(No Model.)

A. L. HOWARD.

DIE FOR MAKING CARRIAGE SHAFT TIPS.

No. 311,430. Patented Jan. 27, 1885.

Fig. 1.

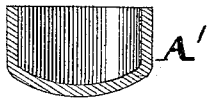


Fig. 2.

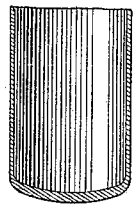


Fig. 5.

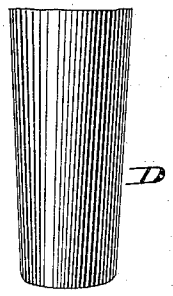


Fig. 3.

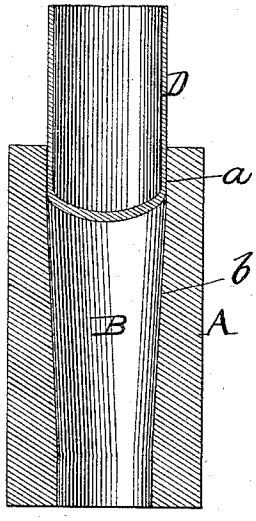


Fig. 4.

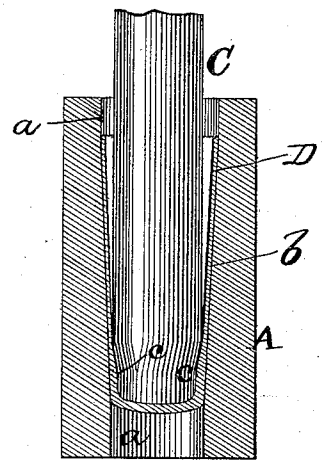
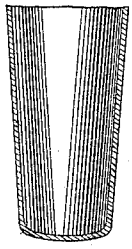
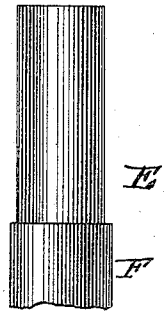


Fig. 6.





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UNITED STATES PATENT OFFICE.

ARTHUR L. HOWARD, OF NEW HAVEN, ASSIGNOR TO WOODRUFF, MILLER & CO., OF MOUNT CARMEL, CONNECTICUT.

DIE FOR MAKING CARRIAGE-SHAFT TIPS.

SPECIFICATION forming part of Letters Patent No. 311,430, dated January 27, 1885.

Application filed February 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR L. HOWARD, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Carriage-Shaft Tips, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in the construction of carriage-shaft tips; and the present invention consists especially of a die and plunger or punch for forming the tips.

In the accompanying drawings I have shown, and have herein described, in addition to the die and punch employed, the method of manufacture pursued by me in forming a tip according to my invention, and also the tip produced; but I do not in this application claim the tip so produced, reserving to myself the right to apply for protection thereon in a subsequent application for patent.

In the accompanying drawings, Figure 1 represents a vertical section of a sheet-metal cup as ordinarily constructed. Fig. 2 represents a vertical section of the said cup after drawing. Fig. 3 represents a vertical section of the die with the shell or thimble resting therein, in readiness for being forced within said die and formed into a tip in accordance with my improvement. Fig. 4 represents a vertical section of the die, plunger, thimble or tip, and extracting-tool, the plunger and thimble or tip being shown in position at the completion of the forming of the tip and the extracting-tool as about to enter the die. Fig. 5 represents a side elevation of a finished tip. Fig. 6 represents a vertical section of a sheet-metal carriage-tip of the usual construction—that is to say, of equal thickness throughout.

Heretofore, as far as I am aware, thimbles or tips for carriage-shafts have either been cast or formed of sheet metal of equal thickness throughout, no provision being made for constructing the front end, upon which the most wear comes, stronger or thicker than the remaining portion; also, heretofore, where such tips have been constructed of sheet metal, they have been folded—not drawn—into shape. When the tip has been cast, the interior has a rough surface formed by the sand mold, and there has consequently been some difficulty in fitting the same to the shaft, and when the tips are cast they have, owing to their non-ductility, often split or broken while being driven into position on shafts, while my tip, being constructed of sheet metal, will expand without breaking.

I will first describe the cup from which I form my shaft-tip and the manner in which it is adapted for use. I take, for convenience, a sheet-metal cup of the usual construction, as represented in Fig. 1 of the accompanying drawings, and draw the same to the length it is desired to make the tip by any of the known means for drawing sheet-metal articles. The cup as thus drawn is, as shown in Fig. 2 of the drawings, so drawn from the closed end rearwardly that while the side walls are thinned out the outer or closed end remains of the same thickness as the original thickness of the cup.

The dies employed by me in forming shaft tips or thimbles from elongated cups, as above described, are constructed as follows:

A represents the die, which is constructed with a central bore, B, which at each end is for a part of its length of straight vertical form, as shown at *a*, and is of a gradual taper from the upper to the lower straight portions, as shown at *b*. By forming the die A with a straight vertical bore at its upper end a seat is formed within which the cup A′ may rest steadily when receiving the impact of the plunger or punch, to be presently described. Were the bore B made of gradual taper from the top downward, the tip would not fit snugly therein, and consequently it would be driven unequally down within the bore on the descent of the plunger or punch.

C represents the cylindrical plunger or punch, which near its lower end has an annular rabbet or reduced portion, *c*, so that a portion of the metal at the end of the thimble will, on said thimble end being forced into the narrowest portion of the bore B, be crowded back into said reduced portion *c*, and thus thicken the lowermost sides of the tip. When the thimble or tip D is placed in position within the upper end of the bore B of the die A, as shown in Fig. 3, its walls are of straight form, and it is of equal circumference throughout its length, its extreme front end being of the

original thickness of the cup A′. The plunger or punch C is then inserted within said thimble or tip and forced down, so as to force the thimble down within the tapered portion of the bore B of the die A, in the manner shown in Fig. 4. As the thimble is thus forced along the tapering portion of the bore B a correspondingly-tapering contour is imparted to said thimble; and as the lower or outer end of said thimble or tip is forced within the narrowest portion of the tapered bore the thick outer end will be forced around the lower end of the plunger or punch and lapped or forced around so as to form the side wall of that portion of the tip immediately adjacent to the point thereof, the result being the production of a tip of gradual taper from end to end, and with the extreme end and sides of the front end, and upon which the most wear comes, of greater thickness than the remaining portion.

E represents an extractor for removing the formed tip from the die A. The spindle or shank of this extractor is of a cylindrical circumference, adapted to fit into the lower straight end of the bore B, and has at its outer end a shoulder or enlarged portion, F. When the thimble or tip D has been formed, the punch C is removed from the bore B of the die A, and the extractor E is then inserted within and pushed up the lower end of the bore B and against the outer end of the tip D, thereby forcing the latter up and out of the bore B. The shoulder F acts as a stop to prevent the extractor passing entirely within the bore B of the die.

By thus constructing thimbles or tips for the shafts of carriages and other vehicles that portion thereof upon which the greatest wear comes is greatly strengthened; they will last longer in use; can be subjected to rough usage without injury; will not be as liable to break or split in use or while being driven in position upon shafts, as is the case where such tips are formed of equal thickness throughout; their inner surface will be smoother than when the tips are formed by casting; consequently they can be the more readily attached in position without injury to the shafts, and by forming them of gradual taper they are adapted to fit shafts of different sizes.

Having thus described my invention, what I claim is—

The die herein described, having a bore of central tapering form and having a straight upper portion, jointly with a punch having an annular rabbet or reduced portion near its lower end for forming carriage-shaft tips, as described and set forth.

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

ARTHUR L. HOWARD.

Witnesses:

H. W. SMITH,

CHAS. J. GOOCH.