

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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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, Trim- mings, Designs, Attachments. | |
| III. THE POWER BAND SAW..... | 32 |
| Varieties of Saws and Blades, Sharpening, Run- ning. | |
| 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, Fric- tion 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

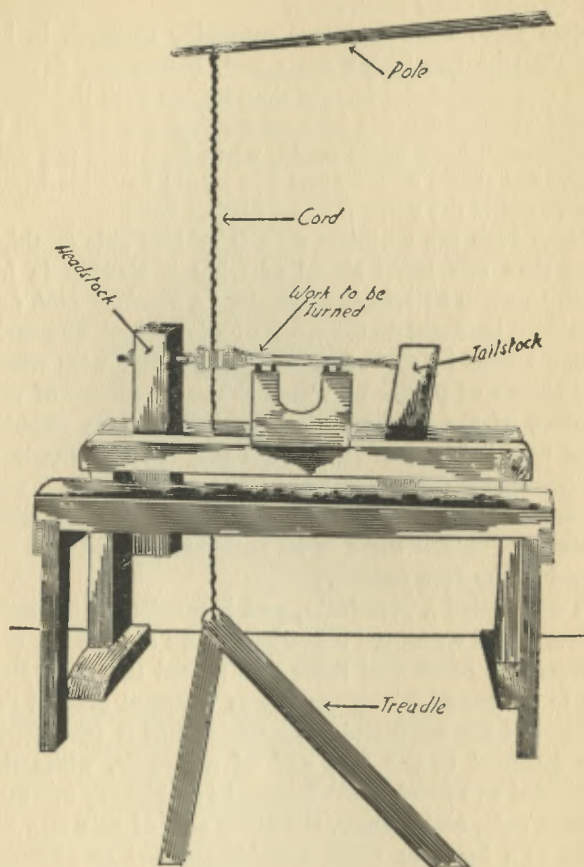


FIG. 2. A POLE LATHE OF THE 16TH CENTURY

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