TOY MACHINE SHOP TOOL

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This invention relates to a new and useful toy machine shop tool and more particularly to a toy, motor-driven, convertible wood-working type machine shop tool.

Toy, motor-driven, convertible wood-working type machine shop tools are available. While generally satisfactory, these prior art toys do have certain disadvantages.

One disadvantage resides in the fact that certain of these prior art toys employ simulated saws, drills and the like which are incapable of performing actual wood-working operations with the result that a child soon becomes bored with them.

Although certain other prior art toys of this type employ saws, drills and the like which are capable of performing wood-working operations, they have the disadvantage that the average child experiences difficulty in setting up the toy for a particular operation and in operating the toy to turn out a finished product having a desired form.

In view of the foregoing factors and conditions characteristic of toy machine shop tools, it is a primary object of the present invention to provide a new and useful toy machine shop tool of the wood-working type not subject to the disadvantages enumerated above and having tool-holder means adapted to cooperate with template means for minimizing the skill required to perform wood-working operations and accurately reproduce objects such as table legs with the machine efficiently, safely and expeditiously.

Another object of the present invention is to provide a toy, motor-driven, convertible wood-working type machine shop tool.

Yet another object of the present invention is to provide a new and useful safety handle for a toy of the type described.

Still another object of the present invention is to provide a new and improved holder for a toy, lathe tool-bit which co-acts with a template of the present invention to guide the tool-bit during wood-working operations.

A further object of the present invention is to provide a new and useful live center for a toy lathe.

A still further object of the present invention is to provide a toy of the type described which may be converted from a lathe to a drill press by a child safely, efficiently and expeditiously.

Another object of the present invention is to provide a new and useful toy jig saw.

Yet another object of the present invention is to provide a new and useful toy bench saw.

Another object of the present invention is to provide a new and useful toy table sander.

According to a first embodiment of the present invention, a toy, motor-driven, convertible wood-working type machine shop tool is provided which comprises a motor driven head-stock, a bed plate and a tail-stock.

A safety handle is provided which can be slidably mounted on the bed and used as a tool holder for the lathe tool-bit when the toy is used as a lathe. When so used, a feltor is attached to the safety handle where it co-acts with a template mounted on the bed to guide the tool during wood-working operations.

The lathe can be converted to a jig saw by rotating the head-stock, bed plate and tail-stock assembly 180 degrees so that the bed is uppermost. The safety handle is then attached to the bed in such a manner that it serves as an arm for supporting a leaf spring. A jig saw blade may then be connected to the spring and to a sliding block on the head-stock which reciprocates the blade.

The head-stock is slidably mounted on ways on the bed and may be either locked to the ways for certain operations or left free to be slid along the ways when the head-stock is used as a drill press. When so used, the safety handle is attached to the head-stock to move it into engagement with the work being drilled.

A circular saw and a sanding head are also provided. These tools may be driven by the head-stock when the bed is in its upper most position. The bed includes an opening through which the sanding disc and the circular saw extend in such a manner that the bed serves as a work supporting table.

According to a second embodiment of the present invention, a motor driven head-stock, a bed plate and a tail-stock are provided. The head-stock is slidably mounted on the bed plate and is spring-loaded against stops at one end thereof by suitable spring means. The tail-stock is removably mounted on the other end of the bed plate and is adapted to be connected to the head-stock for use as a table when the device is used as a circular saw, a jig saw or a sanding machine.

A safety handle similar to that used with the first embodiments is also provided for use in the manner mentioned above in connection with the first embodiment. In addition, the feeler of the second embodiment may also be used as a fence for sawing operations.

The tail stock is provided with suitable legs which may be used to support the bed plate and head-stock vertically for drill press operations. During such operations, the safety handle is connected to the head-stock for moving it downwardly into engagement with a work piece against the bias of the spring means which minimizes the force required to return the head-stock to its elevated position.

An important feature of the second embodiment of the present invention resides in a live-center which may be used in combination with the tail stock to compensate for misalignment of a work piece during lathe operations.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings in which like reference characters refer to like elements in the several views.

In the drawings:

FIGURE 1 is an exploded, perspective view of a toy machine shop tool constituting a first embodiment of the present invention;

FIGURE 2 is a longitudinal, cross-sectional view taken along line 2—2 of FIGURE 1 on an enlarged scale and with parts shown in elevation;

FIGURE 3 is a transverse, cross-sectional view taken along line 3—3 of FIGURE 2;

FIGURE 4 is an enlarged, cross-sectional view of the dead center of the device of FIGURE 1;

FIGURE 5 is a perspective view of the device of FIGURE 1 with the parts arranged for operation as a drill press;
FIGURE 6 is an enlarged, cross-sectional view of the drill blade used in the device of FIGURE 5.

FIGURE 7 is a perspective view of the drill shown in FIGURES 5 and 6.

FIGURE 8 is an enlarged, elevational view, with parts shown in cross-section, of the device of FIGURE 1 with the parts thereof arranged for operation as a table saw or a bench sander.

FIGURE 9 is an enlarged, end view, with parts shown in cross-section, of the device of FIGURE 1 with the parts thereof arranged for operation as a jig saw.

FIGURE 10 is an enlarged, partial view, of the jig saw of FIGURE 9.

FIGURE 11 is a perspective view of a circular saw which may be used with the device of FIGURE 1 arranged as shown in FIGURE 8.

FIGURE 12 is an exploded, perspective view of a toy machine shop tool constituting a second embodiment of the present invention.

FIGURE 13 is an enlarged, cross-sectional view of the device shown in FIGURE 12.

FIGURE 14 is a transverse, cross-sectional view, taken along line 14—14 of FIGURE 13.

FIGURE 15 is a cross-sectional view taken along line 15—15 of FIGURE 14.

FIGURE 16 is an enlarged, elevational view, with parts broken away to show internal construction, of the device of FIGURE 12 with the parts arranged in the form of a table saw or bench sander.

FIGURE 17 is an enlarged end view of the device of FIGURE 12 with the parts thereof arranged in the form of a jig saw.

FIGURE 18 is an enlarged, partial, cross-sectional view of the tail stock of the device shown in FIGURE 12.

FIGURE 19 is an enlarged, partial, perspective view of a portion of the tail stock of the device of FIGURE 12.

FIGURE 20 is a perspective view of the device of FIGURE 12 with the parts arranged for operation as a drill press.

Referred again to the drawings and particularly FIGURES 1—4, a toy, motor-driven, convertible, wood-working type machine shop tool, generally designated 10, includes a bed 12, a motor-driven, slidable head-stock 14 and a fixed tail stock 16.

The bed 12 may be made from any suitable material such as plastic, sheet steel or extruded aluminum and includes a bottom wall 18 and a pair of T-shaped, upstanding, parallel spaced-apart ways 20 and 21 which are engageable at the will of the operator of the toy 10 by a first pair of grooves or slots 22 provided at the lower end 24 of the head-stock 14 or by a second pair of slots or grooves 26 provided at the upper end 28 thereof. The ways 20 and 21 are also engaged by grooves 29 provided in the tail-stock 16 which is affixed to the bed 12 by screws 29a.

The head-stock 14 is reciprocally mounted on the ways 20 and 21 and is biased to the left, as viewed in FIGURE 2, by a compression spring 30 which encompasses a rod 32 having one end 34 secured in the tail-stock 16 and on other end 36 slidably engaged by the head-stock 14. The spring 30 minimizes the effort required to accurately position the head-stock 14, and facilitates employing the toy 10 as a drill press, as will be hereinafter described.

The head-stock 14 may be locked to the bed 12 by a locking device 38 including a block 40 which is slidably mounted in the head-stock 14. The block 40 includes an elongated slot 42 through which an eccentric 44 extends. The eccentric 44 is rotatably mounted in the head-stock 14 and may be rotated by an over-throw lever 46. When rotated in a clockwise direction, as viewed in FIGURE 2, the eccentric 44 forces the block 40 downwardly into engagement with the way 20. This securely locks the head-stock 14 to the bed 12 at any point along the ways 20 and 21.

The toy 10 is shown in FIGURES 1—4 in a form suitable for operation as a lathe. The toy 10 is prepared for operation as a lathe by rotatably mounting a tail-stock bearing 48 in an aperture 50 provided in the tail-stock 16. The tail-stock bearing 48 includes a cylindrical body portion 52 having an annular shoulder 54 formed at one end 56 thereof. The tail-stock bearing 48 may be made from a suitable bearing material such as brass or from a plastic material having a low coefficient of friction and is provided with a counter bore or cavity 58 at its end 56. A pin 60 is mounted in the cavity 58 at right angles to the major axis thereof, and is engageable by the bifurcated end 62 of a live center 64.

The live center 64 includes a wood screw 66 so that it can be screwed into a suitable work piece 68 made of wood, plastic or the like. The bifurcated end 62 is an important feature of the invention because it permits swingably mounting the live center 64 on the pin 60 to minimize the effect when the live center 64 is not placed in the exact center of the longitudinal axis of the work piece 68.

When used as a lathe, the toy 10 also includes a live center 70 having a wood screw 72 which is engageable with the work piece 68 and a bifurcated end 74 which is engageable with a pin 76 fixedly mounted cross-wise in a bore 78 provided in a lathe drive 80. The lathe drive 80 includes an enlarged face plate 82 to which a sanding disc 83 may be affixed in a manner to be hereinafter described. The lathe drive 80 also includes a hub 84 having a cylindrical bore or cavity 86 engageable with non-cylindrical, motor output-shaft 88 provided on a motor 90 in the head-stock 14. The hub 84 engages a flat face 91 on the shaft 88 with a suitable friction fit so that the lathe drive 80 will be driven by the shaft 88.

The motor 90 is cooled by a fan 90a, as more fully shown in FIGURE 13, and is supplied with power through electrical leads 92 and a switchable switch 94.

The toy 10 also includes a safety handle 96 having a C-shaped grip portion 98. A channel-shaped cross bar 100 is affixed to one end 102 of the grip 98 and a tool holder 104 is affixed to the other end 106 of the grip 98. When the device 10 is to be operated as a lathe, a lathe tool bit 108 is retained in position on the tool holder 104 by a thumb screw 110. The skill required to manipulate the tool 108 in wood-working operations is minimized by employing a template 112 which may be mounted in a suitable slot 114 provided on the way 21. The template 112 is provided with a suitable design 116 on its upper edge 117 forming a pattern which may be followed by the toy 108 to reproduce the design 116 on the work piece 68.

The tool 108 is caused to follow the design 116 by a probe or feeler 120 having one end 122 affixed to the cross-arm or bar 100 and its other end 124 engageable with the pattern 116 when the bar 100 is in engagement with the cross way 20. The handle 96 is rockably and slidably mounted on the way 20 by a ridge 126 and lips 128 provided on the channel-shaped bar 100. The feeler 120 co-acts with the template 112 to control the depth of cut obtainable with the tool bit 108 in such a manner that the pattern 116 is reproduced on the work piece 68, as shown in FIGURE 2.

The toy or device 10 may be readily converted from the lathe shown in FIGURES 1—4 to a drill press by removing the tail-stock bearing 48, the lathe drive 80, the lathe bit 108, the probe 120 and the template 112 after which the locking mechanism 38 may be released so that the head stock 14 is free to reciprocate on the bed 12.

Referring now to FIGURES 5—7 after the aforementioned parts have been removed and the locking mech-
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(Figure 2) until a drill blade 134 engages a work piece 136 positioned on the bed plate 12 against the tail-stock 14. The drill 134 is aligned with the aperture 150 so that the drill may pass through the tail-stock 14 after drilling a hole in the work piece 136. The drill 134 may be conveniently stamped from a suitable piece of sheet steel and includes a body portion 130 having a flat, depressed portion 140 engageable with the flat face 91 on the shaft 88 for rotation of the drill bit 134 thereby. The drill 134 is provided with a semi-cylindrical strap member 144 which engages the semi-cylindrical portion 146 of the shaft 88. The drill 134 also includes a blade portion 148 which is provided with a sharpened tip 150 adapted to drill a hole in the work piece 136 when the blade 134 is rotated by motor 90. Of course it will be apparent to those skilled in the art that the toy 10 may also be used vertically as a drill press with the head-stock 14 uppermost and the tail-stock 16 serving as a base.

Referring now to FIGURES 8 and 11, the toy 10 may be readily converted to a bench sander or table saw by removing the head stock 14 from the bed 12 and turning it over so that the grooves 26 engage the ways 20 and 21. The head stock 14 is slid to the end 152 of bed 12 which is remote from the tail-stock 16 and then secured in position by actuating the locking mechanism 38. This operation positions the motor shaft 88 adjacent a slot 154 which is provided in the bottom wall 18 and through which the plate 83 of the lathe drive 80 extends when the hub 84 engages the shaft 88. The toy 10 is then inverted so that the bottom wall 18 of bed 12 becomes a table on which a work piece can be supported. In this position, the device 10 may be supported on a suitable surface by the top walls 14b and 16b of head stock 14 and tail stock 16, respectively. The tail stock 16 and the head stock 14 are of equal height so the bed 18 will be level in its inverted position.

Alternatively, a circular saw 158 having a cylindrical hub 159, which is provided with a non-cylindrical bore 161 adapted to frictionally engage the shaft 88, may be substituted for the lathe drive 80 when it is desired to use the device 10 as a circular saw blade. Danger to a child operating the device 10 as a table saw may be minimized by providing the circular saw 158 in the form of an anti-kick up blade or a plaster cast cutter of types which are well known in the art. One such plaster cast cutter is satisfactorily that shown in Stryker Patent No. 2,427,580.

Referring now to FIGURES 9 and 10, the device 10 may be readily converted for operation as a jig saw by mounting the head stock 14 on the bed 12 in its FIGURE 1 position so that the grooves 22 engage the ways 20 and 21. The device 10 is then turned upside down from its FIGURE 1 position so that the bottom wall 18 is again uppermost. Also, the head stock 14 is positioned on the bed 12 in such a manner that a reciprocating jig saw driving plate 160 is aligned with an aperture 162 provided near the end 152 of the bottom wall 18 (FIGURE 8). The locking mechanism 35 may then be actuated to lock the head stock 14 to the bed 12.

The plate 160 is provided with an aperture 164 at one end 166 which is engageable by an eccentric member 168 affixed to the motor shaft 88 for rotation thereby. Rotation of the eccentric 168 causes the plate 160 to reciprocate within suitable guide members 170 which are affixed to the front wall 176 of the head stock 14. A leaf spring 172 is affixed to the guides 170 in such a manner that shoe 174 provided on the spring 172 bears against the plate 160 to maintain it in sliding contact with the front wall 176 of the head stock 14. The plate 160 and the guides 170 are conveniently made from a suitable plastic having a low coefficient of friction to minimize the force required to reciprocate the plate 160. The other end 176 of the plate 160 is provided with a saw-receiving block 178 which is engaged by a transverse pin 180 provided on one end 182 of a jig saw blade 184. The other end 186 of blade 184 also carries a transverse pin 188 which is engageable with the bifurcated end 190 of a leaf spring 192.

When the toy 10 is employed as a jig saw, the handle 96 serves as a support arm for the leaf spring 192 which may be connected to the handle 96 by inserting the end 194 of spring 192 into the tool holder 104 and retaining it in position by the thumb screw 110. The handle 96 is connected to the head-stock 14 by engaging the bar 100 in the saddle 130 and tightening the thumb screw 132. When the motor 90 (FIGURE 2) is energized to rotate shaft 88, the eccentric 168 causes the plate 160 to reciprocate with a short stroke thereby reciprocating the blade 184.

A toy, motor-driven, convertible wood-working type machine shop tool constituting a second embodiment of the present invention, generally designated 10a is shown in FIGURES 12-20. The tool 10a is shown in FIGURES 12-15 in the form of a lathe and includes, generally, a head-stock 14a, a tail-stock 16a, and a bed 12a. The head-stock 14a includes an electric motor 90 having a shaft 88, both of which may be identical to the same elements shown in connection with the first embodiment of the present invention. The head-stock 14a is provided with grooves or slots 22a which engage ways 20a and 21a to reciprocally mount the head-stock 14a on the bed 12a above its bottom wall 18a. The head-stock 14a also includes a housing 200 in which a spring 30a is coiled. The spring 30a has a first end 202 which is affixed to the housing 200, has a second end 204 which is secured to the bottom wall 18a by a suitable pin 206 and normally maintains the head-stock 14a in position against stops 207 at the end 152a of the bed 12a.

The tail-stock 16a is also reciprocally mounted on the ways 20a and 21a by a pair of grooves 29a and may be locked in position on the bed 12a by a locking mechanism 36a having a hand wheel 46a affixed to a shaft 208 to which an eccentric member 210 is affixed for rotation thereby (FIGURE 18). The eccentric 210 carries a spider 212 having depending arms 214 which are engageable with the ways 20a and 21a to lock the tail-stock 16a in position on the bed 12a. The tail-stock 16a also is provided with an aperture 50a which is adapted to rotatably receive the bulbous end 48a of a live center 64a which includes a fluted head 66a and annular flange 66b. The live drive 80 of the FIGURE 1 tool embodiment may be affixed to the shaft 88 when the tool 10a is to be used as a lathe. Also, a pair of live centers 64a may be used to connect a work piece 68a in position on the tool 10a.

The other end 166a of the live center 64a is connected to the work piece 68a by gouging holes in the ends thereof and inserting the fluted ends 66a therein. One live center 64a is then placed in position on the lathe drive 80 whereupon the tail-stock 16a may be slid toward the head-stock 14a until the other live center 64a engages the tail-stock aperture 50a. The locking mechanism 38a may then be actuated to lock the tail-stock 16a in position and a template 112a may be mounted in a slot 114a on way 21a. The bulbous end 48a of the said one center 74a engages the aperture 78 with a friction fit for rotation by the drive shaft 80.

The bulbous end 48a of the other center 64a on the other hand, is rotatably mounted in aperture 78 and compensates for misalignment of the work piece 68a.

The tool 10a also includes a handle 96a having a first end 102a which is provided with an extrusion 106a. The member 106a may be slidably and rockably attached to the bed 12a by engaging it in a slot 216 provided in the way 20a. The handle 96a also includes an end 106a to which a tool bit holder 104a is affixed by a bolt 218. A lathe tool-bit 108 of the FIGURE 1 embodiment is secured in position on the tool holder 104a by a thumb screw 110a and a probe 120a is attached to the end 102a by screw 220 for engagement with the template 112a.

The tool 10a may be converted from the lathe shown in FIGURE 13 to the bench sander shown in FIGURE 14.
by removing the tail-stock 16a from bed 12a and attaching it to the head-stock 14a. For this purpose, the tail-stock 16a includes a depending flange 222 having a J-shaped opening 224 provided therein which is adapted to straddle the shaft 88. The tail-stock 16a also includes a depending lip portion 226 which is engageable behind in upstanding flange 228 provided on the head-stock 14a. With the tail-stock 16a in position as shown in FIGURE 16, the device 14a may be employed as a bench sander by connecting the lathe drive 80 to the motor shaft 88 in such a manner that the face plate 82 extends through a slot 154a which is provided in the tail stock 16a. Of course, it is apparent that the circular saw 158 shown in FIGURE 11 can be substituted for the lathe drive 80 and that the front wall 16c of tail stock 16a and the top wall 14c of the head-stock 14a cooperate to form a table for supporting a suitable work piece.

The tool 10a may be converted to a jig saw as shown in FIGURE 17 by engaging a slot 230, which is provided in the housing 200 of head-stock 14a, with the extrusion 100b provided on the handle 96a. The handle 96a then forms a jig saw frame wherein the tool holder 104a extends above the head-stock 14a in such a manner that the leaf spring 192 previously described in connection with the tool 10 may be secured to the tool holder 104a by the thumb screw 116a. The bifurcated end 190 of the spring 192 then extends above a notch 232 which is provided in the tail-stock 16a (FIGURE 19). The head-stock 14a is also provided with a reciprocating plate 160a which is reciprocated by an eccentric 160b affixed to the shaft 88 of head-stock 14a for rotation thereby. The plate 160a also includes a block 178a to which the end 182 of the jig saw blade 184 may be attached for reciprocation by the plate 160a upon rotation of the eccentric 160a.

The probe 120a may also be used as a guide fence for a jig saw or table saw operation by engaging the tail-stock 16a with a leg 120b provided on probe 120a and securing the probe 120a in position across the top of tail-stock 16a by tightening the bolt 220.

Referring to FIGURE 20, the tool 10a may be used as a drill press by sliding the tail-stock 16a to the end 152a of the bed 12a and securely locking it in position by actuating the wheel 46a after which the tool 10a is brought to a vertical position where it is supported by legs 234 provided on tail-stock 16a. The aperture 59a provided in tail-stock 16a received the drill bit 134 which is connected to the shaft 88 in the same manner as that employed in connection with the tool 10. A suitable work piece 136a may then be placed on the wall 16c of tail-stock 16a whereupon the head-stock 14a can be lowered toward the work piece 136a by pushing on the handle 96a which is connected to the head-stock 14a as shown in FIGURE 17. Upon completion of a drilling operation on the work piece 136a, the head-stock 14a is readily returned to the end 152a of the bed 12a with a minimum of effort because of the assistance of the spring 30a which also prevents the head-stock 14a from falling when the tool 10a is in its upright position.

While the particular tool, motor-driven, convertible wood-working type machine shop tools herein shown and described in detail are fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that they are merely illustrative of the presently preferred embodiments of the invention and that modifications are intended to the details of construction or design herein shown other than as defined in the appended claims.

What is claimed is:

1. A toy machine shop tool, comprising:
   a bed having parallel, spaced-apart ways provided thereon;
   a tail stock mounted on said ways at one end of said bed, said tail stock being provided with an aperture; and
   a head stock slidably mounted on said ways at the other end of said bed, said head stock including a motor

2. The toy machine shop tool as defined in claim 1 including:
   a tool holder connected to said head stock;
   a leaf spring supported by said tool holder above said reciprocable plate; and
   a saw blade having one end connected to said leaf spring and another end connected to said reciprocable plate for reciprocation thereby.

3. A toy machine shop tool, comprising:
   a bed having parallel, spaced-apart ways provided thereon;
   a tail stock mounted on said ways at one end of said bed, said tail stock being provided with an aperture; and
   a head stock slidably mounted on said ways at the other end of said bed, said head stock including a motor driven shaft to which various tools may be attached for rotation thereby, said shaft being aligned with said aperture, and spring means biasing said head stock away from said tail stock.

4. A toy machine shop tool, comprising:
   a bed having parallel, spaced-apart ways provided thereon;
   a tail stock mounted on said ways at one end of said bed, said tail stock being provided with an aperture; and
   a head stock slidably mounted on said ways at the other end of said bed, said head stock including a motor driven shaft to which various tools may be attached for rotation thereby, said shaft being aligned with said aperture, and spring means biasing said head stock away from said tail stock.

5. A toy machine shop tool as defined in claim 2 including:
   a drill bit connected to said shaft for rotation thereby; and
   a handle connected to said head stock for moving it toward said tail stock against the bias of said spring.

6. A convertible machine shop tool, comprising:
   a bed having parallel spaced-apart ways provided thereon;
   a tail stock mounted on said ways at one end of said bed, said tail stock being provided with an aperture; and
   a head stock slidably mounted on said ways at the other end of said bed, said head stock including a motor driven shaft to which various tools may be attached for rotation thereby, said shaft being aligned with said aperture.

7. An eccentric member affixed to said motor-driven shaft for rotation thereby; and
   a reciprocable plate reciprocably mounted on said head stock, said reciprocable plate including an aperture encompassing said eccentric member, whereby rotation of said eccentric member by said motor-driven shaft reciprocates said plate.

8. A lathe drive connectable to said shaft for rotation thereby, said lathe drive including a sanding face plate and a counter bore;
first and second live centers adapted to be rotatably mounted in said tail-stock aperture and said lathe drive counter bore, respectively; spring means connected to said head-stock for biasing it away from said tail-stock; a handle member having first and second ends, a tool holder mounted on said first end of said handle member and a bar member mounted on the other end of said handle member, said bar member being engageable with one of said ways to slidably and rockably mount said handle member thereon; means provided on said head-stock for affixing said bar member thereto in such a manner that said tool holder extends above said head-stock; a leaf spring connectable to said tool holder when it is extending above said head-stock, whereby said leaf spring extends over said plate; a jig saw blade having a first end connectable to the extended end of said leaf spring and a second end connectable to said reciprocatable plate; a template mounted on said bed plate parallel to and adjacent the other of said ways; a probe member for connection to said handle when it is in position on said one way for extending into engagement with said template to guide said tool holder; and a still bit having a body member adapted to be connectable to said shaft for rotation thereby.

7. In a toy machine shop tool comprising a bed having parallel spaced-apart ways provided thereon, a tail-stock mounted on said ways at one end of said bed, and a head-stock slidably mounted on said ways at the other end of said bed, the improvement comprising: a handle member having a first end adapted to be slidably and rockably mounted on one of said ways in a first operating mode and to be connectable to said head-stock in a second operating mode, said handle member also having a second end with a tool holder mounted thereon in such a manner that said tool holder will be cocked toward a work piece supported between said head-stock and said tail-stock when said handle member is rocked on said one way in said first operating mode and to support a leaf spring above said head-stock when said handle member is attached thereto in said second operating mode.

8. A convertible, toy machine shop tool, comprising: a bed having parallel, spaced-apart ways provided thereon; a tail-stock mounted on said ways at one end of said bed, said tail-stock being provided with an aperture; a head-stock slidably mounted on said ways at the other end of said bed, said head-stock including a motor-driven shaft adjacent a first pair of grooves at one end of said head-stock and a second pair of grooves at the other end thereof, whereby said head-stock may be mounted on said ways in inverted position; an eccentric member affixed to said motor-driven shaft for rotation thereby; a plate reciprocally mounted on said head-stock, said plate including an aperture encompassing said eccentric member, whereby rotation of said eccentric member by said motor-driven shaft reciprocates said plate; a block member affixed to said plate adjacent said second pair of grooves; a compression spring biasing said head-stock away from said tail-stock; an aperture provided in said bed intermediate its ends, said aperture being aligned with said block in one position of said head-stock on said ways; a slot provided in said bed intermediate its ends, said slot being adjacent said shaft when said head-stock is mounted on said bed by engaging said ways with said first pair of grooves, whereby a sanding disc may be connected to said shaft and extended through said slot in such a manner that said bed serves as a sanding table; and a handle member having a bar member affixed to one end and a tool holder affixed to its other end, said bar member being adapted to slidably and rockably mount said handle member on one of said ways in a first mode of operating said toy and to rigidly affix said handle to said head-stock in other modes of operation of said toy.

9. A convertible toy machine shop tool, comprising: a bed having parallel, spaced-apart ways provided thereon; a tail-stock slidably mounted on said ways at one end of said bed, said tail-stock including an aperture near one end and a depending flange at its other end, said depending flange being provided with a U-shaped opening, said tail-stock including locking means for locking said tail-stock to said bed; and a head stock slidably mounted on said ways at the other end of said bed, said head-stock including a motor-driven shaft to which various tools may be attached for rotation thereby, said shaft being aligned with said aperture said head-stock including flange means engageable by said tail-stock when said depending flange straddles said shaft, said head-stock having an upper surface and said tail-stock having a wall providing an upper surface in alignment with the upper surface on said head-stock when said tail-stock is connected thereto.

10. A convertible, toy machine shop tool as stated in claim 6 including a lug on said probe member for affixing said probe member to said tool in such a manner that said probe member functions as a guide fence in a third operating mode.

11. A toy machine shop tool comprising: a bed having parallel, spaced-apart ways provided thereon; a head stock mounted on said ways adjacent one end thereof; a power shaft extending from said head stock, parallel to said ways, adjacent the top of said head stock; means near the top and near the bottom of said head stock for selective mounting engagement with said ways whereby said head stock may be selectively mounted on said ways to position said power shaft close to said bed or spaced upwardly from same.

12. A toy machine shop tool as defined in claim 11 including a tail stock on said ways; said head stock and tail stock being the same height whereby said tool may be selectively positioned with said bed at the top or bottom thereof; and at least one opening through said bed, between said ways and through which a tool can project when said bed is uppermost.

13. A toy machine shop tool comprising: a bed having parallel, spaced-apart ways provided thereon; a head stock mounted on said ways adjacent one end thereof; a tail stock mounted on said ways adjacent the other end thereof; a handle member having a transverse enlargement at one end thereof; and clamp means on said headstock adapted to selectively receive and hold said enlargement in either of two positions in one of which said handle extends laterally of said head stock to serve as a handle for moving said head stock along said ways, and in the other of which said handle extends upwardly to serve as an over-arm for an accessory tool to be driven by said head stock.

14. A toy machine shop tool comprising: a bed having parallel, spaced-apart ways provided thereon; a head stock mounted on said ways adjacent one end thereof; a tail stock mounted on said ways adjacent the other end thereof; a handle member having a transverse enlargement at one end thereof; said enlargement and one of said ways being provided with casting guide means, one of which defines a laterally open guide channel parallel to said ways, and the other of which comprises an elongated head element slidable in said channel and
rockable therein about an axis parallel to said way; and
means on the other end of said handle for fixedly clamping
a cutting tool thereto.

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