E. E. VELEY.

COUNTERBORING TOOL.

APPLICATION FILED JUNE 24, 1908.

911,787.

Patented Feb. 9, 1909.

Fig. 1.

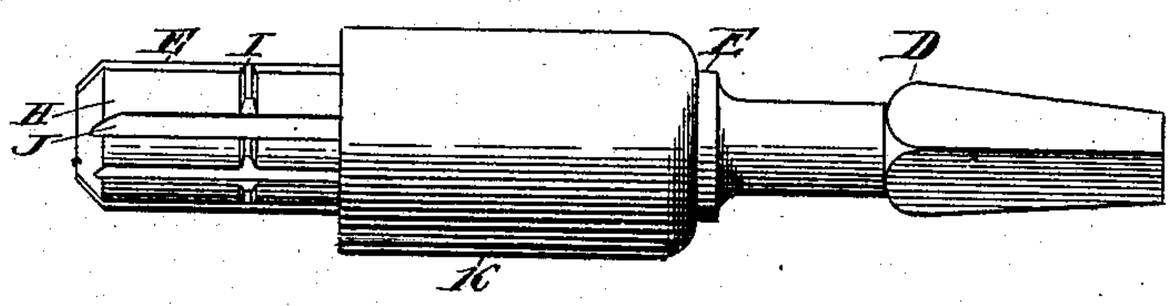


Fig. 2.

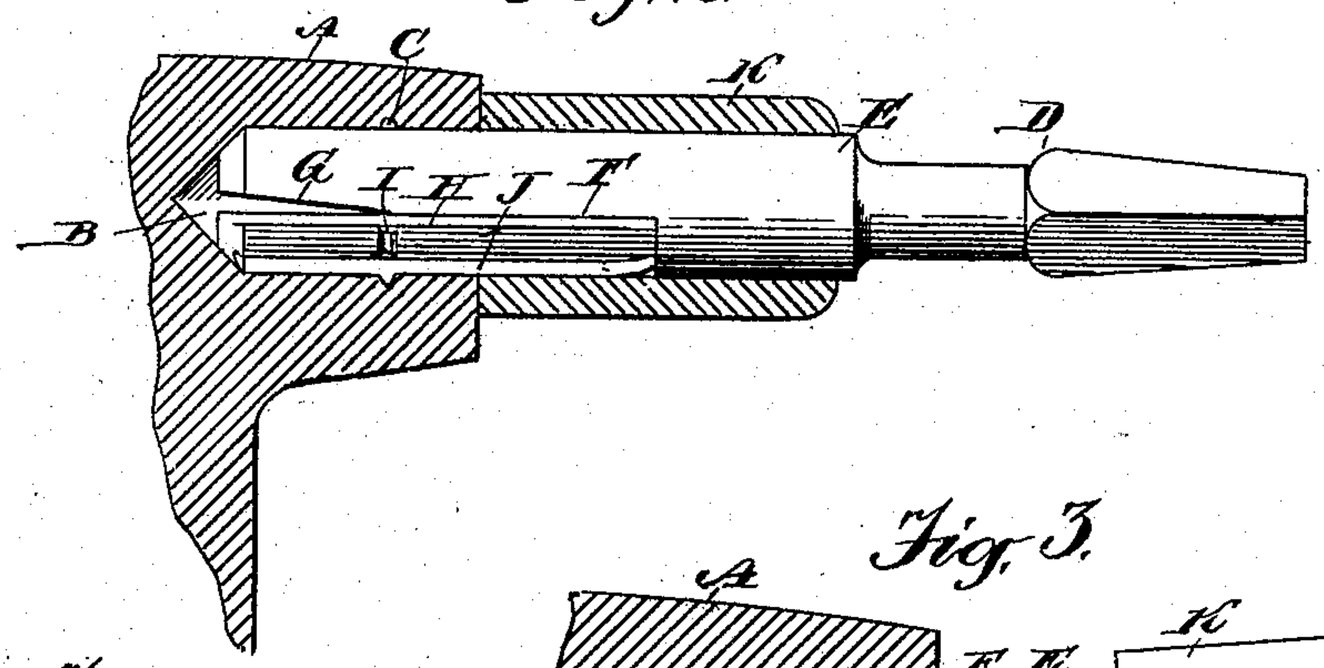


Fig. 4.

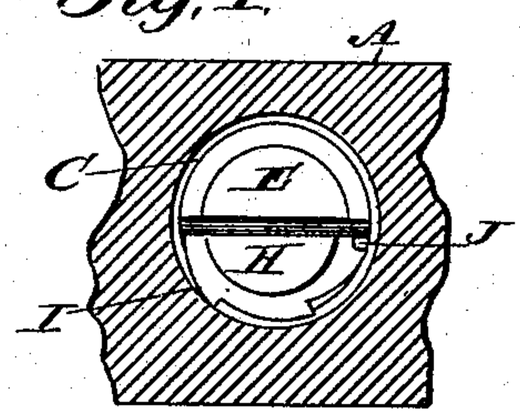
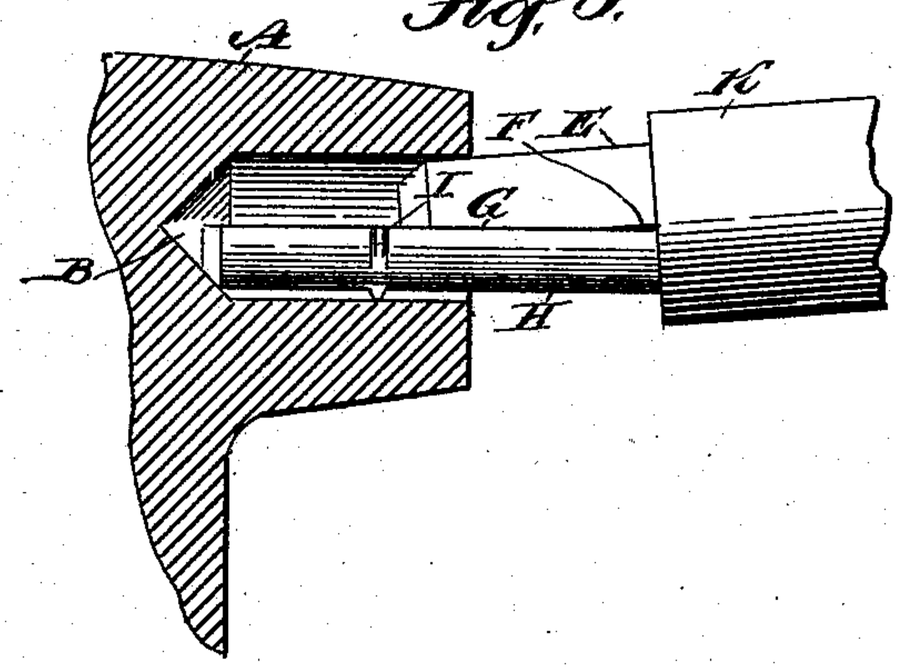


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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COUNTERBORING-TOOL.

No. 911,787. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed June 24, 1908. Serial No. 440,121.

To all whom it may concern:

Be it known that I, ELMER E. VELEY, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Counterboring-Tools; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to produce a simple counterboring tool for hand or machine operation, and so constructed as to do its work efficiently, in a rapid and easy manner, and with little liability to break or get out of order.

The nature of the invention is fully disclosed in the description and claims following, reference being had to the accompanying drawings, in which:—

Figure 1 is a side view of a tool embodying my invention. Fig. 2 is a side view of the same, partly in section, and showing the position of the parts of the tool when finishing the counterbore. Fig. 3 is a similar view of the cutting end of the tool, but at the beginning of its work. Fig. 4 is an end view of the same, showing the circumferential position of the counterboring cutter while cutting, the piece operated upon being shown in section.

The tool has been especially designed for use on electric railway rails, but is applicable to both hand and machine operations and many different sorts of work, where it is necessary to counterbore or undercut a round hole in metal, or the like.

In bonding railway rails to carry an electric current one of the approved methods of attaching the copper bond to the abutting rails is to bore one or more holes in the side of each rail (the ball of the rail, for instance) and drive the cylindrical lugs of the bond-plates into these holes, upsetting the metal tightly therein. In practice it is found that this upsetting in a merely cylindrical hole is insufficient, since the bond must be so attached to the rails as to be difficult of removal by bond thieves, and to positively prevent the admission of moisture, which would of course cause rust and impair the electrical contact. The desired result is best secured by counterboring or undercutting the hole, as illustrated in the drawing, for when the soft copper of the bond plug is upset or swaged into such a groove moisture is effectually dammed out, and it is impossible for the junk thief to withdraw the bond.

Referring now to the drawing, A designates the ball of an ordinary tee-rail, into the side of which is bored a hole B to take the plug of a bond (not shown). In this it is desired to make a groove or counterbore C. For this special purpose a hand tool is necessary. This is provided with a suitable shank D to fit a bit-brace. The stock E is made cylindrical and of the same gage as the hole. About half of the stock is cut away at F, and for a short distance back from the end the flatted portion is tapered, as shown at G. Fitted to lie adjacent to the flat side of the stock is a counterboring cutter-plate H, provided with one or more outwardly projecting cutting teeth I, and suitably fluted at J to give clearance for the chips. The stock should also be provided with a snugly fitting, but movable, sleeve K. This forms a keeper for the tail end of the cutter-plate, and prevents the plate from undue skewing in the hole. In cases where the hole goes clear through the work this sleeve forms a convenient stop-gage for the tool, and for this purpose the sleeve is best made adjustable. It is to be noted, however, that the sleeve is not indispensable, and that the cutter-plate and stock, or driver, will do good work, without the external sleeve.

In practice the cutter-plate is made of a little less relative diameter than the driver. This is for the purpose of allowing the cutter-plate to skew a little, which is an advantage in both cutting and backing out the tool. The cutting position is illustrated in Fig. 4, and it will be noted that the cutter is off-center, skewed a little to the left. This, as will be evident, is due to the resistance of the metal in cutting, and has the effect of distributing the work on the several teeth, the first tooth taking the initial chip, and each succeeding tooth a separate chip. On the completion of the cut, which is made by turning the driver and pushing it from the position shown in Fig. 3 to that shown in Fig. 2, the motion of the driver is reversed. At once the cutter-plate skews in the opposite direction, relieving the teeth from contact with the metal. In the absence of some provision for this purpose there would be the liability of continued breakage of cutters, in

the hands of careless or incompetent workmen:

Having thus described my invention, I claim:

1. In a counterboring tool, the combination of a practically semi-cylindrical cutter-plate provided with one or more projecting cutting teeth, and a semi-cylindrical driver with a flat, part-way inclined face adapted to coöperate therewith.

2. In a counterboring tool, the combination of a practically semi-cylindrical cutter-plate having one or more cutting teeth thereon, and a semi-cylindrical driver having a flat, part-way inclined face of slightly larger relative diameter, shaped to coöperate therewith.

3. In a counterboring tool, the combination of a practically semi-cylindrical cutter-plate having one or more cutting teeth thereon, a semi-cylindrical driver having a flat, part-way inclined face coöperating therewith, and a sleeve on said driver to hold the shank or tail of the cutter.

In testimony whereof I affix my signature in presence of two witnesses.

ELMER E. VELEY

Witnesses:

J. M. St. John,

J. L. Clarke.