H. E. FORREST.

Machines for Turning Carriage-Axles.

No. 137,769. Patented April 15, 1873.

Fig. 2.

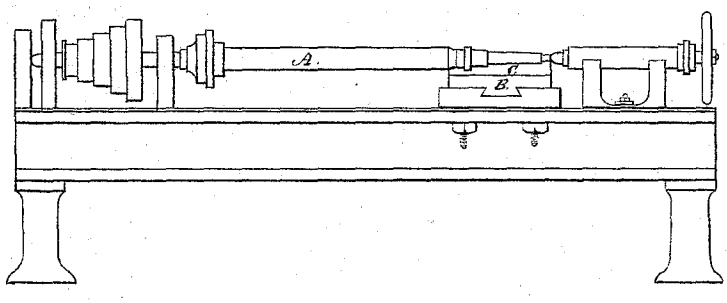

Fig. 1.

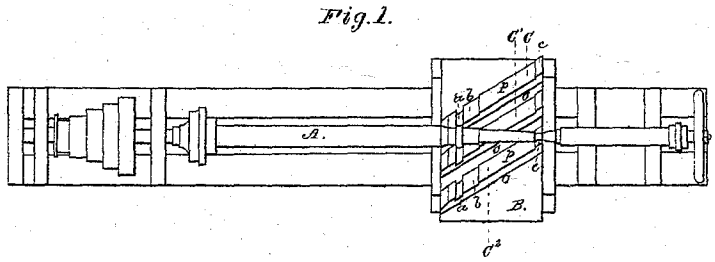

Fig. 3.

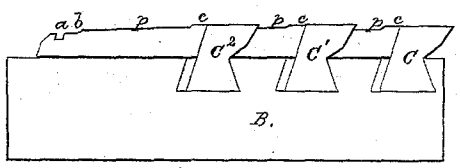

Fig. 4.

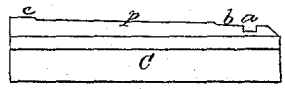

Fig. 6.

Fig. 5.

Witnesses.

Geo Gray

H. G. Hale

Harriet E Forrest.

by his attorney.

A. P. Hale

UNITED STATES PATENT OFFICE.

HAMLET E. FORREST, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF, HORATIO BOOTHBY, OF SAME PLACE, AND JOHN H. LEAVITT, OF PORTLAND, MAINE.

IMPROVEMENT IN MACHINES FOR TURNING CARRIAGE-AXLES.

Specification forming part of Letters Patent No. **137,769**, dated April 15, 1873; application filed February 25, 1873.

To all whom it may concern:

Be it known that I, HAMLET E. FORREST, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Mechanism for Finishing Axle-Blanks, of which the following is a specification:

My present invention may be said to be an improvement upon that invented by me and patented on January 14, 1873, and like that is designed for forming or finishing the journal ends of axle-blanks for cars, carriages, &c. The object of my present invention or improvement is to prevent the great strain upon the cutters and their supporting mechanism that is incident to a single cutter when employed alone in reducing rough heavy forgings for car-axles, &c.; and my invention consists in the combination and arrangement of two or more cutters of corresponding shape, such cutters having their cutting-edges so formed as to reduce the journal end of the axle to the desired shape, each cutter under my improved arrangement being so disposed as to move in the same vertical, but not in the same horizontal, plane, the front one being arranged slightly above that of the other or others, so that the amount or thickness of the metal to be removed is divided so as to be taken off by the different cutters, and thereby the great strain required to effect the result by a single cutter entirely obviated.

In the drawing, Figure 1 denotes a top view of my improvement as applied to a lathe; Fig. 2, a side elevation thereof; Fig. 3, an end view of the cutter-carrier and its cutters. Fig. 4 is an edge view of one of the cutters, and Figs. 5 and 6 end views thereof.

In Figs. 1 and 2, A denotes the axle-blank, and B the cutter-carriage.

In carrying out my present invention, I employ two or more cutters, C C^1 C^2, which are to be firmly secured to their carriage, such carriage being also firmly adjusted upon the bed of the lathe, and so as to slide transversely thereof. Each of the cutters is to have a similar shape, and follow each other in succession, the cutting-edges having such form as to give the desired shape to the journal end of the axle.

I do not limit my invention to the construction of carriage-axles, as shown, as it is equally adapted to the formation of any journal by a simple change in the form of the knives or cutters, to conform to the shape required to be given. Each cutter is disposed diagonally upon the carrier so as to cut with a drawing stroke, and in case of an ordinary carriage-axle, where the journal is to be formed tapering, each cutter is to have a longitudinal inclination, *p*, in accordance with the degree of taper required.

The length of each cutter should correspond with that of the portion of the blank to be reduced. As shown in the drawing, the edge of each cutter is formed with two depressions, *a b*, the former being to produce a collar upon the inner end of the journal, and the latter a re-enforce contiguous thereto. It also has a projecting part, *c*, made on one end thereof, the same being to form the nut-receiving part. The cutters shown in the drawing produce or turn a journal of the ordinary construction, as used in most light carriages; but it is evident that in forming a journal without a re-enforce, and of a regular taper, the depression *b* might be dispensed with. So, also, if the journal is to be of a uniform diameter, the edges of the cutters require no longitudinal inclination or dip, *p*, and the cutters should be so formed as to give the desired reduction to the axle-blank.

Either two or three of the cutters may be used. In case two only are employed, the foremost cutter is to have its edge disposed in a plane slightly above that of the second one, and is to take off the outer rough coat of the blank, and reduce the same to the desired shape and approximate size, while the second cutter takes a thinner shaving, and reduces the axle-journal, &c., to the true and standard size, the latter cutter being so arranged or gaged as to smooth the reduced parts. In case three cutters are employed, and which I consider preferable, the two rearmost ones I arrange on the same horizontal plane as the

rear cutter when two only are employed, the front and second cutters operating as before described, the third acting simply as a smoother in case of springing of the journal or defect in the middle cutter; the rear cutter, having but a little labor to perform, is thus kept sharp, and thereby insures a perfect smoothness and finish in the journals produced.

In operating with my invention, the axle-blank having been duly fixed and centered in the lathe, and the cutters arranged as described, the cutters are to be fed up to the blank, either automatically or otherwise; a small portion of the front cutter, first impinging against the blank, acts upon, reduces it, and passes along under the blank, and allows fresh portions of the cutting-edge of each cutter to act consecutively upon the blank, until the entire series shall have acted upon and reduced the blank to the desired form and size, the cutters having performed their function passing under the finished journal.

Having described my invention, what I claim is—

As a mechanism for finishing axle-blanks, the combination of two or more cutters, C C^1 C^2, formed and arranged as described, and to operate in manner and for the purpose set forth.

HAMLET E. FORREST.

Witnesses:
F. P. HALE,
F. C. HALE.