

THE AMATEUR WOODWORKER AT THE BAND SAW

THE WOODWORKER SERIES

AMATEUR POWER WORKING TOOLS

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"MOTOR CAR TRAILERS"
"THE MARCH OF CHEMISTRY"
"HOW TO UNDERSTAND ELECTRICITY"
"THE NEW WORLD OF SCIENCE"
ETC.

WITH 86 ILLUSTRATIONS

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A WORD TO YOU

IN THE long, long ago when Man made his debut on this good earth of ours the first things that he crudely fashioned with his hands were formed of wood, and, it follows then, that *woodworking* is the oldest of all the crafts. Since this is true the natural desire and innate ability to use tools are inborn in the human race, and whether or not they are developed by the individual and put into a concrete form depends on numerous factors and various circumstances.

Woodworking has not only been one of the chief trades of skilled artisans from time immemorial but it has also been the happy hobby of many people whose efforts are directed along distinctly different fields of endeavor. To have a little shop all your own in the attic, in the basement, or in the backyard, and to make ornamental and build useful things of wood with your own hands is a hobby that will give you unalloyed pleasure, clear the cobwebs from your brain, add to your physical well-being, and, finally, provide you with a side-line that will materially help your bank account along, that is if you want it to.

Now until a few years ago the only tools the amateur had to work with were hand ones, if we except the little foot-power jig saw and turning lathe, and even these latter machines required a considerable expenditure of muscular energy to operate them. Since the fractional horse-power electric motor came into popular use the *work* in woodworking has been entirely eliminated, and so thousands of new followers have taken up the hobby, with the result that you will find innumerable miniature power workshops wherever you go—in the cities, the towns, the villages—in fact, everywhere that electricity is available.

The chief kinds of amateur woodworking power tools are (1) the jig saw, (2) the band saw, (3) the circular saw, (4) the lathe, (5) the drill press, (6) the jointer or planer, (7) the spindle shaper, (8) the sander, (9) the flexible shaft, and (10) the grinder. All of these power tools are run by electric motors that develop from $\frac{1}{4}$ to $\frac{3}{4}$ horsepower, and you can do nearly all kinds of work with them, and with practically no effort, in far less time, and a great deal more accurately than you can with hand tools.

With a power *scroll saw* you can saw out the most intricate designs and do the finest kind of marquetry, and by using what is called a *saber saw blade*, you can saw through wood that is upwards of 2 inches thick. A power *band saw* does the same kind of work as a jig saw but on a larger scale, while with a power *circular saw* you can saw off and rip boards at a rapid rate and with great accuracy.

The power *drill press* is, ordinarily, a machine for drilling holes in metals, but you can use it for a number of woodworking operations, the chief ones of which are (a) boring holes, (b) mortising square end holes, (c) routing out intricate work, that would take hours if you did it by hand, (d) shaping the edges of work, and, finally, (e) smoothing up work. The power *jointer* or *planer* is a machine with which you can plane off boards or other stock evenly and with dispatch, while a power *spindle shaper* enables you to make mouldings of dozens of different patterns, and to shape the edges of straight and curved work.

The power *sander* is a machine that sandpapers with a minimum of labor on your part and which would take hours to do by hand. By using a power *flexible shaft* you can get into places and do jobs that you cannot do otherwise, and, lastly, with a power *grinder*, you

can not only grind your cutting tools, but you can buff and polish work with it as well.

There are numerous makers of power woodworking tools and while they are fundamentally all alike they differ considerably in design and construction and, it follows, in price. I have described various makes and given a detailed description together with the current prices of them to the end that you can select those which will conform to your pocket-book and at the same time meet the requirements of the work you want to do.

Considering the capacity of these small power woodworking tools they are all very inexpensive and it is truly surprising how such good machines can be made to sell for so little. Of course the answer is found in the enormous output by the factories that manufacture them, *i.e.*, mass-production.

In any event if you are a woodworker, or are contemplating becoming one, you should by all means equip your workshop with these up-to-the-minute power tools. You don't need to buy them all at once, but you can get a jig saw, and then a lathe; follow on with a band saw, a circular saw, a planer, a shaper, a sander, a flexible shaft and a grinder, then you will have power tools that will do any kind of a job you want to do, however small or large, or whether you do it for pleasure or profit, or both.

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Hollywood, California

CONTENTS

I. ABOUT POWER WOODWORKING TOOLS...	1
The First Tools, Kinds of Power, Kinds of Tools, Electric Tools.	
II. THE POWER JIG SAW.....	11
Varieties of Saws, Blades and Stocks, Trimmings, Designs, Attachments.	
III. THE POWER BAND SAW.....	32
Varieties of Saws and Blades, Sharpening, Running.	
IV. THE POWER CIRCULAR SAW.....	49
Kinds of Saws and Blades, Running.	
V. THE POWER TURNING LATHE.....	70
Woodturning, Lathes, Metal Work.	
VI. THE POWER JOINTER OR PLANER.....	87
Varieties, Uses, Sharpening.	
VII. THE POWER SPINDLE SHAPER.....	99
Kinds, Shaping, Cutting, Sanding.	
VIII. THE POWER DRILL PRESS.....	111
Varieties, Bits and Drills, Boring, Mortising and Tenoning.	
IX. POWER SANDERS AND GRINDERS.....	131
Meaning, Varieties, Polishing, Grinding.	
X. SOME OTHER POWER TOOLS.....	148
Portable Drills, Flexible Shafts.	
XI. FRACTIONAL H.P. ELECTRIC MOTORS.....	153
Varieties, Starting Devices, Working.	
XII. FINDING SIZE AND SPEED.....	170
Motors, Shafts and Pulleys, Belts, Gears, Friction and Bearings.	

ILLUSTRATIONS

The Amateur Woodworker at the Band Saw	<i>Frontispiece</i>
Fig. 1.—The Primitive Bow Drill	2
Fig. 2.—A Bow Pole Lathe of the 16th Century	4
Fig. 3.—The Ward 12-inch Jig Saw	12
Fig. 4.—The Driver 14-inch Jig Saw	14
Fig. 5.—The Ward 24-inch Jig Saw	17
Fig. 6.—The Driver 24-inch Jig Saw	19
Fig. 7.—The Delta 24-inch Jig Saw	21
Fig. 8.—Kinds of Jig Saw Blades	22
Fig. 9.—Kinds of Jig Saw Files	26
Fig. 10.—The Sanding Attachment	27
Fig. 11.—The Hammer Attachment	28
Fig. 12.—The Router Attachment	30
Fig. 13.—The Ward 9-inch Band Saw	33
Fig. 14.—The Driver 12-inch Band Saw	37
Fig. 15.—The Delta 14-inch Band Saw at Work	38
Fig. 16.—How to Sharpen a Band Saw	42
Fig. 17.—How the Blade is Adjusted	45
Fig. 18.—How to Align the Band Saw	46
Fig. 19.—How to Saw Out a Disk	47
Fig. 20.—The Driver 7-inch Circular Saw	51
Fig. 21.—The Ward 8-inch Circular Saw	54
Fig. 22.—Details of the Driver 8-inch Circular Saw	55
Fig. 23.—The Driver 8-inch Circular Saw	56
Fig. 24.—The Delta 8-inch Circular Saw	57
Fig. 25.—Kinds of Circular Saws	60
Fig. 26.—Dado Heads and Cutters	61
Fig. 27.—Grooves that Can Be Cut with the Cutters	62
Fig. 28.—How to Sharpen a Circular Saw	64
Fig. 29.—How to Use the Pusher Stick	65
Fig. 30.—How to Cross-cut with a Miter Gauge	67
Fig. 31.—Moulding Cutters and the Work They Do	68
Fig. 32.—The Driver 6-inch Lathe	71

Fig. 33.—The Driver 8-10-inch Lathe	72
Fig. 34.—The Ward 13-inch Heavy Duty Lathe	75
Fig. 35.—The Delta Double Duty Lathe	78
Fig. 36.—A Set of Wood Turning Tools	79
Fig. 37.—Tools for Sizing the Work	80
Fig. 38.—Putting the Wood in the Lathe	81
Fig. 39.—How to Hold the Turning Tool	83
Fig. 40.—Sizing the Work with the Caliper	84
Fig. 41.—The Ward 4-inch Planer or Jointer	88
Fig. 42.—The Driver 6-inch Planer or Jointer	92
Fig. 43.—The Delta 6-inch Precision Jointer	95
Fig. 44.—How the Tables are Adjusted	96
Fig. 45.—How the Pusher Block is Made	97
Fig. 46.—The Ward Spindle Shaper	100
Fig. 47.—The Driver Spindle Shaper	101
Fig. 48.—Details of the Spindle Adjustment and Miter Gauge	103
Fig. 49.—The Delta High Speed Shaper	104
Fig. 50.—Some of the Numerous Shaper Cutters	106
Fig. 51.—A Conventional Straight Edge Moulding	108
Fig. 52.—How Curved Shaping is Done	109
Fig. 53.—The Ward Utility Drill Press	112
Fig. 54.—A Jacob's Key Chuck	113
Fig. 55.—Kinds of Power Drives	115
Fig. 56.—The Driver Ball Bearing Pedestal Drill Press...	117
Fig. 57A.—The Delta Double Duty Drill Press	119
Fig. 57B.—Cross Section View of the Delta Ball Bearing Drill Press	121
Fig. 58.—The Delta Triple Duty Drill Press	122
Fig. 59.—Kinds of Woodworking Bits	124
Fig. 60.—Hollow Chisel Mortising Bit and the Router Bit	125
Fig. 61.—How to Saw Out Disks and Circular Holes	129
Fig. 62.—The Ward Stationary Belt Sander	132
Fig. 63.—The Ward Portable Belt Sander	133
Fig. 64.—The Delta Band Saw Belt Sanding Attachment	135
Fig. 65.—The Standard Polishing Head	137

Fig. 66.—The Ward Heavy Duty Direct Driven Bench Grinder	139
Fig. 67.—The Driver 6-Inch Bench Grinder	140
Fig. 68.—The Driver Heavy Duty Direct Driven Bench Grinder	142
Fig. 69.—The Delta Direct Drive Pedestal Grinder	145
Fig. 70.—The Ward Portable Hand Drill	148
Fig. 71.—The Ward Flexible Shaft Unit	150
Fig. 72.—The Portable Flexible Shaft Unit	152
Fig. 73.—Parts of a Direct Current Motor	155
Fig. 74.—How the Starting Switch Works	155
Fig. 75.—How the Reversing Switch Works	156
Fig. 76.—Kinds of Alternating Currents	157
Fig. 77.—A Single Phase Synchronous Motor	159
Fig. 78.—Diagram of an Induction Motor	160
Fig. 79.—A Single Phase Repulsion-Induction Motor	163
Fig. 80A.—Diagram of Connections of the Capacitor-Start Motor	164
Fig. 80B.—A Single Phase Reversible-Capacitor Motor ..	166
Fig. 81.—Diagram of the Windings of a Three Phase Field Magnet	167
Fig. 82.—How a 3-Phase Motor is Connected with a 3-Phase Generator	168
Fig. 83.—A $\frac{3}{4}$ H.P., 3-Phase Motor	169
Fig. 84.—The Speed Indicator	171
Fig. 85.—How to Splice a Belt	174

Chapter I

ABOUT POWER WOODWORKING TOOLS

WORKING in wood is one of the oldest of the crafts and one of the most fascinating and useful. From the time that Man made his initial appearance on this good old earth of ours he has fashioned things of wood according to his ability and the tools he had at hand.

The First Hand Tools. In the beginning of things the tools he had to work wood with were made of *stone*, and considering the crudity of these and the low level of his mentality he used them nobly and well. Millenniums after came the *Bronze Age* and with it tools of a better kind, and, it follows, his skill as a woodworker showed marked improvement.

By the time that *iron* was discovered the human race had advanced mightily in brain power, and with it, came the coördination of eye and hand. *Homo sapiens* had, as his name indicates, become a quite nimble-witted fellow, and he not only made fairly good tools but he had learned how to use them with amazing dexterity.

The Earliest Mechanical Tool. The first of the simple hand tools were the hammer, the axe, the knife and the saw, while the earliest *mechanical tool* was the drill. The first primitive drill consisted of a fish bone, or an awl made of bone set in one end of the cylindrical wooden stick and this was given an alternate rotary motion by holding it between the palms of the open hands and then rolling it forth and back between them.

As a drill of this kind could only be used for making holes in soft materials prehistoric man improved upon it by fixing a bit of flint, or other hard stone, in the end of the stick. Now while this kind of a drill-point was

good enough as a cutter, the speed of it was comparatively slow and it required a lot of energy to keep it going.

Since this was the way of its improvements were in order and then an Edison of his race appeared on the scene of action; looping the cord of his bow around the stick a couple of times and resting the free end of the drill in the palm of his hand, as shown in *Fig. 1*, he



FIG. 1. THE PRIMITIVE BOW DRILL

could, by sawing the bow forth and back, drill a hole in far less time and with much less effort than he could by rolling with his hands. From this primitive drill has been evolved the turning lathe.

The Development of Foot Power Tools. Having developed the various kinds of hand tools that are necessary for working wood, he discovered how to make and temper steel for producing the tools, and how to use them with great skill; the next and obvious thing was to improve upon them so that, (1) less

energy would be required to do a given amount of work, (2) to do the same amount of work faster, and (3) to do it more accurately.

Now since man has more muscular strength in his legs than he has in his arms and, hence, can develop more power with the former than he can with the latter, he conceived the noble idea of making use of them to operate such tools as he could, when he would not only relieve the strain of his arms but would have his hands free to guide the work that was being done.

Since even the brainiest man is seldom able to think more than one jump ahead of what is already in his mind, so when he set out to produce a *machine tool*, i.e., a machine that will do the work of a hand tool, he nearly always begins by trying to couple the latter with whatever source of power he wants to use by means of one or more of the mechanical movements. This premise being true it is not at all strange that the first machine for turning wood, or *turning lathe* as it is called, was worked on the principle of the bow drill and the earliest of these of which there is an authentic record was invented in the 16th century.

It was called a *pole lathe*, and it consisted of a lathe bed on which was fixed a headstock and a tailstock, and between the centers of these was placed the work that was to be turned up. A cord was wrapped around the one end of the work and the lower end of it (the cord) was fastened to the free end of a treadle, while the upper end was fixed to the free end of a hickory or other springy pole, and, finally, the other end of this was secured to a beam or other suitable support as pictured in *Fig. 2*. Now when the turner pressed down on the treadle with his foot the cord caused the work to rotate in one direction, and when the pressure on the treadle was released the bent pole pulled the cord up and this

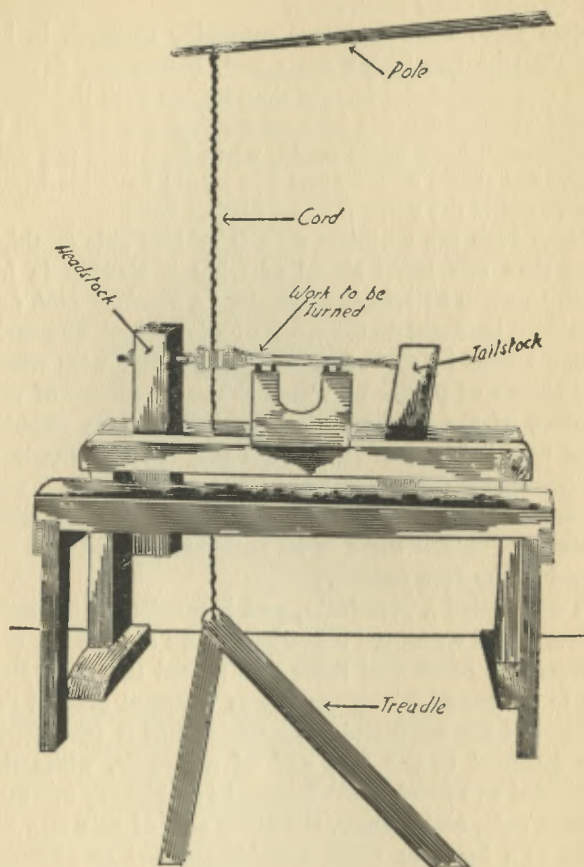


FIG. 2. A POLE LATHE OF THE 16TH CENTURY

rotated the work in the opposite direction. Pretty crude you will say but it was the best lathe of its time.

In the later part of the 17th century the *foot power lathe*, in which the treadle was connected with a grooved wheel by means of a rod called a *pitman*, came into use. At first these foot-power lathes were used by professional artisans but when water and steam power became available, they (the foot power lathes) were made in lighter and more compact forms and were used by the amateurs.

The *jig saw*, *fret saw* or *scroll saw*, as it is variously called, had its beginning when a very fine saw blade was fitted into a rectangular frame, and thousands of woodworking hobbyists throughout the world are still using it. Later on the jig saw was operated on the principle of the pole turning lathe, that is to say a cord or wire was fastened to the lower end of the saw blade, while to the upper end of the latter another cord or wire was fixed, and this was secured to a spring pole.

The saw blade was held in a vertical position by guide blocks above and below the table on which the work was placed. Now when the sawyer pressed down on the treadle with his foot the cord or wire would pull the blade down and make the cutting stroke, and when he released the pressure on the treadle the bent pole pulled the cord or wire up and, of course, the saw with it.

Following on came the jig saw that was operated with a wheel and pitman; this was belted to a pulley on a shaft that was rotated by either water or steam power, and a small portable one that was worked by foot power, for the amateur.

The Beginning of Power Driven Tools. *The water wheel* was the first machine that was devised which could deliver anything like useful power for