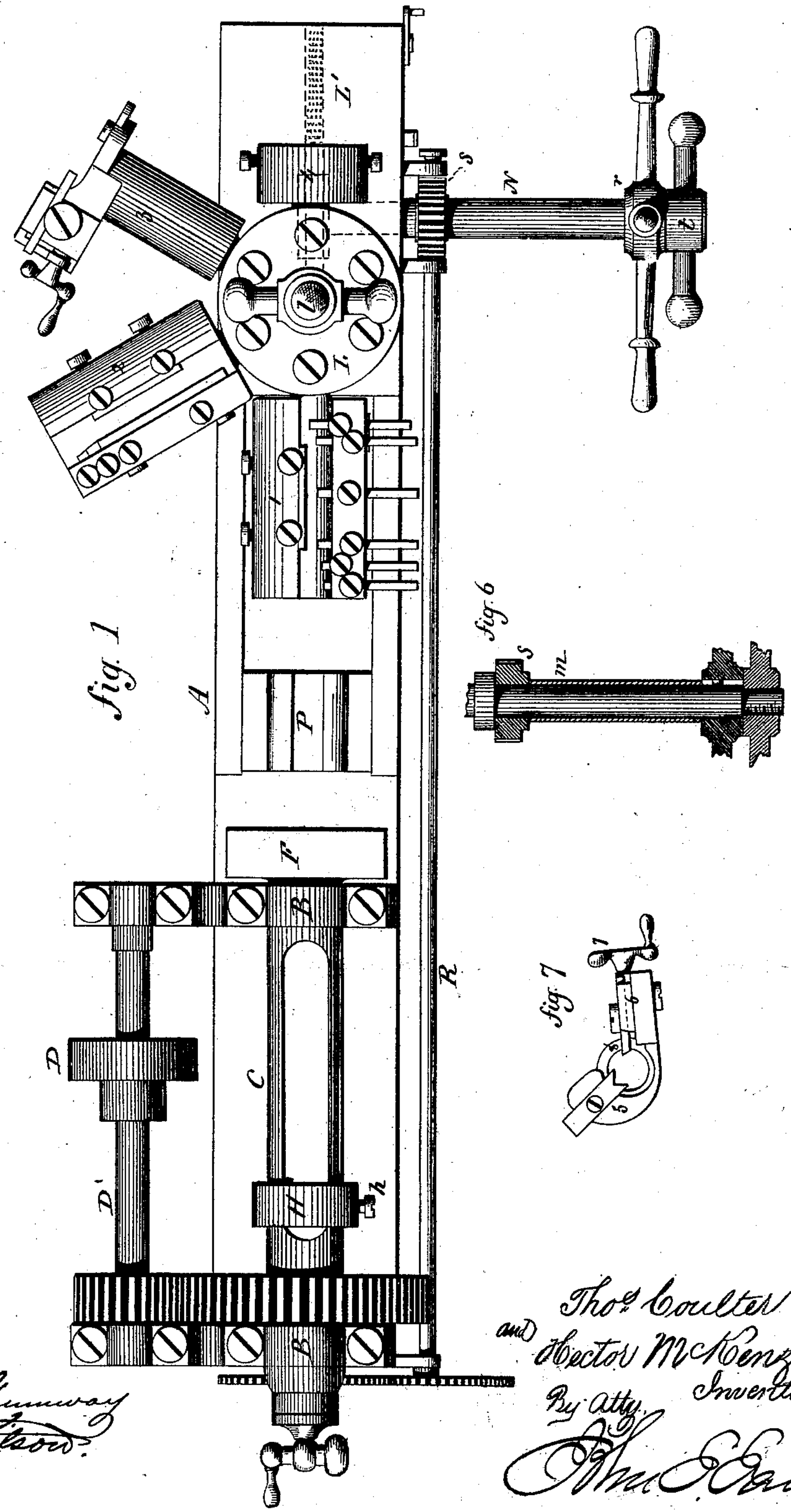
2 Sheets—Sheet 1.

T. COULTER & H. McKENZIE.

Machine for Turning Wooden Axles.

No. 197,999. **Patented Dec. 11. 1877.**



Witnesses.
J. H. Shumway
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2 Sheets—Sheet 2.

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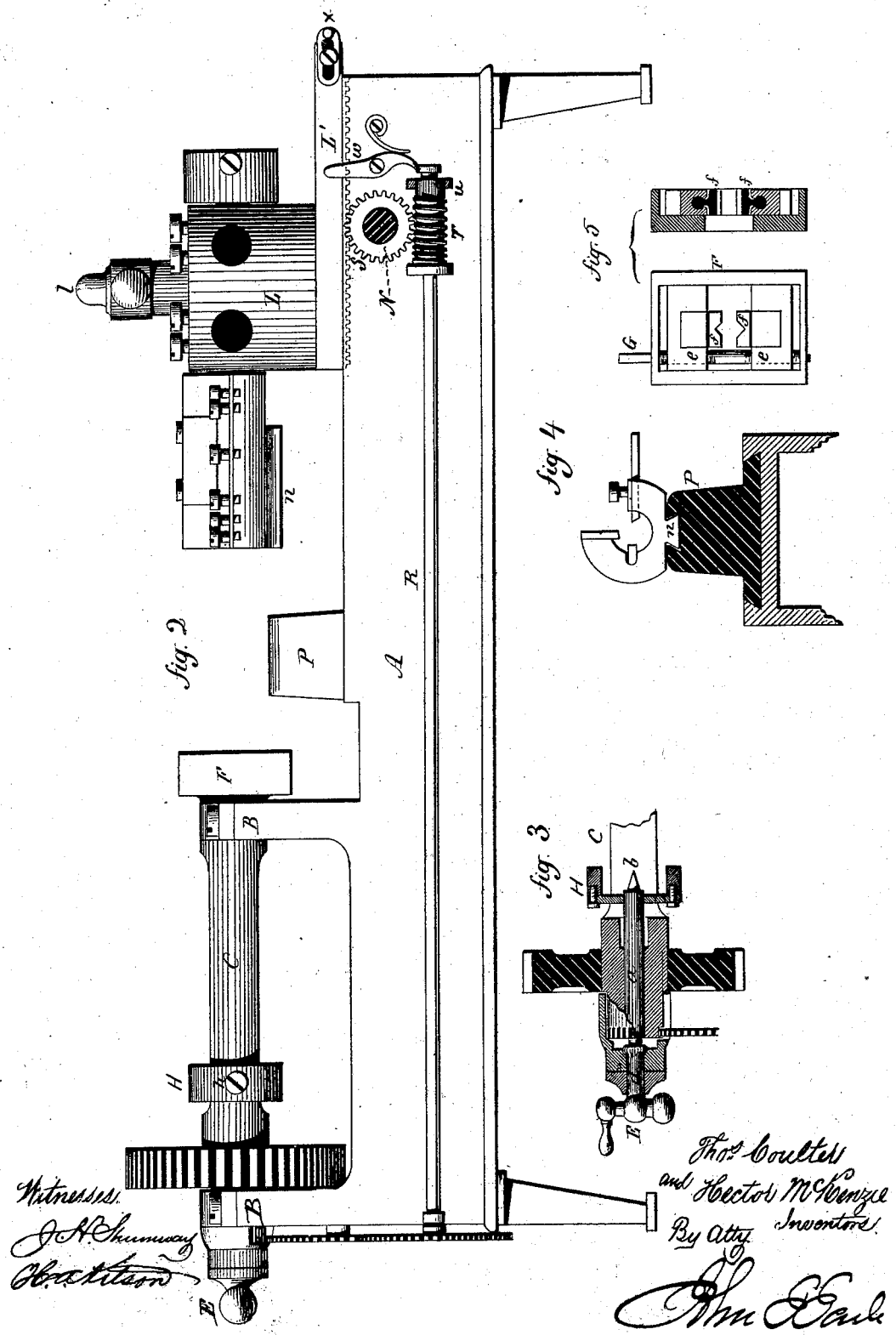

Witnesses.
J. A. Shumway
Chas. Wilson

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and Hector McKenzie
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UNITED STATES PATENT OFFICE.

THOMAS COULTER AND HECTOR McKENZIE, OF BRIDGEPORT, CONN.

IMPROVEMENT IN MACHINES FOR TURNING WOODEN AXLES.

Specification forming part of Letters Patent No. **197,999**, dated December 11, 1877; application filed November 22, 1877.

To all whom it may concern:

Be it known that we, THOMAS COULTER and HECTOR McKENZIE, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new Improvement in Machines for Turning Carriage-Axles; and we do hereby declare the following, when taken in connection with the accompanying drawings, and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, plan view; Fig. 2, side view; Figs. 3 to 7, detached views.

This invention relates to an improvement in machines for turning carriage-axles, and is an improvement on the machine for which Letters Patent were granted to these applicants dated February 17, 1874, No. 147,674, the object being the greater perfection of work and more convenient adjustment; and it consists in the construction, arrangement, and combination of the parts, as hereinafter described, and more particularly recited in the several claims.

A is the bed, at one end of which, in suitable bearings B B, a mandrel, C, is arranged. To the mandrel C power is applied to cause its revolution through a pulley, D, on a shaft, D′, geared to the said mandrel; but power may be applied directly, if desired. The mandrel is employed for the support of the axle, and is made hollow, and open in one or two sides, so as to allow the body of the axle to be introduced therein from the front end. Through the rear end of the mandrel C a spindle, *a*, is arranged, its inner end terminating in a point or center, *b*, as seen in Fig. 3. At the extreme rear end a fixed nut, *d*, is arranged, threaded corresponding to a thread on the outer end of the spindle *a*, and this nut is provided with a suitable handle, E, by which it may be turned to move the center *b* out or in, to accommodate itself to the varying lengths of the body of the axle to be finished. The inner or forward end of the mandrel C is provided with a chuck, F. The chuck is shown in Fig. 5. In this chuck two slides, *e*, are arranged to be worked toward or from each other by a right and left threaded screw, G. In each of these slides a jaw, *f*, is arranged and constructed with a universal seat, so as to be self-adjusting relatively to each other, and grasp the forward end of the body of the axle near the arm.

In case of shorter axles, and so as to properly center them, a collar, H, is arranged on the mandrel C, which may be easily moved along its surface, and, by means of the screw *h*, set at any desired point. The inner end of the center or spindle *a* rests in said collar; hence, if the body of the axle be short, and the center thrown far enough forward to meet it, it will be supported by the said collar, and render the holding of the inner end of the axle very firm.

On the bed, and in line with the axis of the mandrel, a rotating tool-holder, L, is arranged on a slide, L′, substantially as in said previous patent, and to the slide L′ a longitudinal movement is imparted by means of a shaft, N, turning a pinion working in a rack in the said slide, as indicated in broken lines, Fig. 1, as in the original patent.

The holder L may be set at any point desired by means of a screw, *l*. At several points around the holder the tools for finishing the axle are arranged, (here represented as 1 2 3 4,) and so that either, as 1, may be turned into axial line with the mandrel, and substantially as in the said patent.

In order to secure the tool-holders while in operation, and hold them unvaryingly in the relative position, a guide, P, is arranged on the bed, its upper surface grooved, and on the surface of the several tools a rib, *n*, is made, corresponding to the said groove, as seen in Figs. 2 and 4, and so that before the advancing tool reaches its working point the rib will enter the groove, and this groove and rib form an unvarying guide for the tool presented.

If preferred, the groove may be on the tool, and the rib stationary, the essential feature of this part of the invention being the rigid support for the tool while moving forward and working.

In order to feed the tools automatically there is arranged a shaft, R, on the side of the bed, which receives a slow rotary motion by gears at the head, as seen in Figs. 1 and 2, and on the shaft N there is a pinion, S, which engages with a worm, T, on the shaft R.

On the shaft N, as seen in Fig. 6, there is

a sleeve, *m*, between the gear S and a hand-wheel, *r*. The hand-wheel *r* engages with the shaft N, but is arranged so as to have axial movement thereon. Outside the hand-wheel, and on the end of the shaft, is a nut, *t*, and when the nut is turned hard up, it forces the hand-wheel *r* and sleeve *m* on the shaft toward and so as to grasp the pinion S firmly, and couple it with the shaft N. In that condition the revolution of the shaft R imparts, through the shaft N, the requisite longitudinal feeding movement to the slide L′; but when the nut is released the slide may be moved freely and more rapidly by means of the hand-wheel *r;* hence, it may feed slowly while doing its work, and be quickly returned thereafter.

In order to arrest the tool when it shall have done its work, a clutch, *u*, is arranged on the shaft R to engage the worm T, and from this a lever, *w*, extends up; and on the slide is an adjustable stop, *x*, which, when the slide has moved forward to the predetermined distance, will strike the upper end of the lever *w* and disengage the clutch and stop the revolution of the worm T. This enables a single workman to tend several machines.

The tool 3 is for turning the back of the collar on the axle, and is shown in Fig. 7. It consists of a back-rest, 5, arranged on the barrel projecting from the tool-holder, and an adjustable tool-stock, 6, arranged in suitable slides on the said barrel, and provided with adjusting-screw 7, by which the tool 8 in said slide may be moved outward and inward, for the purpose of turning the back of the collar, the arm of the axle passing into the barrel and to the stop.

We claim—

1. In a machine for turning axles, the hollow open mandrel to receive the body of the axle, combined with a centering device for adjusting the axle-arm to its proper relative position to the tools, and substantially as described.

2. In a machine for turning axles, the combination of the mandrel for receiving the body of the axle, and tools for working the surface of the said axle, the chuck consisting of the self-adjusting jaws, arranged in slides, and means for forcing the said jaws to grasp the axle, substantially as described.

3. The combination, in an axle-turning machine, of the hollow mandrel, with a self-adjusting chuck at its forward end and an adjustable center at its rear, substantially as described.

4. The combination, in an axle-turning machine, of the hollow mandrel with a self-adjusting chuck at its forward end, an adjustable center at its rear, and adjustable collar H on said mandrel, substantially as described.

5. The combination of an axle-holding mandrel and two or more tools arranged so that either may be presented to the axle, with a stationary guide between the said holding device and the said tools, with which the working-tool will engage, substantially as described.

6. In a machine for turning axles, having a mandrel for holding the axle, and a tool-holder for carrying two or more tools for turning the axle-arm, the combination therewith of the tools, consisting of the barrel 3, back-rest 5, and adjustable tool-stock 6, substantially as and for the purpose described.

7. The combination, with a mandrel for holding the axle-tools, arranged on a slide working toward and from said axle, in line parallel thereto, a feed substantially such as described, combined with a clutch, lever, and stop, whereby the said slide will be arrested at any predetermined point in its forward movement, substantially as described.

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