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J. A. RODGERS
LATHE ATTACHMENT

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2 Sheets-Sheet 2

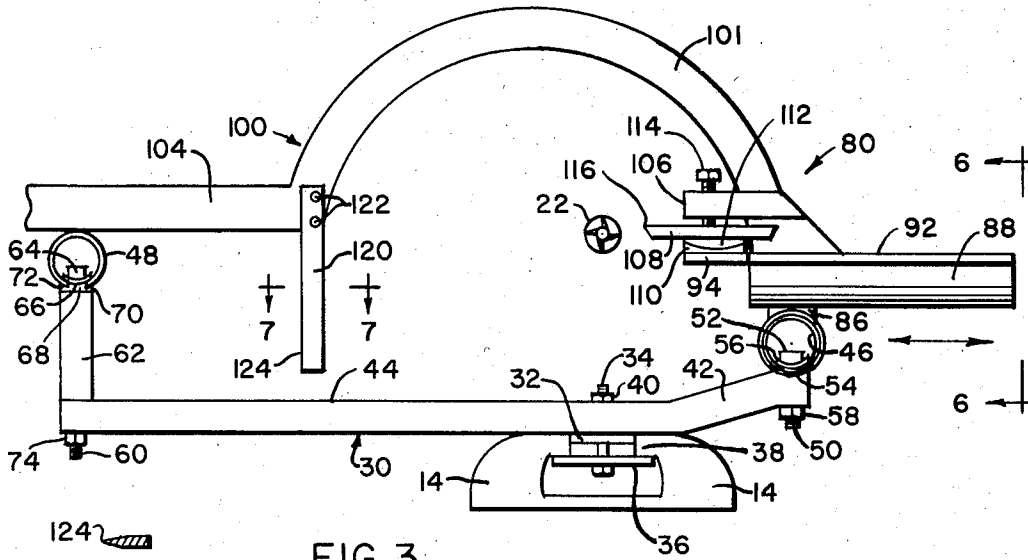


FIG. 3

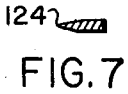


FIG. 7

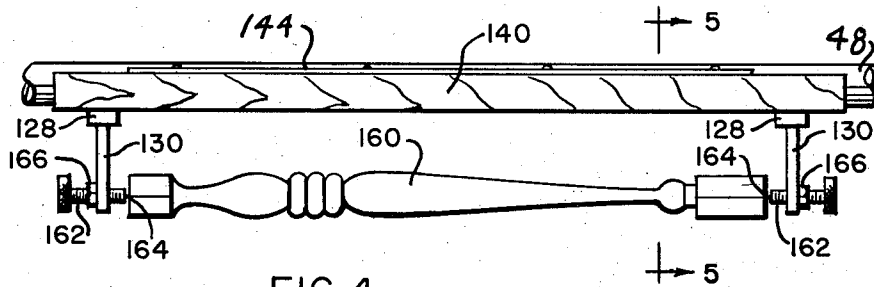


FIG. 4

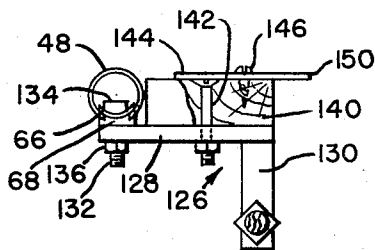


FIG. 5

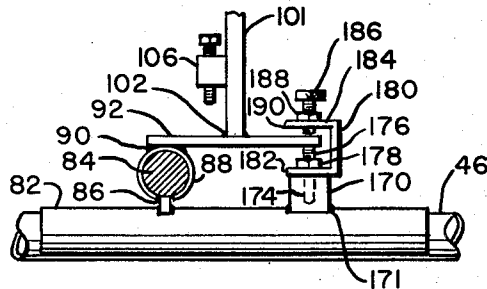


FIG. 6

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LATHE ATTACHMENT

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9 Claims. (Cl. 142—55)

This invention relates generally to lathe attachments and relates more particularly to improved apparatus for attachment to woodworking lathes whereby improved work may be turned out.

While the invention has particular utility in connection with woodworking lathes, and is shown and described in such connection, it is to be understood that its utility is not confined thereto.

Heretofore it has been extremely difficult, if not impossible, to duplicate turned parts with the ordinary woodworking lathe, particularly those used in small shops, hobbyists and the like and it is, therefore, an object of the present invention to provide apparatus that may be attached to a lathe and with which parts, such as turned table and chair legs and the like, may be duplicated.

Another object of the invention is to provide apparatus of this character wherein a pattern or template may be used in connection with the cutting of the work.

Still another object of the invention is to provide apparatus of this character wherein a model or prototype of the article to be cut may be used in lieu of the above referred to template or pattern.

A further object of the invention is to provide apparatus of this character with which extremely accurate work may be turned out.

A still further object of the invention is to provide, in apparatus of this character, tool carrying means well supported against forces or stresses arising from engagement of the tool with the rotating work.

Another object of the invention is to provide apparatus of this character wherein the tool carrying means is securely held against lateral pressure.

Still another object of the invention is to provide apparatus of this character wherein the tool carrying means is smoothly and easily slidable longitudinally of the lathe and laterally thereof.

A further object of the invention is to provide apparatus of this character wherein the feel of the work is not lost by the operator.

A still further object of the invention is to provide, in apparatus of this character, means engageable with the pattern or template or model and adapted to follow the configuration thereof even into relatively narrow recesses or grooves.

Another object of the invention is to provide apparatus of this character having means for adjusting the tool upwardly and downwardly with respect to the axis of the work.

Still another object of the invention is to provide apparatus of this character that is simple in construction.

A further object of the invention is to provide apparatus of this character that is relatively easy to attach to a lathe and, if desired, to remove therefrom.

A still further object of the invention is to provide apparatus of this character that is sturdy in construction and relatively inexpensive to manufacture.

Another object of the invention is to provide apparatus of this character that is well adapted to its intended use.

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The characteristics and advantages of the invention are further sufficiently referred to in connection with the following detailed description of the accompanying drawings which represent one embodiment. After considering this example, skilled persons will understand that variations may be made without departing from the principles disclosed, and the employment of any structures, arrangements or modes of operation that are properly within the scope of the appended claims is contemplated.

Referring to the drawings:

Fig. 1 is a top plan view of a lathe with apparatus embodying the present invention attached thereto;

Fig. 2 is a side elevation of the same;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1 but without the pattern or model supporting means;

Fig. 4 is a side elevation of the pattern or model carrying means;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a sectional view taken on line 6—6 of Fig. 3; and

Fig. 7 is a sectional view taken on line 7—7 of Fig. 3.

Referring more particularly to Figs. 1 and 2, there is shown a lathe, indicated generally at 10, to which is attached the present attachment or apparatus, indicated generally at 12.

The lathe is adapted to be mounted on any suitable support and comprises the usual bed, shown herein as including a pair of longitudinally extending, laterally spaced members or ways 14. There is also the usual head piece 16, tail piece 18 and driving pulleys 20 whereby the center 22 of the head piece may be driven in the usual well-known manner. The tail piece 18 includes the usual center 24 and adjusting means 26 therefor whereby the center 24 may be adjusted longitudinally with respect to the lathe.

There are a plurality of transversely extending rail supporting bars 30, Figs. 1, 2 and 3, two of such bars being shown herein although it is to be understood that more may be used if desired. Bars 30 are of the same construction and hence a description of one only will be made. Adjacent one end there is a transverse block 32 on the bottom of the bar and integral therewith, said block 32 being snugly but slidably received between the ways 14 so that the bars may be adjustably positioned longitudinally of the ways. There is a vertical bore through the bar and block 32 for reception of a clamp bolt 34 there being a clamping member 36 disposed beneath the longitudinally extending flanges 38 of the ways 14. Clamp member 36 is also provided with a hole or opening for reception of the bolt 34 and a nut 40 is provided on the free end portion of said bolt to draw the clamping member and adjacent part of the bar toward each other to secure said bar to the top of said ways.

It is to be noted that the right-hand end portion 42 of said bars 30, as viewed in Figs. 1 and 3, are at the front of the lathe and are substantially shorter than the rearwardly extending portions 44. Also, the end portions 42 are inclined upwardly and forwardly somewhat, as best shown in Fig. 3.

The present apparatus also includes a longitudinally extending front rail 46 and a longitudinally extending rear rail 48. Rails 46 and 48 are generally tubular in character and each has a longitudinally extending slot at the bottom thereof.

The forward free ends of the bars 30 are provided with vertical openings therethrough for reception of bolts or screws 50. Each bolt 50 has a head 52 and there is a clamping plate 54 on said bolt in engagement with said head. Plate 54 extends over the adjacent marginal edge portions of the rail 46 on the inside thereof and is adapted to clamp said edge portions against an arcuate fixed clamping member 56 formed integrally with the adjacent

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portion of the respective rail. A nut 58 is provided on the bolt for tightening the clamping members 54 and 56 to thereby secure the rail to the respective bar.

The rear rail is supported by the rearwardly extending portions 44 of the rail supporting bars 30 adjacent the rear free ends thereof. The rail 48 is at a higher elevation than the front rail 46 and the means for operably mounting said rail 48 to the rear ends of said bars 30 is the same so that a description of one such mounting means is sufficient.

Adjacent the free rear end of each supporting bar there is a vertical opening, not shown, for reception of a bolt 60, the lower end portion of said bolt 60 projecting below said bar. A tubular spacer 62 is disposed on the bolt 60 and the head 64 of said bolt is disposed within the rail 48. Beneath the head 64 is a clamping plate 66 which overlaps the adjacent edges of the rail, as does the clamping member or plate 54 overlaps the adjacent edges of the rail 46. Also, on the bolt 60, between the upper end of the spacer 62 and the clamping plate or member 66, there is disposed an adapter 68 having front and rear grooves 70 and 72 respectively for reception of the outer adjacent edge portions of the rail 48 at opposite sides of the longitudinal slot in the lower side thereof. A nut 74 is threaded on the lower end of the bolt 60 for tightening the assembly and securely holding the rail 48.

The tool holding mechanism, indicated generally at 80, comprises a sleeve 82 snugly but slidably received on the front rail 46. The sleeve 82 extends a substantial distance about the rail 46 with the longitudinal edges spaced sufficiently apart at the bottom of the sleeve to clear the clamping means for clamping the rail 46 to the bars 30 when said sleeve is moved longitudinally on said rail 46. Above the sleeve 82 is a cylindrical bar 84 having its axis normal to the axis of said sleeve, the bar 84 being secured to sleeve 82 by means of a web 86 which is secured to both the bar 84 and the sleeve 82 by means of welding or any other suitable arrangement. On the rod 84 is slidably mounted a sleeve 88 slotted at the bottom longitudinally at its length so as to clear the web 86 when said sleeve is moved longitudinally on the rod 84. To the top of sleeve 88 is secured, by welding 90 or any other suitable means, a plate 92, said plate being secured to the sleeve 88 adjacent one edge of said plate so that the latter extends laterally of the sleeve, as best shown in Figs. 1, 2 and 6. Plate 92 has a tongue 94 which extends centrally of the plate 92 toward the rear of the lathe, said tongue being at the rear of said plate.

There is a guide finger support, indicated generally at 100, which includes an arcuate part 101 having one end secured to the plate 92 adjacent the rearward end of said plate, by welding 102 or the like. The arcuate shaped part 101 is bowed upwardly and is substantially semi-circular. From the rearward end of the part 101, there is a rearward, substantially horizontal portion 104 which is adapted to contact the upper part of the rear rail 48 and to slide freely thereon, said part 104 being of sufficient length to rest on said rail 48 as the tool support is moved forwardly and rearwardly in a normal manner.

The arcuate part 101 is adapted to provide clearance for work on the centers of the lathe and adjacent the end of said part 101 attached to the plate 92 there is an arm 106 which extends rearwardly above the tongue 94 and terminates at its free end in substantially the same vertical plane as the rearward end of the tongue 94. It is to be noted that said arm 106 is spaced above the plate 92 and tongue 94 a sufficient distance to provide room for a cutting tool 108 and an adjustable support therefor which comprises a lower member 110 having a concave upper face and an upper member 112 which has a convex lower face adapted to seat on said upper face of the member 110. Arm 106 is provided with a vertical, tapped bore for threadable reception of a screw 114 wherewith the tool 108 is secured in operative position. In wood-working it is best to have the cutting point 116 of the

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tool 108 not lower than the horizontal plane through the axes of the lathe centers and often said point should be above said horizontal plane. Adjustment of the tool 108 to properly position the point 116 with respect to the work is easily effected by having the adjustable tool support, the upper part 112 sliding in the concave portion of the lower part 110 to permit this adjustment of said tool 108.

At the rearward end of the part 101, there is a vertically arranged finger 120 which is secured adjacent its upper end to said part 101 by means of rivets 122 or by any other suitable means. The sides of the finger 120 are beveled rearwardly so as to provide a relatively narrow rear edge 124, best shown in Fig. 7, which is adapted to follow the configuration of a pattern or a model of the part to be turned.

Means for supporting a pattern or model is provided and comprises a pair of brackets, indicated generally at 126. Each bracket includes a horizontal part 128 which is attached to the rear rail 48 by means hereinafter described and which extends forwardly relative to said rail, and a vertical part 130 which depends from the forward free end of said horizontal part 128. There is a vertical opening through the part 128 adjacent the rear end thereof for reception of a screw 132 which has a head 134 at the upper end thereof. On said screw and above the arm 128 there is a clamping plate and an adapter of substantially the same construction as the clamping plate 66 and adapter 68 so that said parts are here again given the same reference numerals. A nut 136 is provided on the depending end portion of the screw 132 whereby the bracket 126 is securely clamped to the rear rail 48. With this arrangement the brackets 126 may be adjusted longitudinally of the lathe relative to each other.

A member 140, which may be of wood or any other suitable material is secured to the brackets 126 by bolts 142 or the like. The member 140 extends longitudinally of the lathe and a pattern 144 is secured to the member 140 by any suitable means such as clamps, bolts or screws, the latter being shown and indicated at 146, the forward edge portion of said pattern extending forwardly of the adjacent edge of member 140 and the forward free edge 150 of said pattern is contoured, as best shown in Fig. 1. The pattern may be of any suitable material, such as metal, plywood, plastic or the like and any desired pattern configuration, angle or taper may be used. It should be noted that the rear edge 124 of the finger 120 should be honed or ground to a small radius for smooth contact with the pattern.

In operating the device, the operator moves the tool holding mechanism 80 rearwardly at some high point in the pattern. The tool will cut into the work until the rear edge 124 of the finger 120 engages the adjacent portion of edge 150 of the pattern. The cutting will be from the high points toward the low points and the tool holding mechanism is moved longitudinally of the lathe during the cutting operation as well as rearwardly in conformity with the pattern edge 150.

Alternatively to the use of a pattern, a model, indicated at 160 in Fig. 4, may be used. For this purpose the arms 130 of the brackets 126 are provided, adjacent their lower ends, with aligned tapped openings for reception of screws 162 having pins 164 at their inner free ends for engagement with the adjacent ends of the model 160. Lock nuts 166 are provided on the screws to hold same in adjusted positions.

If the model 160 is of such length as to be received between the centering screws 162 without removal of the member 140, it is only necessary to remove the pattern 144 from said member. However, if the length of the model 160 is such as to require adjustment of the brackets 126 toward or away from each other, then the member 140 is removed from said brackets and the latter are then adjusted to properly hold the model 160 therebe-

tween. When the model 160 is used, the operator operates the mechanism as hereinabove described but in this case, the edge 124 of the finger 120 is moved into engagement with the model itself which now forms the pattern for the piece of work being turned. Whether the pattern is used or the model is used an exact duplication of parts is possible with this mechanism.

Means for supporting the side of the plate 92 opposite the side secured to the sleeve 88 is provided and comprises a boss 170 secured to the sleeve 82 by means of welding 171 or the like, said boss extending upwardly from said sleeve 82 and having a tapped bore 174 extending downwardly from the upper end thereof for reception of a screw 176 on the upper end of which the adjacent side of the plate 92 rests. The screw 176 is threaded into the tapped opening 174 a sufficient distance to level the plate 92 and the adjustment of said screw 176 is secured by means of a nut 178 thereon.

If desired, means for indicating the relative position forwardly or rearwardly of the tool holding mechanism a bracket 180 may be provided which is in the general shape of a U lying on one side with the open side facing the plate 92, with the adjacent side portion of said plate received within said bracket. The lower arm 82 of the bracket is provided with an opening whereby the bracket may be placed on the screw 176 and secured thereby by the lock nut 178. The upper arm 184 is provided with a tapped opening aligned with the opening in the arm 182 and there is a screw 186 received in the opening in the arm 184, said screw having a lock nut 188 thereon. The free end of the arm 184 may be pointed as at 190, for cooperation with a scale 192, Fig. 1, on the upper side of the plate 92. The plate 192 and the parts carried thereby may be secured in an adjusted position by means of the screw 186 or said screw may not be tightened on said plate so that said plate may slide readily on the upper end of screw 176 as the tool holding mechanism is moved forwardly and rearwardly on the rod 84.

In order to provide smooth easy movements of the tool holding mechanism, both longitudinally and transversely (forwardly and rearwardly) the outer surfaces of the rail 46 and rod 84 are ground. Likewise, the inner surfaces of the respective sleeves 82 and 88 are reamed to closely engage said rail 46 and rod 84 but still permitting easy sliding of said sleeves on said rail and rod respectively. With the present arrangement it may be said that the tool holding means "floats."

It is to be noted that the long leverage of the guide finger support 100 also provides firm support for the tool supporting mechanism or assembly to hold same in position against displacement from forces caused by engagement of the tool with the rotating work.

Instead of using the tool 108 a boring bar or tool may be secured in the tool holder at an angle substantially normal to the position of the tool 108 and may be used for cutting or cupping out items secured wholly on the lathe spindle or driving head. Operation may be free hand or in accordance with a pattern so as to duplicate the item.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it is also thought that it will be apparent that various changes may be made in the form, construction and arrangement of the parts of the invention without departing from the spirit and scope thereof or sacrificing all of its material advantages, the arrangement hereinbefore described being merely for purposes of illustration.

I claim:

1. An attachment for a lathe having lathe ways and work supporting means and rotating centers mounted thereon, comprising: a plurality of rail supporting bars secured to said ways, said bars extending transversely of said ways and spaced apart from each other longitudi-

nally of said ways; a longitudinally extending, tubular rail secured to said bars adjacent the forward ends thereof; a longitudinally extending tubular rear rail secured to said bars adjacent the rear ends thereof, said rear rail being disposed above the horizontal plane of the front rail, said rails being substantially parallel to each other; a sleeve slidably mounted on the front rail; a guide rod mounted on said sleeve, normal to the axis thereof; a sleeve slidably mounted on said rod; a plate, secured at one side to the last mentioned sleeve; means secured to the first mentioned sleeve for supporting the other side of said plate, said plate having a rearwardly extending tongue; a finger support comprising an arcuate part having the forward end thereof secured to said plate adjacent the rear thereof and arching rearwardly, and a substantially horizontal part extending from the rear of the arcuate part and slidably resting on the rear rail; a tool clamping arm on said arcuate part, extending rearwardly over said tongue; a tool between said clamp and said tongue, said tool extending rearwardly for engagement with work on the centers of said lathe; a screw carried by said clamp arm for securing said tool in operative position; a sensing finger depending from said support and having a relatively thin rear edge; and pattern and model holding means comprising brackets adjustably secured to the rear rail and spaced apart longitudinally relative thereto; a longitudinally extending pattern holding member removably secured to said brackets; and a longitudinally adjustable center for each bracket, said centers being aligned on an axis extending longitudinally of the lathe and substantially parallel to the axis of the lathe centers.

2. An attachment for a lathe having lathe ways and work supporting means and rotating centers mounted thereon, comprising: a plurality of rail supporting bars secured to said ways, said bars extending transversely of said ways and spaced apart from each other longitudinally of said ways; a longitudinally extending, tubular rail secured to said bars adjacent the forward ends thereof; a longitudinally extending tubular rear rail secured to said bars adjacent the rear ends thereof, said rear rail being disposed above the horizontal plane of the front rail, said rails being substantially parallel to each other; a sleeve slidably mounted on the front rail; a guide rod mounted on said sleeve, normal to the axis thereof; a sleeve slidably mounted on said rod; a plate, secured at one side to the last mentioned sleeve; means secured to the first mentioned sleeve for supporting the other side of said plate, said plate having a rearwardly extending tongue; a finger support comprising an arcuate part having the forward end thereof secured to said plate adjacent the rear thereof and arching rearwardly, and a substantially horizontal part extending from the rear of the arcuate part and slidably resting on the rear rail; a tool clamping arm on said arcuate part, extending rearwardly over said tongue; a tool between said clamp arm and said tongue, said tool extending rearwardly for engagement with work on the centers of said lathe; a screw carried by said clamp arm for securing said tool in operative position; a sensing finger depending from said support and having a relatively thin rear edge; pattern holding means comprising brackets adjustably secured to the rear rail and spaced apart longitudinally relative thereto; and a longitudinally extending pattern holding member removably secured to said brackets.

3. An attachment for a lathe having lathe ways and work supporting means and rotating centers mounted thereon, comprising: a plurality of rail supporting bars secured to said ways, said bars extending transversely of said ways and spaced apart from each other longitudinally of said ways; a longitudinally extending, tubular rail secured to said bars adjacent the forward ends thereof; a longitudinally extending tubular rear rail secured to said bars adjacent the rear ends thereof, said rear rail being disposed above the horizontal plane of the front

rail, said rails being substantially parallel to each other; a sleeve slidably mounted on the front rail; a guide rod mounted on said sleeve normal to the axis thereof; a sleeve slidably mounted on said rod; a plate secured to the last mentioned sleeve, said plate having a rearwardly extending tongue; means for releasably securing a tool on said tongue; a finger support comprising an arcuate part having the forward end thereof secured to said plate adjacent the rear of said plate and arching rearwardly, and a substantially horizontal part extending from the rear of the arcuate part and slidably resting on the rear rail; a sensing finger depending from said support and having a relatively thin rear edge; and pattern and model holding means comprising brackets adjustably secured to the rear rail and spaced apart longitudinally relative thereto; and a longitudinally extending pattern holding member removably secured to said brackets.

4. An attachment for a lathe having lathe ways and work supporting means and rotating centers mounted thereon, comprising: a plurality of rail supporting bars secured to said ways, said bars extending transversely of said ways and spaced apart from each other longitudinally of said ways; a longitudinally extending, tubular rail secured to said bars adjacent the forward ends thereof; a longitudinally extending tubular rear rail secured to said bars adjacent the rear ends thereof, said rear rail being disposed above the horizontal plane of the front rail, said rails being substantially parallel to each other; a sleeve slidably mounted on the front rail; a guide rod mounted on said sleeve normal to the axis thereof; a sleeve slidably mounted on said rod; a plate secured to the last mentioned sleeve, said plate having a rearwardly extending tongue; means for releasably securing a tool on said tongue; a finger support comprising an arcuate part having the forward end thereof secured to said plate adjacent the rear of said plate and arching rearwardly, and a substantially horizontal part extending from the rear of the arcuate part and slidably resting on the rear rail; a sensing finger depending from said support and having a relatively thin rear edge; model holding means comprising brackets adjustably secured to the rear rail and spaced apart longitudinally relative thereto; and a longitudinally adjustable center for each bracket, said centers being aligned on an axis extending longitudinally of the lathe and substantially parallel to the axis of the lathe centers.

5. An attachment for a lathe having lathe ways and work supporting means and rotating centers mounted thereon, comprising: a plurality of rail supporting bars secured to said ways, said bars extending transversely of said ways and spaced apart from each other longitudinally of said ways; a longitudinally extending rail secured to the forward ends of said bars; a longitudinally extending rear rail secured to said bars adjacent the rear ends thereof, said rails being substantially parallel to each other; a sleeve slidably mounted on the front rail; a guide rod mounted on said sleeve normal to the axis thereof; a sleeve slidably mounted on said rod; a plate secured to the last mentioned sleeve; a finger support comprising an arcuate part having the forward end thereof secured to said plate adjacent the rear of said plate and arching rearwardly, and a part extending from the rear of the arcuate part and slidably resting on the rear rail; a sensing finger depending from said support and having a relatively thin rear edge; means for operably securing a tool to said plate; and pattern holding means adjustably secured to the rear rail and engageable by the rear edge of said finger.

6. An attachment for a lathe having lathe ways and work supporting means and rotating centers mounted thereon, comprising: a longitudinally extending front rail; a longitudinally extending rear rail parallel thereto; means for securing said rails to the lathe ways with said rear rail disposed above the horizontal plane of the front rail; a sleeve slidably mounted on the front rail; a guide

rod mounted on said sleeve normal to the axis thereof; a sleeve slidably mounted on said rod; a plate secured to the last mentioned sleeve; a finger support comprising an arcuate part having the forward end thereof secured to said plate and arching rearwardly, and a part extending from the rear of the arcuate part and slidably resting on the rear rail; a sensing finger depending from said support and having a relatively thin rear edge; means for holding a tool on said plate with the cutting end extending rearwardly beneath the arch formed by said arcuate part; and means secured to the rear rail for holding a part having a configuration to be imitated on said lathe and located so as to be engageable by said finger.

7. An attachment for a lathe having lathe ways and work supporting means and rotating centers mounted thereon, comprising: a longitudinally extending front rail; a longitudinally extending rear rail parallel thereto; means for securing said rails in operative relationship to the lathe; a sleeve slidably mounted on the front rail; a guide rod mounted on said sleeve normal to the axis thereof; a sleeve slidably mounted on said rod; a plate secured to the last mentioned sleeve; a finger support comprising an arcuate part having the forward end thereof secured to said plate and arching rearwardly, and a part extending from the rear of the arcuate part and slidably resting on the rear rail; a sensing finger depending from said support; means for holding a tool on said plate with the cutting end extending rearwardly beneath the arch formed by said arcuate part; and means secured to the rear rail for holding a part having a configuration to be imitated on said lathe and engageable by said finger to follow said configuration.

8. An attachment for a lathe having lathe ways and work supporting means and centers mounted thereon, comprising: a longitudinally extending front rail; a longitudinally extending rear rail; means securing said rails to the lathe ways; a sleeve slidably mounted on the front rail; a guide rod mounted on said sleeve normal to the axis thereof; a sleeve slidably mounted on said rod; a plate secured to the last mentioned sleeve; a finger support comprising an arcuate part having the forward end thereof secured to said plate and arching rearwardly, and a part slidably resting on the rear rail; a sensing finger depending from said support; means for holding a tool on said plate with the cutting end extending beneath the arch formed by said arcuate part; and means secured to the rear rail for holding a part having a configuration to be imitated on said lathe, said part being engageable by said finger so that said finger will follow said configuration.

9. An attachment for a lathe having lathe ways, work supporting means and rotating centers mounted thereon, comprising: front and rear rails, parallel to each other, means securing said rails to said lathe ways; a sleeve slidably mounted on the front rail; a guide rod mounted on said sleeve normal to the axis thereof; a sleeve slidably mounted on said rod; plate means secured to the last mentioned sleeve; a finger support comprising an arcuate part having the forward end thereof secured to said plate means and arching rearwardly, and a part slidably resting on the rear rail; a sensing finger depending from said support and having a rear vertical edge that is narrow in extent; means for holding a tool on said plate means with the cutting end extending beneath the arch formed by said arcuate part; and means secured to the rear rail for holding a part having a configuration to be imitated on said lathe, said part being engageable by the rear vertical edge of the finger.

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