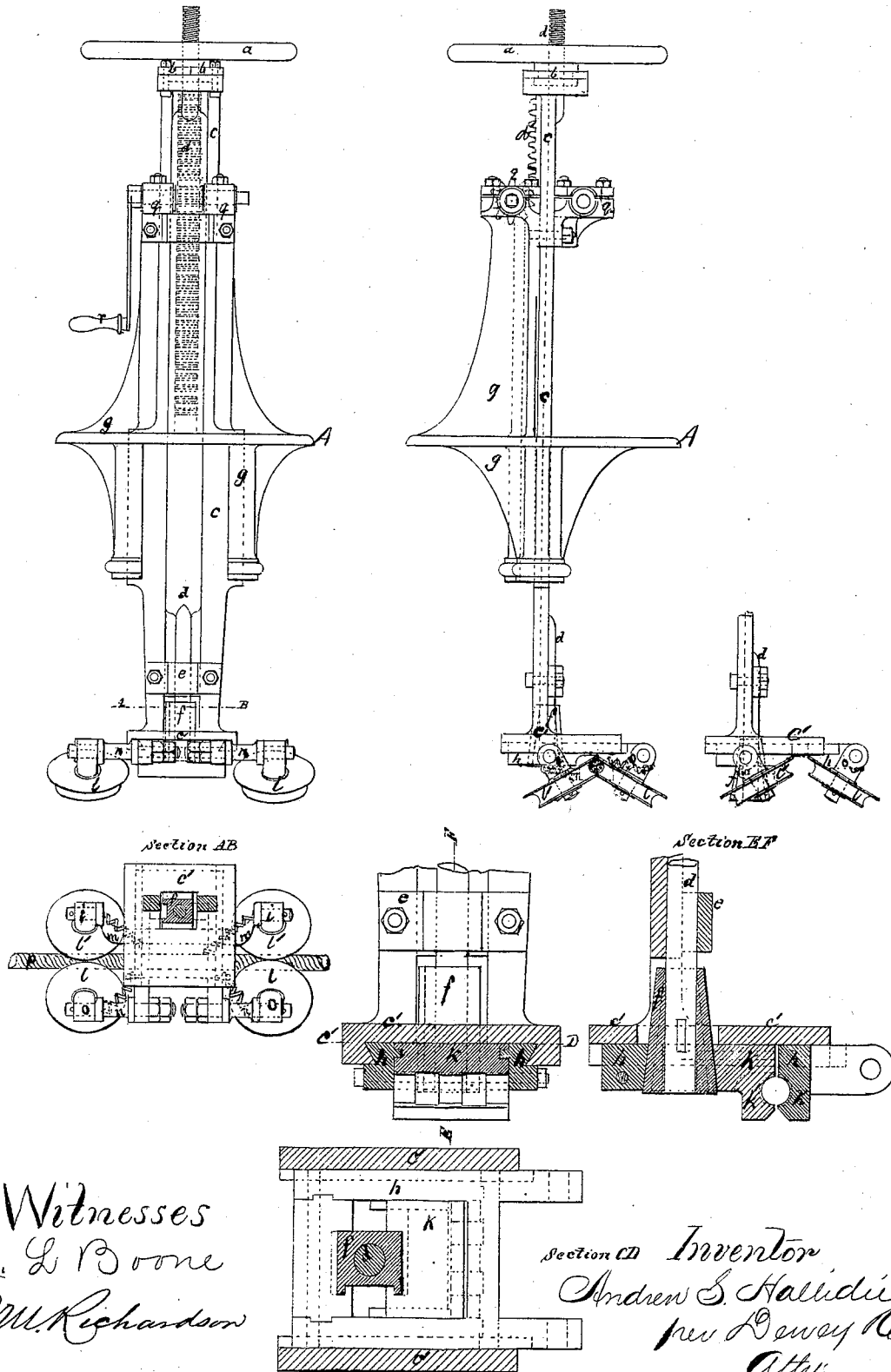


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Improvement in Gripping Attachments for Rope-Ways.

No. 129,130.

Patented July 16, 1872.



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN GRIPING ATTACHMENTS FOR ROPE-WAYS.

Specification forming part of Letters Patent No. 129,130, dated July 16, 1872.

### SPECIFICATION.

*To all whom it may concern:*

Be it known that I, ANDREW S. HALLIDIE, of San Francisco, San Francisco county, State of California, have invented a Gripping Attachment for Vehicles and Vessels; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

An endless running or traveling chain, band, or rope, the latter preferably of steel wire, being employed to actuate vehicles on land or vessels on water, I attach to such a vessel or vehicle, directly or by means of a tender or other suitable vehicle or vessel or device, an adjustable or automatic gripe, so that, without impeding or interfering with the running of the chain or rope, the vehicles or vessels can be stopped at any point on their transit, to take up or set down passengers or freight or for other purposes, by slacking up the gripe, and can be set in motion again by the tightening of the same. In canal transportation, where an endless traveling rope, chain, or band is employed, be it submerged or not, economy and other circumstances make it best that the endless rope, band, or chain should be traveling at a regular rate of speed without intermission during working hours, and that a quick and simple mode of connecting and disconnecting the rope, band, or chain from the vessel, so far as its propelling power is concerned, be provided, so as not to cause delay, and the connection be made in such a manner as to avoid too sudden a strain on the traveling rope, band, or chain and the machinery connected therewith. In methods heretofore adopted or in use, or which have been tried, for hauling or propelling passenger or freight cars or vehicles along and through streets and roads of towns and cities, especially if densely populated, great difficulty has been experienced in connecting and disconnecting the vehicles on inclines or grades or at crossings of streets. An equal difficulty has been experienced in keeping the connection between the vehicle and the rope while passing a change of grade or angle of inclination on the line of the route, and at the same time keeping the

endless rope, chain, or band at all points below the surface of the street, so as not to interfere with the ordinary street traffic. Also, difficulties have been encountered on account of the delay and time consumed in stopping and starting the vehicles whenever it is necessary to take up or set down a passenger. The object of my invention is to overcome these difficulties, and this I accomplish by attaching to the vehicle or car or train of cars to be hauled or propelled the gripe here described in the drawing.

Figure 1 is a front view of the attachment, showing the sliding bar for moving the wedge. Fig. 2 is a side view, showing most distinctly the rack and toothed wheel for raising and lowering the gripe. Fig. 3 shows the guide-pulleys separated. Fig. 4 is a top view, showing the arrangement of the guide-pulleys. Figs. 5, 6, and 7 are detail views of the gripping attachment.

The frame in which the gripping device is held and operated consists of a plate or flange, *a*, which is to be strongly secured to the floor or deck of the vehicle or vessel to be propelled, and which has a standard, *g*, extending upward to the desired height; also a similar standard, *g'*, extending downward below it a sufficient distance to support the gripping apparatus. This frame is a single casting, which should be made as light as possible, regard being had to the strength of material required to withstand the strain to which it will be subjected. Secured, at a short distance apart, to the upper end of the standard *g* are two pairs of boxes, *q*, between which the vertical sliding stem *c*, which supports the gripping device, passes. The stem *c* has a rack, *d*, secured to or formed upon one side of it, and a toothed roller, *s*, is supported in one pair of the boxes *q* so as to engage this rack. The roller *s* can be turned by a crank, *r*, and thus elevate or lower the stem *c* as required, according to the direction in which the crank is turned. The use of the extra pair of boxes will be explained further on. The slide *c* passes down through an opening in the plate or flange *A*, being guided by wings, which move in grooves in the side of the opening, so as to keep it closed up against the side of the standard *g*. At the lower end of the sliding stem is a block, *c'*, which is secured to the

stem at one side of the center in the form of an L, below which the gripping-jaws and holding-pulleys are secured and operated. A small frame, *h*, is secured in the under side of the block *c'* by dovetail grooves, as shown at Fig. 5, so that it can be moved back and forth in the grooves, and inside of this frame is another slide, *k*. Secured to the two corners of the frame *h*, which are furthest from the stem *c*, are short journals *n*, shown at Figs 1 and 4, to which pulleys *l l* are secured by a short box. These pulleys are held at an angle to the frame by spiral or other springs, shown at Fig. 4. Similar pulleys *l' l'* are secured to the slide *k* by arms *m*, and are held at an opposite angle by springs in the same manner. One end of the sliding frame *h* is formed into a downwardly-projecting jaw, *h'*, while an opposing jaw, *k'*, is secured to the slide *k*, as shown, each of which are provided with a semicircular groove on their opposing faces for grasping the rope when they are forced together. For operating the pulleys *l l'* and jaws *h'* and *k'*, a sliding bar, *d*, which moves in a recess in the face of the stem *c*, is employed. The upper end of this bar extends above the stem *c*, where it is provided with screw-threads and a hand-wheel, *a*, which, secured upon the upper end of the stem, serves to raise and lower the bar as necessary. The lower end of this bar passes down through the block *c'*, and has secured at its lower extremity a wedge, *f*, which is broadest at its lower end. This wedge moves between the sliding frame *h* and inside slide *k*, so that when the wedge is lifted by turning the hand-wheel the jaws and pulleys are forced together by the increasing size of the wedge. Flanges at the corners of the wedge, moving in corresponding recesses on the slides, serve to draw the slides together when the movement of the wedge is reversed.

The operation of my gripping attachment is as follows: The vehicle or vessel to be propelled being in the proper position, and the gripping attachment being directly over the traveling rope, band, or chain, the gripe is lowered by means of the crank *r* until the rope or chain is received both between the jaws *h'* and *k'*, and also between the opposing faces of the pulleys *l l' l' l'*; then, by turning the hand-wheel *a* so as to lift the wedge *f*, the jaws and pulleys will be closed upon the rope or chain. The pulleys first embrace the rope and hold it in place, revolving upon their journals; a further lifting of the wedge clamps the jaws upon the rope or chain, so that the vehicle or vessel is drawn by it.

When it is simply desired to stop the vessel or vehicle without casting loose from the tow-

ing rope or chain, the wedge should be lowered just enough to free the jaws from the rope without dropping it from the pulleys. The rope or chain will then move between the pulleys at its ordinary speed, ready to be gripped at any moment. In the case of hauling vehicles through streets of a city, where the rope or chain is necessarily under ground, and where a narrow groove running lengthwise between the tracks, through which the shank or the gripping attachment passes, is the only means of reaching the traveling rope, and when it is necessary to haul the vehicle in the reverse direction, the attachment can be readily reversed by lifting the stem *c* until it can be turned around in the opening through the flange or plate *a*. The toothed roller will in that case have to be transferred to the opposite pair of boxes *q'*.

When the endless rope or chain is submerged and runs on sheaves or wheels at the bottom of the canal, a modification of my invention can be made so far as the L shape is concerned, and the guide-pulleys for supporting the rope or chain might be dispensed with.

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

1. The standard *g*, with its toothed roller *s*, in combination with the sliding stem or plate *c*, with its rack *d'*, substantially as and for the purpose above described.
2. The adjustable sliding stem or plate *c*, with its L-shaped foot or block, substantially as and for the purpose above described.
3. The spring-pulleys *l l' l' l'*, when attached to the oppositely-operating slides *h* and *k*, for the purpose specified.
4. The jaws *h'* and *k'*, when secured to the oppositely-moving slides *h* and *k*, for the purpose specified.
5. The jaws *h'* and *k'* and pulleys *l l' l' l'*, when secured to the oppositely-moving slides *h* and *k*, for the purpose specified.
6. The sliding bar *d*, operated by the hand-wheel *a*, and having the wedge *f* secured at its lower end, in combination with the oppositely-moving slides *h* and *k*, substantially as and for the purpose above described.
7. Operating gripping-jaws *h' k'* and guide-pulleys *l l' l' l'*, or either of them, from the deck of the vessel or floor of the vehicle by means of the sliding rod *d* and wedge *f*, substantially as described, and for the purpose specified.

In witness whereof I hereunto set my hand.

ANDREW S. HALLIDIE.

Witnesses:

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