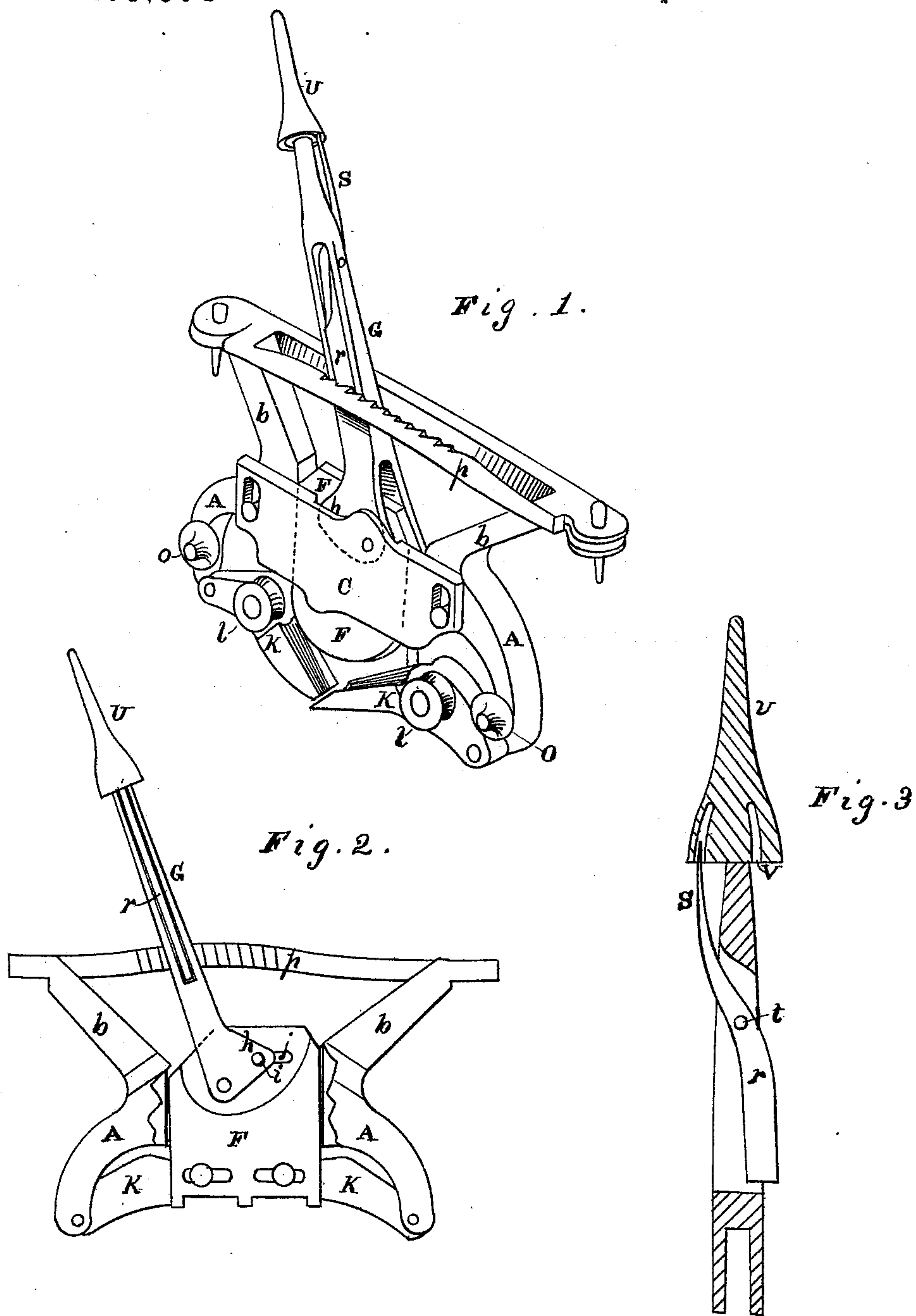


**C. A. GUSTAFSON.**  
**GRIPPING DEVICES FOR TRACTION CABLES FOR PROPELLING**  
**CARS AND VEHICLES**

No. 195,504.

Patented Sept. 25, 1877.



**Witnesses •**  
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# UNITED STATES PATENT OFFICE.

CHARLES A. GUSTAFSON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO  
ANDREW S. HALLIDIE, OF SAME PLACE.

IMPROVEMENT IN GRIPING DEVICES FOR TRACTION-CABLES FOR PROPELLING CARS AND VEHICLES.

Specification forming part of Letters Patent No. 195,504, dated September 25, 1877; application filed July 2, 1877.

*To all whom it may concern:*

Be it known that I, CHARLES A. GUSTAFSON, of the city and county of San Francisco and State of California, have invented an Improved Gripping Device for Traction-Cables; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to an improved gripping device for connecting a car or other vehicle with an endless moving rope or cable, which is arranged to travel in an underground tube or tunnel for propelling the car or vehicle along a track or roadway.

My improved griper is operated by a lever; and it consists of a jaw, which forms a part of the frame-work of the griper, and two movable lever-jaws, which are operated by a vertically-moving slide and the lever above referred to. Pulleys are provided for sustaining the moving rope when the jaws release it, all as hereinafter more fully described.

Referring to the accompanying drawing, Figure 1 is a perspective view of my griper; Fig. 2, an elevation of the same, showing the plate F; and Fig. 3, a section of the lever and handle.

A represents the frame-work of the griper, which has the upward-projecting arms or prongs *b b*. These prongs serve as the shank which moves in the slot of the underground tube, and connects the car or vehicle with the operative parts of the griper. The frame A is made semicircular in form, and moves in the tube with its convex side uppermost. The arms or prongs *b b* project upward from this convex side, and their upper ends are attached at the opposite ends of a slot in the floor of the car or dummy.

The fixed jaw C is attached to one side of the frame A, or may be simply an enlargement, with a detachable shoe secured to its lower edge, which forms the face of the jaw. In the present instance this jaw is represented as being secured to the side of the griper-frame by means of a screw at each end, which passes through a vertical slot in the jaw, so that by loosening the screw the jaw can be adjusted up or down. This arrangement is necessary

when a wearing-face or detachable shoe is not used, in order to adjust the shoe as its permanent face wears away; but when the detachable shoe is used the jaw C is fixed. A plate, F, is fitted to move in a vertical recess in the frame underneath the jaw C, and it is long enough to extend both above and below the jaw. This slide is arranged to be raised or lowered by means of a lever, G. In the present instance I have represented the lever with its lower end bifurcated and formed with an arm or projection, *h*, on one side. The upper end of the slide fits in the bifurcation of the lever, and a rivet or bolt, *i*, passes through the arm or projection and through a horizontal slot, *j*, in the slide, while the lower end of the lever is secured to the jaw C, on one side, and the frame on the other, so that when the lever is moved back or forth the slide F is raised and lowered.

I employ two movable jaws, both of which are operated simultaneously by the slide F and lever G, as follows: Each movable jaw consists of a curved or knee-shaped bar, K. One jaw is placed on each side of the slide, and has one end attached to the downward-projecting end of the curved frame, while its opposite end is attached to the slide. They are attached so that their convex sides are uppermost. The meeting ends of these jaws are re-enforced with an extra thickness of metal, the upper side of which is flattened, so that, when the jaws are drawn up against the permanent jaw by the slide and lever, they will fit against the lower edge of the stationary jaw, the journal at their opposite ends serving as centers about which they move. These movable jaws can also be provided with detachable wearing-faces.

At the middle of each jaw-bar K, and on its outside, I attach a pulley, *l*. These pulleys will then stand opposite the jaws at the bend, so that, when the jaws are slightly lowered, the rope will be released from the gripe, and will rest upon the pulleys and travel upon them as long as the jaws remain in this position. A slight movement of the lever, however, will close the jaws and gripe the rope permanently between them.

On each of the downward-projecting por-



tions of the frame, and in a line with the center of the pulleys *l*, I construct a conical projection or incline, *O*, the base of which is against the frame, while the apex projects out as far as the pulleys. When the rope is supported by the pulleys *l*, so as to move freely through the gripe, it does not touch the cones or inclines; but when the jaws are lowered far enough to drop the pulleys *l* below the center of the cones or inclines, the rope will be thrown off by the inclines, so as to entirely free it from the jaws. Therefore, when it is desired to simply loosen the gripe of the jaws I move the lever slightly, so as to separate the jaws and allow the rope to travel on the pulleys; but when it is desired to drop the rope altogether, I lower the jaws far enough to let the incline *O* throw it entirely free from the griper.

*p* is the horizontal rack against which the lever *G* moves. For greater convenience in handling this lever, I have devised a very simple device for operating the pawl which engages with the teeth of the rack.

To apply my pawl I make a mortise lengthwise through the lever-handle, which extends both below and above the rack. The pawl *r* is a thin plate of metal, which fits in the mortise, and has an arm, *S*, projecting upward on one side of the lever toward the lever-handle. This plate is secured by a rivet or bolt, *t*, near its upper end, so that by pressing the arm *S* toward the lever the pawl-plate is drawn into the mortise; but by pushing the arm outward the edge of the plate is projected out of the mortise, so as to engage with the teeth of the rack.

To operate this pawl I employ a rotary handle, *U*, which has a cam-groove, *V*, in its lower end, into which the end of the arm *S* enters, so that by a partial rotation of this handle the

pawl is drawn in or projected out of the mortise, as desired. This rotary handle may be a simple sleeve which fits over the ordinary handle, as represented.

This device is quite simple and convenient, as it requires but a slight rotary movement to operate the pawl, and the entire operation is done in one movement.

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

1. The semicircular frame *A*, with its shank arms or prongs *b*, in combination with the jaw *C* and vertically-moving jaws *K K*, operated by a slide, *F*, and lever *G*, substantially as and for the purpose described.

2. The jaw *C*, attached to a griper-frame, *A*, in combination with the curved or knee-lever jaws *K*, with the pulleys *l*, said arms being hinged at one end to the frame *C*, while their opposite ends are raised and lowered by a slide, *F*, and lever *G*, substantially as and for the purpose described.

3. The griper-frame *A*, provided with the attached jaw *C*, and having the hinged lever-jaws *K K*, with their pulleys *l*, operated as described, in combination with the inclines or cones *O*, substantially as and for the purpose described.

4. The pawl-plate *r*, secured, by a bolt near its upper end, in a mortise in the lever-handle, and provided with the arm *S*, in combination with the rotary handle *U*, with its cam-groove *V*, substantially as and for the purpose described.

In witness whereof I have hereunto set my hand and seal.

C. A. GUSTAFSON. [L. S.]

Witnesses:

OLWYN T. STACY,  
FRANK A. BROOKS.