(No Model.)

G. U. MEYER.

ARBOR.

No. 441,889. Patented Dec. 2, 1890.

Fig. 1.

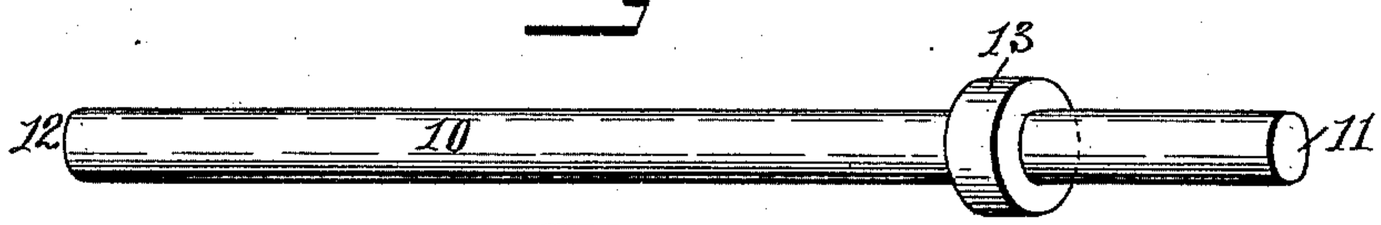


Fig. 2.

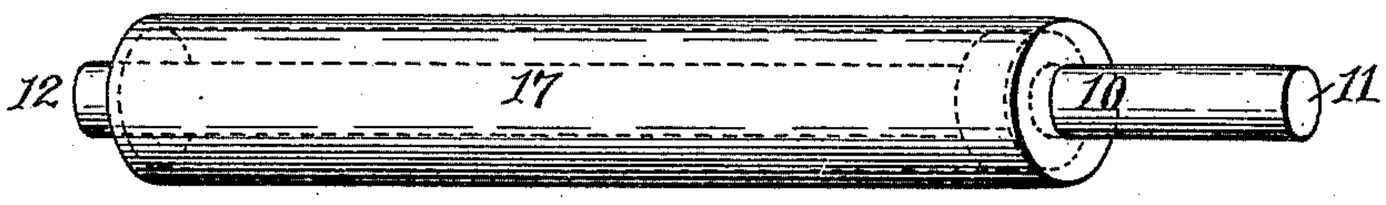


Fig. 3.

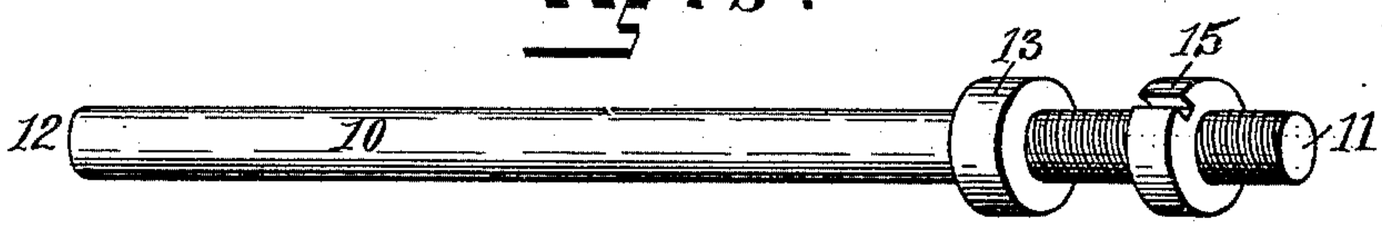


Fig. 4

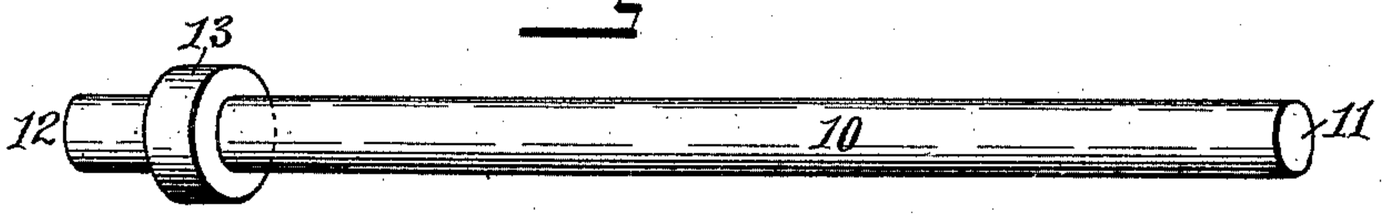


Fig. 5.

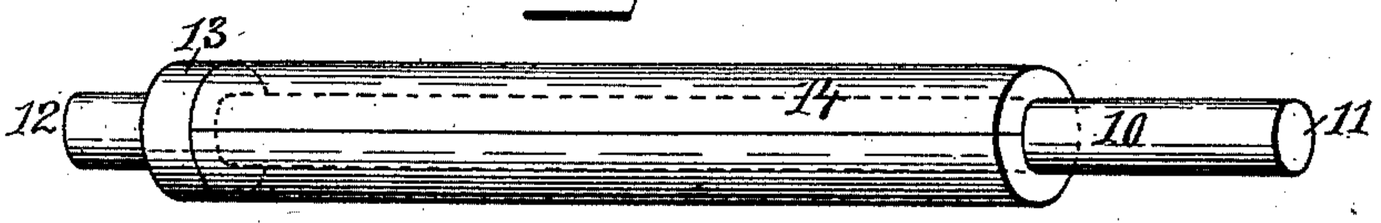


Fig. 6

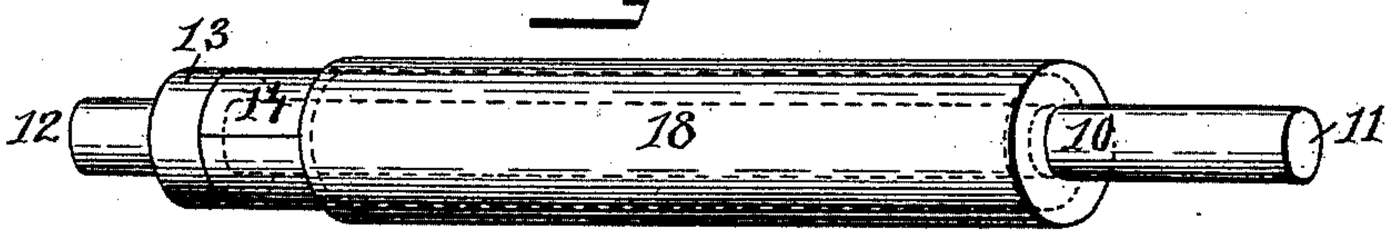
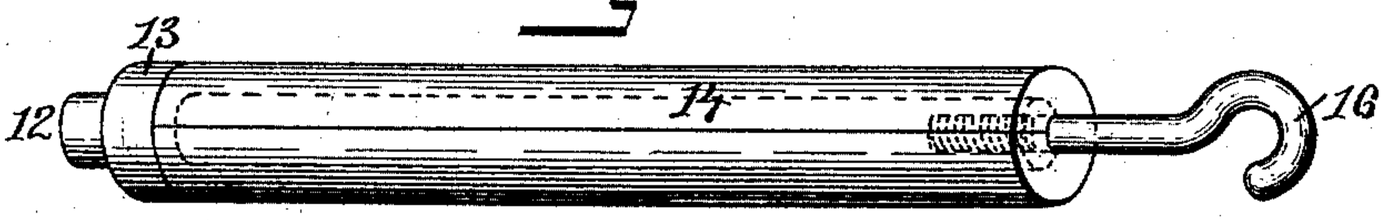


Fig. 7.



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GEORGE U. MEYER, OF PROVIDENCE, RHODE ISLAND.

ARBOR.

SPECIFICATION forming part of Letters Patent No. 441,889, dated December 2, 1890.

Application filed September 9, 1890. Serial No. 364,463. (No model.)

To all whom it may concern:

Be it known that I, GEORGE U. MEYER, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Arbors; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in arbors adapted for drawing seamless tubes from sheets of metal.

The object of this invention is to so construct an arbor that a sheet of metal or composition of metals may be drawn into a tube by the use of the ordinary draw-bench.

The invention consists in providing the arbor or draw-bar with a collar or cylindrical portion of larger diameter than the draw-bar, so as to form a shoulder by which the sheet metal will be held while the portion of the metal extending beyond the cylindrical portion is drawn into a tube by drawing the arbor through the hole of a draw-plate.

The invention further consists in providing the arbor with a collar forming a guide for the arbor.

The invention also consists in providing the arbor with detachable tubes and a detachable draw-hook, all of which will be more fully set forth hereinafter.

The improved arbor is designed for use in a new process for drawing seamless tubes from sheet metal or sheet metal plated with other metal, an application for a patent for which is filed of even date herewith.

Figure 1 is a perspective view of the arbor or draw-rod provided with a cylindrical collar near one end. Fig. 2 is a perspective view of a tube, showing the arbor within the tube, partly in broken lines. Fig. 3 is a perspective view of the arbor provided with a screw-threaded collar. Fig. 4 is a perspective view of the arbor having the cylindrical collar at the rear end of the draw-bar. Fig. 5 is a perspective view of the arbor provided with a cylindrical sleeve. Fig. 6 is a perspective view showing the arbor provided with a cylindrical sleeve and a tube drawn over the sleeve. Fig. 7 is a perspective view of the mandrel provided with a tubular sleeve and a detachable draw-hook.

Similar numbers of reference indicate corresponding parts in all the figures.

In the drawings, 10 indicates the draw-bar, 11 the forward end of the draw-bar, and 12 the rear end of the same.

13 is a cylindrical collar, either permanently secured to the draw-bar 10 or held on the bar by resting against a shoulder formed by making the forward part 11 of the draw-bar of less diameter than the rest of the draw-bar, the collar 13 having a central hole closely fitting the smaller portion 11 and resting against the shoulder formed by the larger portion 10 of the draw-bar. The end 11 of the draw-bar is the end to which the gripping-tongs or other drawing means are secured to draw the arbor and the metal to be drawn into a tube through the holes in the draw-plate.

For the purpose of this description, the draw-bar 10 and collar 13 are designated as the "arbor." The collar 13 may be secured near the forward end 11 of the draw-bar, as is shown in Figs. 1, 2, and 3, or near the rear end 12, as is shown in Figs. 4, 5, and 6, in which the cylindrical sleeve 14 is placed on the draw-rod 10, the rear end bearing against the collar 13. The cylindrical sleeves 14 may be tubes of any required diameter, bored out to form a close-sliding fit on the draw-bar. They may be split longitudinally to facilitate their withdrawal from the mandrel. When the sleeves 14 are cylindrical tubes having a close sliding fit on the draw-bar 10, then the collar 13 may be dispensed with and the tubular sleeve made to bear against the shoulder formed by making the end 12 of the draw-bar of greater diameter than the rest of the bar.

The collar 15 is represented in Fig. 3 as screw-threaded on the end 11 of the draw-bar 10. The object is to make the same collar serve the purpose of securing the disk of sheet-metal against the face of the disk 13. The essential offices of the collar 15 are to form a guide for the drawing of the arbor and metal through the holes in the draw-plate and to hold the same concentric with the hole, and for these purposes the collar 15 is usually made of a diameter that will pass through the hole in the draw-plate and is bored out so as to slide over the end 11 of the draw-bar.

The number 16 indicates a draw-hook screw-threaded into the forward end of the draw-

bar. As the hook can be screwed into the draw-bar through the hole in the draw-plate, the hook may be of any required size, since it does not have to pass through the hole in the draw-plate. The guide-disk 15 may be placed on the straight end of the hook, so as to guide the arbor concentric with the hole in the die-plate.

In using the arbor a disk of sheet metal is perforated in its center with a hole through which the end 11 of the arbor is inserted, so that the disk of sheet metal rests against the collar 13 or the forward end of the sleeve 14. A guide-collar 15 is now placed on the end 11 of the arbor, and the arbor and sheet metal are drawn through a hole in the die-plate of a draw-bench to partially form the disk into a tube. By drawing the arbor and the sheet metal through successively smaller holes the sheet metal is formed into the tube 17, as is shown in Fig. 2, the forward end of the tube being provided with a perforated disk of the thickness of the original disk, while the walls of the tube are much thinner. When the sleeves 14 are used, the perforated disk of sheet metal bears against the forward end of the sleeve 14. The first sleeve 14 used is of much greater diameter than the collar 13, so that the tube first formed may be of any required diameter, and by gradually changing the sleeve 14 to one of less diameter, and drawing the sheet metal and arbor through holes of successively less diameter, the tube 18 is at last drawn on a sleeve of the diameter of the collar 13, as is shown in Fig. 6, in which the tube 18 has still at its forward end a perforated disk of practically the thickness of the original disk of sheet metal. By the use of this arbor the strain is exerted on the central portion of the metal forming part of the original disk, and the drawing out of the seamless tube is effected by the strain on this end, greatly facilitating the drawing of the tube.

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

1. In an arbor adapted for drawing seamless tubes, the combination, with a draw-bar, of a collar forming a shoulder for holding the metal against the strain of the draw-plate, as described.

2. In an arbor adapted for drawing seamless tubes, the combination, with the draw-bar and a collar forming a shoulder, of a guide-collar detachably secured on the draw-bar in front of the metal to be drawn, as described.

3. The combination, with a draw-bar and a collar forming a shoulder, of a tubular sleeve inclosing the draw-bar and forming a cylindrical extension of the collar of the same or greater diameter than the collar, as described.

4. The combination, with a draw-bar provided with a cylindrical portion of larger diameter than the rest of the draw-bar, of a cylindrical sleeve fitting over a portion of the draw-bar, the forward end of the draw-bar projecting beyond the sleeve, as described.

5. The combination, with the draw-bar 10, the collar 13, and the guide-collar 15, as described.

6. The combination, with the draw-bar 10, the collar 13, and the detachable sleeve 14, as described.

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