

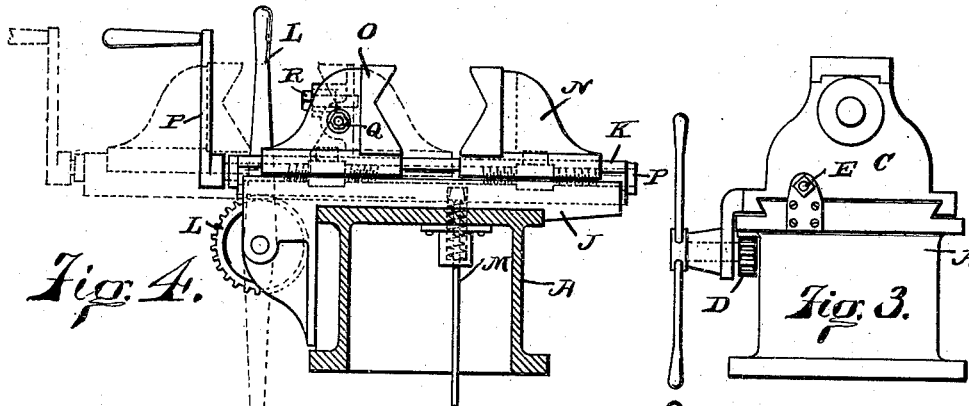
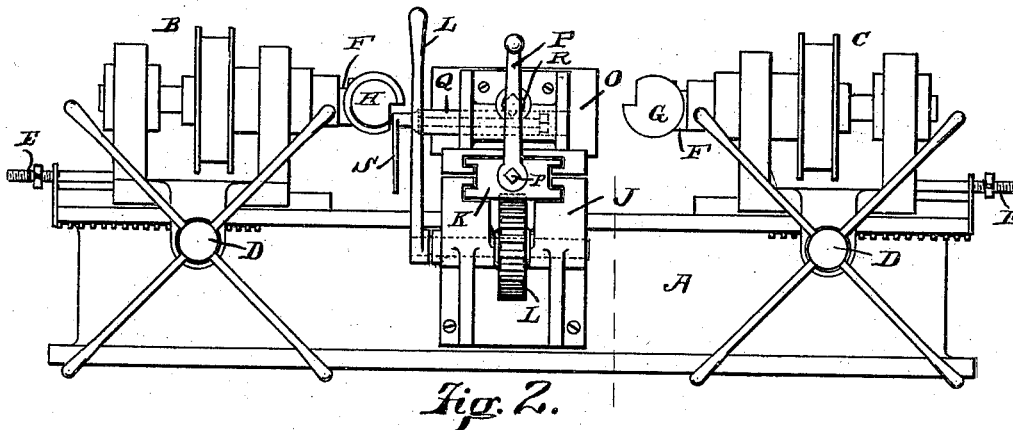
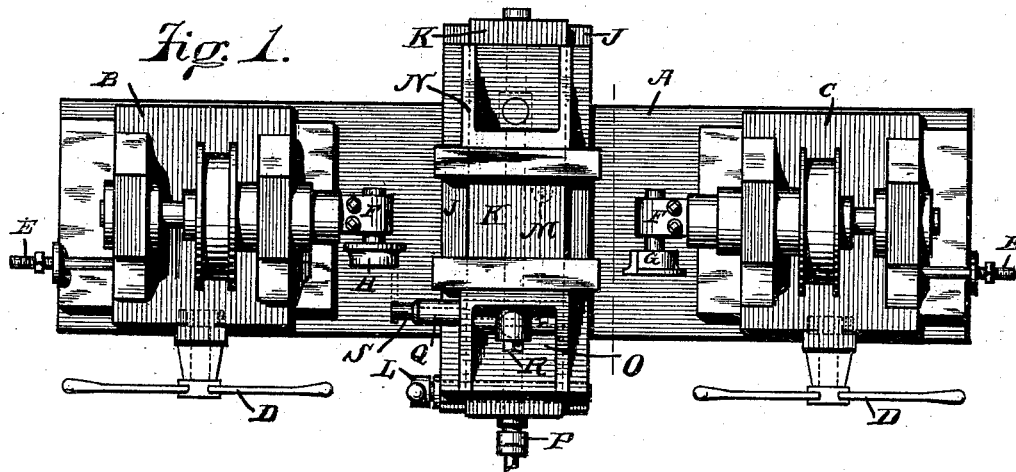
(No Model.)

2 Sheets—Sheet 1.

A. PATERSON.  
AXLE BOX MILLING MACHINE.

No. 383,540.

Patented May 29, 1888.



Witnesses  
Carl Spengel  
Waldward

Andrew Paterson Inventor

By his Attorney James M. See

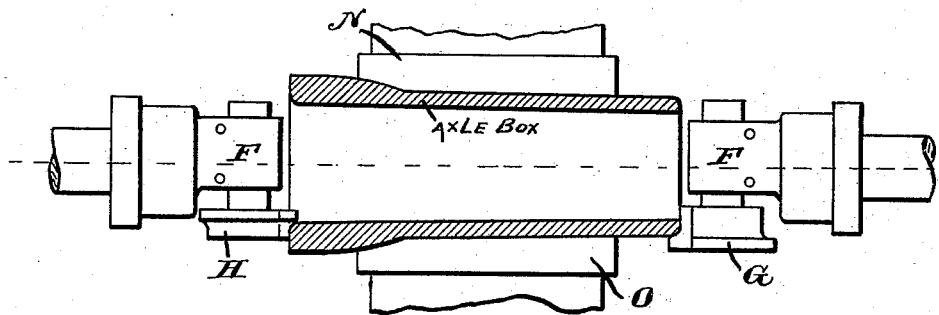
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*Fig. 5.*

*Andrew Paterson*

*Inventor.*

*Witnesses*  
*W. A. Howard*  
*A. Myers.*

*By his Attorney James W. See.*

# UNITED STATES PATENT OFFICE.

ANDREW PATERSON, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR TO THE  
NATIONAL TUBE WORKS COMPANY, OF BOSTON, MASSACHUSETTS.

## AXLE-BOX-MILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 383,540, dated May 29, 1888.

Application filed March 9, 1888. Serial No. 266,661. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW PATERSON, of McKeesport, Allegheny county, Pennsylvania, have invented certain new and useful Improvements in Axle-Box-Milling Machines, of which the following is a specification.

This invention pertains to a machine for facing off the ends of the hub-boxes used on vehicle-axles, the object of the facing being to bring the axle-box to an accurate standard length, and to produce true faces upon the ends thereof, and to properly round the corner of the bore at one end of the box and the exterior of the box at the other end.

My improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan of an axle-box-milling machine illustrating my improvements, the chuck being shown in the position it will occupy when the box is being operated upon by the machine; Fig. 2, a front elevation of the same; Fig. 3, an elevation of the right-hand end of the machine, showing the bed and the right-hand head-stock; Fig. 4, a vertical transverse section of the bed of the machine, showing the chuck-saddles and slide, the chuck being in the position it will occupy when the machine is operating upon an axle-box, dotted lines indicating also the position of the chuck when drawn forward for the replacing and removal of the axle-boxes; and Fig. 5 is a horizontal section through an axle-box, shown in working relation to the cutters and chuck-jaws.

In the drawings, A represents a horizontal bed; B, a head-stock fitted to slide longitudinally upon the left-hand end thereof and provided with a spindle adapted to be revolved by belt and carry a cutter at its inner end; C, a similar head-stock at the right-hand end of the bed; D, head-stock traversing mechanism at each head-stock to serve in sliding the head-stocks to and from each other, such mechanism being illustrated as a rack-and-pinion device operated by hand-levers arranged in capstan form; E, adjustable stop-screws—one for each head-stock—serving as

means for limiting the inward movement of the head-stocks along the bed and as a means for adjusting such limit; F, a cutter-chuck projecting inwardly from each spindle and provided with a bore at right angles to the spindle; G, a facing-cutter consisting of a disk upon the end of a concentric shank clamped in the bore of the cutter-chuck of the right-hand head-stock, this disk having in its jaw a notch producing a peripheral cutting-edge upon the disk, such cutting-edge presenting itself toward the opposite head-stock, the disk having also an outer flange filleted where it joins the disk, so that the cutting-edge of the cutter forms a line radial to the spindle of the head-stock and terminating outwardly in a curve; H, a similar facing-cutter carried by the spindle of the left-hand head stock, this cutter, however, having its flange upon the inner portion of the disk; J, a saddle secured to the bed at a point midway between the two head-stocks and provided with a horizontal slideway transverse to the bed; K, a chuck-slide fitted to said slideway and adapted for motion therein to and fro across the bed; L, a rack-and-pinion mechanism operated by hand-lever, engaging the saddle and chuck-slide and serving as a means by which the chuck-slide may be moved back and forth in the saddle; M, a dowel carried by a saddle and adapted to engage a dowel-hole in the chuck-slide when the chuck-slide is at its proper backward position, such position corresponding to the normal working position of the chuck-slide, this dowel being provided with a spring tending to press it into such hole when the hole presents itself to the dowel, the dowel having a rod projecting downwardly through the bed, so as to permit the attachment thereto of a foot-treadle, by means of which the dowel can be pulled downwardly out of engagement with the dowel-hole; N, a jaw-bracket fitted for sliding movement upon the rear end of the chuck-slide and carrying a horizontal V-shaped jaw presenting itself forwardly toward the spindle-axis of the machine; O, a similar jaw-bracket upon the forward end of the chuck-slide, presenting its jaw toward the opposite jaw; P, a chuck-screw disposed longi-

itudinally in the chuck-slide and engaging both the jaw-brackets, and adapted, when turned, to serve in forcibly closing the chuck-jaws or in opening the same; Q, a sleeve fitted to slide horizontally in a socket in the front jaw-bracket in a line parallel to the spindle-axis of the machine, this sleeve projecting outwardly to the left of the jaw-bracket; R, a pinching-screw at the socket of this sleeve, serving to clamp the sleeve in adjusted position in the socket to prevent any improper endwise motion of the sleeve, and S a gage-tongue hanging normally in a vertical position, its upper end being provided with a shank loosely journaled in the sleeve Q, but incapable of endwise motion therein, this gage-tongue being of such length that when turned horizontally forward it will project somewhat beyond the inner face of the front chuck-jaw.

The axle-boxes to be operated upon are to be clamped between the chuck-jaws, which jaws may have special forms adapted to the boxes, and which jaws are by preference separably attached to the jaw-brackets, so as to permit the selection and use of appropriate jaws. When an axle-box is clamped in the chuck, it should project at each end therefrom, so as to be properly operated upon by the facing-cutters when the head-stocks are moved inwardly, and, as the axle-box is held immovable and the head-stocks move up to positive stops, it is important that the axle-boxes be properly adjusted endwise in the chuck before being clamped; otherwise one of the facing-cutters might remove entirely too much metal from its end of the box, while the other facing-cutter could not reach the box.

The cutter G, as the spindle revolves, is swept around in a circle corresponding to the end diameter of the axle-box. The cutting-edge will face the end of the box, and will neatly round the exterior peripheral corner of the box. The cutter is sharpened by grinding the face of the notch in an obvious manner, and the cutting-edge is caused to present itself properly by an appropriate rotatory adjustment of the shank of the cutter in the cutter-chuck before being clamped therein. The cutter H operates in a similar manner to face the other end of the box and to neatly round the inner corner of the box.

The operation is as follows: Both cutter-spindles are to be in revolution by means of suitable belts. Both head-stocks are to occupy their outer positions. The chuck is to be open, and the chuck-slide is to occupy the front position, as indicated by dotted lines in Fig. 4, and the gage-tongue is to hang down, as indicated in Fig. 2. The operator places an axle box in the open chuck; he turns the gage-tongue up horizontally; he pushes the axle-box to the left until its end goes against the gage-tongue; he tightens the chuck and clamps the axle-box firmly therein in adjusted position; he permits the gage-tongue to fall back to normal position, and he operates the rack-and-pinion mechanism L to move the chuck-

slide and chucked axle-box to the rear. When the axis of the axle-box coincides with the spindle-nose of the machine, the dowel M engages the dowel-hole in the slide and holds the chuck rigidly in proper position. The operator then forces both head-stocks inwardly. The cutters operate upon the ends of the axle-box, and cease their work when the head-stocks reach the limit of their inward motion by reason of the stops E, thus completing the work. The operator now moves the head-stocks outwardly, releases the dowel, pulls the chuck forward, opens the chuck, removes the faced axle-box, places another, and proceeds as before.

The position of the gage tongue to the right or left, to suit different lengths of axle-boxes, is adjusted by unclamping the sleeve Q and moving it to the desired position and then re-clamping.

I claim as my invention—

1. In an axle-box-milling machine, the combination, substantially as set forth, of a bed, a pair of head-stocks fitted for sliding at the ends thereof and carrying each a cutter-spindle, cutter-chucks on the inner ends of the spindles, and a chuck disposed upon the bed between the head-stocks and provided with a pair of jaws facing each other.

2. In an axle-box-milling machine, the combination, substantially as set forth, of a bed, a pair of head-stocks fitted for sliding at the ends thereof and carrying each a cutter-spindle, a saddle secured to the bed between the head-stocks and provided with a slideway transverse to the bed, a chuck-slide fitting said slideway, means, substantially as described, for moving the chuck-slide in the saddle, and a pair of chuck-jaws facing each other and carried by said chuck-slide.

3. In an axle-box-milling machine, the combination, substantially as set forth, of a bed, a pair of head-stocks fitted for sliding at the ends thereof and carrying each a cutter-spindle, cutter-chucks on the inner ends of the spindles, a saddle secured to the bed between the head-stocks and provided with a slideway transverse to the bed, a chuck-slide fitted to slide in said slideway, means, substantially as described, for moving the chuck-slide in the saddle, a pair of chuck-jaws facing each other and carried by the chuck-slide, and a dowel arranged to hold said chuck-slide in normal working position in the saddle.

4. In an axle-box-milling machine, the combination, substantially as set forth, of a bed, a pair of head-stocks fitted for sliding at the ends thereof and carrying each a cutter-spindle, cutter-chucks on the inner ends of the spindles, a chuck disposed upon the bed between the head-stocks and provided with a pair of jaws facing each other, and a gage-tongue at one of said jaws, adapted to be projected at one of the ends of said jaw beyond its face and to be withdrawn from such projection.

5. In an axle-box-milling machine, the com-

5 bination, substantially as set forth, of a bed, a pair of head-stocks fitted for sliding at the ends thereof and carrying each a cutter-spindle, cutter-chucks on the inner ends of the spindles, a chuck upon the bed between the head-stocks, and a cutter at each of said cutter-chucks, having a notched disk and having a shank engaged by the cutter-chuck.

10 6. In an axle-box-milling machine, the combination, substantially as set forth, of bed A, head-stocks B C, with their spindles, shifting devices, and cutter-chucks, jaw-brackets N and O, with their jaws, sleeve Q, clamped in one of the jaw-brackets, and gage-tongue S, 15 pivoted in said sleeve.

7. In an axle-box-milling machine, the com

ination, substantially as set forth, of bed A, head-stocks B C, with their spindles, shifting devices, and cutter-chucks, saddle J on the bed between the head-stocks and provided 20 with a slideway, dowel M in the saddle and having a rod projecting downwardly and adapted to be attached to a treadle, and chuck-slide K, fitted to slide in the saddle and carrying a pair of chuck-jaws facing each other, and having a 25 dowel-hole to be engaged by said dowel when the chuck is in normal working position with reference to the axis of the head-stock spindles.

ANDREW PATERSON.

Witnesses:

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CHAS. J. ROESLER.