No. 714,546. Patented Nov. 25, 1902.

C. WIGTEL.

HYDRAULIC PUNCHING TOOL.

(Application filed July 21, 1902.)

(No Model.)

Fig. 1.

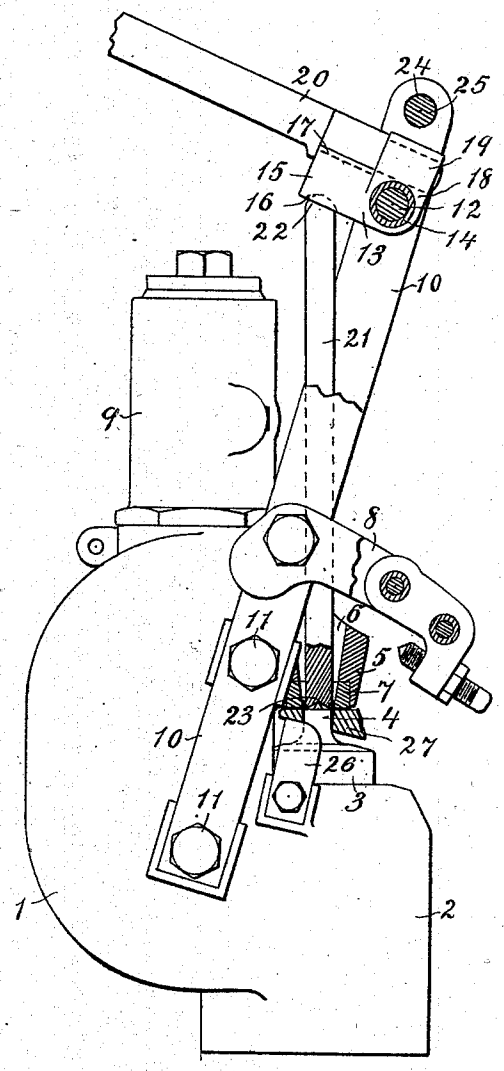
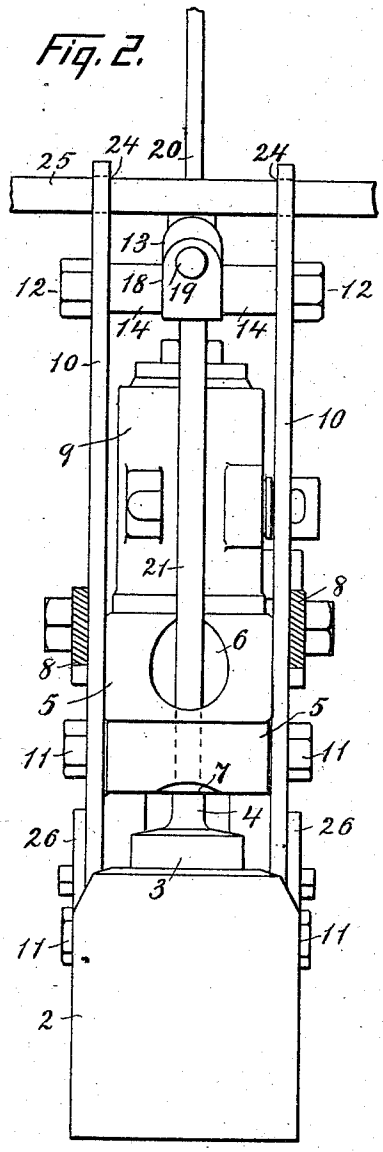


Fig. 2.



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HYDRAULIC PUNCHING-TOOL.

SPECIFICATION forming part of Letters Patent No. 714,546, dated November 25, 1902.

Application filed July 21, 1902. Serial No. 116,323. (No model.)

To all whom it may concern:

Be it known that I, CARL WIGTEL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and city and State of New York, have invented a certain new and useful Improvement in Hydraulic Punching-Tools, 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 especially to improvements in hydraulic punching-tools of the type of that patented in Letters Patent of the United States No. 641,175, dated January 9, 1900; and the invention consists of a tool comprising a ram and a punch secured on and actuated by the ram and the apparatus hereinafter described and claimed, in combination with the ram and punch, to act on the punch after the ram has been advanced, this apparatus constituting means to force the ram and punch backward.

On the accompanying sheet of drawings, Figure 1 is a side elevation of a tool embodying the invention, and Fig. 2 a front elevation thereof.

Similar reference-numerals designate like parts in both views.

The main object of this invention is to embody in a tool of the type above specified suitable means with which to force the ram and punch backward after a hole has been punched in the base or flange of a rail. The means employed to depress the ram and punch when the patented tool was first put into use was unsatisfactory, because the action on the tool of the bar inserted in the opening in the back of the frame and operated as stated in the patent tended to displace the tool from its proper position, cramping the punch in the hole in the rail and subjecting it to a lateral strain that was sometimes great enough to break it and that nearly always rendered it hard to force the ram down.

The tool shown herein comprises the body 1, ram-cylinder 2, ram 3, punch 4 on the ram, jaw 5, containing the slug-passage 6 and die 7, hooks 8 to engage the rail, and the head 9, mounted on the body and containing a pump, the interior of the pump-chamber being connected with that of the ram-cylinder by a fluid-passage drilled in the body 1. These parts of the tool are essentially like those of the patented tool in construction and operation, except that their relations to one another are such that the axis of the head is parallel to the prolonged axis of the ram instead of inclined thereto at an angle of thirteen degrees.

The particular apparatus shown for depressing the ram and punch includes an attachment or frame secured to the body 1 of the tool and extending upward and forward therefrom over the jaw 5. The sides 10 of this frame are fastened to the sides of the body 1 by tap-bolts 11, and near the top of the frame is a cross-bolt 12, which extends across the frame and on which is a block 13, held between spacing-sleeves 14 on the cross-bolt, the block being free to turn on the cross-bolt. When the rear part 15 of the block is horizontal and behind the axis of the cross-bolt, it projects over the punch and die of the tool. It contains a recess 16 and groove 17, (indicated by dotted lines in Fig. 1,) and in the other part 18 of the block is an eye 19, which is in alinement with the groove 17. A bar 20 fits in the groove 17 and eye 19, as appears by Figs. 1 and 2, the bar and block together forming a lever hinged to the cross-bolt 12. The bar is easily inserted in and withdrawn from the block. The apparatus also includes a rod 21, whose ends 22 and 23 are rounded and recessed, respectively, the rod being of the proper length to extend from the block 13 to the top of the punch and being from its end 23 for a distance greater than the length of the movement of the punch a little smaller than the punch in diameter. The end 22 of the rod fits loosely in the recess 16 in the block 13, and the recessed end 23 of the rod fits the face of the punch. In the sides 10 of the frame, above the cross-bolt and block described, are holes 24, in which is shown a round bar 25, which fits loosely in the holes and by which the tool may be conveniently lifted and carried by two men.

On the sides and near the top of the ram-cylinder are fastened two blocks 26, which extend above the level of the top of the punch when it is in its lowest position and which act against the bottom of the rail or other

work, forming a stop or stops to help maintain the tool in its proper position and to facilitate the stripping of the work from the punch, as hereinafter explained, when the ram and punch are forced downward.

The punch and ram are shown elevated, as they appear just after the operation of the tool on the work 27, which is represented in Fig. 1 as a fragment of a T-rail. When the slug has been discharged or removed from the slug-passage 6, the bar 20, which is preferably the bar used to actuate the pump, is engaged with the block 13, and the rod 21 is adjusted between the block and punch, its lower end being applied to the face of the punch and its upper end being inserted in the recess 16, and then pressure is exerted by the lever through the rod on the punch to force down the punch and ram. Although this action of the lever tends to raise the body of the tool, this tendency is overcome by the resistance of the blocks 26, acting against the under side of the work, and the pressure of the blocks on the work acting against the friction between the punch and margin of the hole in the work facilitates the stripping of the work from the punch. As the action of the rod on the punch is directly or almost directly against the end of the punch, the ram and punch are readily depressed by this apparatus, and the punch is not subjected to a strain likely to break it or cramp it in the work. The rod acts on the punch first within the die and then within the work and afterward below the work.

Obviously other means instead of the particular frame and lever described might be used to drive downward a rod or similar device in contact with the punch. So it is not intended to limit the invention claimed to a tool embodying this particular apparatus.

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

1. A hydraulic punching-tool comprising the combination with a ram and punch of apparatus to exert pressure on the face of the punch within the work to force the ram and punch backward, substantially as described.

2. A hydraulic punching-tool comprising the combination with a ram and punch of apparatus including: a rod movable endwise on the face of the punch within the work to force the ram and punch backward; and means to exert proper pressure on the rod; substantially as described.

3. A hydraulic punching-tool comprising the combination with a ram and punch of apparatus including: a rod movable endwise on the face of the punch within the work to force the ram and punch backward; and a lever to actuate the rod; substantially as described.

4. A hydraulic punching-tool comprising the combination with a ram and punch of apparatus including a rod to act on the face of the punch to force the ram and punch backward, the rod being on the prolonged axis of the punch from end to end and being movable endwise on the punch within the die and work, substantially as described.

5. A hydraulic punching-tool comprising the combination with a ram and punch of apparatus to act on the face of the punch within the work to force the ram and punch backward, and a stop to simultaneously act on the back of the work, the stop extending nearer to the plane of the face of the die than does the punch, when the latter is farthest from the die, substantially as described.

6. A hydraulic punching-tool comprising the combination with a ram and punch that act upward on the work, of apparatus to act on the face of the punch to depress the ram and punch, said apparatus including an attachment secured to the body of the tool, and a vertically-movable rod to act on the punch within and below the die, substantially as described.

7. A hydraulic punching-tool comprising the combination with a ram and punch that act upward on the work, of apparatus to act on the face of the punch to depress the ram and punch, said apparatus including a frame attached to the body of the tool, a vertically-movable rod to act on the punch within and below the die, and a lever pivotally connected with the frame to actuate the rod, substantially as described.

8. A hydraulic punching-tool comprising the combination with a ram and punch that act upward on the work, of apparatus to act on the face of the punch to depress the ram and punch, said apparatus including a frame attached to the body of the tool, a block pivoted in the frame, a vertically-movable rod to be engaged by the block and to act on the punch within and below the die, and a bar that engages with the block and forms with it a lever to actuate the rod, substantially as described.

9. A hydraulic punching-tool comprising the combination with a ram and punch that act upward on the work, of apparatus to act downward on the face of the punch to depress the ram and punch, said apparatus being attached to the body of the tool, and a stop or stops to act upward against the work to counteract the upward action of the apparatus on the body of the tool, substantially as described.

10. A hydraulic punching-tool comprising the combination with a ram and punch that act upward on the work of: apparatus to act on the face of the punch to depress the ram and punch, said apparatus comprising an attachment secured to the body of the tool, and a vertically-movable rod to act on the punch within and below the die; and a stop or stops to act upward against the work to counteract the upward action of the apparatus on the body of the tool; substantially as described.

11. A hydraulic punching-tool comprising the combination with a ram and punch that

act upward on the work of: apparatus to act on the face of the punch to depress the ram and punch, said apparatus including a frame attached to the body of the tool, a vertically-movable rod to act on the punch within and below the die, and a lever pivotally connected with the frame to actuate the rod; and a stop or stops to act upward against the work to counteract the upward action of the lever on the body of the tool; substantially as described.

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In presence of—
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