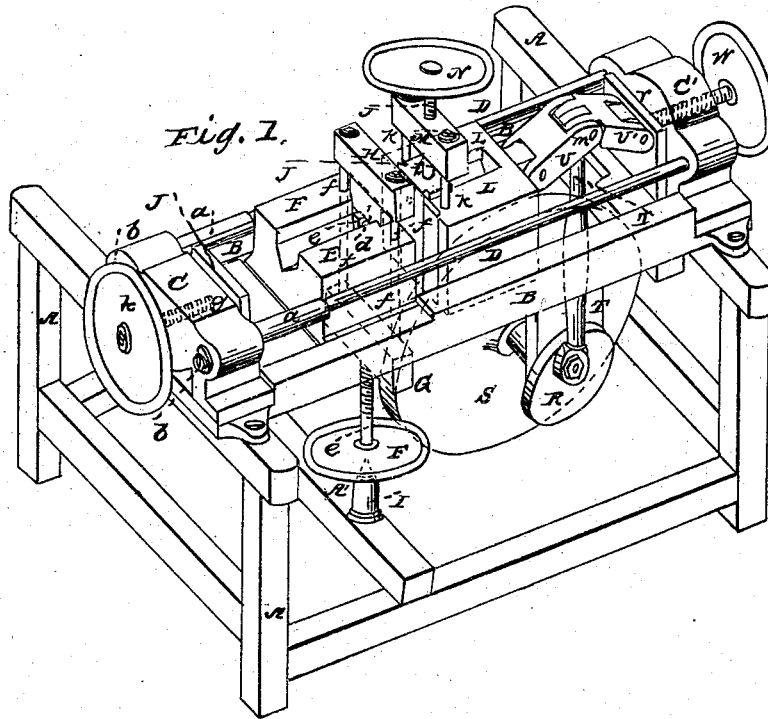


C. YOUNG.

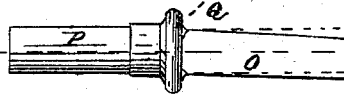
Machine for Making Carriage Axles.

No. 54,638.

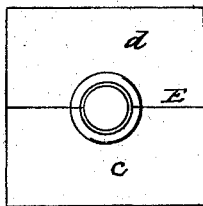
Patented May 8, 1866.



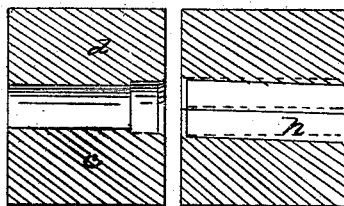
*Fig. 2.*



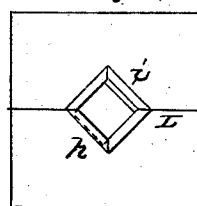
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses:  
*Heckhoff*  
*Wm. P. P. P.*

Inventor:  
*Calvin Young*  
*By Atty. W. B. Houghton*

# UNITED STATES PATENT OFFICE.

CALVIN YOUNG, OF AUBURN, NEW YORK.

## IMPROVEMENT IN MACHINES FOR MAKING CARRIAGE-AXLES.

Specification forming part of Letters Patent No. 54,638, 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 or Wagon Axles, where a collar or shoulder is necessary at any point between the two ends; and a set given to the bed or arm of the axle at the same time that the shoulder or collar is formed; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of a machine in which the collar or shoulder is jammed up and the set given by a single operation and by a single set of dies. Fig. 2 represents, on an enlarged scale, a portion of the axle, and one journal after it has been operated upon in the machine; and Figs. 4, 5, and 6 represent different views of the dies in which the jamming-up is done and the set given.

My invention consists in jamming up a solid collar on a carriage or other axle, and at the same time or by the same mechanism putting the set in the bed or arm of the axle, as will be explained.

A represents a substantial frame, upon which is placed the iron bed B and head-blocks C C', which are firmly held and supported by through-bolts D, with suitable collars *a* and nuts *b* thereon for that purpose.

E is a stationary die-block for holding the sectional dies *c d*. The under portion of the die *c* may be permanently fixed in or be a part of the die-block E, while the upper portion, *d*, moves and fits in suitable grooves or recesses therein, and is raised or lowered and held by a screw, *e*, having a hand-wheel, F, thereon, which screw passes through a nut-block, G, that is connected by through-bolts *f* to a cross-head, H, that carries the said upper movable die, *d*. The lower end of the screw *e* is supported upon a pillar, I, or a step on a cross-piece, A', of the main frame, and by this arrangement the dies *c d* are opened to receive, and are closed to firmly hold, the piece of iron upon which the collar and set are to be wrought.

J is a gage, made adjustable by means of the screw *g*, made fast to a hand-wheel, K, by

which it is operated, this gage being so arranged as to make the collar or swell on such part of the bar or blank, between its two ends, as may suit the length of journal to be made for the time being, and to alter it at pleasure.

L is a movable die-block, holding or controlling the two sectional dies *h i*, of which the lower one, *h*, may be firmly attached to or made a part of the die-block, while the upper one, *i*, is raised and lowered by means of a screw, *j*, passing through a nut-block, M, that is connected to the die-block L by through-bolts *k*, said screw being operated by a hand-wheel, N.

The object in raising and lowering the upper section, *i*, of the die is for introducing the bar or blank, and then clamping it tightly, so that the swell that forms the collar on the finished axle may be properly formed by forcing up the movable jaw-die toward the other fixed jaw-die E.

The die-block L or its dies are so arranged relatively to the die-block E or its dies as that a bend, or "set," as it is termed, may also be given to the bed O or to the arm P of the axle, as shown by the dotted lines in Figs. 2 and 5, at the same operation with the forming of the swell or collar Q and the other shoulders or lines shown in said Fig. 2.

The movable die-block L is reciprocated by means of a crank-wheel, R, driven from a main driving-pulley, S. To a wrist on said crank-wheel one end of a pitman, T, is connected, the other end thereof being connected to a pivot-pin, *m*, in the toggle-arms U U', one of which, U, is pivoted to the die-block L, and the other, U', to a cross-head, V, which is controlled or adjusted by a screw, *n*, and hand-wheel W, said screw passing through the head-block *c'*.

When the bar or blank is suitably heated it is clamped between the two sets of dies in the two die-blocks E L, the portion of the bar or blank which is upset and jammed up to form the swell or collar Q occupying a space between the two sets of dies, but not controlled by either. When the movable die-block L is forced up by the driving machinery this uncontrolled portion of the blank or bar is jammed up between the faces or walls of the two sets of dies, disposing of itself laterally without control until the dies meet or are about to meet, when the metal is driven or

forced into the dies and receives its proper form and set.

At the commencement of the process of forming the swell on the bar the faces or walls of the dies only control the metal, which disposes of itself laterally or radially with entire freedom from restraint; but when sufficient metal has, thus uncontrolled, laterally formed to make the collar, then, and then only, the dies receive it and give it proper form and shape; or, in other words, the metal is first upset without regard to shape, but in proper position, and then, when jammed up, forced into the dies that give it shape and form.

Of the advantages of a solid collar on an axle over one welded or screwed on it is unnecessary here to speak, as that constitutes the subject-matter of a separate application for Letters Patent.

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

Forming a swell or collar on axles and giving the bed or arm thereof a set by one and the same operation, by means of a stationary and a movable clamping-die that seize the bar or blank at points remote from its ends, and leave uncontrolled that portion of the bar or blank from which the enlargement is to be made until the dies are about to meet, when said enlargement is jammed up into the proper form by said dies, substantially in the manner herein described and represented.

CALVIN YOUNG.

Witnesses:

LOREN PATCHIN,  
C. E. COATES.