No. 697,648. Patented Apr. 15, 1902.

W. A. McCALLUM.

MECHANISM FOR RECESSING TROLLEY WIRES.

(Application filed July 29, 1901.)

(No Model.)

Fig. 1.

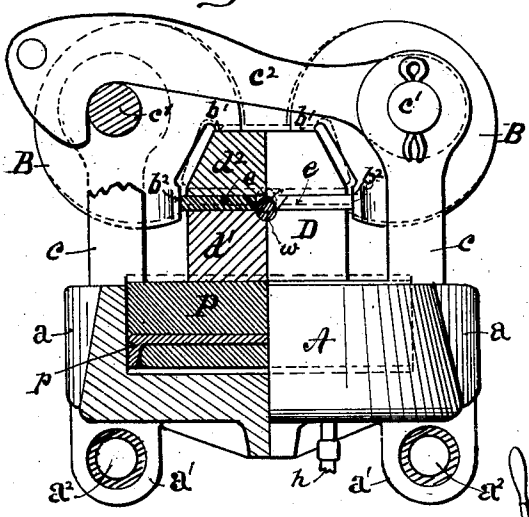


Fig. 2.

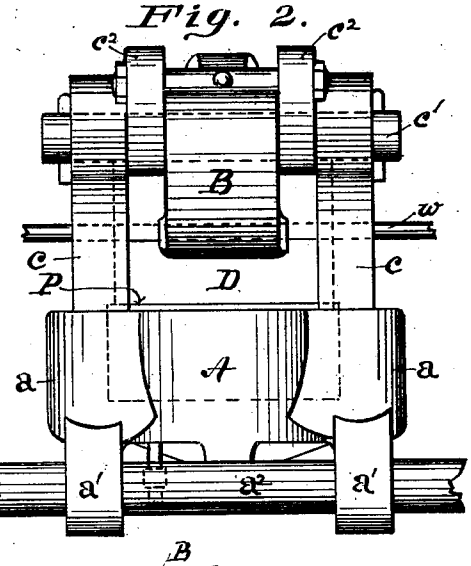


Fig. 3.

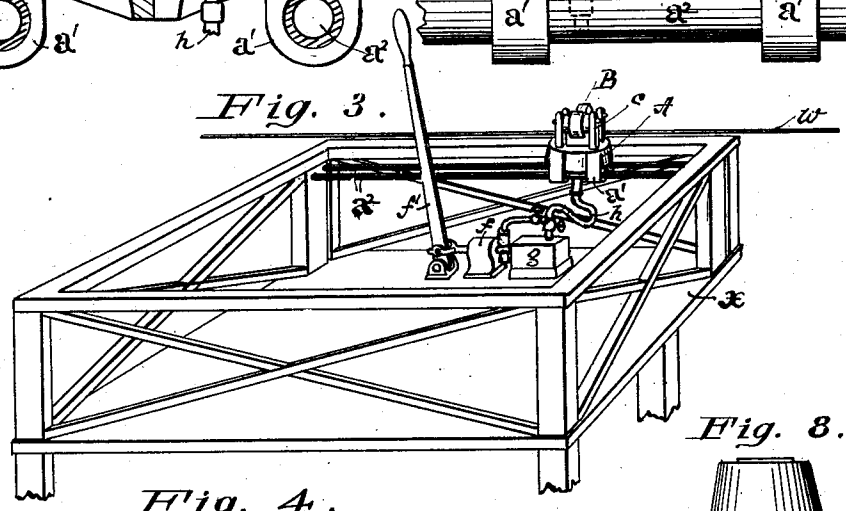


Fig. 4.

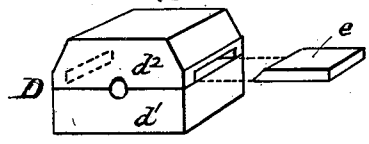


Fig. 8.

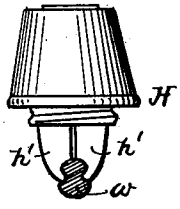


Fig. 5.

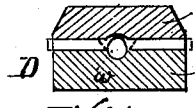


Fig. 6.

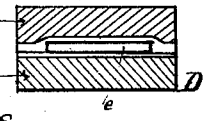


Fig. 7.



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Walter A. Knight.

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UNITED STATES PATENT OFFICE.

WILLIAM A. McCALLUM, OF CINCINNATI, OHIO.

MECHANISM FOR RECESSING TROLLEY-WIRES.

SPECIFICATION forming part of Letters Patent No. 697,648, dated April 15, 1902.

Application filed July 29, 1901. Serial No. 70,155. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. McCALLUM, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Mechanism for Recessing Trolley-Wires, of which the following is a specification.

My invention relates to mechanism for compressing opposite recesses in trolley-wires of electric railways while attached in place or in the act of being attached to "span-wires" suspending the same between poles erected at opposite sides of the trackway, having reference more particularly to the production of corresponding recesses at opposite sides of the wire for the reception and engagement of the "ears" by which the trolley-wire is suspended from and beneath the span-wires in proper relation to the trackway.

Early in the history of electric railways the trolley-wire was attached to the suspending-ears by soldering and later by bending the wire into a curved groove of the ear; but both these methods proving objectionable a wire drawn with a continuous groove at each side has been more recently employed in connection with an "ear" embodying clamping-jaws adapted to seat in the grooves at opposite sides. The latter method of attachment makes a secure holding; but the "twist" of the wire and the disposition to creep through the ear have proved objectionable, besides necessitating the complete substitution of the grooved wire for the usual cylindrical wire most generally in use.

The object of my invention is to form recesses in the trolly-wire at opposite sides of the same, the recesses so formed corresponding with the form, size, and relative position of the "hangers" or ears engaging and supporting the trolley-wire from the span-wire. My present invention supplies an apparatus for producing the said recesses at the time and place of actual need in cylindrical wires already in use without removal from position. The apparatus may be carried on the repair-wagon and used with the same facility as ordinary repair-tools.

To this end my invention consists in a hydraulic press especially designed and adapted to the end in view.

The preferred form of apparatus shown herein consists, essentially, of a shallow hydraulic cylinder adjustable longitudinally in relation to the wire upon supporting-guides, opposite lever-arms carried pivotally upon the cylinder, a two-part box-die interposed between the piston of the hydraulic cylinder as a platen and the compression-levers, "compression-chisels" carried in the die and actuated by the action of the compressing-levers, and means for forcing a compressing fluid into the cylinder behind the piston.

The details of construction and arrangement will be more clearly set forth in connection with the drawings attached to and forming part of this specification.

In the drawings, Figure 1 is an end elevation of the apparatus in the cross-plane of the supporting-guides, partly sectioned to show construction; Fig. 2, a side elevation of the same. Fig. 3 is a perspective elevation of the apparatus on a reduced scale in operative position upon the elevated platform of a repair-wagon, showing the operative adjuncts; Fig. 4, a perspective view of the die with one of the chisels withdrawn; Figs. 5 and 6, detail cross-sections of the compression-die; Fig. 7, a view of a portion of the trolley-wire, showing one of the recesses; and Fig. 8 an elevation of one of the ears or clamps with cross-section of wire taken through the opposite recesses.

Referring now to the drawings and the parts indicated by the letters of reference, A designates a block of metal cast and finished as a shallow cylinder with four "bosses" a, arranged with axes parallel with the axis of the cylinder and concentric therewith at diagonally opposite points at the outer side of the cylinder and with four diagonally-arranged lugs a' at the under side.

The cylinder A is bored for the reception of a piston P, provided with a cup-leather packing p and projecting through the open mouth of the cylinder to form a platen to carry the die D, presently to be described.

Secured in and rising from the bosses a are four standards C, through and between each two of which (constituting pairs at opposite sides of the platen P) are inserted studs or pintles c', carrying bell-crank levers B B, constructed in the form of disks, with peripheral

segment cut out of each, as and for a purpose presently to be described. A double hook-bar c^2 is pivoted to one of said pintles c' and arranged to engage removably over the opposite pintle.

The apparatus as a whole rests upon two parallel guide-bars a^2 a^2, embraced by the lugs a', and is movable thereon across the platform x of the trouble-wagon longitudinally in relation to the trolley-wire w.

The die D is formed in two parts d' d^2, flat blocks resting one upon another, each having a semicircular groove in the contact-face, forming when placed together a cylindrical perforation fitting the trolley-wire w. The groove in the upper block d^2 is slightly enlarged to afford space for the metal displaced in forming the recesses y, Fig. 7, to be carried wholly to the upper side of the wire, leaving the lower side straight and level for the rolling contact of the trolley-wheel.

Rectangular channels are formed in the contact-face of the upper block d^2 from the sides inward to the central aperture for the reception and play of compression-chisels e e, whose operative edges are formed to produce the desired contour of the recesses y and whose length is so proportioned that as the desired depth of perforation is reached the outer ends shall be flush with the outer sides of the die, the die itself thus forming a stop for the operative devices employed to force the chisels inward.

The bell-crank levers B, as already stated, are formed as disks pivoted upon the pintles c' and having segments cut away at one side. Thus are left two surfaces b' and b^2 in planes substantially at a right angle to each other, and the parts are so proportioned and arranged that when the die D is upon its platen P the surfaces b' of the disks rest upon the top of the die and the surfaces b^2 rest against the outer ends of the compression-chisels. In this position an upward movement of the piston-platen P carries the block-die vertically against the surface b' of the opposite disks, and the disks are thereby caused to oscillate in opposite directions, and the surfaces b^2 move toward each other until arrested by contact with the outer sides of the block-die, which forms a stop. It will be seen, therefore, that no vertical displacement can take place between the blocks d' d^2, because the entire initial force acts against a resistance tending to hold the blocks together; also, that the recesses formed by the inward movement of the chisels must be exactly uniform, because the depth of penetration is always exactly the same by reason of the positive action of the die-block as a stop.

The means for supplying the power I have here shown as a force-pump f, operated by a hand-lever f', connected for supply with a small tank g, all located upon the platform x. The pipe h in such case is flexible to accommodate the movements of the compressing apparatus on its guide-rods a^2. These may all be located upon a suitable carriage movable upon the guides a^2 or attached to the cylinder A as part of its structure. The details of these parts are of usual construction, well understood, and require no further description.

The mode of operation, partly indicated in the foregoing description, may be summarized as follows: The cylinder A being empty and the platen P at its lowest limit, the apparatus is adjusted to the required position of the recesses to be formed in the wire w. The hooked levers c^2 are thrown back, the upper half d^2 of the die D removed, and the wire w is brought down into the groove in the lower die-block d' and the upper die-block d^2 placed in position covering the same and the hooked levers c^2 replaced in position. This brings the die D into the relations with the bell-cranks or disks B, indicated in full lines in Fig. 1. Fluid (water or oil) being forced into the cylinder A, the piston-platen P rises, carrying the parts into the relative position shown by the dotted lines in Fig. 1, in which the chisels e are forced to their inward position. The fluid is then allowed to flow back into the tank y, and thereupon the parts return to their former position.

The result of the operation is the formation of opposite recesses y in the wire corresponding in length and form with the horizontal width and edge contour of the chisels e, the recesses being adapted to the contour of the inner faces of the jaws h' of the clamping-ear H. The displaced metal is by pressure forced wholly upward into the enlargement of the die-perforation, forming a slightly-elevated ridge at the upper side of the wire for the length of the recess, as indicated in Fig. 7, while the lower side of the wire is left straight and level.

The operation concluded, the upper member d^2 of the die D is removed, and the wire is thus freed until again engaged at a new place by a reversal of these steps.

Thus but a few seconds are required for adjusting the apparatus to its work and forming the recesses described.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. A die for the compression of trolley-wires, having a longitudinal perforation for the reception of the wire, and provided with lateral channels for the reception and play of compression-chisels, said die having an enlargement at one side only of its perforation to receive and control the displaced metal, as set forth.

2. In trolley-wire-compressing apparatus, a die provided with a longitudinal perforation and lateral channels substantially as set forth, said die being divided in two parts in an axial plane of the longitudinal perforation and one of said parts having its portion of the said perforation enlarged to receive and control the displaced metal.

3. The combination of a die having a lon-

gitudinal perforation for the reception of the trolley-wire, said perforation being enlarged at one side to receive and control the displaced metal, and lateral channels opening into the same, in combination with compression-chisels adapted to be contained and guided in the lateral channels, as set forth.

4. A die for holding and recessing trolley-wires, consisting of a block of metal longitudinally perforated to fit the wire, with a central enlargement on one side of the perforation to receive and control the displacement of metal caused by compression of recesses at opposite sides, substantially as set forth.

5. A die consisting of two flat blocks of metal to fit one upon the other, each having a corresponding semicylindrical groove, the two grooves forming a longitudinal aperture for reception of a trolley-wire, one of said grooves being enlarged, correspondingly with the recesses to be formed in the wire, to receive the metal displaced by compression, in combination with two chisels entering the aperture at opposite sides, substantially as set forth.

6. In a trolley-wire-recessing device, a die adapted to embrace the wire, compressing-chisels entering the die at opposite sides and bearing against the wire, and means including bell-crank levers engaging the chisels horizontally, for applying mechanical pressure equally to the outer ends of the compression-chisels to force them into the wire a predetermined distance, substantially as set forth.

7. In a trolley-wire-recessing device, the combination of a hydraulic single-acting cylinder, a piston adapted to act as a platen, a block-die perforated for the reception of the wire and adapted to rest upon and be carried upward by the platen, compression-chisels entering the block-die laterally toward the perforation, and pivotally-supported bell-crank levers arranged at the sides of the die each with one arm bearing vertically upon the die and the other bearing horizontally against the chisels, substantially as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM A. McCALLUM.

Witnesses:
WALTER A. KNIGHT,
ARTHUR DOVEY.