

(No Model.)

A. L. HOWARD.
CARRIAGE SHAFT TIP.

No. 315,787.

Patented Apr. 14, 1885.

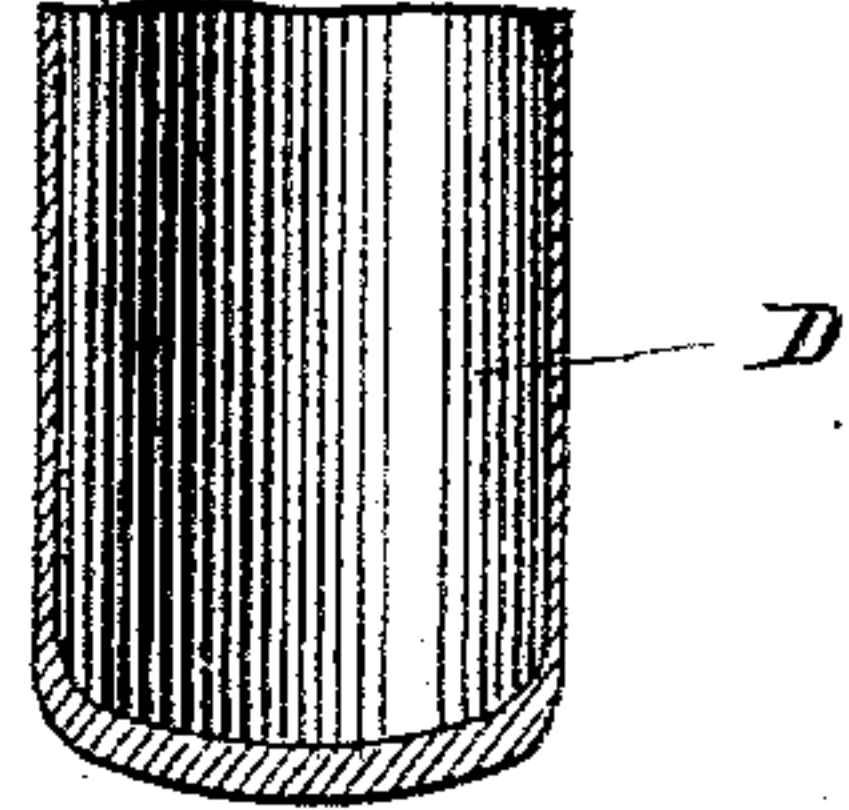
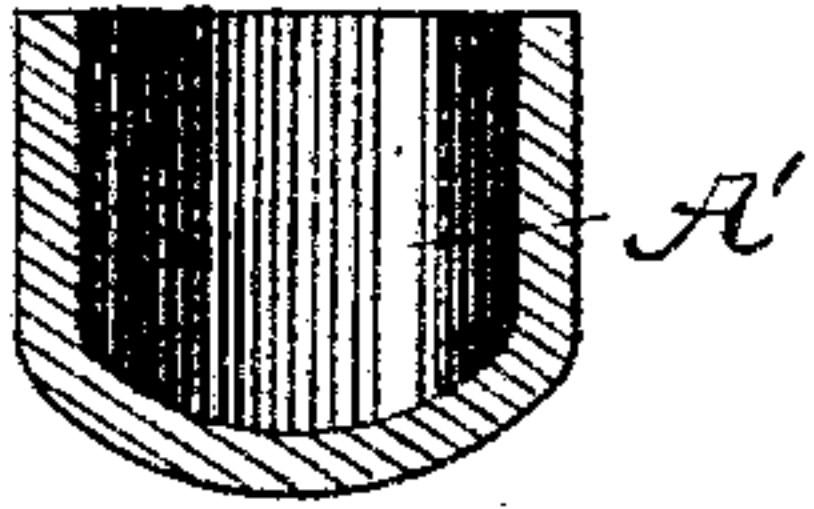


Fig. 5.

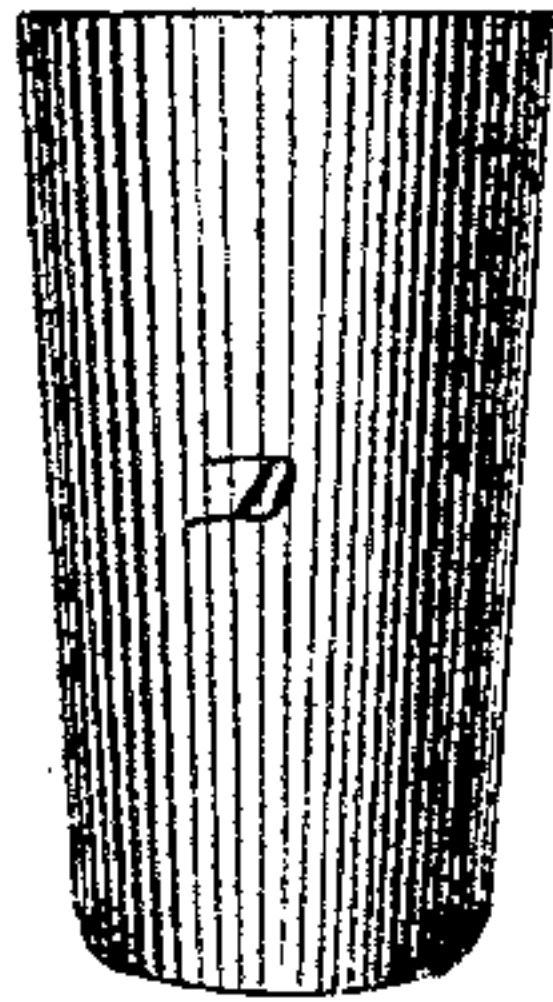


Fig. 3.

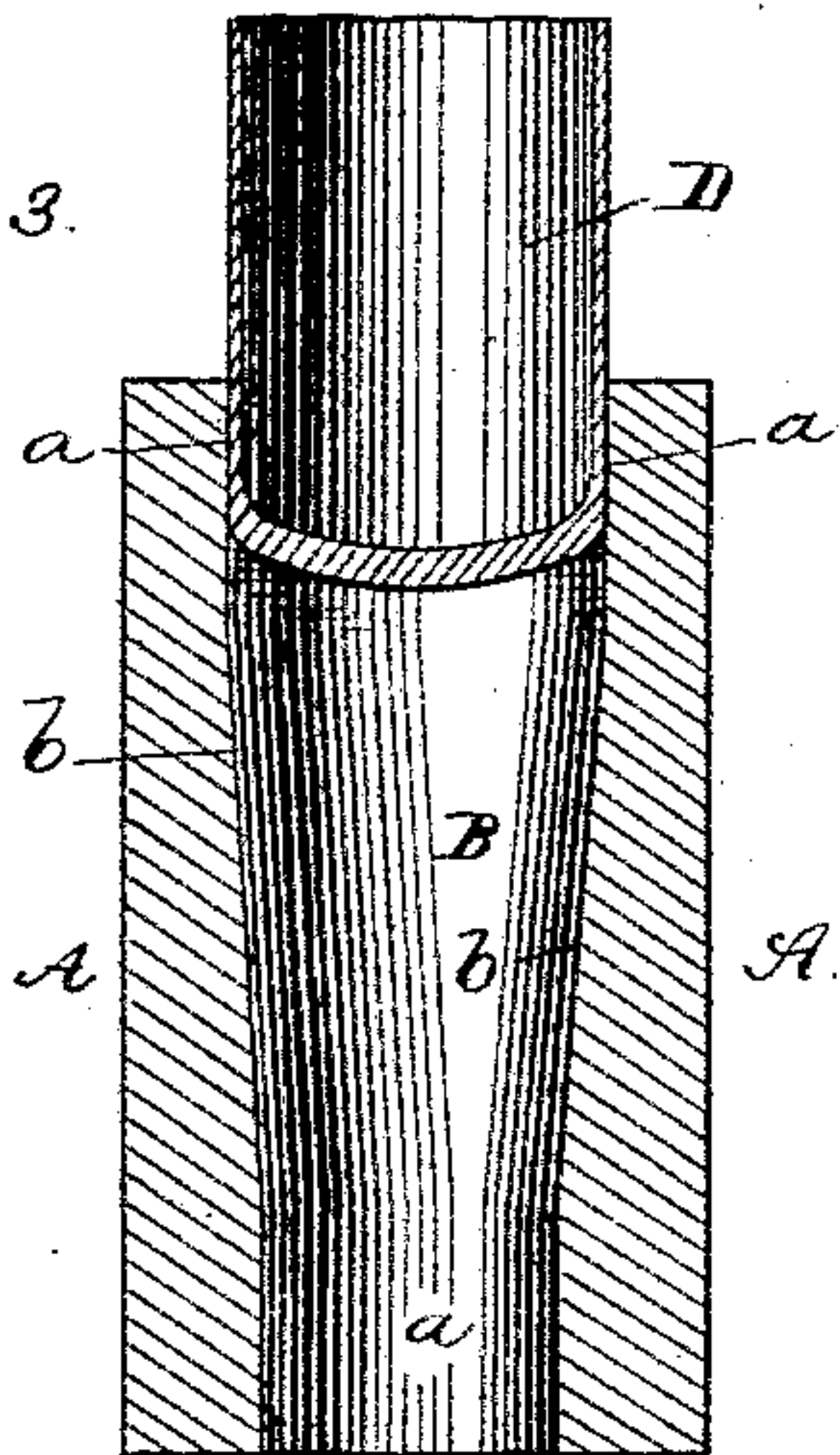


Fig. 4.

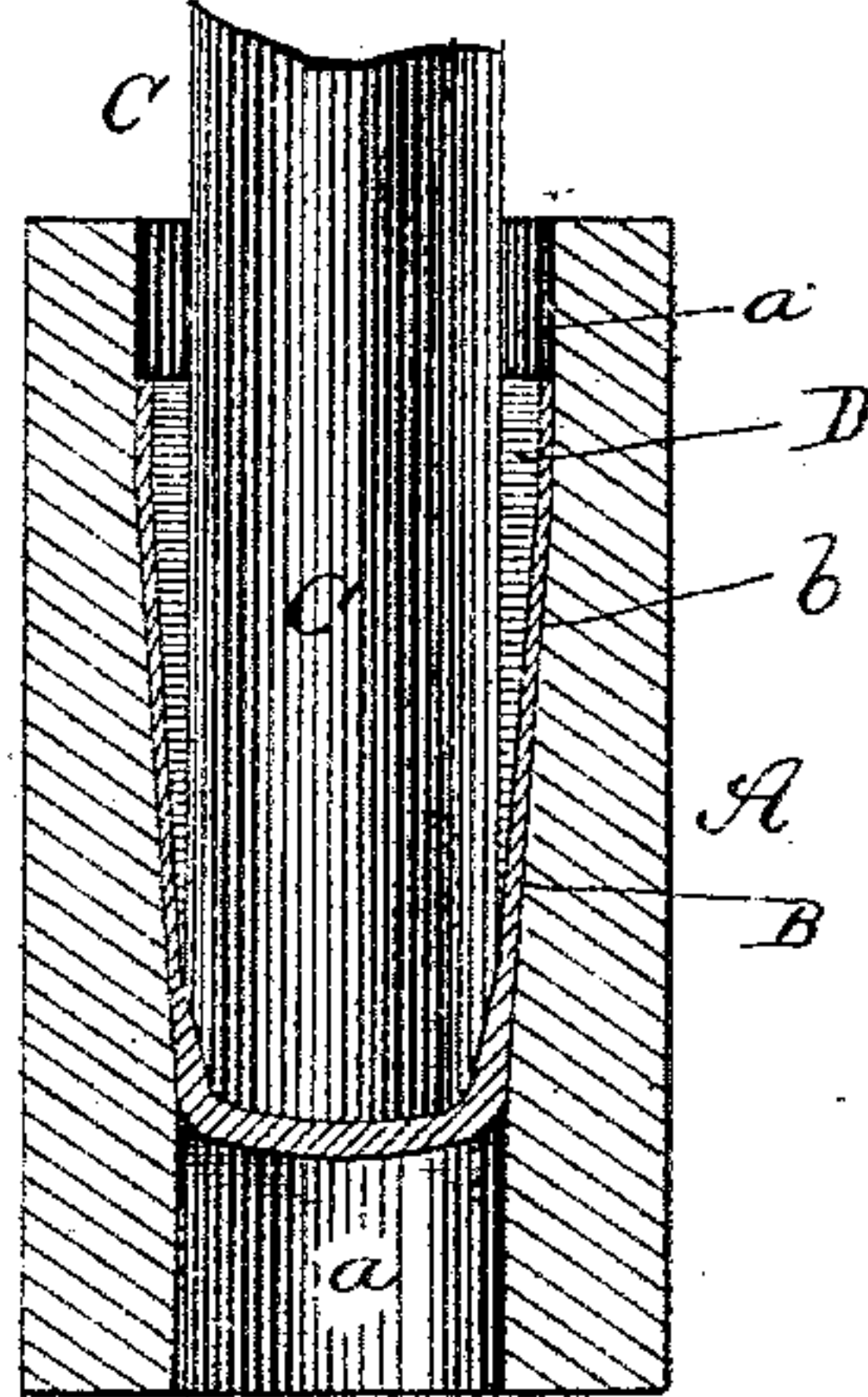
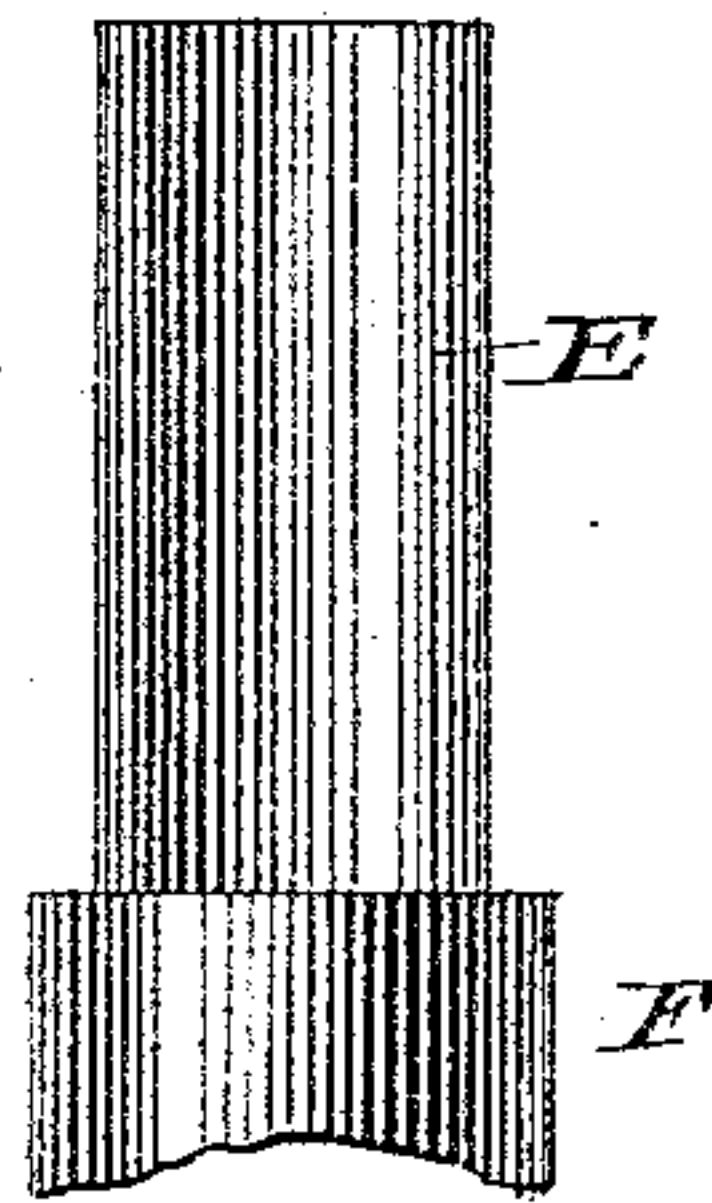
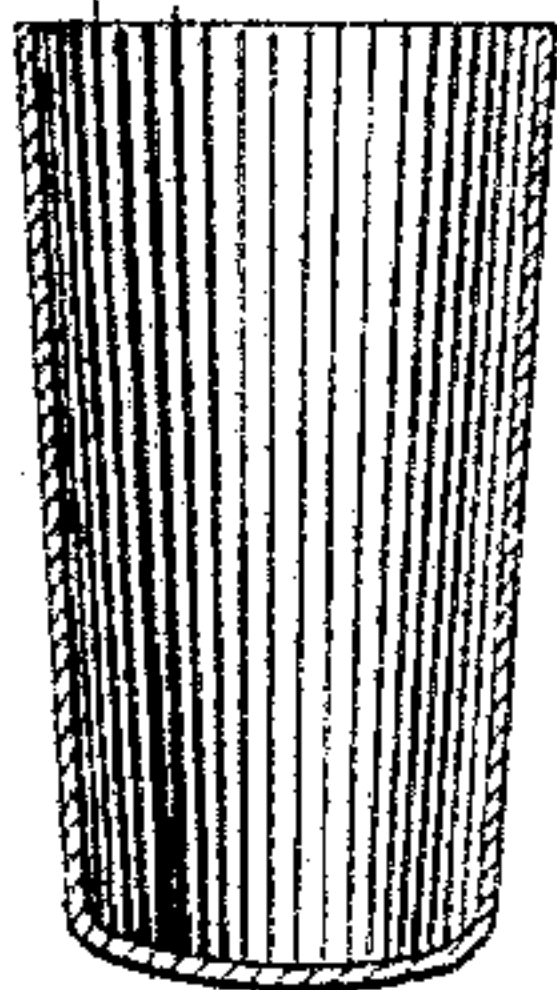


Fig. 6.



Attest:-

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UNITED STATES PATENT OFFICE.

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CARRIAGE-SHAFT TIP.

SPECIFICATION forming part of Letters Patent No. 315,787, dated April 14, 1885.

Application filed July 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR L. HOWARD, a citizen of the United States of America, 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.

10 This invention relates to improvements in the construction of carriage-shaft tips.

The invention consists in constructing the shaft-tip of taper form from a single piece of sheet metal, without seam or join, and with 15 its forward end and wearing-point of greater thickness than the remaining portion.

In the accompanying drawings I have shown the die and punch, and also the article from which I prefer to form my improved tip, 20 and I have also herein described such method of manufacture; but I lay no claim thereto in the present application, as the die and punch are the subject of another application for Letters Patent filed February 29, 1884, Serial No. 25 122,472.

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 30 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 35 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. 40 5 represents a side elevation of a finished tip. Fig. 6 represents a vertical section of a sheet-metal tip of the usual construction—that is to say, of equal thickness throughout.

Heretofore, as far as I am aware, thimbles 45 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 and sides, upon which the most wear comes, stronger or thicker 50 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 55 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 ex- 60 pand 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 65 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 70 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. 75

The die and punch 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 80 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 with a straight vertical 85 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 90 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 95 punch, which is of less diameter than the small end 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 100

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 with-
 5 in 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
 10 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
 15 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
 20 to end, and with the extreme end and side of the front end, upon which the most wear comes, of greater thickness than the remaining portion.

E represents an extractor for removing the
 25 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
 30 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
 35 D, thereby forcing the latter up and out of the bore B. The shoulder F acts as a stop to pre-

vent 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
 40 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
 45 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 at-
 50 tached 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—

1. As a new article of manufacture, a sheet-metal carriage-shaft tip, having its outer end
 55 and wearing-point of greater thickness than the remaining portion, substantially as and for the purpose set forth.

2. As a new article of manufacture, a sheet-metal carriage-shaft tip of gradual taper ex-
 60 teriorly from its inner to its outer end, and having its outer end and wearing-point of greater thickness than the remaining portion, substantially as and for the purpose set forth.
 65

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

ARTHUR L. HOWARD.

Witnesses:

CHAS. J. GOOCH,
 E. P. HOUGH.