No. 641,175. Patented Jan. 9, 1900.

C. WIGTEL.

HYDRAULIC PUNCH.

(Application filed May 19, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

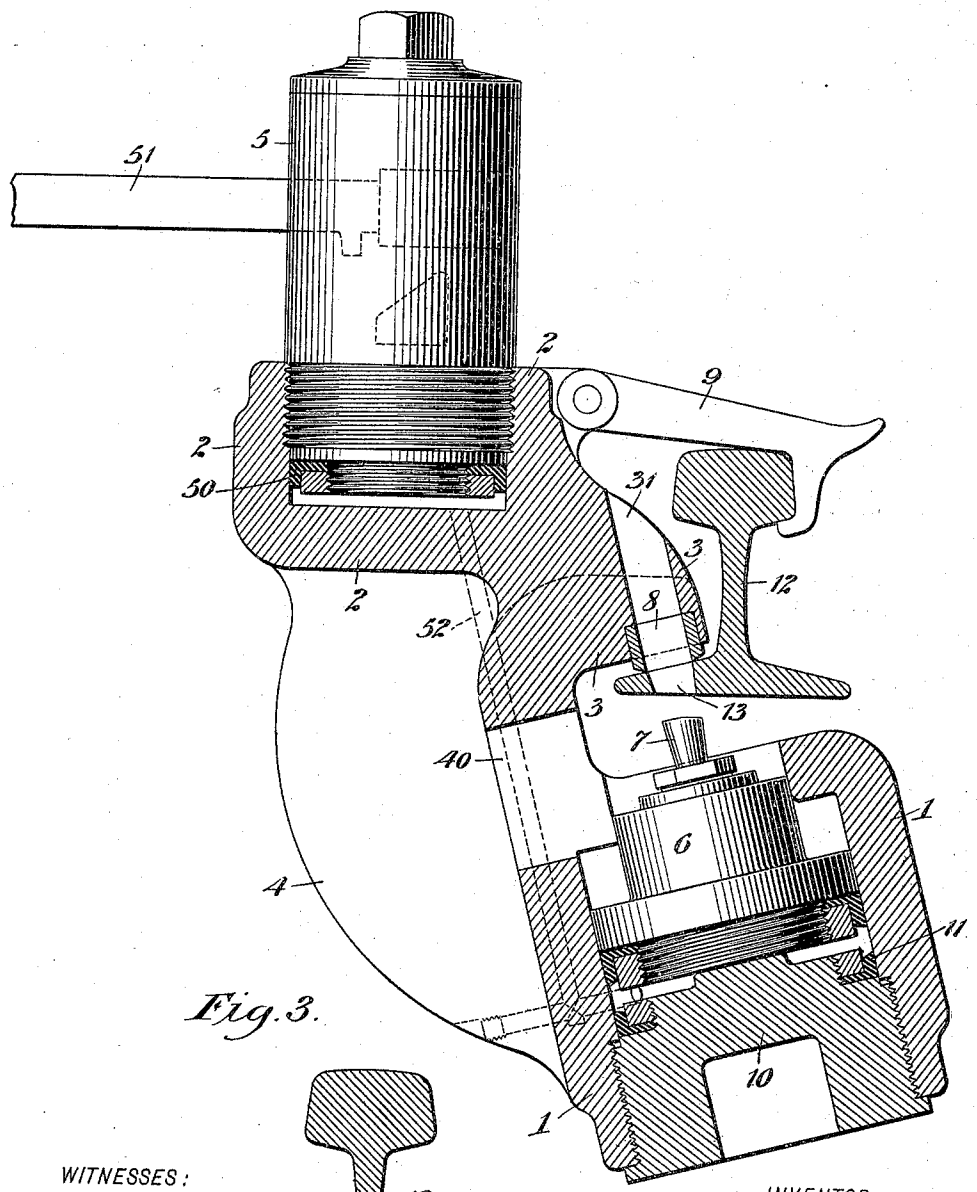
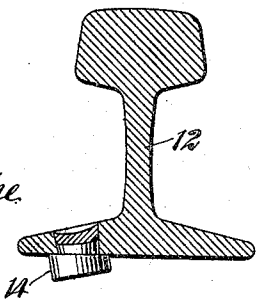


Fig. 3.



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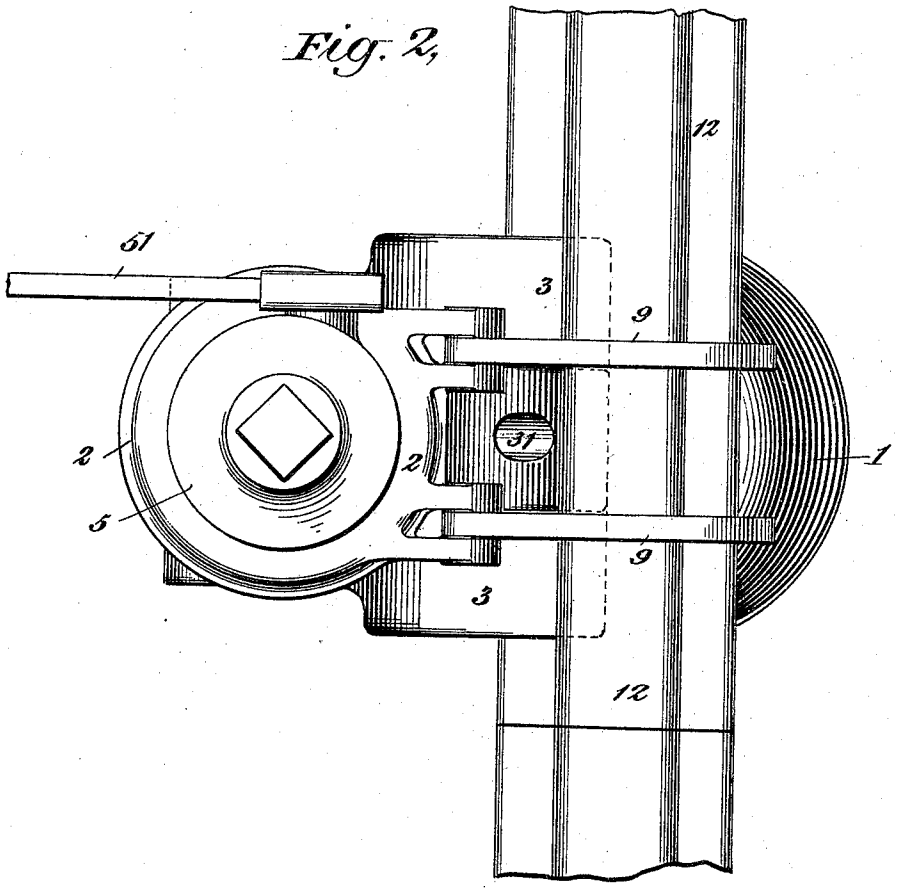
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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC PUNCH.

SPECIFICATION forming part of Letters Patent No. 641,175, dated January 9, 1900.

Application filed May 19, 1899. Serial No. 717,452. (No model.)

To all whom it may concern:

Be it known that I, CARL WIGTEL, a citizen of the United States, residing in the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Hydraulic Punches, of which the following is a full, clear, and exact description, reference being made to the accompanying drawings, forming part of this specification.

This invention relates to improvements in hydraulic punches by which holes are punched in the rails of electric railways preparatory to bonding the rails; and the object of the invention is to provide a tool by which suitable holes may be readily punched in the bases of the rails after as well as before the rails have been permanently laid.

On the accompanying sheet of drawings, Figure 1 is a partly-sectional elevation of this punching-tool and a cross-section of a T-rail and illustrates the relation of the tool to the rail when the tool is in use; Fig. 2, a plan of the tool, and Fig. 3 a cross-section of a T-rail with a bond secured thereto.

Similar reference-numerals designate like parts in the different views.

By means of this invention and a riveting-tool, which is described in another application for a patent, a line of T-rails or girder-rails may be bonded more conveniently, effectively, and durably than by the common practice, in which the bonds are secured to the webs of the rails.

The body of this punch is a steel casting composed of the short hollow cylinder 1, the head-block 2, the fixed jaw 3, and the back 4, the main part of the back being hollow and there being an opening 40 from the hollow part of the back to the top of the cylinder 1. This cylinder is at the bottom, and the head-block 2, which is also a hollow cylinder, is at the top, of the body. The cylinder 1 is in front of the prolonged axis of the cylinder 2 and is inclined backward from the bottom to the top, its prolonged axis and that of the cylinder 2 making with each other an angle which is equal to that made by the upper surface of one side of the base of a T-rail or girder-rail with the bottom of the rail. The bottom of the cylinder 1 is closed by a screw-plug 10 and made tight by packing 11.

In the head-block 2 is fixed the head 5, the joint being made tight by packing 50. The head contains a pump that is operated by a handle 51, of which only a fragment is shown. The interior of the head is connected with that of the cylinder 1 by a water-passage 52, shown mainly by dotted lines. The cylinder 1 contains a ram 6, and on the ram is the punch 7.

The jaw 3 projects in front of the head-block 2, back 4, and prolonged axis of the cylinder 1, but only far enough beyond that axis to render the jaw capable of properly holding the die. The face of the jaw is parallel to that of the ram 6. A passage 31 extends through the jaw on the prolonged axis of the cylinder 1, and in the face of the jaw is fixed the die 8. The interior diameter of the die is greater than the diameter of the punch. The front and upper surface of the jaw is curved and slopes backward to the head-block 2 to allow the jaw to pass freely under the head of the rail and to rest supported by the die on the base of the rail, that being the position of the jaw when the tool is operated. A pair of hooks 9 holds the tool in its proper position on the rail, the weight of the tool being sustained by the base of the rail, on which the tool hangs by the jaw 3. These hooks are hinged to the head-block 2 and engage the rail, as represented in Fig. 1, and they confine the tool to the rail, since they overcome the force of its center of gravity, which being behind the die tends to draw the upper part of the tool backward away from the rail. A hole is dug in the ground under the rail, if necessary, to make room for the lower part of the tool.

The tool being held on the rail by the hooks 9, as described, it is to be observed that the head 5 is vertical, as it should be to secure the proper action of the pump, and that the axis of the ram, punch, and die is inclined to a vertical plane at an angle which is equal to that made by the top of one side of the base of the rail with the bottom of the rail, and that the axis or prolonged axis of the punch is at right angles to that part of the upper

surface of the base of the rail with which the die is in contact. The punch is actuated by pumping water through the passage 52 into the cylinder 1, the punch being driven by the ram through the base of the rail 12. A tapering hole 13 is thus made in the base of the rail, the diameter of the hole at the bottom being the same as that of the punch and its diameter at the top being the same as that of the interior of the die. The slug flies up through the passage 31 out of the jaw 3. The ram, which is commonly held up by the friction of the punch in the hole, is pried down by a bar pushed through the opening 40 from the back of the tool.

The rivets of the bonds are inserted in the holes made by this punch in the bases of the rails, all parts of the bonds except the stems of the rivets being underneath the rails, where they do not interfere with the fish-plates or other rail-fastenings and where they are practically safe from injury, and the bonds are secured to the rails with the riveting-tool, which crushes and spreads the rivets within the holes, so that each upset rivet 14 conforms perfectly from its head upward to the shape of the hole and is tightly fastened therein. This not only renders secure the attachment of the bond to the rail, but it effects a superior contact between the rivet and the rail, the surfaces of contact being more than commonly large and the contact being very tight throughout the whole extent of those surfaces. The upper end of the rivet is depressed slightly below the top of the base of the rail to prevent the rivet from being subjected to any pressure or blow which might tend to loosen it.

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

1. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a fixed jaw projecting over the punch, the jaw having a slug-passage extending through it on the prolonged axis of the ram; a die in the face of the jaw; a pump; and a water-passage extending from the pump to the cylinder containing the ram; the tool having its center of gravity behind the die, when the face of the die is in contact with the top of the base of a rail of a railway, and the tool being provided with means for connecting it at a point or points above its center of gravity with the rail; substantially as described.

2. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a head on the upper part of the body; a water-passage extending from the head to the cylinder containing the ram; a fixed jaw projecting over the punch, the jaw containing a slug-passage extending through it on the prolonged axis of the ram; and a die in the face of the jaw; the tool having its center of gravity behind the die, when the face of the die is in contact with the top of the base of a rail of a railway, and the tool being provided with means for connecting it at a point or points above its center of gravity with the rail; substantially as described.

3. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a fixed jaw projecting over the punch, the jaw having a slug-passage extending through it on the prolonged axis of the ram; a die in the face of the jaw; a pump; and a water-passage extending from the pump to the cylinder containing the ram; the tool having its center of gravity behind the die, when the face of the die is in contact with the top of the base of a rail of a railway, and the tool being provided with a hook or hooks hinged to the upper part of the body and properly fashioned to engage the head of the rail; substantially as described.

4. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a head on the upper part of the body; a water-passage extending from the head to the cylinder containing the ram; a fixed jaw projecting over the punch, the jaw having a slug-passage extending through it on the prolonged axis of the ram; and a die in the face of the jaw; the tool being provided with means for securing it to a railway-rail, with the face of the die in contact with the upper surface of one side of the base of the rail; substantially as described.

5. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a head on the upper part of the body, the prolonged axis of the head below the head being behind the axis of the ram; a water-passage extending from the head to the cylinder containing the ram; a fixed jaw projecting over the punch and in front of the head, the jaw having a slug-passage extending through it on the prolonged axis of the ram; and a die in the face of the jaw; substantially as described.

6. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a head on the upper part of the body, the prolonged axis of the head below the head being behind the axis of the ram; a water-passage extending from the head to the cylinder containing the ram; a fixed jaw projecting over the punch and in front of the head, the jaw having a slug-passage extending through it on the prolonged axis of the ram; and a die in the face of the jaw; the tool being provided with means for securing it to a railway-rail, with the face of the die in contact with the upper surface of one side of the base of the rail; substantially as described.

7. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a head on the upper part of the body, the prolonged axis of the head below the head being behind

the axis of the ram, and the axis of the ram being inclined to that of the head from the bottom of the ram upward at an angle equal to that made by the top of one side of the base of a railway-rail with the bottom of the rail; a water-passage extending from the head to the cylinder containing the ram; a fixed jaw projecting over the punch and in front of the head, the jaw having a slug-passage extending through it on the prolonged axis of the ram; and a die in the face of the jaw; substantially as described.

8. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a head on the upper part of the body, the prolonged axis of the head below the head being behind the axis of the ram, and the axis of the ram being inclined to that of the head from the bottom of the ram upward at an angle equal to that made by the top of one side of the base of a railway-rail with the bottom of the rail; a water-passage extending from the head to the cylinder containing the ram; a fixed jaw projecting over the punch and in front of the head, the jaw having a slug-passage extending through it on the prolonged axis of the ram; and a die in the face of the jaw; the tool being provided with means for securing it to a railway-rail, with the face of the die in contact with the upper surface of one side of the base of the rail; substantially as described.

9. A hydraulic rail-punching tool comprising the combination of: a ram in the lower part of the body; a punch on the ram; a head on the upper part of the body; a water-passage extending from the head to the cylinder containing the ram; a fixed jaw projecting over the punch, the jaw having a slug-passage extending through it on the prolonged axis of the ram; and a die in the face of the jaw; the tool being provided with a hook or hooks hinged to the upper part of the body and properly fashioned to engage the head of a railway-rail, when the face of the die is in contact with the upper surface of one side of the base of the rail; substantially as described.

10. A hydraulic rail-punching tool having its body composed of the cylinders 1 and 2, the fixed jaw 3, and the back 4, the axis of the cylinder 1 being inclined to that of the cylinder 2 at an angle equal to that made by the top of one side of the base of a railway-rail with the bottom of the rail, and the jaw 3 projecting in front of the prolonged axis of the cylinder 1 and having a slug-passage extending through it on that axis, and the tool comprising the combination of: a ram in the cylinder 1; a punch on the ram; a head with its lower end in the cylinder 2; a water-passage extending from the head to the cylinder 1; and a die in the face of the jaw 3; the tool being provided with means for connecting it at the upper part of its body with a railway-rail, when the face of the die is in contact with the upper surface of one side of the base of the rail; substantially as described.

CARL WIGTEL.

In presence of—
DAVID E. GRAHAM,
EDWARD R. M. VANNETT.