage with the teeth on the boss of the main lever, a vertically sliding bar adapted to be raised and lowered by said pivoted lever, a grooved roller carried by said sliding bar and grooved rollers arranged below and at each side of the said roller, and adapted to grip the rope in the manner and 75 for the purpose specified.

3. In a device of the character described, the combination with a main operating lever, teeth upon the boss of said lever, a pivoted lever adapted to engage with the teeth on the boss of the main lever, a vertically sliding bar, a pin carried thereby, a guide carried by the said pivoted lever into which projects the said pin, a grooved roller carried by said sliding bar and grooved rollers arranged below and at each side of the said roller and adapted to grip the rope in the manner and for the purpose specified. 85

4. In a device of the character described, the combination with a main operating lever, 90 teeth upon the boss of said lever, a pivoted lever adapted to engage with the teeth on the boss of the main lever, a vertically sliding bar adapted to be raised and lowered by said pivoted lever, a grooved roller carried by the said sliding bar, grooved rollers arranged below and at each side of the said roller, and adapted to grip the rope as described, an inclined stud arranged intermediate the said lower rollers, a lug on the boss of the main lever and having 100 teeth, and teeth carried by the sliding bar with which the teeth on said lug are adapted to engage, for the purpose specified.

GEORGE SEXTON EVANS.

Witnesses:

EDWARD WATERS,
EDWARD NEEDHAM WATERS.