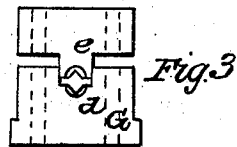
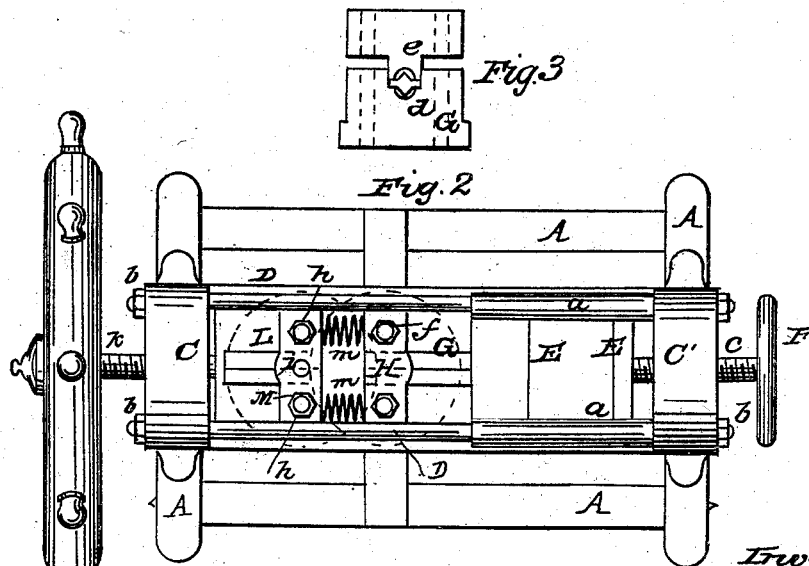
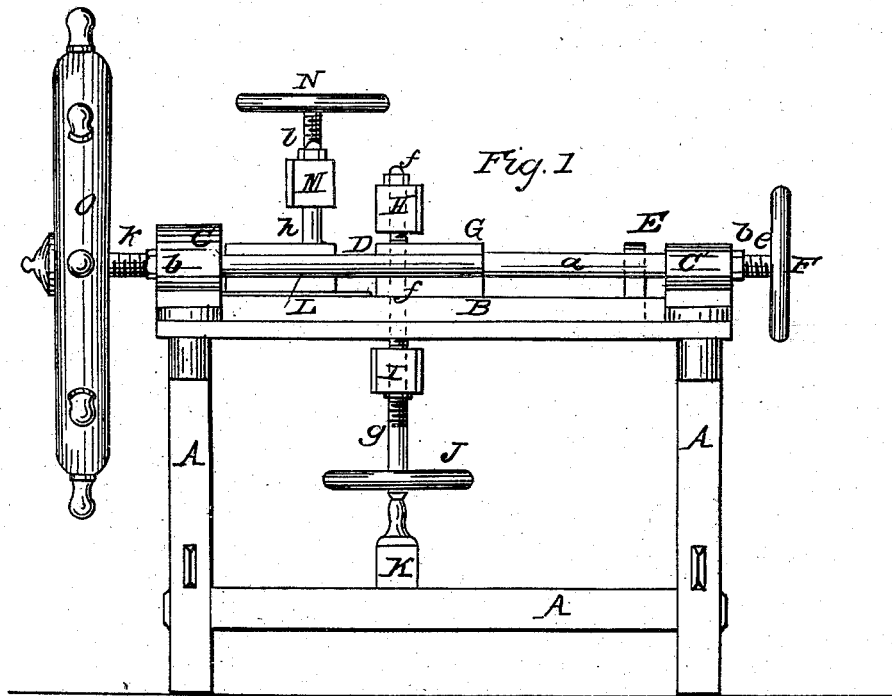


C. YOUNG.

Machine for Making Carriage Axles.

No. 54,639.

Patented May 8, 1866.



Witnesses  
*N. W. Hildner*  
*L. W. Dagg.*

Inventor  
*Calvin Young*  
 by *A. B. Houghton*  
*att'y*

# UNITED STATES PATENT OFFICE.

CALVIN YOUNG, OF AUBURN, NEW YORK.

## IMPROVEMENT IN MACHINES FOR MAKING CARRIAGE-AXLES.

Specification forming part of Letters Patent No. 54,639, dated May 8, 1866.

*To all whom it may concern:*

Be it known that I, CALVIN YOUNG, of the city of Auburn, county of Cayuga and State of New York, have invented a new and Improved Mode of Manufacturing Carriage, Wagon, Car, or other Axles, when a solid collar or shoulder is necessary at any point between the two ends; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 represents a side elevation of the machine for forming a solid collar or shoulder on the axle. Fig. 2 represents a top plan of the same, and Fig. 3 represents one of the sets or pairs of dies on an enlarged scale.

Similar letters of reference where they occur in the separate figures denote like parts of the machine in all the drawings.

I am perfectly aware that iron has been upset into dies so as to give it suitable shape and form. This is no part of my invention independent of the particular way and of the particular place where I upset the metal, and of the particular thing produced by the process or manipulation, as I shall hereinafter describe and mention.

My invention consists in making a solid collar or shoulder upon a carriage or other axle by grasping the bar or blank of which the axle is to be made at points remote from its ends, and leaving the portion of the metal of which the collar or shoulder is to be made unrestrained laterally or radially and only kept in position on the bar by the vertical walls or faces of the gripping-dies until said dies approach or nearly touch each other, when the metal, by the same end pressure or force upon the movable gripping-die of the pair which jams up the metal between the dies, now forces it into more perfect form in the dies, as will be explained.

A substantial frame, A, is first provided, upon which is placed an iron bed, B, for containing the machinery. At the ends of the bed are two head-blocks, C C', held together and against the strain of the machine by through-bolts D, having collars *a* and nuts *b* thereon for that purpose.

A gage, E, is arranged at one end of the bed,

which is adjustable by means of the screw *c* and hand-wheel F, the screw passing through the head-block C' and into or against the gage E. This gage is designed for properly placing the bar or blank so that the collar or shoulder thereon shall be at the point or part that will form a proper journal on one end of said bar or blank.

The die-block G is made stationary on the bed, and the bed-die *d*, Fig. 3, therein may be permanently fixed or be a part of the block itself. The other portion or section, *e*, of said die is made movable by being attached to a cross-head, H, which is connected to a nut-block, I, by through-bolts *f*, and moved by the screw *g* and hand-wheel J, said screw resting upon a pillar, K, and passing up into the nut-block I. The object in making the upper section of the die movable is that the bar or blank may be readily placed and gripped therein.

The gripping die-block L is movable upon suitable ways on the bed-plate B. It also has an under and upper die, as in the other die-block, G, except that said dies may be made round to grasp the round part or arm of the axle instead of angular for receiving the bed part thereof. A nut-block, M, is connected to the movable die-block by pillar-bolts *h*, and a screw, *i*, passes through block M, so that its point will press upon the upper gripping-die of the pan to hold the bar or blank firmly in the dies. A hand-wheel, N, is arranged on the screw *i* by which it may be operated to clamp or release the arm of the axle. The movable die-block L is operated by force applied to it by a hand-wheel, O, upon a screw, *k*, which screw works in a thread formed in the head-block C.

Springs *m* may be placed between the stationary and movable die-blocks to push back the latter when the screw *k* is run back.

The operation is as follows: A bar or blank is placed in the dies, which are separated, as shown in Fig. 2, the end of the bar being laid against the gage E to define the point where the collar or shoulder is to be made. The dies are then gripped or clamped rigidly to the bar at points remote from its ends, and leaving a portion of the bar between the gripping-dies uncontrolled and free to expand or be swelled out and upset (the bar being of course previously heated to the proper degree to upset) by

end-pressure applied to one of the griping die-blocks. The walls or vertical faces of the dies control the disposition of the metal in the line of the length of the bar or blank; but otherwise the metal is free to dispose of itself laterally until at the end of the movement of the forced die-block, when it may be driven into dies to give it a more finished or compact form.

The advantages of a solid collar or shoulder on an axle over one welded on is very great both in economy and strength; but the size of the bar, the quantity of metal to be upset, and the difficulty of getting at the position on the bar where the collar is to be made has heretofore prevented the forming of such solid collars upon axles. I have succeeded by my peculiar manner of working the metal, first uncontrolled and then by suitably-shaped dies, in making such solid collars, and thus producing a very superior carriage or other axle.

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

Forming a solid collar or shoulder on an axle by griping the bar or blank of which the finished axle is made at two points remote from its ends by griping-dies, so as to leave a portion of said bar between the two sets of dies uncontrolled and free to expand laterally by end-pressure applied to one of the griping-dies until near the end of the movement of said dies, when the expanded or swelled metal may be driven into the dies to give it better form and shape by means substantially as herein described and represented.

CALVIN YOUNG.

Witnesses:

C. E. COATES,

C. EUGENE BARBER.