

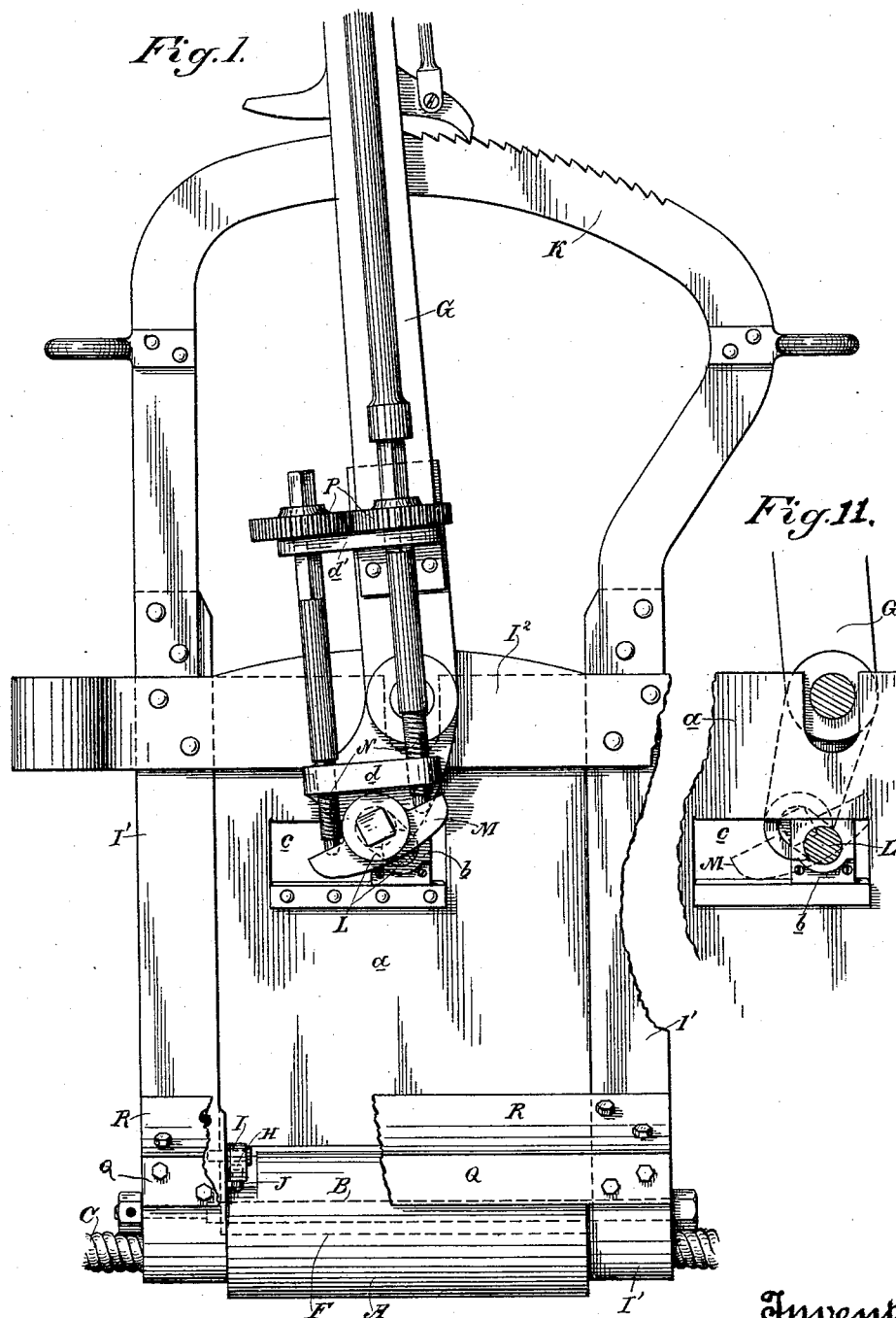
(No Model.)

3 Sheets—Sheet 1.

J. C. H. STUT.  
CABLE RAILWAY GRIP.

No. 454,235.

Patented June 16, 1891.



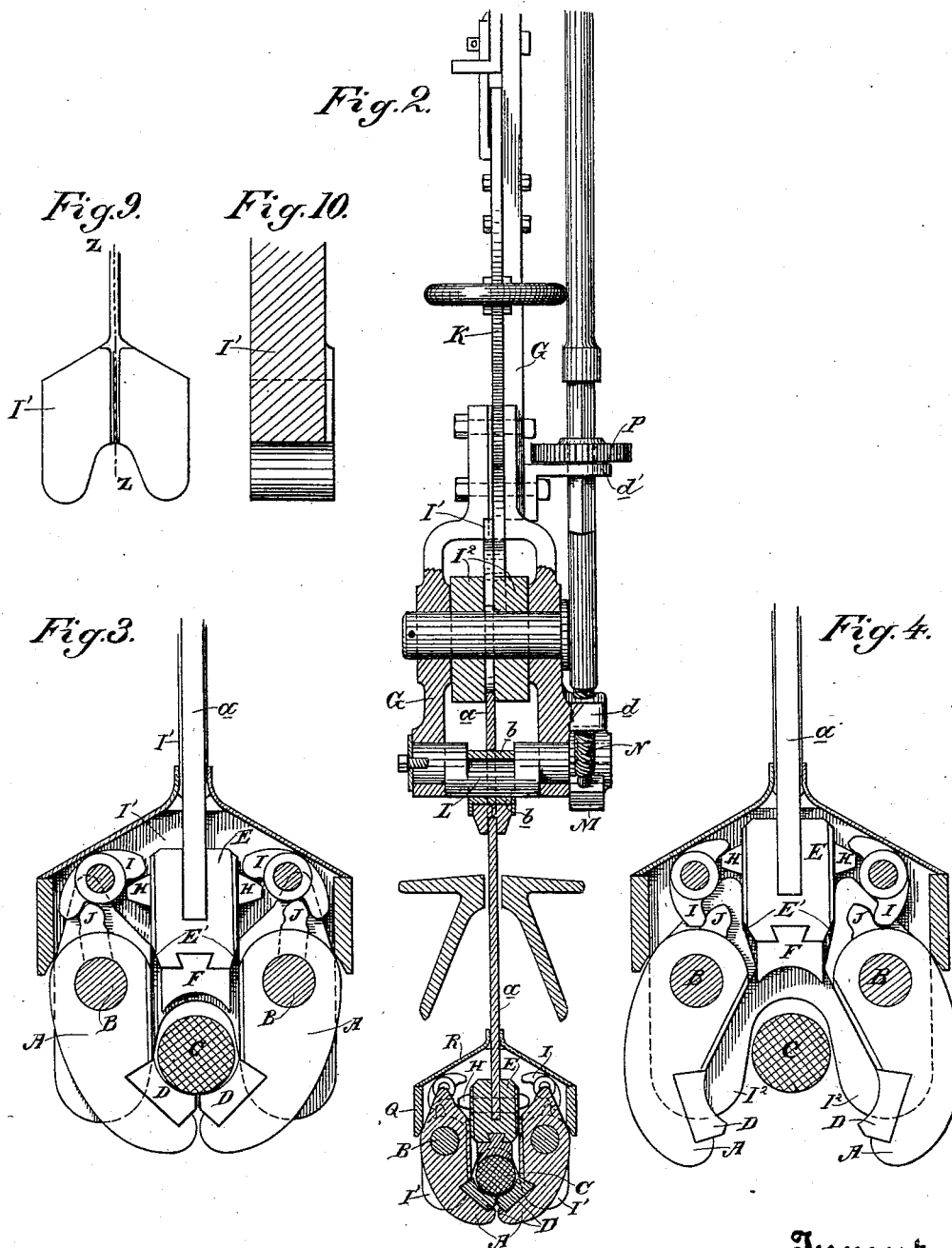
Witnesses,  
P. H. Hulse  
H. C. Lee.

Inventor,  
John C. H. Stut,  
By Dewey & Co.  
attys

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Fig. 5.

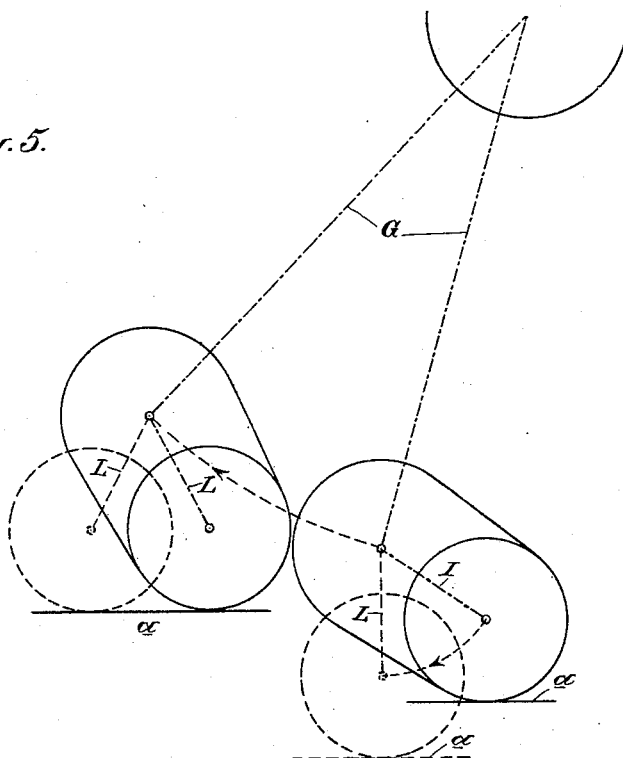


Fig. 6.

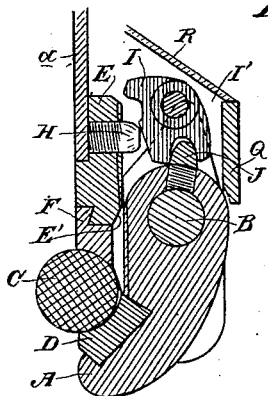


Fig. 7.

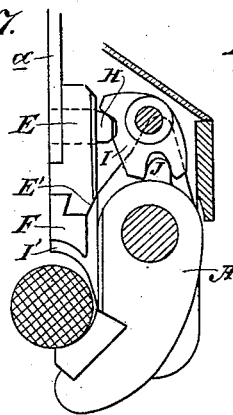
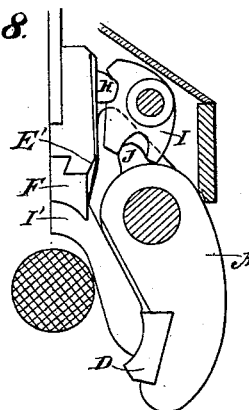


Fig. 8.



Witnesses,  
H. C. Lee.

Inventor,  
John C. H. Stut.  
By Dewey & Co.  
attys

# UNITED STATES PATENT OFFICE.

JOHN C. H. STUT, OF SAN FRANCISCO, CALIFORNIA.

## CABLE-RAILWAY GRIP.

SPECIFICATION forming part of Letters Patent No. 454,235, dated June 16, 1891.

Application filed December 1, 1890. Serial No. 373,240. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. H. STUT, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Cable-Railway Grips; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in grips such as are attached to cars for the purpose of connecting the car with the traveling cable by which it is to be propelled.

It consists in certain improvements whereby the grip may be released from the cable for the purpose of stopping the car without dropping the cable, while at the same time retaining that construction which allows the cable to be dropped directly, in case of necessity, from the bottom of the grip. A grip of this kind is technically known as a "bottom" or "center" grip in distinction from that class of grips in which the cable is removed from the side of the grip, and which are known as "side grips."

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a side elevation showing the general construction of the grip. Fig. 2 is an enlarged transverse section showing the grip closed. Fig. 3 is a similar view showing the grip released from the cable, but not open enough to drop it. Fig. 4 shows the grip entirely open, so as to drop the cable. Fig. 5 is a skeleton drawing of the relative position of the lower end of the lever and the eccentric. Figs. 6, 7, and 8 are views showing a modification of the mechanism for opening and closing the grip. Fig. 9 is an inner end view of the button of one crotch, showing guide-slot for center plate. Fig. 10 is a vertical section through the crotch at *z z*. Fig. 11 is a detail to be referred to.

My invention is designed to combine the valuable features of that class of grips known as "bottom and side grips" and to overcome the objectionable features of both of these forms of grip. In what is known as the "bottom grip" the jaws open and close horizontally, or nearly so, and when the cable is released it drops directly downward below the grip, and but little space can be allowed for the movement of the jaws. By reason, however,

of the compression upon the sides of the cable the latter is pressed into an oval section, and by reason of the wear upon the dies which form the jaws of the grip the lower edges of the dies soon become so sharp as to greatly injure the cable when the grip is slightly released from the cable while running. In what is known as the "side grip" pressure is also applied on two sides, which flattens the cable and shortens its life. The upper vertically-moving jaw closes and uncloses upon the cable, and when it is opened for the purpose of releasing the cable the latter has the support of the lower jaw while it is traveling; but when it is to be entirely released from the grip considerable space must be allowed for the grip to move to one side for this purpose, and it is more difficult to pick up the cable after it has been released when this form of grip is used. The distance between the dies of the grip and the center line of the cable in its ordinary course on the carrier-sheaves is also considerably more with these grips, because the lower die, with its support, has to clear the carrier-pulleys in traveling.

In my invention, A A are two jaws turning upon the horizontal pivot-pins or axes B, so as to open away from each other or close with the lower ends beneath the cable, which is here shown at C. One or more jaws close upon the cable from above, and the gripping-surfaces are approximately equally spaced, so that a radial pressure is brought upon the cable from three or more directions, and the cable is so nearly inclosed by the dies that it is not pressed out of shape by the strongest pressure.

In the lower curved ends of the jaws A are fixed the steel dies D, which are so fitted as to be removed and replaced by new ones whenever worn out. These jaws being closed together, it will be manifest that the cable may run freely through them, traveling over the dies D, and if the cable is to be dropped entirely it is only necessary to open these jaws sidewise to allow it to drop out and be entirely clear and independent of the grip. In order to grip the cable within these jaws, I have shown a vertically-moving jaw E, having the steel die F fitted in its lower face, and when this jaw is forced downward by

the movement of the operating-lever G the die F will be forced down upon the top of the cable, and as the jaws A are closed together before this can be done it will be manifest that the cable will be gripped between the 5 equally-spaced dies D and F. Whenever the jaw E is raised sufficiently to allow the cable to travel freely, it will be manifest that it will travel over the dies D which support 10 it, and the jaws A need not be opened to drop the cable; but if it is necessary to drop the cable a further movement of the operating-lever will open these jaws and allow it to drop entirely free of the grip.

15 In order to close the jaws A, the jaw E is forced down between the upper ends of the jaws A above the plane of their fulcrum-shafts, and it has its lower end beveled or inclined on both sides, as shown at E', to allow 20 it to enter, while the thickness of the upper portion of the jaw E is such that when the jaws A are closed it will just pass between these two. By thus turning the jaws A around the fulcrum-pins the lower ends will be closed, 25 and as the point of contact between this wedge or jaw E and the upper ends of the jaws A is above their pivot-pins it will be manifest that the jaws cannot be opened, because the upper ends cannot approach each other, as they must 30 do when the jaws are opened. When, however, the jaw E has been raised so that its widest portion is above the line of the upper ends of the jaws A, they can be opened. In order to open them by a positive action, I 35 have shown the pins H fixed at suitable points in the jaw E and the oscillating levers I so fulcrumed in the crotch or side bars I' that the ends of the pins H will come in contact with these levers, and thus cause them to partially rotate upon their supporting fulcrum- 40 pins. The opposite ends of these levers I will then come in contact with the pins J, which project from that portion of the jaws A which is in line with the levers I, so that by the action of these levers and the pins J the jaws 45 A will be rotated outwardly around their fulcrum-pins, and thus open sufficiently to drop the cable, as shown in Figs. 4 and 8. The lower ends being thus opened will cause the 50 upper ends to approach each other, and when the jaw E is pressed downward again, its beveled or inclined sides acting upon the inclined surfaces of the jaws A above, their axes of rotation will separate the upper ends and close 55 the lower ends until the body of the jaw E again passes between the upper ends of the jaws A, and thus retains them in a closed position.

The quadrant-rack K is bolted or otherwise 60 fixed to the vertical side or crotch bars I', and the whole structure is immovably fixed to the bars I<sup>2</sup>, these being attached to and supported upon the car or its truck. The lower end of the lever G is forked, as shown in Fig. 2, and 65 it is fulcrumed to the frame or the bars I<sup>2</sup>.

The lever G has a pawl engaging the quadrant-rack K and has stops which limit its

movement, so that by one movement the cable may be released in the grip without dropping, and by a further movement the grips A may 70 be opened, so as to allow the cable to drop entirely. It will be manifest that in this upward movement the upper die must always come to the same height, and therefore the wearing of the dies D and F, which neces- 75 sarily takes place, must be compensated by a device which will constantly adjust the parts to correspond with the wear in the dies. This device consists of a short crank L, the crank portion of which passes through the 80 upper part of the vertically-sliding center plate a, which carries the upper jaw E, while the ends are journaled in the two lower forks of the lever G, as shown. The crank passes through a plate b, which slides transversely 85 in a guide-slot c in the plate a, (see Fig. 11,) and this allows for the adjustment of the crank and for the movements of the lever G about its fulcrum, while the plate a slides vertically between its guides. 90

Upon one of the outer projecting ends of the crank-shaft, which is made square, is fitted a cam M, and when this cam is moved in either direction it will turn the short crank-shaft L, before described. This cam is used 95 to regulate the parts for wear and is operated by two screws N in threaded lug d on one of the forks of the lever G. The upper ends of the screw-shafts extend upward and are journaled in lugs d' on one side of the operating- 100 lever G. The upper ends of these shafts are either squared to receive a crank or wrench by which they can be turned or otherwise constructed so that they may be rotated, and the two screw-shafts are connected together 105 by means of spur-gears, as shown at P. The portion of these shafts on which the gears are fitted is either square or polygonal, so that while turning with the gears they may also slide loosely through them when moved up 110 or down by the screws.

It will be manifest that when one of the screw-shafts or its extension is turned the other one will be turned in the opposite direction, so that as one screw pressing upon 115 one end of the cam M is advanced the other one will be correspondingly retracted, and the position of the two ends of the cam will thus be relatively changed, so as to turn the short crank-shaft L in its bearings sufficiently 120 to move the jaw E and compensate for the wear of the dies until such time as it is necessary to replace the dies with new ones. The vertically-moving jaw E is actuated by the movement of the lever G, as before described, 125 and is plainly shown in Fig. 1. The gripping-jaws A are mounted upon bolts fitted into the crotches I' and have the wear-plates Q fixed to the sides, forming the contact-surfaces for the grip when it passes around 130 curves.

R is a covering or roof of light iron, which prevents dirt from falling down into the working parts of the grip.

Removable wear-plates may be fixed to the sides of the jaws A and to that part of E which slides between them.

Figs. 6, 7, and 8 show the levers I so made that the pins H engage them, so as to cause a positive movement of the jaws A in the preliminary movement of closing and independent of the action of the wedge-shaped inclines E'. The dies in the grip-jaws abut against the crotches I' at each end and are thus held in place.

The skeleton Fig. 5 shows the short crank or cam L and the lever G in the two positions which they occupy when the lever is thrown forward or back, and the adjustment of the crank is also shown in dotted lines, showing that the lever is always moved over the same arc to close or open the grip whether the dies are new or whether they are worn out, and the jaw is always raised to the same height to properly open the grip by the same movement of the lever.

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

1. The side jaws fulcrumed to open and close transversely and a vertically-moving jaw adapted to act in conjunction with the side jaws to grip the cable, means for raising the vertical jaw to release the cable, and means, substantially as described, between the vertically-moving jaw and the side jaws for retaining the side jaws solidly locked together to support the cable and allow it to travel upon them after it is released and before the side jaws are opened.

2. A cable-grip consisting of the jaws fulcrumed so as to open and close transversely about the horizontal fulcrum-shafts and dies within the lower ends of said jaws upon which the cable may travel freely or between which and a vertically-moving jaw it may be gripped, the vertically-moving jaw fitting between the upper ends of the side jaws and above the line of their fulcrum-shafts, so that when said jaw is forced between the side jaws it acts as a block to keep the lower ends of the side jaws closed and having its lower end beveled and made narrower to allow the upper ends of the side jaws to approach it, so that the lower ends may be opened when this jaw is raised, substantially as herein described.

3. The combination, in a cable-grip, of the side jaws rotating about horizontal axes, so that when closed the lower ends are brought together and the upper ends separated, pins J, projecting from the upper ends of said jaws, levers fulcrumed so that one end of each lever engages with a pin upon one of the jaws, and a vertically-sliding gripping-jaw moving between the upper ends of the side jaws and having projecting pins H, which engage the opposite ends of said levers, so that by the upward movement of this jaw the side jaws are released and opened, substantially as herein described.

4. The side jaws fulcrumed upon horizontal axes so that their lower ends open transversely and away from each other, while the upper ends are closed inwardly about the axes, and a vertically-moving jaw adapted to pass between the upper ends of the side jaws, having its lower end made narrow enough to allow said upper ends to swing inwardly when the lower ends of the side jaws are opened, and having inclined or beveled sides E', uniting the narrower and wider portion, said inclines acting as wedges when the vertically-moving jaw is forced downward to separate the upper ends and close the lower ends of the said jaws, substantially as herein described.

5. A cable-grip having the side jaws turning about horizontal axes, provided with wearing plates or dies, and the vertically-moving jaw acting in conjunction with the side jaws and having a wearing plate or die to grip the cable, in combination with a take-up or adjusting mechanism consisting of the rocking cam, a crank connected therewith so as to act upon the vertically-moving jaw, and means for adjusting said rocking cam and crank, substantially as herein described.

6. The vertically-moving jaw of a cable-grip, having a crank connected therewith, a cam fixed to said crank, and screws passing through fixed nuts and pressing upon opposite ends of the cam, in combination with the gears upon the screw-shafts engaging with each other, so that when one of said shafts is turned one of the screws will be advanced and the other correspondingly retracted, substantially as herein described.

7. A cable-grip consisting of hinged swinging jaws adapted to open or close beneath the cable, a vertically-moving jaw closing from above and in opposition to the first-named jaws, crotches with fixed supports, a vertically-sliding plate guided between and in said crotches and having the upper gripping-jaw fixed to its lower end, a crank-shaft passing through the sliding plate, and a lever fulcrumed to the fixed supports, having the ends of the crank-shaft mounted within it, whereby the lever is connected with the vertical plate, so that the plate and gripping-jaws are moved directly from the lever, substantially as herein described.

8. The vertically-sliding plate by which the gripping-jaws are actuated, the transverse slot and slide traveling therein and the lever forked at its lower end, a crank-shaft journaled in the forked ends of the lever, with the cranked portion passing through the slide, a cam fixed to the end of the crank-shaft, screws turning in stationary nuts on the lever, with their ends in contact with the opposite ends of the cam, and gears upon the screw-shafts, whereby one screw is advanced and the other retracted simultaneously and the cam and crank-shaft turned to adjust the jaws, substantially as herein described.

9. The side jaws of a cable-grip fulcrumed

to open transversely, having removable dies fixed in their lower meeting ends to form a support for the cable when the latter is allowed to run freely between said jaws, a vertically-moving jaw with a die fixed in its lower end, said jaw being raised to allow the cable to run freely between the side jaws and depressed to clamp the cable between its die and those of the side jaws, and removable wear-plates fixed to the vertical jaw and the side jaws where they slide in contact, substantially as herein described.

10. The side jaws fulcrumed between vertical bars or crotches at opposite ends to open and close transversely and the vertically-sliding jaw guided in and between the crotches, acting in conjunction with the side jaws to grip the cable, and dies fitted into the jaws, said dies having their ends abutting against the crotches, whereby they are prevented from being forced out of place when the cable is gripped, substantially as herein described.

11. In a cable-grip, the side jaws rotating about horizontal axes to open and close about and beneath the cable, pins J, projecting from the upper ends of said jaws, levers fulcrumed so that one end of each lever engages with a pin upon one of the jaws, a vertically-moving gripping-jaw sliding between the upper ends

of the side jaws, and pins H, projecting from the sides of the vertically-moving jaw and engaging with depressions in the opposite ends of the levers, whereby the levers act directly to close the side jaws before the locking portion of the sliding jaw enters between them, substantially as herein described.

12. A cable-grip having the side jaws turning about horizontal axes, provided with wearing plates or dies, and the vertically-moving jaw acting in conjunction with the side jaws and having a wearing plate or die to grip the cable, in combination with a lever to move the vertical jaw and a take-up or adjusting mechanism consisting of a crank or cam journaled in the lower end of the lever and turning in the center piece, which carries the vertical jaw, with means for turning the crank so that the full opening or closing of the side jaws always occurs at a certain position of the lever whether the dies be thick or thin, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOHN C. H. STUT.

Witnesses:

S. H. NOURSE,  
H. C. LEE.