J. W. ELLIS.

MACHINE FOR TURNING CARRIAGE AXLES.

No. 170,538. Patented Nov. 30, 1875.

FIG. 1

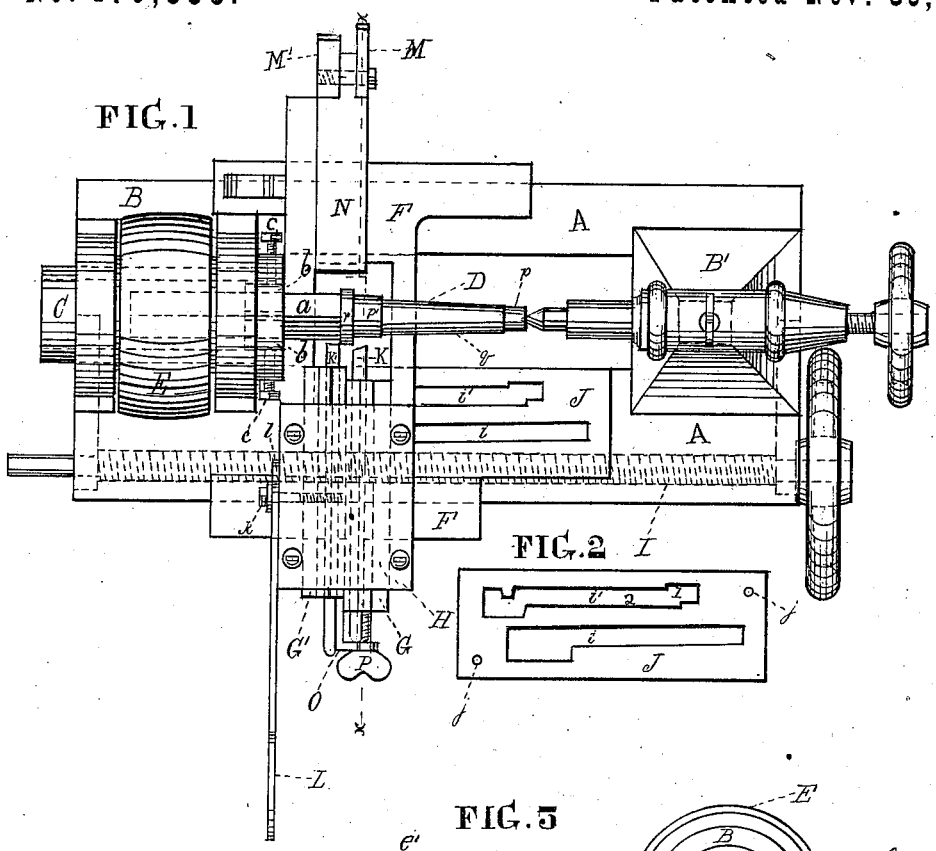

FIG. 2

FIG. 4

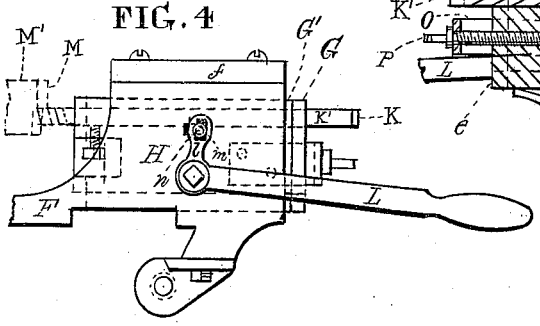

FIG. 5

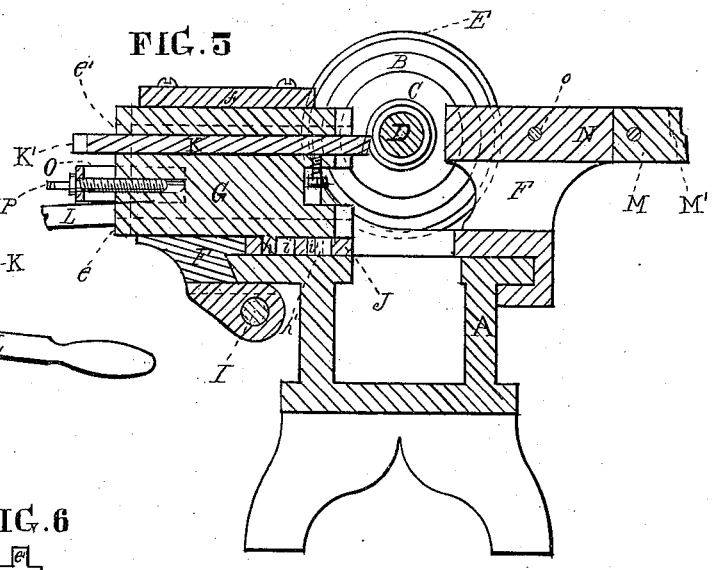

FIG. 5

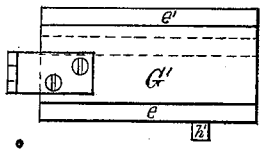

FIG. 6

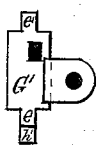

FIG. 7

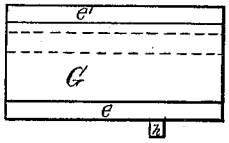

FIG. 8

Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH W. ELLIS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JACOB H. ARMBRUSTER, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR TURNING CARRIAGE-AXLES.

Specification forming part of Letters Patent No. **170,538**, dated November 30, 1875; application filed March 18, 1875.

To all whom it may concern:

Be it known that I, JOSEPH W. ELLIS, of the city and county of Philadelphia, in the State of Pennsylvania, have invented an Improvement in Machines for Turning Carriage-Axles, &c., of which the following is a specification:

My invention, in the first place, consists in the combination of two or more sliding cutter-holders with a carriage combined with a pattern-plate, having slots for guiding the slides, in such a manner that the different cutters turn separately the different-formed members of the axle, or other article, at one operation, as the carriage is moved on the bed-plate of the machine by means of a feed-screw or other suitable device. The cutter-holder, which operates one of the cutters, when it has finished its work, is drawn outward therefrom, whereby it is free to pass succeeding larger diameters by means of a lever connected with the next cutter-slide and box of the carriage; the said slide being connected with the preceding slide by means of an adjustable screw, whereby the outwardly-receding distance of the first-mentioned slide is determined. A like arrangement is used in the combination of any additional cutter-slides with the others, for carrying the preceding cutters outward to prevent their contact with the piece to be turned after they have performed their work.

In the second place the invention consists of a swivel-plate, connected to the rear end of the above-mentioned carriage, and provided at one end with a gage for each cutter, whereby, by turning the gage end of the swivel toward the front of the machine, the cutters may be accurately adjusted for their work, after which the swivel is brought to its former position, with the gages out of the way.

In the accompanying drawings, Figure 1 is a plan view of my improved machine for turning axles, &c. Fig. 2 is a like view of the pattern-plate J. Fig. 3 is a cross-section, at the line *x x* of Fig. 1. Fig. 4 is a rear side elevation of the front end of the carriage F. Figs. 5 and 6 are a side and end views, respectively, of the cutter-holder G′. Figs. 7 and 8 are like views of the cutter-holder G.

Like letters of reference in all the figures indicate the same parts.

A is the bed-plate of my improved machine. B is the standing head, provided with a hollow mandrel, C, in the usual manner, to receive the square part *a* of the axle D, which is confined in its central position by means of the clamping-pieces *b* and set-screws *c*; or, if desired, the clamping-pieces *b* may be dispensed with. B′ is the movable head. E is the driving-pulley on the mandrel C. F is a carriage, provided with the sliding cutter-holders G and G′, situated in the box H at the front end of the carriage, there being grooves in the bottom of the box for the reception of the tongues *e e* on the lower edge of the cutter-holders, and in the under side of the top *f* for the tongues *e′ e′* on their upper edges, whereby the said cutter-holders have a sliding movement at right angles to the line of movement of the carriage F, as the latter is moved forward by the feeding screw-rod I, or other suitable mechanism, there being lugs *h* and *h′*, respectively, on the lower edges of the cutter-holders, which slide in the slots *i* and *i′* of the pattern-plate J, of the requisite form to guide the cutter K, for turning the bevel part of the axle, and the cutter K′, for turning the straight parts as the carriage F is moved toward the stationay head B of the machine. The pattern-plate, which is shown in detail in Fig. 2, has dowel-pins *j j*, by which it is held in place on the front shear of the bed-plate A. For passing the guide-lug *h′* of the sliding tool-holder G′ past square shoulders, or other abrupt parts of the slot *i′* of the pattern-plate, there is a lever, L, hung on the fulcrum-pin *k* in the rear side of the box H, the short arm *l* of the lever having a slot, *m*, as seen in Fig. 4, which receives the outer end of the stud *n*, that projects from the rear side of the said tool-holder through a slot in the side of the box. The cutters K and K′ are adjusted by means of the gages M and M′ on one end of the swivel-plate N. The plate is hung on the pin *o* at the rear end of the carriage F, and turned into the position seen in Fig. 3, with the gages at the rear side of the machine out of the way.

The cutters are adjusted when the carriage F is at the outer end of the axle, the swivel-plate being turned into the reverse position, whereby the gages are brought toward the front of the machine, and the cutters set to them, as represented by dotted lines in Fig. 4; then the position of the plate N is reversed to bring the gages out of the way, as seen in Figs. 1 and 2.

The operation is as follows: The carriage F is brought toward the movable head B′, and the axle D placed in the position for turning, as seen in Fig. 1, and by the action of the feeding screw-rod I the carriage F is moved forward into the position seen in Fig. 1, the lugs *h* and *h′* sliding in the slots *i* and *i′* of the pattern-plate J, in which movement all the parts of the axle are turned, except the back shoulder of the collar. When the carriage starts in its forward movement the square cutter K′ forms the pin *p* on the outer end of the axle D, as the lug *h′* of the cutter-holder G slides in the part 1 of the slot *i′*; then the cutter-holder is pulled forward, and the lug enters the part 2, to bring the tool out of the way until it comes to the next straight part *p′* of the axle, and the cutter K forms the tapered part *q* of the axle as the carriage advances, being guided by the movement of the lug *h* in the slot *i*, which is on an angle corresponding to the taper of the part *q* of the axle, the straight part *p′* being turned by the cutter K′ while the cutter K is completing the turning of the tapered part *q*, the outer shoulder of the collar *r* being formed by the forward edge of said cutter K′; then, by means of the lever L, above described, the holder G′ is moved outward from the axle, carrying the holder G with it, to bring the cutter K out of the way in passing larger diameters than the tapered part *q*, the holder G being connected with the holder G′ by means of the adjusting-screw P of the former, and the arm O of the latter. The cutter-holder G′ is then drawn outward from the axle by the action of the lever, to bring the cutter K′ into position to turn the circumferential face of the collar, the lug *h′* being guided by the slot *i′*, and then the cutter-holder is pushed inward by the action of the lever for the cutter to form the rear shoulder of the collar, which completes the turning of the axle. After this the tool-holder is drawn outward, to bring the cutter K outside of the collar, and the lug *h* into the proper position to clear the lug *x* of the pattern-plate, and the carriage F, by a reverse movement of the feed screw-rod I, returns to its former position. The turned axle is then taken out of the machine, and another put in its place to be turned. A spring may be placed between the outer end of the cutter-holder G and the arm O of the holder G′, or a nut may be placed on the screw to be adjusted, whereby the inward movement of the holder G′ may give a corresponding movement to the holder G.

I have described the operation of turning an axle of the shape represented in the drawings; but it will be seen that when any variation has to be made in the shape, a corresponding shape has to be given to the slots of the pattern-plate.

The machine may be used for turning a variety of other articles, using the hollow mandrel or other device, as may be necessary, with the standing head, and having the slots in the pattern-plate of corresponding shape to the article to be turned. When two cutters alone cannot be adapted to all the members of the piece to be turned, any additional number may be used, the cutter being made of the requisite form to produce the proper shape. As this is a matter which belongs to the province of the workman, a further explanation is deemed unnecessary.

I claim as my invention—

1. The combination, with a metal-turning lathe, of a carriage, tool-box, cutter-holders, cutters, and pattern-plates, substantially as described and shown.

2. The combination of the box H, holders G G′, cutters K K′, and lever L, substantially as described and shown.

3. The combination of the cutter-holder G′, having an arm, O, in combination with the cutter-holder G, having an adjustable screw, P, for giving outward and inward movements to the latter, substantially as set forth.

4. The swivel N, having gages M and M′, in combination with the carriage F and cutters K and K′, for adjusting the same, substantially as set forth.

JOSEPH WM. ELLIS.

Witnesses:

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STEPHEN USTICK.