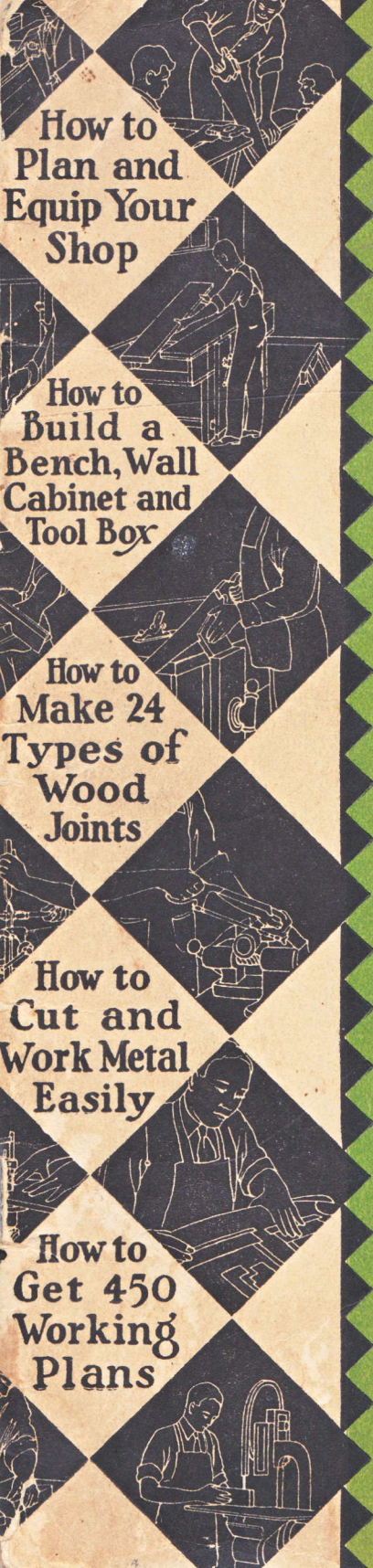
Floyd Baumann

1932 EDITION

The "How-To Do-It" Book for Home Workshops



Issued by E.C. Atkins and Company
Makers of "SILVER STEEL" Saws
Indianapolis, U.S.A.

10¢ a copy

To All Who Like to Work With Fine Tools

May your perusal of the 1932 Edition of "How To Do It" Book point the way to as many happy and profitable hours, in responding to the call of "The Home Workshop," as have been enjoyed by

The Author

First Edition 2— 9-31

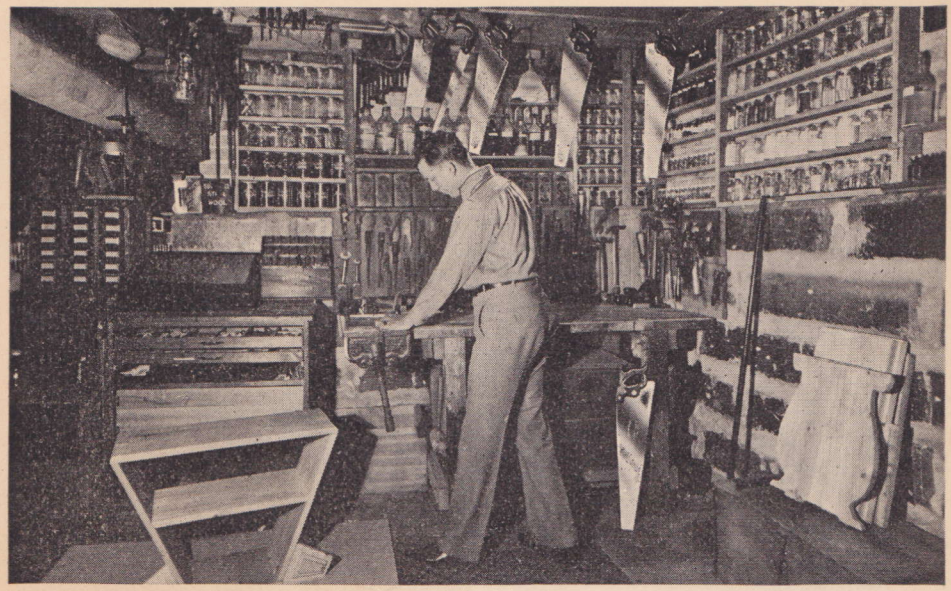


Fig. 1—You'll find home-crafting a most fascinating and enjoyable hobby, whether you begin with just a few tools and a bench, or fit up a complete workshop, with all the latest equipment

OWNING A HOME WORKSHOP

The Modern Hobby for Men and Boys

MANY of America's best-known business and professional men, as well as countless thousands of their less prominent brothers, know the joy of having a hobby.

Henry Ford's hobby is collecting things for his museum of early America. Charles Schwab runs a model farm in his spare time. Dr. John A. Harriss has become a national authority on traffic control as a result of a hobby. Col. E. H. R. Green's chief diversion from finance is electrical experimenting. And many another leading banker, manufacturer, doctor or lawyer finds happy relief from his exacting daily duties by working a while each evening at his home shop bench. Even some of the famous moving picture actors and executives turn home-craftsmen in spare hours.

For ANY man, whether millionaire or mechanic, there is genuine fun, relaxation and health to be found in pursuing a vigorous hobby such as home-crafting. It develops one's creative ability, as well as giving the mental and physical play which is so essential to relieve the high pressure of modern life.

And for an active boy, this hobby ideally satisfies the constant urge to "do things," and trains his mind and hands to accuracy. Fathers find the home shop a new center of comradeship in working with their sons; and even mother and the girls often enter heartily into the spirit of this fascinating pastime.

Home-crafting may mean simply working in a corner of the garage, kitchen or attic, with a household tool kit; or, it may involve the use of a whole room in the home basement, which is fully equipped with modern tools and machines for cutting and working wood, metals, and other materials.

But, whether large or small, a home workshop soon proves an intensely interesting and profitable hobby—one which pays the owner regular dividends in healthful pleasure, to say nothing of the value and utility of all the articles made in the shop.

A great many home craftsmen have developed their ability to build things, into a side-line business which brings a most welcome addition to the family income, especially during periods when many industries are working only part time.

So, whether you are considering home-crafting as a source of pleasure or profit, lose no time in finding the best spot in your home for a shop, and begin to experience the thrills of genuine satisfaction which come to every one who uses his spare time and his creative talents to make things with his own hands.

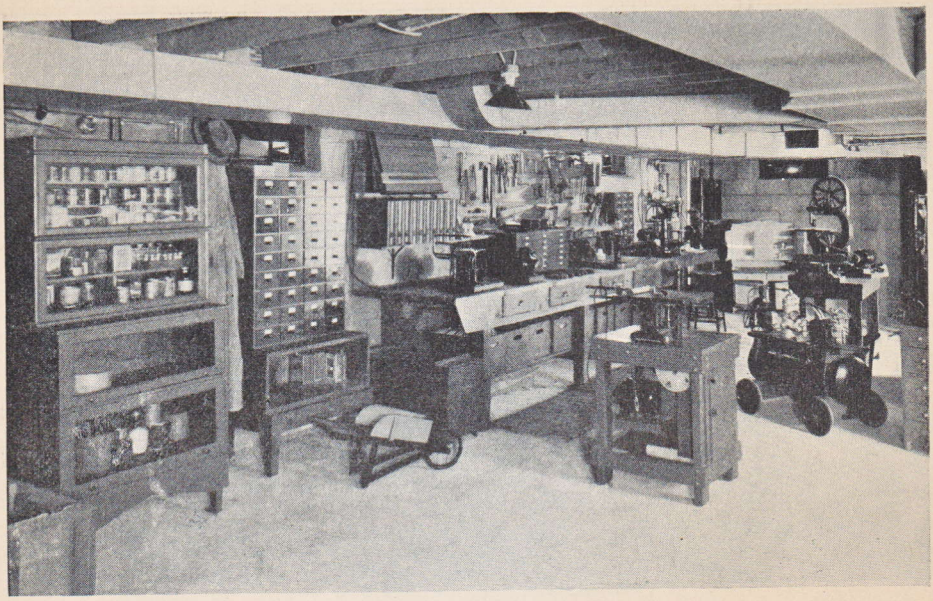


Fig. 2—This large workshop in the home basement is unusually well arranged, equipped and lighted

HOW TO PLAN A NEW WORKSHOP

Shown in Three Progressive Stages of Equipment

AT FIRST glance, it may seem a very easy matter to plan and fit up a new home shop. But the owner soon finds it is not such a simple task as he imagined. For, there is much more involved than just buying a few saws, tools, fixtures and machines, setting them up in a handy place, and starting to use the shop.

Just as the factory is planned for production, so must the modern home workshop be arranged for efficiency, if the owner is to get real enjoyment from his investment. Too often, the ambitious beginner works more or less blindly in fitting up his shop, and when he begins to use his equipment, he finds to his sorrow, that an improper shop arrangement makes it difficult for him to do fast and efficient work. The only sure guide to success in fitting up a new shop, or in modernizing an old one, is to work out a detailed floor plan first, and then arrange every item of equipment according to this plan.

In order to simplify this problem of shop lay-out for the new worker, we present a typical shop plan, in three progressive stages of equipment. It begins with the bare essentials of a home shop, and its growth in tools, machines and fixtures keeps pace with the increasing skill and requirements of the owner. In its final stages, it presents a completely equipped work-shop in which any home craftsman may well be proud to pursue his hobby.

The problem of finding a suitable place in the home, to carry out the new resolve to join the ranks of the home-crafters, will soon be solved if it is backed with a strong desire to make a start. For, even in a small apartment, a corner of the living room or hall may be fitted up with a folding bench, and a tool-box-seat (See Figs. 37 and 38) which will provide entirely satisfactory equipment for making many smaller articles, and doing home repairs.

The most popular place for the home shop appears to be in the basement, although many thousands of workers find space in their garages or attics to carry on their hobby. Sometimes, a spare room in the home may be used as a workshop, even though at first "the lady of the house" may have visions of sawdust and shavings being tracked across her rugs. Large space is not always necessary; often it is surprising to see what an efficient and useful shop can be fitted up in a small area, if properly planned.

We will, however, assume that our prospective home-worker has available a space about 10x18 feet, in the basement, and this size will serve well for a modest beginning. But space is not the only factor involved in locating the new shop.

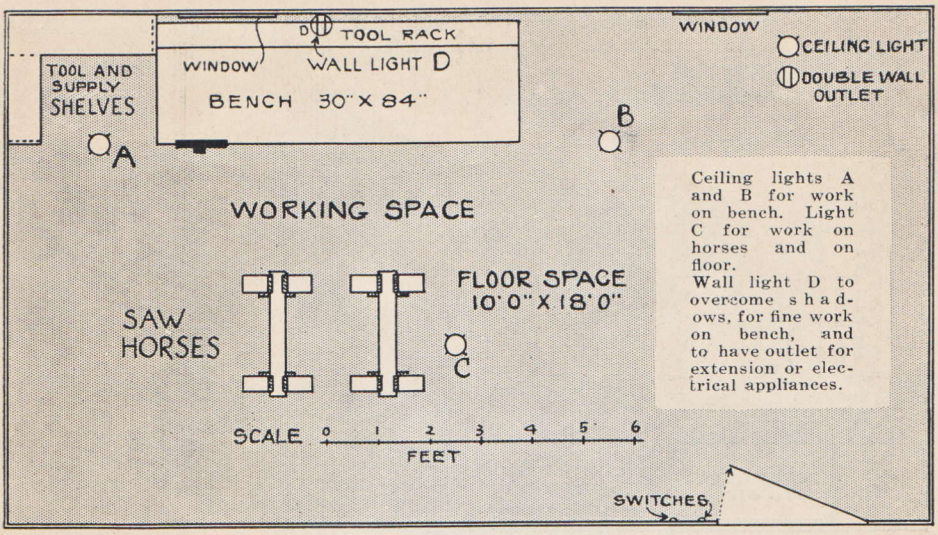


Fig. 3—Plan of shop for the beginner; equipped with bench, saw horses, tool rack and supply shelves

First of all, a home shop should be dry, or the shrinking and swelling of wood and the rusting of tools will cause endless trouble and discouragement. A wood floor is to be preferred for a home shop, but most basement floors are of concrete which is rather hard on the feet, and using linoleum or other floor covering will be a decided improvement. The necessity for electric lights is taken for granted, because generally the home worker will be in his shop only during the evening; often in preference to a bridge party or a show. One or more windows through which the sun can enter during the day and which provide ventilation, will do much toward maintaining a low moisture content in the air, but as a source of light for working they will not be of great importance. Usually the heating plant of a modern house is in the basement and especially during cold, wet weather it will add much to comfort and dryness. Unless the basement is exceptionally dry and well ventilated during the summer months some dampness will be present, in which case polished tools should be removed to suitable quarters or oiled to prevent rust.

Basement walls of concrete usually reflect light satisfactorily, but brick, or other dark walls and ceilings, should be whitewashed or painted white before the equipment is installed, because the reflection of light from white walls is an important factor in home shop lighting. Even with a most effective system of diffused lighting, light walls and light colored equipment add much to the brightness of the shop and make all shadows more transparent. Unless the home shop door is large enough to permit a good-sized piece of work to be taken out when completed, our home worker may unintentionally furnish a good joke for his neighbors.

Probably the first desire of the new home worker is to obtain a simple outfit of furniture, tools and machines, which may be added to from time to time, until a well-equipped shop has been acquired. Hence we will begin with an ordinary basement floor space, 10 feet by 18 feet. At first, only one corner will be occupied by a bench, horses and shelves for supplies as in "A Beginner's Home Shop," Fig. 3. An efficient and substantial bench is the natural center of the home shop equipment, and it should be placed so that the craftsman may work from each end as well as at the front. While most manual training departments of schools are equipped with benches about 22 inches by 48 inches long, the adult home worker with more room available, will find a slightly larger bench much more satisfactory. See Fig. 39. In some cases a still larger bench, 30 inches by 84 inches is desirable, and the home worker can build it readily, by enlarging the dimensions of the bench shown on page 20.

A rapid-action vise will be more efficient than a wooden vise, and an iron tail vise will be a convenience but is not an imperative need.

The wall tool cabinet shown on page 21 may be preferred where tools must be out of sight when not in use, or must be kept under lock and key, but a tool rack on the back of the bench and 8" above its top, or tool panels upon the wall, will be found more roomy and

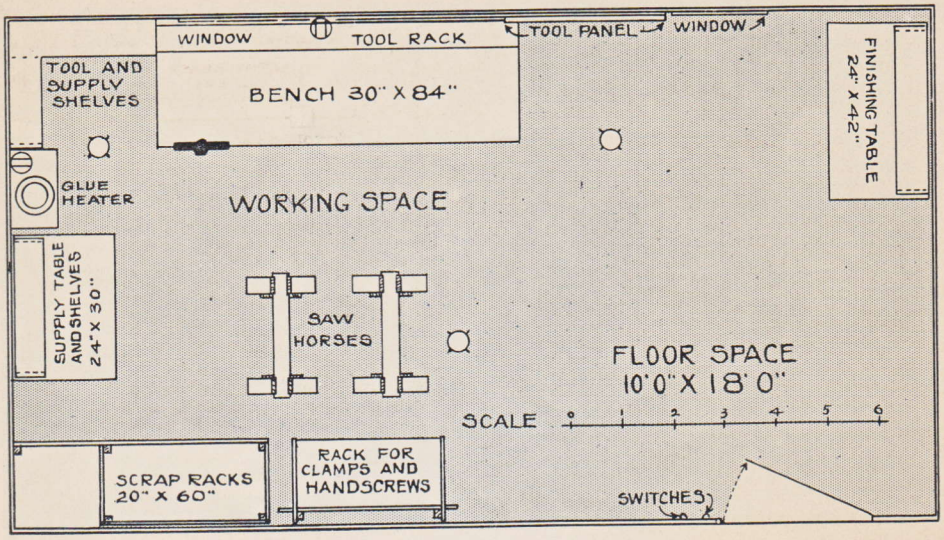


Fig. 4—Plan of shop for the more experienced worker. Tool panels, finishing table, supply shelves, scrap racks, glue heater, etc., have been added to the beginners workshop

convenient. The shelf below the bench is an excellent storage place for an iron mitre box or other bulky articles which are seldom used but should be kept near at hand. Saw horses described on page 18 will be a vast improvement upon working on chairs and boxes.

The corner shelves may not at first seem important, but tools, hardware and odds and ends begin to accumulate just as soon as the shop is started and provision should be made for them.

The space we have visualized has two windows which, with windows on the other side of the basement, provide sufficient sunlight and ventilation. Notice that the outlets A and B for diffusing light fixtures, are placed so that the craftsman will work in his own light as little as possible. These fixtures provide not only the downward rays of overhead lighting which are necessary for certain kinds of work, but by turning one or more lights off, the glancing rays, which show minute imperfections, are available at will. Light C was especially placed for lighting work on the floor or on the horses; for, the home worker will find it a good plan to follow the custom of the professional craftsman and assemble his work on saw horses, thus leaving the bench top free for the use of tools. Often light D with a flexible fixture will be used alone for fine work on the bench, for it will throw a concentrated light wherever it is necessary to use extreme care. Also the wall outlet D should have a connection for an electric drill or other appliance, or an electric light extension to be used on either the bench, floor, or the horses.

Each light should be turned on or off at the outlet as well as at conveniently placed switches near the shop door.

In Fig. 4 we see a shop plan for the more experienced home worker, showing the different pieces of equipment that have been added from time to time. A table with shelves above the overflow of supplies and equipment from the corner shelves, and another for finishing materials have been installed. A high grade electric glue heater was bought after our home worker had purchased a "bargain store" one which soon refused to behave itself. The experience was not altogether a loss, for it convinced our friend that it was questionable economy to buy any but the best tools. Those indespensible adjuncts of gluing, clamps and handscrews, were purchased, and racks for them installed near the working space. The need of a scrap rack for long and short pieces was felt, and was built in a convenient corner.

Soon, the vision of our home worker, feeding upon his shop successes and pleasures, and the praises of his young wife when his first finished project graced their modest home, reached beyond his present hand-work equipment to an outfit of light machinery for wood-working. See Fig. 5. He knew there was room for it and still have ample space for work on the horses and for finishing. He had shrewdly observed that while many of the home shops of wealthy friends were equipped with interesting machines and accessories, much of the equipment was more orna-

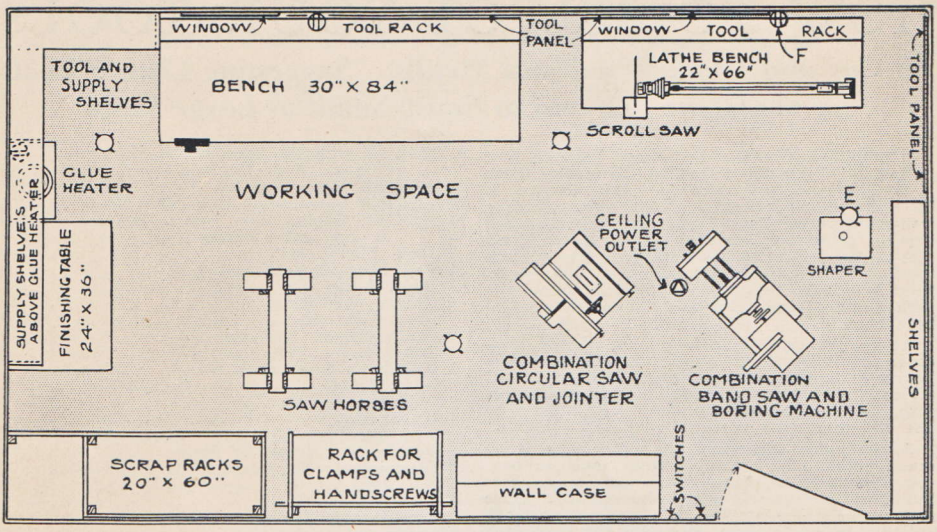


Fig. 5—Floor plan of same shop now fitted up for an advanced home-crafter, with the addition of several machines for cutting and working wood and metals

mental than useful, and its presence so reduced the actual working space that he felt the really creative purpose of the shop was being missed.

In his shop, the need of a circular saw and jointer seemed imperative for the chest of drawers and other projects he proposed to build, and many types of these machines were investigated. Remembering his experience with the "bargain" glue heater he quickly rejected the obviously "Made to Sell Cheap" machines. Their general appearance of cheapness, the lack of good workmanship, the (ridiculously) light weight and low prices as compared with real machines, all evidenced their quality. Also, inquiries regarding replacement parts and quality guarantees of the light machines and their cutting equipment quickly convinced him that such tools were not intended for his shop. He finally purchased a nationally-known combination saw and jointer which was operated by one motor and occupied a minimum of floor space. The manufacturer's name guaranteed the machines, and the ATKINS trade mark guaranteed the quality of the cutting equipment. The many utility features of both machines, such as the tilting guide and adjustable front and rear table sections of the jointer, and its accuracy in such difficult work as making glue joints, all exceeded his highest expectations.

Soon, a turning lathe swinging 7½"x36" between centers, with equipment for sanding, drilling and buffing was giving new thrills to our home worker. A scroll saw placed on the same bench and driven by the lathe motor added other interesting possibilities. A 12" band saw with tilting table and a boring, routing and mortising machine, mounted on the same pedestal and driven by the same motor made possible the making of curved designs which he had been obliged to side-step. A direct-connected, single-spindle shaper, fitted with an assortment of ATKINS cutters made it a pleasure to do matching, molding of edges and other decorative work. These machines were placed and fastened to the floor to insure room to handle pieces of reasonable length and leave ample working space at the bench, as shown in the layout of a shop for the advanced home worker. Fig. 5.

In the interest of lighting efficiency it was found necessary to install a ceiling lamp at E and a wall outlet at F, to insure that each machine and its work would be properly illuminated. In the ceiling was placed a power outlet (See Fig. 5) into which the extension cord to the motor of each machine could be pushed; the lathe and scroll saw taking their power from the wall outlet at F.

The assembling, placing and installation of each machine, as well as making tool panels and shelves for cutters and other accessories, gave our home worker and an interested young nephew many thrills. The final result was an excellently arranged shop which was enthusiastically admired by neighboring home workers, for he had ample working space in which to make and finish even the largest shop project. Especially did they appreciate the advantages of the glancing lights so indespensible in locating and remedying minor defects, and in polishing broad surfaces.

HOW TO SELECT YOUR TOOLS

To Cut and Work Wood and Metals. Suggesting Lists of Tools for the Home Kit, and to Equip Small or Large Shops

"WHAT tools do I need?" is the first question asked by the new home worker, once he has decided to start a shop of his own. With a well-filled purse, there is some danger he will buy too many tools, or the wrong types. If his tool capital is limited, he is likely to buy a stock group of low-priced, second-grade equipment. In either case, he lacks the definite knowledge with which to select his initial tools wisely and economically.

At the outset, the new worker should keep these points in mind. First, buy only the tools he really needs. Second, buy only the best tools; it is better to choose a few good tools rather than several cheap ones. Third, learn to use the new tools correctly.

As he gains experience, he will not need so much outside advice as to what tools to buy, for his work, finances, shop space and other individual factors will guide him reliably. Once the new shop is started, the worker may add tools as he needs them, buying a new tool each week or month until the shop equipment is complete for his requirements.

To assist the beginner in selecting his initial tools, we suggest three lists, which may be adjusted to suit individual needs.

The Handy-Man's Home Kit

With this group of tools, the home-worker will be equipped to undertake ordinary repairs and odd jobs around the home. While some of these tools may be used in building furniture, etc., others will be valuable only for repair work.

*1	ATKINS Hand Saw, 24", No. 9	$1.50
*1	ATKINS Junior Mechanic Hand Saw, 20"	2.40
*1	ATKINS Hack Saw Frame No. 10, 8" Blade	2.50
*1	ATKINS Slim Taper File, 6"	.15
*1	ATKINS Mill Bastard File, 8"	.20
1	12-oz. Bell Face Claw Hammer	1.50
2	Screw Drivers, 3" and 6", Blade through Handle	.75
1	Wire Cutting Pliers, 6½"	1.00
1	Zig-zag Rule, 4 ft. Aluminum, .85, or Wood	.40
1	Socket Firmer Chisel, ½"	.75
1	Block Plane, 7"	2.00
1	Combination Mitre Square, 12" Blade	1.25
1	Bit Brace Drill, ¼"	.28
2	Auger Bits, ¼" and ½"	.75
1	Ratchet Bit Brace, 8" Swing	2.50
1	Ripping Bar, 12"	.50
1	Cold Chisel, ½"x6"	.25
1	Putty Knife	.15
1	Utility Jack Knife	1.50
1	Glass Cutter, Multiple Wheel	.35
*1	ATKINS Wall Scraper, 3½", No. 30	.45
1	Pipe Wrench, 10"	1.00
1	Auto Wrench, 9"	.50
1	Tinner's Snips, 3" Cut	1.75
1	Kitchen Grinder	$1.00 to 3.00
1	Combination Oil Stone, 1"x2"x6"	1.25
1	Oil Can and Oil	.30
1	Iron Vise, 2" Jaws	2.25

The Home Craftsman's Outfit

The home craftsman who wishes his interest and skill to find expression in making furniture and accessories of beauty and utility for his home or camp, will find suitable tools in the following list.

*1	ATKINS Rip Saw No. 53, 22"	$3.00
*1	ATKINS Panel Saw No. 53, 22"	3.00
*1	ATKINS Back Saw No. 2, 12"	2.70
*1	Nest of ATKINS Saws No. 3 (Nail Saw, Compass Saw, Keyhole Saw)	2.40
*1	ATKINS Hack Saw No. 10	2.50
*3	ATKINS Silver Steel Hack Saw Blades	.90
*1	ATKINS Coping Saw Frame, No. 50	.60
	1 doz. extra blades	.25
1	Jack Plane, 14"	5.25
1	Bell Face Claw Hammer, 12-oz.	1.50
1	Block Plane, 7"	2.00
1	Chisel, Socket Firmer, ⅛", ¼", ½", each, .80; ¾"	.90
1	Screw Driver, 3" Blade Through Handle	.25
1	Screw Driver, 6" Blade Through Handle	.50
1	Bit Brace Drill, each No. 4, .18; No. 6, .23; No. 7, .25; No. 8, .28; No. 12, .39; No. 16, .53	1.86
1	Auger Bit, each ¼", .50; ⅜", .50; ½", .55; ¾", .75	2.30
1	Ratchet Bit Brace, 8" Swing	2.50
1	Shoemaker's Peg Awl Haft, with Extra Awls	.20
1	Utility Jack Knife	1.50
1	Combination Try-square, 12" Blade	1.25
1	Screw Driver Bit, ⅜"	.25
1	Rose Countersink, ½"	.50
2	Nail Sets, 1/16" and ⅛"	.25
*1	ATKINS Slim Taper File, 6"	.15
*1	ATKINS Mill Bastard File, 8"	.20
*1	ATKINS Cabinet Maker's Half Round Bastard File, 8"	.50
*1	ATKINS Spokeshave, No. 6	.45
1	Drawshave, 8" Blade	1.35
1	Mallet, 2½" Face	.45
1	Combination Oil Stone, 1"x2"x6"	1.00
1	Oil Can and Oil	.30
1	Wire Cutting Pliers, 6½"	1.00
1	Zig-zag Rule, 4-ft.	.40
1	Fourfold Rule, 2-ft.	.50
1	Wing Divider, 6"	.60
1	Mortise Gauge, Double Bar	.50
*1	ATKINS Cabinet Scraper, 3"x5"	.35
1	Hatchet, 3½" Edge	1.50

Tools for the Advanced Worker

Home craftsmen who undertake more ambitious work than their less experienced brothers of the craft may not find in the preceding list all the tools they need; hence the tools of the following list are suitable not only for their ordinary activities, but for most work of a professional range.

*1	ATKINS No. 400 Hand Saw, 26"	$5.00
*1	ATKINS No. 400 Rip Saw, 26"	5.00
*1	ATKINS Dovetail Saw, 10", No. 25	1.60
*1	ATKINS Compass Saw, 14", No. 2	.90
1	Jointer Plane, 22"	6.95
1	Smoothing Plane, 9"	4.75
1	Rabbet Plane, 9"	4.75
1	Circular Smoothing Plane, 10"	8.00
1	Chisel, Socket Firmer, each, ⅛", .70; ⅝", .85; 1"	.95
	Tanged Firmer Chisels cost about 20% less	
1	Screw Driver, 12" Blade Through Handle	1.00
1	Drill, each No. 2, .18; No. 3, .18; No. 5, .20; No. 9, .31; No. 10, .34; No. 11, .36	1.57
1	Auger Bit, each 5/16", .50; 7/16", .50; 9/16", .60; ⅜", .60; 11/16", .70; 13/16", .84; ⅞", .84; 15/16", .96; 1", .96	6.50
1	Bracebit, 8"	1.00
1	Extension Bit, ⅜"-1¼", 2.50; ⅞"-3"	3.00
1	Depth Gauge for Auger Bits	.50
1	Automatic Drill, with Points	2.50
1	Breast Drill; may be used with round shank bits and drills, or fitted with a chuck to hold square shanks, for rapid boring	3.25

*** E. C. Atkins and Company manufacture only the tools marked with asterisk. We do not make the others. Only approximate prices can be given as they fluctuate at different times, localities and even in neighboring stores.**

1	Hand Drill	2.75
1	Try-Square, 6", .50; 12"	1.00
1	Steel Square, 16"x24", graduates in 12th	2.00
1	Slip Joint Pliers, 8"	1.00
1	Round Nose Pliers, 6"	1.00
1	Wire Nippers, End Cutting, 6"	1.00
*1	ATKINS Half Round Pointed Tooth Rasp, 10"	.90
1	Grinder, 1"x6" Wheel	7.50
1	Set of Four Carver's Slip Stones	1.30
1	Slip Stone, Round Edge, 2"x4"x⅜" to ⅛"	.50
1	Four Fold Rule, 2-ft.	.50
1	Wing Dividers, 10"	1.00
1	Pencil Clasp for Dividers	.15
1	Marking Gauge	.50
1	Cross Pein Riveting Hammer, 4-oz.	.85
1	Plumb and Level, 24"	1.50
1	Brass Slide	1.50
1	Mortise Gauge, Useful in Grooving	2.75
1	Router Plane, Useful in Grooving	2.75
*1	ATKINS Perfection Scraper, No. 3	1.25
	Carving Tools, range from 55c to $2.50 each	
1	Utility Jack Knife	1.50
*1	ATKINS Bench Scraper, No. 1	.90
1	Socket Mortising Chisel, ¼"	1.25
1	Dowel Sharpener	.50
1	Dowel Plate	.65
1	Turning Saw, 14" with Extra Blades	1.50
*1	Ram's Horn Floor Scraper, No. 4	1.65
1	Scratch Awl	.15
	Wood Mitre Box and Open Front Iron for Panel Saw	$3.00 to 6.00
	Iron Mitre Box	$8.00 to 25.00
*	ATKINS Silver Steel Mitre Saw, for above	6.00
*1	ATKINS Saw Set, No. 395	1.50
*1	ATKINS Saw Jointer AAA, No. 15	.20
*1	ATKINS Hand Saw Filer	2.70
1	Steel Vise, 2½" Jaw	4.00
	Wood Handscrews 8" Jaws, $1.25; 12"	2.00
	Steel Screws Adjustable Hand Screws, 8", $1.70; 12", each	2.55
	Steel Bar Clamps, 2-ft., $2.00; 4-ft.	2.75
	Glue Heater, Oil	$3.00 to 4.00
	Electric	$6.00 to 25.00

Bench Machines for the Home Work Shop

The more ambitious home craftsman will not rest content with even an elaborate equipment for tools for hand work, when there are so many motor-driven bench machines available today for doing all kinds of work faster and easier in the modern home shop. In the process of converting his shop from the hand tool stage to a complete equipment of light wood-and-metal-working machines, the craftsman usually purchases machinery in the following order: Circular Saw, Jointer, Band Saw, Lathe, Scroll Saw and Grinder. However, different shop needs may change the order.

In selecting these machines, certain features should be considered, and we will mention them, as well as suggest the ATKINS Saw equipment which should be used on the machines to obtain the finest results.

Bench Circular Saw Table—The saw table should have a machined surface and be of rigid construction to reduce vibration. The table should be level at all heights, with a tilting range of 45° and locking devices for each adjustment. Every bearing should be self oiling and the arbor long enough to receive groovers, grinders, etc. ½-H. P. should drive the saw efficiently. Sizes range from 12" to 14" wide and from 14" to 18" long. These tables use 4" to 8" saws, dado heads, buffing wheels, etc. Some of these are built for boring, jointing, sanding and other attachments. A table fitted with a removable throat to permit the use of a dado or grooving head is to be preferred. The table should have an adjustable squaring and mitring gauge, an adjustable ripping fence, and a safety appliance. The equipment for such a saw table should contain:

*1	ATKINS Silver Steel Circular Saw, 6"	$2.08
*1	ATKINS Silver Steel Mitre Saw, 6"	3.40
*1	ATKINS Groover or Dado Head, 6"x⅛" to 1" by 16ths, No. 4 set	14.18
*1	ATKINS Silver Steel Grooving Saw, ¼"x5", Patent tooth	5.33

Band Saw—Sizes of tables range between 13" to 18" wide to 13" to 20" long, the wheels allowing 11" to 18" swing. The frame should be rigid, and the wheels, preferably disk, perfectly balanced with vertical and tilting adjustments, and have self-oiling bearings and safety devices. The tilting table should be of ribbed construction with machined top. A disk or roller guide will give the best results. ¼-H. P. will drive a light band saw. The saw equipment may be chosen from the following:

*ATKINS Silver Steel Band Saws per ft., 3/16", ¼", .091; ¾"		$.126
*ATKINS Brazing Clamps		3.75
*ATKINS Brazing Torch, may be used for soldering		7.50
*ATKINS Brazing Tongs		4.00
Band Saw Guide, No. 0		10.00

Bench Jointer or Plainer—The front and rear tables should be accurately machined, rest on four slanting bearings and have separate adjustments. The base should have ample strength and liberal shaving clearance. Self-oiling bearings, perfectly balanced safety cutter head and knives and a safety device to cover knives at rest are essentials. The average shop planer will take cuts from 4" to 6" wide and should be provided with adjustable fence and safety appliance.

*ATKINS Machine Knives are made in sizes for any Jointer, Planer or other machine. Prices sent on request.

Turning Lathe—A lathe with cone head stock or other method of changing speed is preferred. The lathe should take at least 28" between centers, 36" will be vastly more efficient. Heavily constructed bed, head and tail stocks, perfectly balanced cones, self oiling bearing and a ball thrust bearing are necessities. The four toothed live center and the cup shaped dead center should have movable center spurs. The face plate, grinding arbor, sanding drum, and disk should be accurately balanced. ¼-H. P. will drive the lathe.

Turning Tools, for cutting—chisels, ⅜", .60; ⅝", .75; 1"	$1.10
Gauges, ¼", .80; ½", .85; ¾", 1.10; 1¼"	1.60
Parting Tool, ½"	.95
Scraping Tools about 20% less.	
Carborundum Oil Stone, 1"x2"x6"	1.00
Tapering Slip Stones, 2"x4"x⅜" to ⅛"	.50
Outside Calipers, 8"	.80

Jig or Scroll Saw—Only a heavy base will adequately support the tilting table and reduce vibration. The frame arms should allow a 12" swing and hold either jeweler's or scroll saws. A pressure arm will hold the stock down and reduce saw breakage. An automatic blowing attachment is needed. Extra blades should be on hand. ATKINS Silver Steel Blades are of great advantage in doing fine, fast cutting on Jig or Scroll Saws.

An Electric Hand Drill—An assortment of drills, reamers, and countersinks fitted to the machine will be required.

Bench Grinder—A belt driven bench grinder with two different wheels allows a far wider range of work than is possible on any direct-connected grinder. One 6" to 8" x ½", one 6" to 8" x 1" wheel and 6" to 8" cloth buffers

Emery Wheel Dresser	$1.00

*ATKINS Bench Grinders for belt drive; with an assortment of various shaped ATKINS Grinding Wheels, practically any job of grinding can be done.

*** E. C. Atkins and Company manufacture only the tools marked with asterisk. We do not make the others. Only approximate prices can be given as they fluctuate at different times, localities and even in neighboring stores.**

HOW TO CHOOSE YOUR WOODS

Giving Helpful Facts about Various Types of Woods Widely Used in Home Workshop Carpentry

IN ANY article you make of wood, whether soft or hard, it is essential and very important that the lumber used be thoroughly seasoned and dried; otherwise disappointing and costly results, such as warping, checking, or shrinking may ruin your best efforts.

When ordering lumber specify **kiln dried;** or you must be prepared to give it sufficient time to dry out before using. Warping is caused by uneven shrinkage, generally across the grain, curling the edges up. Splitting or checking results from evaporation of moisture at a point where the lumber is drying out more rapidly than at other places.

As unfinished wood is more easily affected by climatic changes, it should be painted as soon as possible. This is especially true of any wood used outside, such as for building a garage, fence, or yard furniture, and siding where it is exposed to the weather. In using white or yellow pine and other similar woods, the knots should be shellacked on both sides before painting. This keeps the knot from falling out.

For general knowledge and home workshop use, woods may be divided into two classes, soft woods and hardwoods.

Hard Woods

Ash—Its appearance is somewhat like oak, only slightly coarser grained and not as attractive, but easier to work. Adaptable for all kinds of furniture. Generally straight grained, heavy, hard, strong, stiff and tough, it has a tendency to become brittle with age.

Birch—Very durable. Will stand considerable wear and tear because it is hard, tough, close grained. Recommended for furniture Good for lathe turning. Takes most any stain, mahogany or black walnut finish with fine results.

Black Walnut—This is probably the most popular wood today because it is a beautiful rich brown color. Very adaptable for furniture. Heavy, hard, strong, smooth grained, and easily worked. Black walnut is becoming scarce.

Chestnut—Light weight, of average strength, hardness and flexibility. Very easy to saw, plane, turn, althought it splits readily and warps quite badly.

Mahogany—The most important varieties of mahogany come from Central America, Africa, Mexico and the Philippine Islands. They vary considerably in color, hardness, and ease of working.

Oriental mahogany is rather hard on sharp edged tools. Generally mahogany is easy to work, glues exceptionally well, and produces a high finish,

Maple—Very hard, strong, and flexible, but rather difficult to work as it splits badly when nailed, warps easily. Its close crooked grain takes an excellent finish, and produces unusually beautiful pieces of Colonial Period furniture. Good for carving, tool handles, and similar work where hardness is essential.

Oak—Highly recommended and accepted for all kinds of furniture and cabinet work. Very heavy, strong and hard. Quarter-sawed oak produces a smooth attractive finish. Very durable but checks considerably.

Yellow Pine—Probably the most popular lumber used at the present time for framing houses, sub-flooring, sheeting for roofing, and lining houses. Rift-sawed yellow pine extensively used for hardwood flooring—when properly finished produces a beautiful floor. Extensively used in building trade. Southern yellow pine is very strong and durable. Easy to saw and nail, and stays in place.

Soft Woods

Basswood—Recommended for picture frames, moulding, etc., because it is light, straight grained, and will hold its shape. It is exceptionally easy to work and nails readily.

Cedar—Extensively used for moth-proof chests and clothes closets. The modern house of today is not considered complete without a moth-proof cedar closet. Saws and nails readily. Takes a good finish. Does not split.

Cypress—Beautiful rich and reddish brown. Its beauty and adaptability lends itself to many pieces of furniture. Soft, not difficult to work, and does not warp very easily but is likely to contain many fine checks. Nails readily and very durable against weather when used on outside work.

Gum—Except for one quality would be one of the most useful woods. Very easy to work, of even texture, takes a beautiful finish. Lends itself to wood carving. With little care it can be nailed well. Beautiful brown color, of uneven deposits of coloring. Twists and warps probably more than any other common wood. Used quite extensively for small articles of household use. (75% of all houses are finished in gum.)

Poplar—A very good wood, lends itself well to all kinds of furniture, except those that will carry heavy weight and considerable wear and tear. Used extensively for veneer backing; exceptionally easy to work, light, soft and stiff, but not strong. Takes a fair finish.

Redwood—Because of its rich red coloring and curly nature it is used with excellent effect in cabinet work, such as paneling of cabinet and paneling of walls. Easy to work. Is soft, yet brittle. Warps and shrinks very little and is very lasting for both inside and outside work.

White Pine—Light wood of average strength and durability. Large quantities of it are used for many carpenter purposes. Grain is straight and easy to work. Clear white pine is used for patterns more than any other wood.

White Spruce—Soft, medium elasticity and strength. Light yellow in color. Splits easily and fairly lasting. Used extensively for sounding boards of musical instruments.

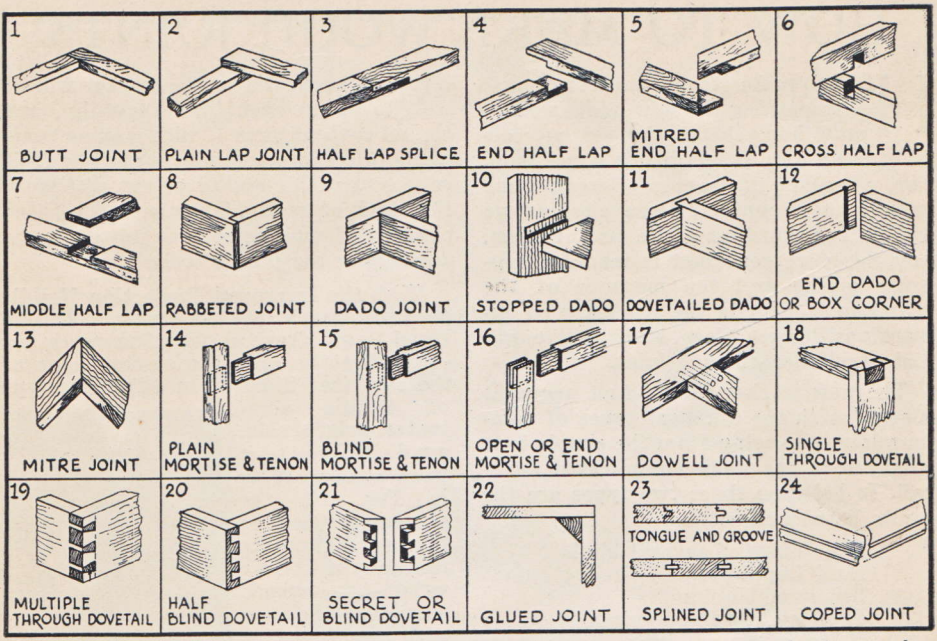


Fig. 8—Showing 24 joints most widely used in home-workshop carpentry, joinery, and cabinet making

24 COMMON WOOD JOINTS

1 **Butt Joint**—used widely in making boxes. Joint is simply nailed together, or fastened with other pieces. See Fig. 9, page 10.

2 **Plain Lap Joint**—a basic method of joining wood. Generally used as a splice, angle or corner lap, or reinforced with blocks as in Fig. 11, page 10.

3 **Half Lap Splice**—used to join ends of two straight or curved pieces, to lengthen them.

4 **End Half Lap**—used as corner joint on wide variety of frames, such as window or door screens, and light panel constructions.

5 **Mitred Half Lap**—similar to end half lap joint, but with corner mitred instead of cut square.

6 **Cross Half Lap**—Used as a joint where square edges of two pieces cross each other, as in the dividing sections of a drawer, etc.

7 **Middle Half Lap**—used to join two pieces which come together in a T-shaped joint; as in dividing cross members to main frame.

8 **Rabbeted Joint**—A grooved joint cut WITH the wood grain. Most used in construction of cabinets and drawers; end grain is concealed from front.

9 **Dado Joint**—A grooved joint cut ACROSS the wood grain. Used in building shelves, and in the back construction of drawers, etc.

10 **Stopped Dado Joint**—Used in making shelves, etc., where it is desired to conceal the groove from the front.

11 **Dovetailed Dado**—Used instead of simple dado joint, where extra strength is needed. Requires careful cutting to insure a good fit.

12 **End Dado Joint**—A strong type, combining a dado and rabbet joint; mainly used in box construction. Tongue-and-rabbet-dado is a variation of this joint.

13 **Mitre Joint**—Used in making all kinds of picture frames, also door and window casings, and mouldings. A true mitre is cut at 45°, but the joint may be cut at any angle.

14 **Plain Mortise and Tenon**—Used in many types of frame and panel construction. Tenon extends clear through other piece.

15 **Blind Mortise and Tenon**—Same as above, except that end of tenon does not show. Used in leg and rail construction.

16 **Open Mortise and Tenon** or slip joint—A more simple type of joint used to join corners of frames, etc.

17 **Dowel Joint**—Employed in fine cabinet work, as a butt edge or mitre joint, plus two or more dowel pins. Entire joint is glued.

18 **Single Through Dovetail**—Used to join narrow pieces, in place of a mitre, rabbet or other joint.

19 **Multiple End Dovetail**—Most used in drawer construction, where two or more dovetails are needed.

20 **Half Blind Dovetail**—More difficult to make, but often used in making drawer fronts. Dovetails show only at side.

21 **Blind Dovetail**—Requires real skill to make. Used only in very fine drawer constructions. The mitre cut is only part of joint to show.

22 **Glued Joint**—Used in cabinet work to join panels, table tops, or other pieces. Often reinforced with glued blocks, or dowels.

23 **Matched Joints**—Tongue-and-groove or splined. Widely used in floorings, doors, table tops, partitions, etc.

24 **Coped Joint**—Used as corner joint for mouldings of various types, or where an inside mitre is to be made.

The making of these 24 types of joints is treated in detail on the following pages.

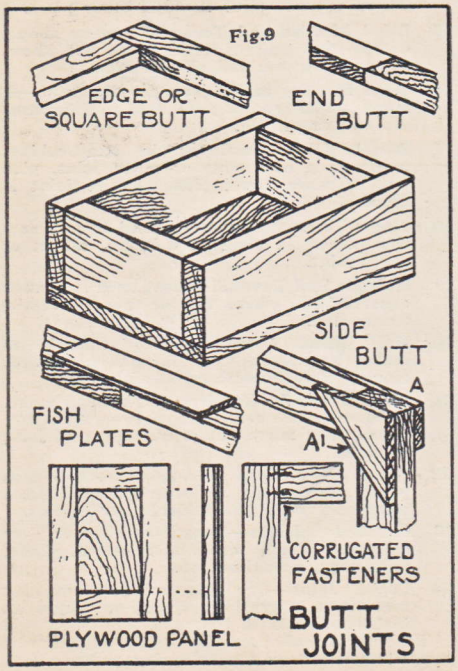
HOW TO MAKE WOOD JOINTS

HOW to make strong, accurate joints is something the new home worker must know before he can successfully build any article in his home shop. For, wherever two pieces of wood come in permanent contact, we have some type of joint. Regardless of its size or form, any thing we construct is made of separate pieces and the measure of the craftsman's skill is the accuracy of dimensions of each piece, and the strength and excellence of each joint.

The new worker should first acquaint himself with the different types of common joints, ranging from the simple butt joint up to the more complicated dovetail. In between these two types are the joints listed below:

Lap Joints of several kinds
Half Lap Joints
Rabbeted Joints
Grooved and Dado Joints
Mitre Joints
Mortise and Tenor Joints
Dowel Joints
Dovetail Joints
Glued Joints
Matched Joints
Coped Joints

On the following pages all of the above types of joints are illustrated in detail and complete instructions given for making them accurately. The worker will do well to study each type carefully, and should content himself with making practice joints with waste pieces until he feels confident of his ability to cut and work the stock correctly. Thus he will take no chances of making serious mistakes and destroying the pieces to be used.

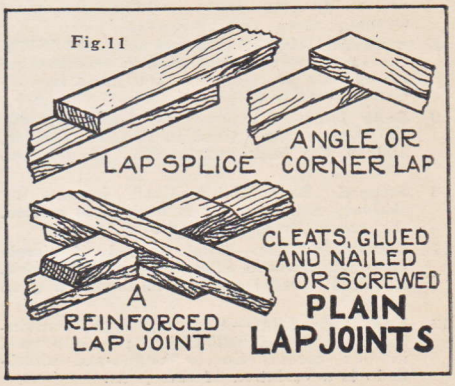


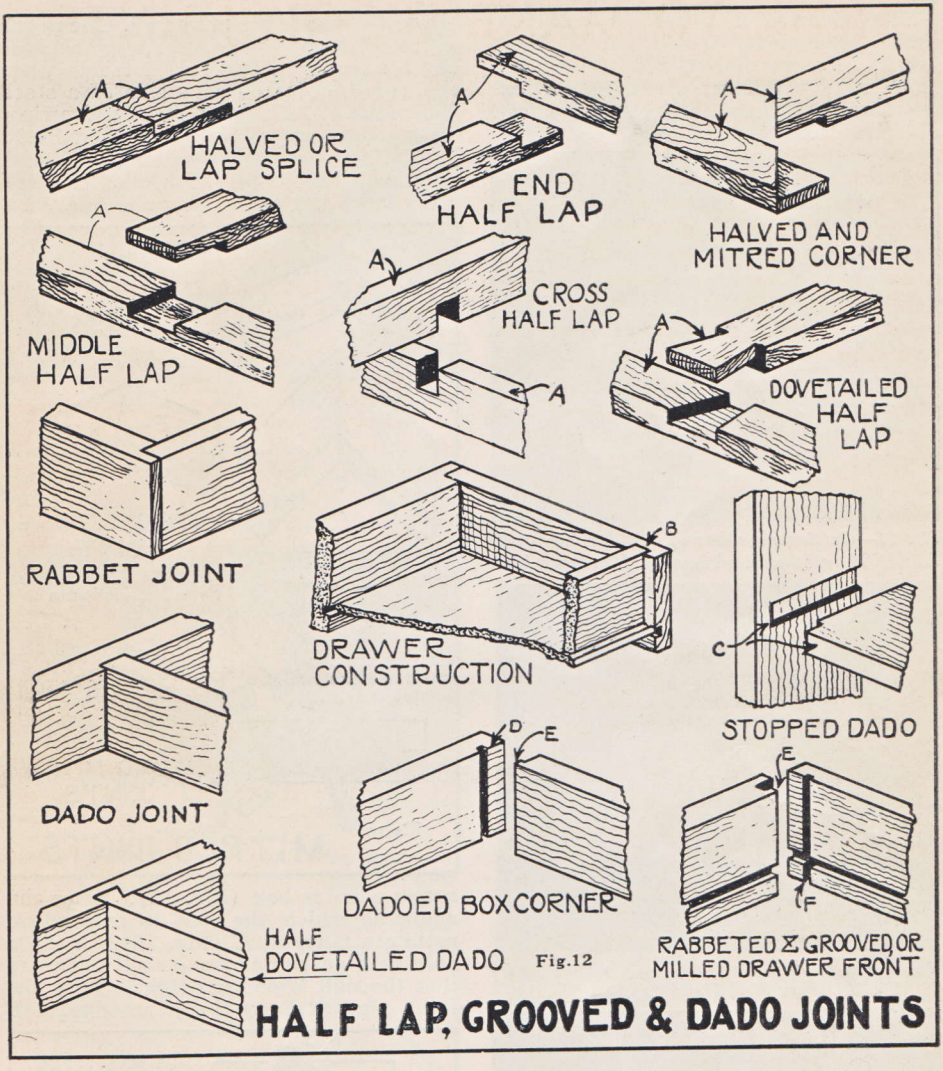
With the Improved Perfection Handle used on many of the finest ATKINS Hand Saws, every ounce of power is exerted directly upon the cutting edge of the saw (see illustration 44). This type of handle eliminates wrist strain, and makes the work easier. Note in Fig. 10, the proper position of the thumb, and the relation of the wrist, arm, elbow, shoulder and eye with line A, which is the direction in which the force of the stroke must be applied for straight sawing, as well as to keep the saw from catching and jumping.

Fig. 10—Correct position for straight sawing.

Butt Joint—(Fig. 9)—This joint should be used only where the pieces may be fastened to other construction, reinforced by "fish plates," by a plywood panel, by corner braces, as at A and A1, or with corrugated fasteners, as shown.

Plain Lap Joint—(Fig. 11)—This type of joint and the butt joint are of the simplest construction and constitute the fundamental methods of putting wood together. Often a lap joint may be reinforced by separate pieces as suggested in A which results in a lock joint.





Halved, Half-Lap Grooved and Dado Joints—(Fig. 12)—In laying out the cuts make all gauge marks and measurements from the face side A. Use the ATKINS SILVER STEEL BACK SAW No. 2, with 12" blade in cutting the shoulder (Fig. 13) and the same, or ATKINS SILVER STEEL RIP SAW in making the depth cuts (Fig. 14). In the lock joints, the depth cuts must be finished with a chisel.

The Halved, Spliced and Corner Joints (Fig. 12) are used in lengthening boards, and in screens and other frames that may be fastened with glue, clinch nails or screws. In laying out these joints, be sure and work from the face side A at all times. Often the rabbeted or shouldered joint is used in making drawers as suggested. Instead of the dado joint being made at B, a butt joint may be used.

The Stopped Dado Joint is used where shelves or other members are fitted into grooves which would show as blemishes were they cut through (Fig. 15-c). The grooves should be laid out with a knife mark.

Place straight edge outside to coincide with knife mark on either side; hold it with brads as shown at D, in (Fig. 15) or with hand-screws if preferred. The saw cuts must be made from the back edge and finished at the front with a chisel. A router plane will make the groove of uniform depth. In making a box with dadoed corners (Fig. 12), the piece D is the weakest place in the joint, hence the tongue E may be less than ⅛" thick. In making the milled drawer front, E (Fig. 12) should fit the groove F with a "push" fit.

The advanced homeworker with machine equipment can machine these joints. The dovetailed dado joint (Fig. 12), is very strong; often adaptations of it are found in 18th century chests of drawers.

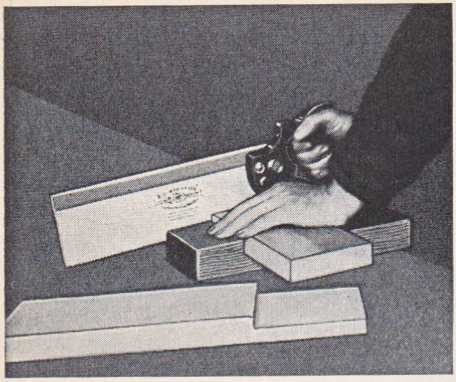


Fig. 13—Cutting shoulders of half lap joint with ATKINS Silver Steel Back Saw No. 2, in bench hook

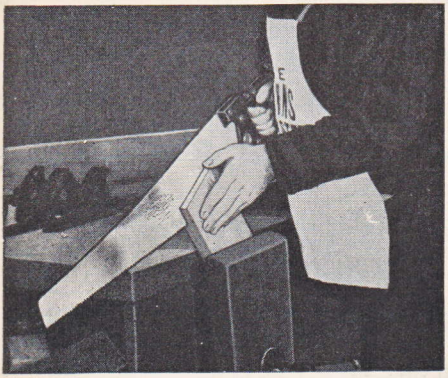


Fig. 14—Making depth cut of half lap joint with ATKINS Silver Steel Hand Rip Saw No. 53

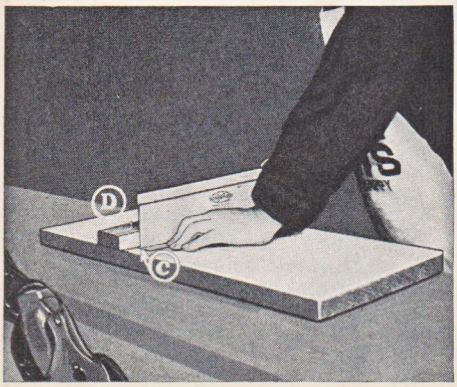
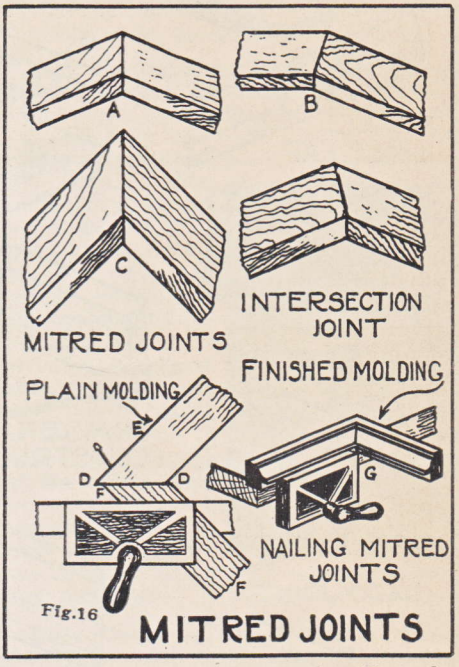
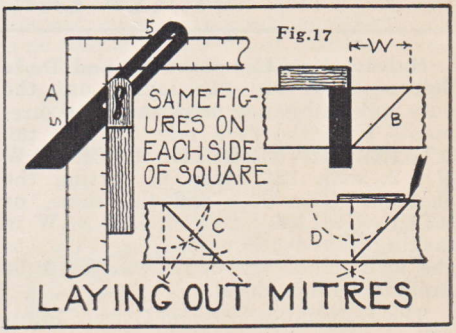


Fig. 15—Making cut in stopped dado joint, with ATKINS Silver Steel Back Saw

Mitred Joints—(Fig. 16)—The mitre joint is commonly used in making picture frames and in the casings of doors and windows. The intersection joint is made of two pieces of different widths hence the angles are not equal. The usual mitre angle of 45 degrees may be laid out by setting a bevel to coincide with the same figures on each side of a steel square as at A (Fig. 17) or by drawing square lines across the piece as at B, C, and D. An accurate mitre may be sawed with an ATKINS SILVER STEEL Panel Saw (Fig. 18) though usually they are



cut in a mitre box (Fig. 19). Note the angle at which the nail is entered in nailing a mitre at E (Fig. 16). Make a hole with an awl or small drill to insure that the nail is pointed right. Push the joint edge of E by the joint edge of F



as at D to allow the nail to draw E to its place as it is driven home. A finished moulding may be held in the vise as suggested at G of Fig. 16 without being marred.

Mitred joints may be fastened by glued dowels as in Fig. 20, with blocks rub glued as at A, clamp strips placed as at C (Fig. 21), or with corrugated

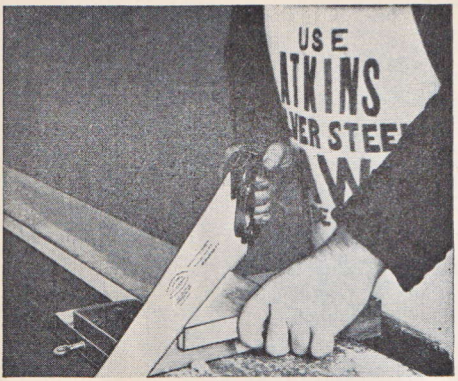


Fig. 18—Cutting a mitre joint with ATKINS Silver Steel Panel Saw No. 53

fasteners. Or with a circular saw table and an ATKINS SILVER STEEL GROOVER, each member may be grooved, and a spline or key, push fitted

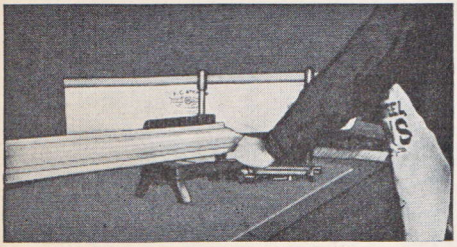
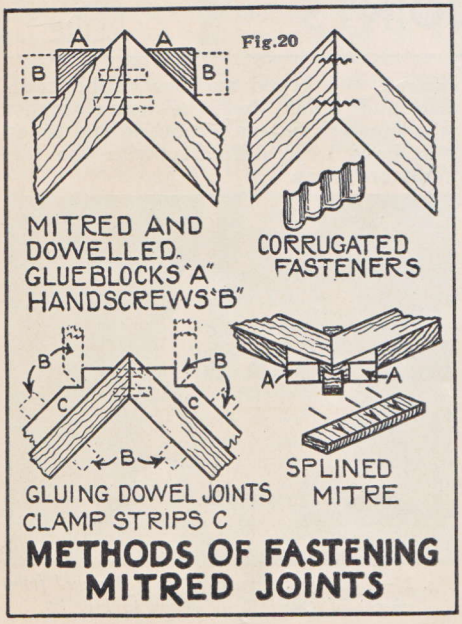


Fig. 19—Using ATKINS Silver Steel Mitre Saw No. 1 to cut moulding in a mitre box

as suggested. Note that the grain of the spline runs the short way as indicated by the arrow points. This joint may be glued, pushed together, the



frame squared and the glue allowed to set. Blocks A and hand screws, or nails may be used if desired.

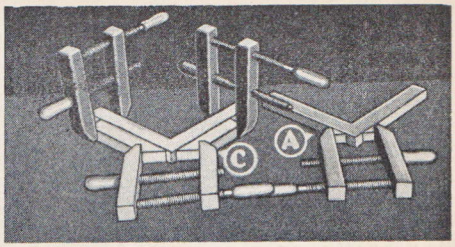


Fig. 21—Gluing mitre joint with blocks and clamps Especially useful in making dowel mitre joints

Mortise and Tenon Joints—(Fig. 23)—Joints of this type are used wherever the best constructive results are desired. Generally wedged forms of this joint are used only upon the best work. In making mortise joints follow the sequence indicated by the numerals of the sketch. In every case work from the face side G in squaring and in gauging. Locate the mortise accurately and square across the face and both edges as in step No. 1, marking with a pencil. Using a mortise gauge from the face side G, make the gauge lines of step No. 2 which give the width of the mortise. Do this on each edge for a through tenon, but

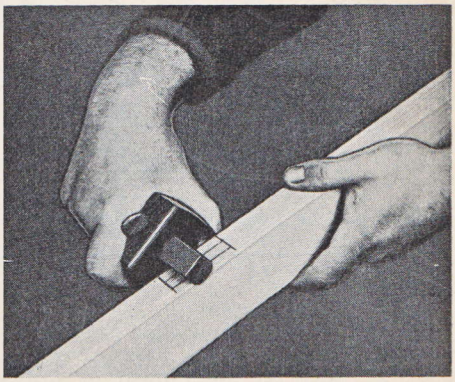


Fig. 22—Marking lines for a mortise and tenon joint with mortise gauge

on only one edge for a blind tenon (Fig. 22). Bore a hole about the width of the mortise near the middle of its length as at 3 (Fig. 24). Beat out the mortise as in step 4 cutting from the hole each way, (Fig. 25), to about ⅛" from each end of the mortise as at J. Clean out the shavings and make the last cut as shown in step 6 exactly to the line thus making the mortise the correct length. In step 7 the tenon shoulder should be marked across the face with a knife point. Gauge mark both edges and end as in step 8, working from the face side G. In step 9 saw the shoulder closely beside the knife mark on each side down to the tenon gauge marks. Make cheek cuts

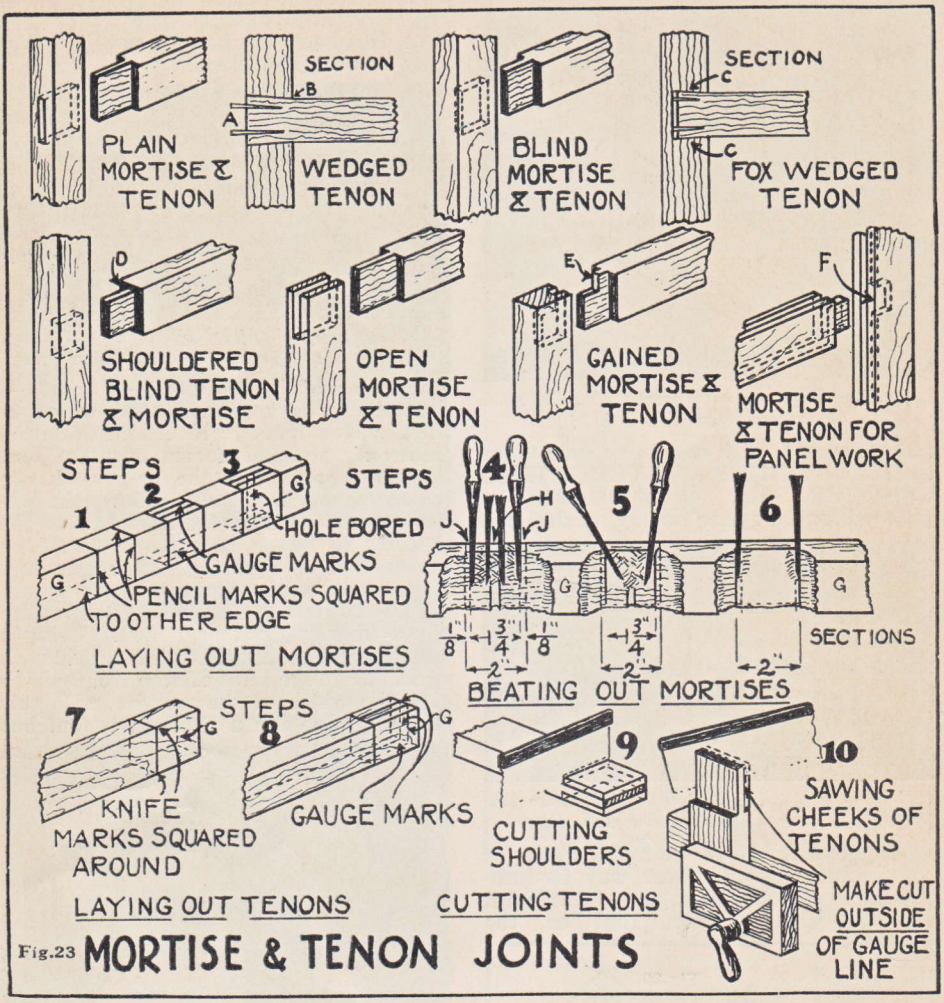


Fig.23 **MORTISE & TENON JOINTS**

by sawing exactly beside and outside of gauge lines as in step 10.

There are many varieties of mortise and tenon joints beside those shown in Fig. 23, such as the pinned or draw-pinned, the keyed and the double mortise and tenon, but the home worker who masters the plain mortise and tenon will have little difficulty with the less common types.

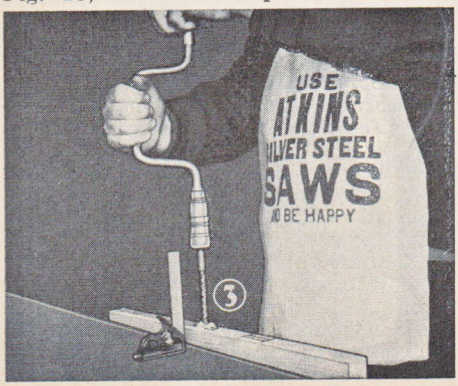
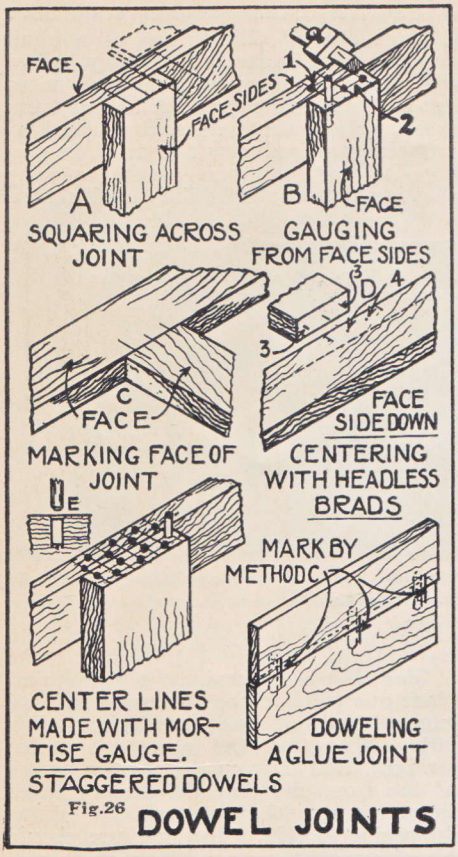


Fig. 24—Boring holes to make a plain mortise

Fig. 25—Beating out mortise. Spalls A sawed from cheeks of tenon B, as shown in Fig. 14



Dowel Joint—(Fig. 26)—The usual scamping of dowel joints upon cheap furniture has given this really excellent form of construction an undeserved reputation. A common method of laying out dowel centers is shown at A; place the pieces in correct relation and, using a try-square on the face side, draw lines across the two pieces as shown. With a single-point gauge held against the face make center lines cutting the three marks as at 1 and 2, which gives the center of the dowel.

In method C, lines are drawn across the face of a correctly placed joint, the pieces separated and the lines squared across the joint surface of each piece; the center lines made as at B locate the exact center of the hole. In method D, drive headless brads until they project about one-eighth of an inch as at 3. Lay both pieces face down, push the rail or the piece with the brads in its end against the other member at the exact place where the joint is to be made, thus marking the centers of the dowel holes 4 in the edge. Draw the brads from the end wood and the center hole will show plainly. Dowel centers in pieces of irregular forms may be located by this method. The staggered dowel joint is the strongest joint of the type and is used in jointing a wide rail piece to a stile. Make two center lines with a mortise gauge, locate dowels and bore holes accurately. Sighting by the edge of a try-square, placed as in Fig. 27, will help in doing this. To insure uniform depth,

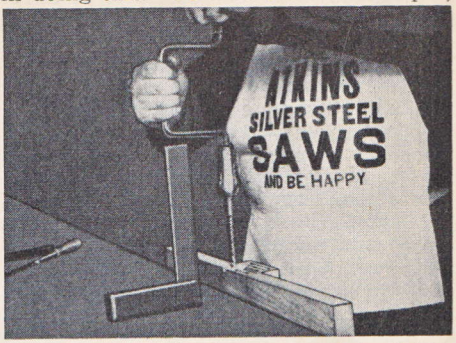
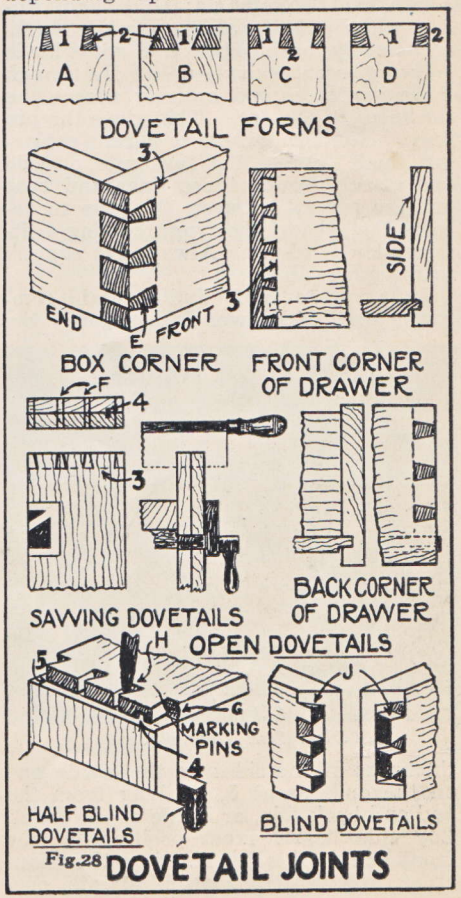


Fig. 27—Boring holes for a staggered dowel joint

the turns of the bit may be counter or a bit stop used. The method of fitting and gluing a dowel mitre joint is illustrated in Figs. 20 and 21.

Generally ⅜" or ½" dowels are used, depending upon the thickness of the



stock. In every case, the dowels must enter the holes each side of the joint with a push fit.

Dovetail Joints—(Fig. 28)—To the bonafide home worker, the making of dovetails signifies the attainment of real skill. A shows the correct form of dovetail, for the sharp angles of the tail of B may be easily split off as suggested. As the strength of the dovetail joint depends upon the pins, joint D with but one tail is not nearly so strong as C.

In making a dovetail box allow the end wood of the pins E only to show on the front. Make a light gauge mark on each side of both ends of each piece as at 3. Lay out the tails by placing the sides in a vise and marking the tail lines across both ends as at F; the tails may be two or three times wider than the pins. Mark the tails with a bevel or a pattern, though generally the craftsman saws them by his eye. Cut outside the tail lines with an ATKINS SILVER STEEL DOVETAIL SAW; with a sharp chisel cut the piece out of the pin hole between the tails, cutting a little under from each side as at G. Place each end in the vise, lay side on end so edges and gauge marks exactly coincide; hold them rigidly, with brads if necessary, while marking closely beside the tail with knife point or scratch awl, as at H, though these marks extend entirely across the thickness of the end. This gives the pin lines. Number corners to permit replacing them. Make the saw cuts outside and closely beside these lines and beat out the spaces between the pins to receive the tails of the front, cutting a little under as above. Always cut exactly to the gauge lines.

In laying out half blind dovetails commonly used on drawer fronts, gauge the

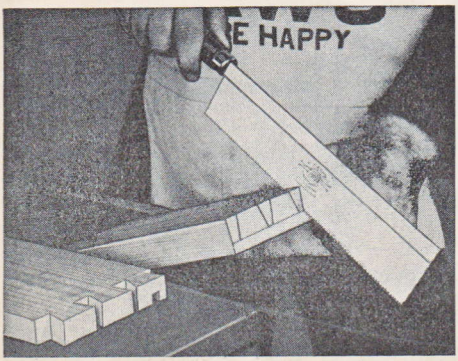


Fig. 29—Sawing half-blind dovetails with ATKINS Silver Steel Dovetail Saw

thickness of the sides on the inside and on the ends as at 5, working from the end and back side, or inside of the front. Lay side in its exact position on the front and mark as at H. Saw the triangular cuts for the half blind tails outside the pins, number corners and proceed as above. The mitres of a blind dovetail must be made accurately. Allow the pieces J to project from each mitre for the tails and pins must be cut from these. Mark the tails and proceed as in making an ordinary dovetail. In gluing the box together, blocks may be glued on the outside and hand screws used as in Fig. 21.

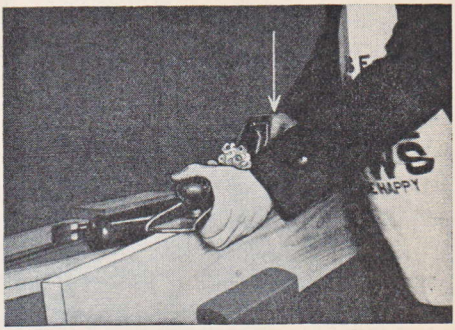
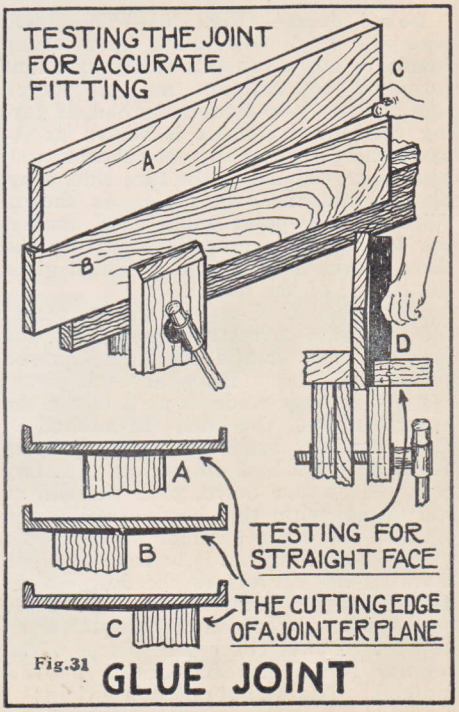


Fig. 30—Making a glue joint. One piece in vise. Note how plane is carried straight, with fingers under it to guide, thumb on knob, and pressure on rear of plane at arrow

Glue Joint—In making a glue joint, place one piece in the vice and joint one edge with a well conditioned plane (Fig. 30). Note that the plane is carried straight, that it is cutting in the center of the iron, and that the fingers under the plane prevent its uncertain wobbling from side to side. The pressure should



be upon the rear end, or the heel, as indicated by the arrow. Note the rather exaggerated shape of the cutting edge of the jointer iron (Fig. 31). A very fine shaving should be the rule while fitting. If the plane is cutting in the middle as at A, the shaving will be of equal thick-

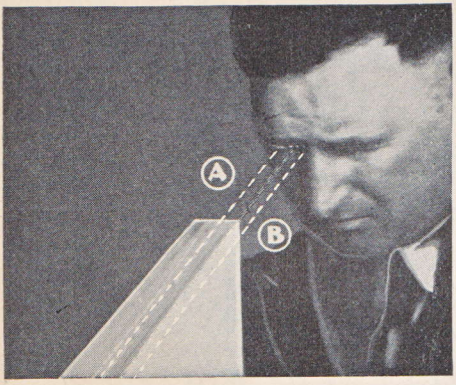
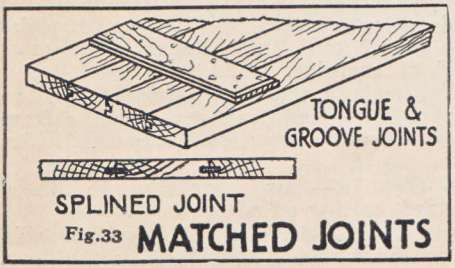


Fig. 32—To test joints before gluing, do not sight along center of edge A, but along corner, as at B

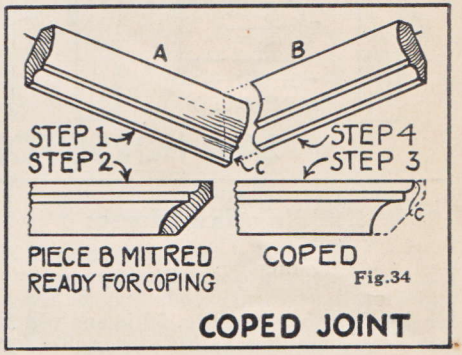
ness and the original squareness of the edge will be maintained. If the try-square shows the edge to be out of square, carry the plane as shown at B or C as required. Generally in testing the joints, the novice sights along the middle of the width of an edge as at A. If his eye should instead follow the line B, he can see the corner of edge and detect any inaccuracy. (Fig. 32). To test the joint, place pieces as shown with the right hand as at C of Fig. 31; move A back and forth and it will swing upon any high place on either edge. With the jointer set to take a very fine shaving, plane the high places down until only the ends touch with a practically invisible joint between them. Reverse positions of the boards if necessary. Try the faces of the joint as at D, and remedy any defect by the method described at either B or C of Fig. 31. The glue joint may be reinforced by dowels as in Fig. 26. The homeworker who has an accurate power jointer may make the joint upon it.

Gluing should be done in a heated room; to insure utmost speed and surety, set the work up dry, being sure that all clamps and appliances are set to desired size and placed conveniently at hand. If dowels are used, put glue in the holes of one side on each joint, drive the dowels home, and try the work together to check possible errors before the glue is spread. After the glue has been applied and the clamps have drawn the pieces together, apply straight edges and hand screws if necessary to hold the surface of the work straight.



Matched Joint — (Fig. 33) — Plain matching (tongue and groove) is commonly used in floorings, board partitions and doors. Matched flooring of oak, maple, birch, white wood or pine may be glued together for table tops.

Splined Joint—As a substitute for matched boards a splined joint gives good satisfaction. A homeworker with a bench circular saw table and an ATKINS groover, may easily groove the edges of a fitted glue joint and fit a spline the entire length, as suggested. (Fig. 33).



Coped Joint—(Fig. 34)—In making this joint, moulding A of step 1 is first cut to length with square ends and nailed permanently in place. Moulding B in step 2 is then turned upside down in a mitre box and the mitre sawed as in Fig. 19. Cope this mitre as in step 3 using coping saw as in Fig. 35. When

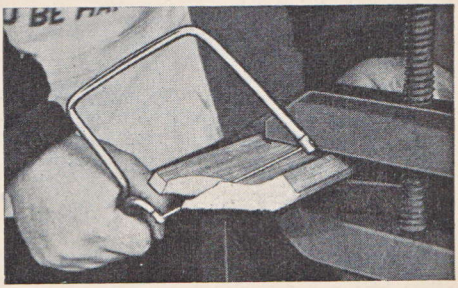


Fig. 35—Using the ATKINS Silver Steel Coping Saw No. 100 to cut moulding for a coped joint

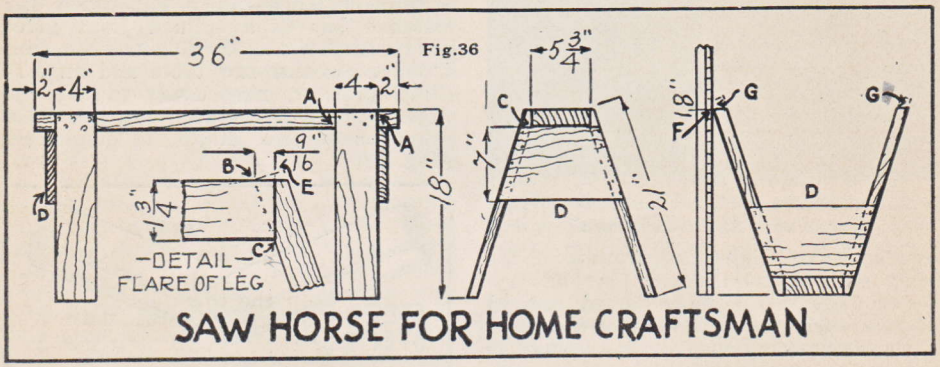
in place the joint will show as a mitre and driving nails will not force it open.

This type of joint is commonly used in fitting picture moulding around rooms, and whenever an inside mitre is made.

HOW TO BUILD A SHOP OUTFIT

Saw Horses, Work Benches, Tool Box, Cabinet, etc.

NOW THAT the home craftsman understands how to make the various types of common joints he will encounter, he is ready to build the working outfit needed in his shop. For, we will assume that he starts with nothing more than the space for his shop, and the resolve to build his equipment himself. With no bench to work on, he should first build a pair of saw horses. In making these, and other pieces of equipment for his shop, he will utilize many of the more common types of joints treated in the preceding pages. This will be valuable joint-making practice for him, and by the time his new shop outfit is finished, he will have confidence in his ability to make strong, tight joints of types most used in home shops.



SAW HORSE FOR HOME CRAFTSMAN

Building Saw Horses

For building the saw horse shown in Fig. 36, pine, white wood, spruce, or any other easily worked woods may be used. The design shown in Fig. 36 is one which has been simplified as far as possible for construction by beginners. Many woodworkers prefer a saw horse on which the legs flare toward each end as well as outward, and give more stability. If this style of saw horse is desired, the minor change in leg design can be made as construction proceeds. To build the horse shown in Fig. 36, the following material is needed:

2 Tops—3′0″x5¾″x1¾″.
8 Legs—21″x4″x⅞″ (Full size).
4 Braces—13″x7″x⅞″.

While as mentioned before, a large kit of tools may be bought for the first work, as but a few tools will be needed in making the horse, we will speak of these only.

1 ATKINS Silver Steel Cutting Off Saw, 22″ or 24″, No. 53.
1 Bell Face Claw Hammer, 12-oz.
1 Marking Gauge.
1 Chisel, 1″.
1 Zigzag Rule, 4-ft.
1 Try-square, 6″.
1 Pencil.

Usually failure to make an accurate cut with the above saw results from an incorrect posture in which the force was not applied in the same plane as the cut. (See Fig. 10).

Step 1—Saw the two tops and eight legs to given length.

Step 2—With try-square mark pencil lines A (Fig. 36) to fit the legs and square across the top and each edge.

Step 3—Gauge line B between these lines 9/16″ from the edge.

Step 4—Make a triangular saw cut between and beside lines A from B to C.

Step 5—With chisel cut the bottom of the groove from B to C.

Step 6—Nail legs in place, using 8d common nails.

Step 7—Place braces D, pencil mark the flare of each leg on the brace and saw to the marks.

Step 8—Nail braces with 8d common nails.

Step 9—Plane ends of braces flush with legs.

Step 10—Plane the top of the legs as at E flush with the top.

Step 11—Turn the saw horse upside down on the floor. With a rule, make a pencil mark 18″ from the floor as at F, on each leg.

Step 12—Place a straightedge to these lines and draw a pencil line from one to the other across edges and sides of the legs.

Step 13—Saw carefully to these lines, cutting off pieces to G.

Step 14—Turn the horse right side up and it should rest firmly on the floor.

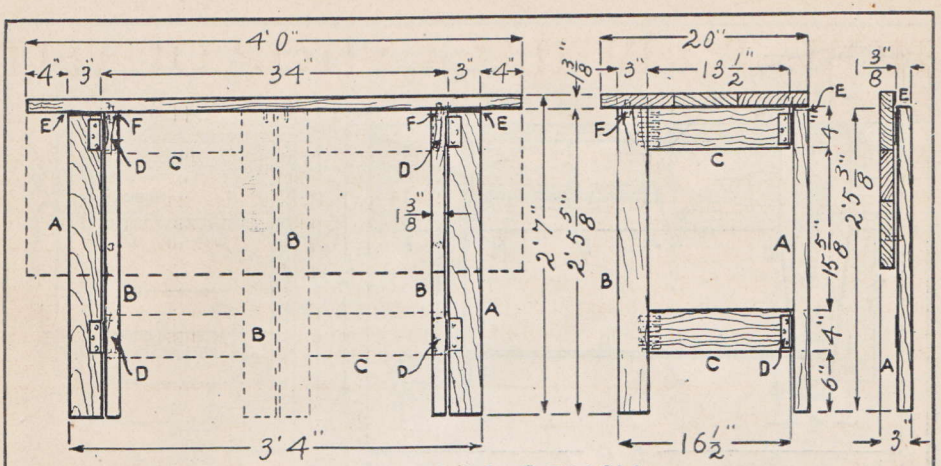


Fig. 37 FOLDING BENCH

Folding Work Bench—(Fig. 37)—To aid those living in restricted quarters to realize their desire to join the "Fraternity of Home Craftsmen" we would suggest this folding bench, the top of which may be folded down and project not more than 3½" from the wall.

The bench may be built of any moderately hard wood; white wood we will say. Beside the tools needed to build the saw horses, we shall need:

1 Bit Brace, 8" Swing.
1 Auger Bit, ½".
1 Drill each ⅛" and 3-16".
1 Screw Driver, 6" blade.

The following stock list may be worked out at the mill or at home.

1 Top 4'0"x20"x1⅜". May be dowel glued in two or three pieces.
2 Back Legs A 2'5⅜"x3"x1⅜".
4—Rails C 13½"x4"x1⅜".
6 Steel Butts, 3"x3" with 1¼" screws.

With these at hand we will proceed as follows:

Step 1—Glue up top.

Step 2—Trim top to exact size.

Step 3—Fasten the back legs to the wall with screws or bolts.

Step 4—Join front legs B and rails C with ½" dowels.

Step 5—Place the leg frames between the back legs as shown by dotted lines of the front view. Fasten 3" hinges at D with 1¼" screws with the top rail ¼" or the thickness of the closed hinge above the top of the back leg at E.

Step 6—Fasten hinges permanently to the under side of the top and to the top of the back leg A with one screw in each hinge.

Step 7—Raise the top, open legs at right angles with the wall, drive a headless brad in the top of each front leg at F; drop the top carefully upon the brads which will mark the centers of the dowel holes in the top.

Step 8—Draw brads, close the legs, and remove screw in hinges, bore ½" holes for dowels in the top at F and in the top of the front legs. Glue the dowels in the holes in the top, replace the top and fasten permanently to the back legs.

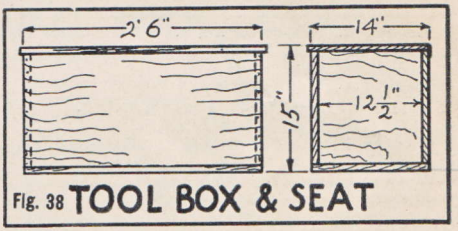


Fig. 38 TOOL BOX & SEAT

Tool Box and Seat—(Fig. 38)—This easily made piece of shop equipment serves as a handy seat and as a convenient repository for tools. It may be made of pine, bass wood or white wood. It will need:

1 Top 2'7"x14½"x¾".
2 Sides 2'6"x13½"x¾".
2 Ends 12½"x13½"x¾".
1 Bottom 2'6"x14"x¾".

When squared at the mill or cut by hand, the pieces are ready to be nailed together with 8d finish nails. The cover may be hung with 2½" narrow brass butts and the chest stained or covered with cloth of desired color and texture. The tools used in making the saw horses and bench will be ample for making this chest.

Home Worker's Handy Bench—(Fig. 39). This bench may be made of any easily worked wood, and when completed the home worker may undertake almost any kind of work, for the masterpieces of the old cabinet makers were produced upon benches of the same type. The iron plate at A adds much

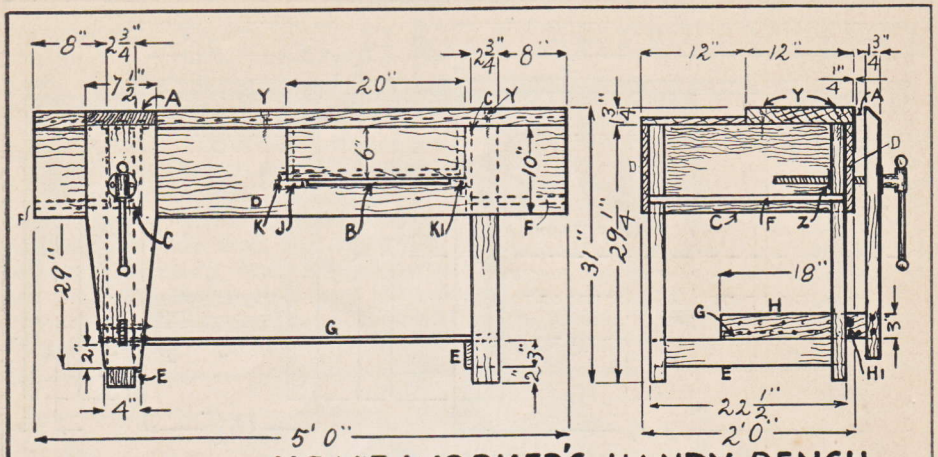


Fig.39 **HOME-WORKER'S HANDY BENCH**

to the efficiency of the vise, and the 1" hand hole B under the drawer is a great convenience for odd jobs of sawing. An iron tail vise may be fitted if desired.

Cut the following pieces to exact size:

1 Front Top, 5'0"x12"x1¾". Preferably hardwood.
1 Back Top, 5'0"x12"x¾". The two pieces should aggregate 24" in width.
2 Ledges C, 22½"x10"x¾".
2 Front and Back Aprons D, 5'0"x10"x¾".
2 Ledges E, 22½"x3"x¾".
4 Legs, 2'5¼"x3"x1¾".
2 Supply Shelves F, 22½"x10¾"x¾".
1 Supply Shelf G, 2'5"x12"x¾".
1 Drawer Front, 20"x6"x¾". (Rabbeted as in Fig. 12) to receive ¾" sides.
2 Drawer Sides, 22⅛"x5½"x¾".
1 Drawer Back, 18½"x5⅜"x¾".
1 Drawer Bottom, 20"x16"x½".
1 Vise Jaw, 2'5½"x7½"x1¼"—Oak or Maple.
1 Traveller H, 18"x3"x¾".
1 Drawer Run J, 22½"x4"x¾".
2 Drawer Runs K and K-1, 22½"x1"x¾".
1 Vise Plate A, 7½"x5"x¼"—Iron or steel with countersunk screws.
1 Vise Screw 1" diameter.
18 No. 12 Flat Head Screws 2¾".
3 lbs. 8d common nails.

Besides the tools mentioned in the two previous projects we shall need:

ATKINS Half Round Wood File, 8".
½" chisel for fitting vise screws.
¼" drill bit for boring for screws that fasten the bench top.
1 ATKINS Compass Saw.

In assembling, square all angles.

Step 1—Bore 1⅛" holes in the front leg to receive the vise screw, 6¼" from the top of the leg to the center. If an extension bit is not available, bore several half-inch holes and finish with a chisel and an ATKINS Half Round Wood File. Fit the nut Z and fasten with screws.

Step 2—Cut a mortise 5" from the bottom of the leg which will allow the traveller H to slide freely but not loosely. Bore holes as shown to receive ⅜" foot bolts H-1.

Step 3—Nail ledges C and E in place with 8d common nails.

Step 4—Place aprons D and fasten with nails.

Step 5—Continue holes for the vise screw through the aprons.

Step 6—Cut openings in the front apron for the drawer front and the hand holes. Verify measurement by the drawer front. (Fig. 40.)

Step 7—Nail drawer runs J and K-1 in place.

Step 8—Assemble drawer; fit and nail the back between the sides 15¼" from the back of the front with a butt joint. Nail the bottom to the bottom edge of the drawer sides. Fit the drawer and nail run K in place beside it.

Step 9—Nail supply shelves F in place.

Step 10—Plane tops of legs, ledges and aprons flush.

Step 11—Bore ½" holes, ½" deep and finish with ¼" drill as at Y. Fasten the front top strongly with 2½" No. 12 screws, especially at the vice. Glue wooden plugs in holes and plane flush with bench top.

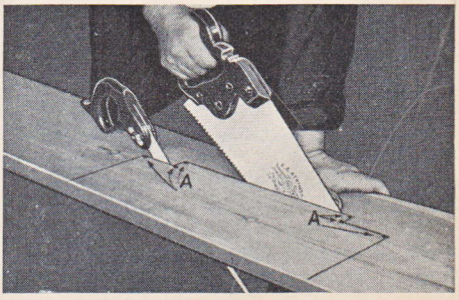


Fig. 40—Cutting drawer opening in bench apron with Rip Saw; showing ⅜" holes bored at A, and the use of Compass Saw in starting the cut

Step 12—Cut mortise in the vise jaw to receive traveller H and hold in place with ⅜" bolts as shown. Place the traveller in the leg mortise to support the vise jaw a little above the top of the bench.

Step 13—Locate accurately and bore a rather close fitting hole in the jaw to receive the vise screw.

Step 14—Fit the vise screw and fasten to jaw; put vise in place and set it up. Cut the top of the vise jaw off so it will rest flush with the top of the bench, and bevel as shown.

Step 15—Nail supply shelf G in place.

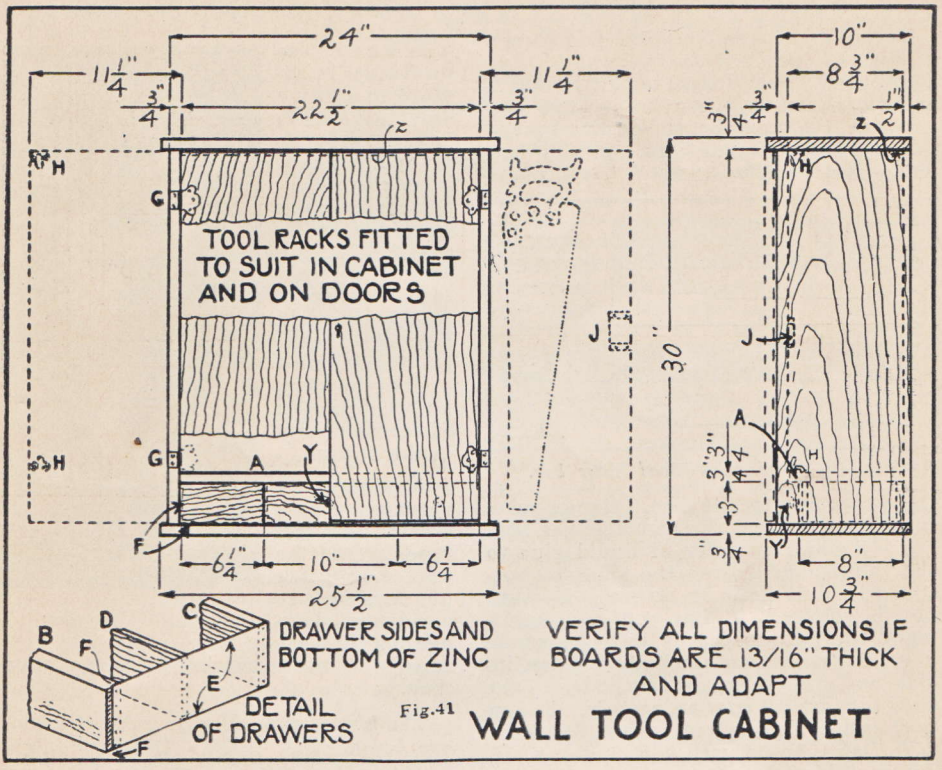


Fig. 41

Wall Tool Cabinet—(Fig. 41)—The wall cabinet may be built of pine, white wood or cypress, which may be stained and varnished and be quite as efficient as a more elaborate cabinet. Among the tools used in making the saw horses and bench will be found all that are necessary to build this cabinet. The following list of material will be needed; ¾" boards are mentioned, but if boards are $\frac{13}{16}$", allowance must be made in cutting to sizes.

2 Top and Bottom, 25½"x10¾"x¾".
2 Sides, 28½"x10"x¾".
1 Back, 28½"x22½"x½", board or ply wood.
1 Furring Z, 22½"x1"x½".
1 Shelf A, 22½"x8¾"x¾".
2 Doors, 28½"x11¼"x¾". Quarter sawed boards to resist tendency to warp.
1 Drawer Front B, 10"x3"x¾". Rabbeted 1-16"x½" on each end and bottom to receive zinc, tin or copper as at F.
1 Drawer Back C, 9⅞"x2⅞"x½".
1 Drawer Partition D, 9⅞"x2⅞"x¼".
2 Drawer Fronts, 6¼"x3"x¾".
2 Drawer Backs, 6⅛"x2⅞"x½".
2 Drawer Partitions, 6⅛"x2⅞"x¼".
1 Drawer Bottom and Sides E, 15¾"x7¾" sheet metal.
2 Drawer Bottoms and Sides E, 12"x7¾", sheet metal.
2 Pairs of Surface Butts G.
2 Spring Door Catches H.
1 Cupboard Lock J.

To assemble:

Step 1—Fasten top and bottom and sides with 6d finish nails or 2" No. 10 round head screws. Be sure the distance between the sides equals the length of shelf A. If made of hardwood the surface should be scraped with ATKINS Scraper before sand papering and assembling. (Fig. 42.)

Step 2—Fasten shelf A with nails or screws; be sure it is placed just the width of the drawer fronts from the bottom.

Step 3—Nail furring Z in place and fit and nail the back to Z and to shelf A.

Step 4—Fit and hang the doors with surface butts as suggested. The door may be glued of narrow pieces to resist warping, if quarter sawed boards are not available, or they may be cleated on the inside. Panelled doors may be made if desired.

Step 5—Bend the sheet metal drawer bottom and sides accurately. Fasten with 1" No. 16 wire nails and fit the drawer fronts.

Step 6—Place tools in the cabinet as desired; fit blocks, racks or screws to support them.

Step 7—Stain, shellac, varnish or paint the cabinet inside and out as preferred.

Step 8—Fit spring door catches H to the inside of the door as shown and place a small knob Y in the center of each drawer front.

Step 9—Hang the cabinet on the wall by driving screws through the back into the wall studs, or put up cleats to support cabinet. On masonry walls, drill holes and drive in wood plugs for screws.

Fig. 42—Using an ATKINS Silver Steel Scraper Blade on hard wood, in building wall tool cabinet

Mitre Box of Wood

To build the wooden mitre box shown in Fig. 43, proceed as follows: 1. Cut a piece of 1½" board to 38" x 4½", and plane and face, mark one edge and one side. Gauge the width and square the edges with extra care. 2. Cut two pieces for the sides 38"x4½", and plane

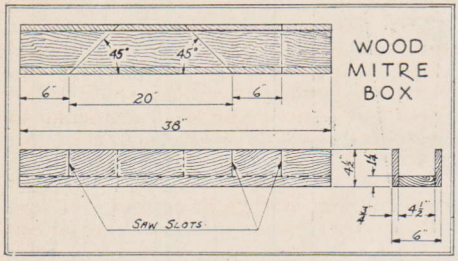


Fig. 43—Diagram of Wood Mitre Box.

them together to one size. Gauge carefully for width. 3. To assemble the box, apply a small quantity of liquid glue to the joints, and fasten the sides to bottom with box nails or screws. Be sure box is square. 4. Lay out and knife-mark the two 45-degree lines shown in Fig. 43, and extend lines down sides, inside and out, to guide saw cuts. Take care to mark all cuts accurately. 5. Saw both sides at one cut, using the same saw that is to be used with the box. 6. Mark and cut the square saw-cut at end of box, as shown. This cut is a great aid in squaring off small stock.

Other Shop Equipment to Build

In fitting up his shop, the home worker often finds need for other equipment. In the reference lists on pages 29 and 30 several special items of shop equipment are suggested, and plans or working details are available from different sources.

Rust-Proof Case For Saws

Where the workshop is located in a home basement which has a tendency to dampness, it is advisable to protect the saws against rust by constructing a damp-proof saw case. Such a case is shown in Fig. 44. It may be hung on a wall in the shop, with a small dish of kerosene kept in the bottom.

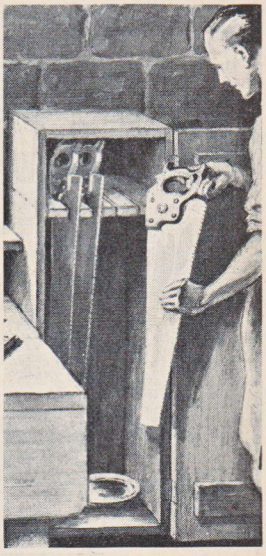


Fig. 44—Saw Case

Another advantage of a cabinet of this type is that the saw teeth are not exposed to accidental damage, as they are when the saws are hung in the open shop.

The box may readily be built of ordinary lumber ⅞" thick. It is 42" high, 14½" wide, and 12" deep. The saw holder is 12½"x11", with slots 2½" apart, running with the grain. There should be a reinforcing cleat 4"x12½" nailed across the underside of the saw holder, at the back. The door should be cleated at top and bottom, to prevent warping. It should be hung on three hinges. The saw cabinet may be finished with stain and varnish, or with paint, as preferred.

Layout of Workshop for Doing Decorative Metal Work

The home craftsman who takes up ordinary decorative metal work can usually adapt his present bench equipment to serve his needs, but if he wishes to specialize in this type of work, it is best to arrange and equip a section of his shop exclusively for metal working.

A shop layout, such as that shown in Fig. 45, is ideal where the equipment may be placed along one wall of the room. The units may be arranged to suit any other floor plan, but in any case, the small bench on which finer types of work are done, should be placed under a window.

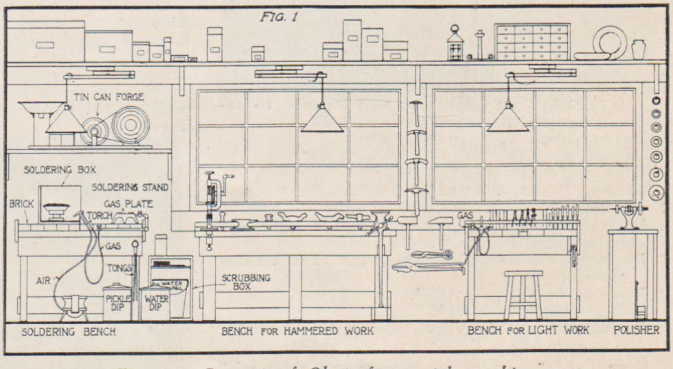


Fig. 45—Layout of Shop for metal working

HOW TO CUT AND WORK METALS

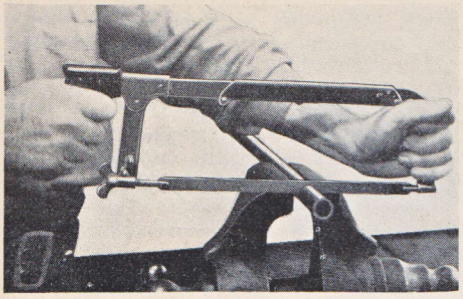


Fig. 46—You can cut SIX TIMES more metal with Atkins Silver Steel Hack Saw Blades

MORE and more home shop owners are making things from metals—decorative objects such as lighting fixtures, furniture hardware, home equipment, and many other things. Some are model enthusiasts, making miniature locomotives and railway equipment, or mechanical models of every kind.

In decorative metal work, sawing is the most important operation, and it is most essential that the new metal-worker first acquire the proper saws and knowledge to do metal-cutting efficiently.

In practically every shop the hack saw is the most useful tool ever devised for the rapid cutting by hand, of metal bars, rods, pipe, conduit, tubing, bolts, screws, and many other materials; as well as being of great aid in shaping various pieces used in mechanical and decorative work.

Modern hack saw frames are designed to get the utmost out of any hack saw blade. They are made to fit the hand comfortably and to allow for the quick changing of blades. Fitted with high grade hack saw blades, suited to the job in hand, they are invaluable in the home shop.

A great many home shops are now equipped with small power tools, which, while they are designed primarily for wood working, are also available for a surprisingly large number of efficient metal working operations.

Thus, the owner of a shop equipped with a power saw table may equip this table with a metal-cutting circular saw especially designed for this purpose and he will be amazed at the speed and accuracy with which he may cut the softer metals such as aluminum, brass, copper, etc., in sheet, bar or tube form. Tedious hand labor is eliminated and the accuracy obtained is comparable to that of the finest equipped shop.

Then, there are types of circular saws for cutting bakelite, formica, and most of the various wall board compositions which quickly dull saws made for wood only. Radio and electrical workers, and others using these materials will find this type of saw of great value, as it cuts cleanly, rapidly and smoothly.

The power saw table may also be equipped with a thin bakelite bonded wheel, which is made of bakelite impregnated with cutting abrasives. This wheel is mounted and used the same as a circular saw. It is very effective for cutting off hard and soft steel (even tempered tool steel), wrought or cast iron, aluminum, brass, copper, etc., as well as tile, slate, and many compositions which previously, it had not been possible to cut in the home shop with speed and accuracy, if at all.

When a power hand saw is equipped with a metal cutting band saw blade it will saw out sheet metal projects with speed, accuracy and smooth results obtainable in no other way. This saves an immense amount of time and labor, over the old method of cutting with cold chisels, or drilling along a line and chiseling out, leaving a lot of filing to be done.

Grinding wheels play an important part in even the most simple shop equipment. Most of the power driven shop outfits now provide for mounting a grinding wheel on the lathe or saw arbor; or, separate polishing heads are provided for mounting grinding wheels and polishing buffs. The ATKINS Acrolite grinding wheel is for general purposes as in sharpening edge tools as the cold chisels, drills, punches, etc., used by metal workers. The amateur metal worker will also find the ATKINS Ferrolite wheel very useful for grinding copper, brass, cast iron, etc., when cleaning up such metals before polishing.

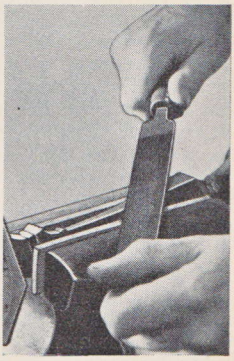


Fig. 47—Draw-filing brass candlestick before polishing

Indispensable in the home workshop is a set of good files of various cuts and shapes, to be used in finishing and even shaping much of the work done by hand. On sheet metal, the edges are smoothed and rounded, more or less, files are often used for cleaning up and smoothing off work before polishing. See Fig. 47.

How to Use Hand Hack Saws

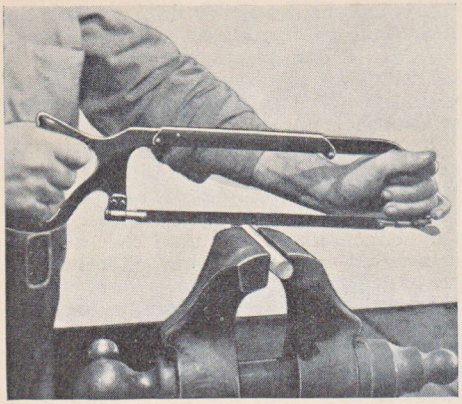


Fig. 48—Cold rolled steel shafting ¾" dia., cut off in 80 seconds with an ATKINS Silver Steel Hack Saw Blade

FOR best results, in using hack saws in the home shop, the work should be solidly mounted in the vise jaws, and the vise firmly bolted to the bench to prevent any movement. The top of the vise jaws should be about level with the operator's elbow.

The hack saw blade is always placed in the frame with the teeth pointing AWAY from the operator. Simple as this may seem, hack saw blades are occasionally mounted backward, with the teeth pointing toward the handle, in which position they do not cut effectively at all. See that the blade is mounted tightly in the frame, by using the wing nut adjustment. This will save much unnecessary breaking of blades and also cause the saw to cut faster and more truly. Blades with hard teeth and soft backs, such as the ATKINS Non-Breakable Hack Saw Blades need more tension than the "All Hard" or Silver Steel "Blue End" blades.

Stand firmly on the feet, in a convenient position before the vise, holding the hack saw frame with both hands as shown in Fig. 48. Start the cut easily with just enough pressure on the blade to make the teeth bite into the metal. If the teeth are allowed to ride over the metal without cutting, it tends to dull them.

As soon as the hack saw starts cutting the metal, use full length of the blade at each stroke, not just a part of it. Do not bear too heavily on the blade, as it will cut more effectively when the correct pressure is applied. The number of strokes used per minute will have much to do with the speed of cutting. From 45 to 50 strokes per minute are usually recommended by experts. Run the hack saw blade back and forth in a straight line, relieving the pressure on the return stroke. Avoid any sudden side twists when sawing, or you are apt to damage the blade. If more than one saw is used for making a single cut, start the new saw in a **fresh** cut by turning the work, as the new saw being slightly wider, may jam in the old cut.

Select a hack saw blade best suited to the job. For general work ATKINS Silver Steel Hack Saw Blade, with the Blue End with 14 or 18 teeth to the inch, is recommended. This blade will cut cold rolled steel, wrought and cast iron, brass, etc., as encountered in

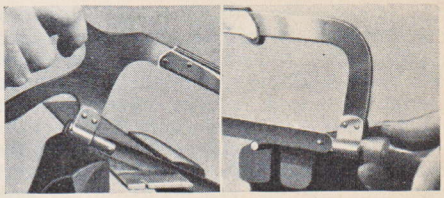


Fig. 49—Left—Correct position of blade for cutting band iron or other flat stock. Right—Correct position of hack saw, in sawing pipe, tubes, rods, etc.

the average job in the home shop, so long as the work is of ample diameter to support at least three of the teeth when it is being used. For iron pipe, steel conduit, tubing of brass, copper or steel (Fig. 46), or thin rod material as in Fig. 49 right—hack saws with from 24 to 32 teeth to the inch should be used. The thinner the walls of the tubing, or the smaller the diameter of the rods, the finer the teeth of the hack saw used for cutting it effectively. These finer toothed hack saws should also be

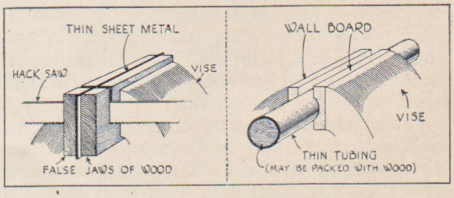


Fig. 50 — Left — Very thin metal is placed between pieces of wood, for sawing Right—Thin tubing is filled with wood dowel or roller to prevent damage in vise.

used for sheet metals, 32 teeth to the inch being recommended for metals thinner than 18 gauge.

It is a decided advantage, even in the small shop, to have two hack saw frames.

One may be fitted with an ATKINS Silver Steel Blue End Hack Saw Blade, either 14 or 18 teeth to the inch and the other hack saw frame fitted with an ATKINS Silver Steel Blue End Hack Saw Blade of either 24 or 32 teeth to the inch. With the two frames so fitted you are ready to cut many kinds of work without stoping to change blades.

Fig. 49—left shows the correct position of the saw blade when used for cutting a piece of band iron commonly used in the small shop. Note that a slanting cut is being taken, with the work held horizontally in the vise jaws, to avoid cutting at right angles across its thinnest part. Such stock should **not** be mounted vertically in the vise and sawed straight across.

The band iron was 2 inches wide and ⅛" thick and was cut across in forty seconds, using an ATKINS Flexible Back Non-Breakable Saw Blade with 14 teeth to the inch.

By making a slanting cut on thin material, it is easier to follow a straight line, and more hack saw teeth engage the metal. Thin metals, sawed straight across, at right angles to the surface, will often strip the teeth from cheap, inferior grades of hack saws. ATKINS Silver Steel "Blue End" Hack Saw Blades will handle such jobs most effectively and the teeth of these saws will not break out. A fine toothed saw of either 24 or 32 teeth to the inch should be used when cutting straight across a thin section of metal. For metals under $\frac{3}{16}$" in thickness a hack saw with 32 teeth to the inch should be used when the cut is made at right angles to the surface.

Very thin sheet metals, as from 20 to 30 gauge, may be clamped between two pieces of wood, which should completely cover the cut to be made. Work so mounted may be placed in the vise as shown in Fig. 50—left or clamped to the bench top. Very clean cuts may be made in this way, without bending soft metals.

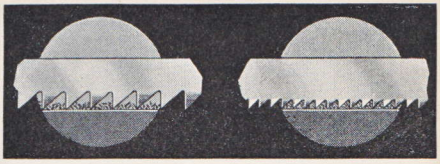
Angle, channel, I beam, or other angular shapes should be mounted in the vise so as to take a slanting cut across the wider surfaces and avoid cutting straight across the thinner sections. The cut should usually be started as shown in cutting band iron.

Work which is sometimes difficult to mount in vise jaws, such as round bars, or angular shapes, or polished work which must not be marred, may be held securely if strips of heavy cardboard or soft wall board, are placed between the work and the vise jaws. The brass candlestick is so mounted for filing as shown in Fig. 47.

How to Select Hack Saw Blades

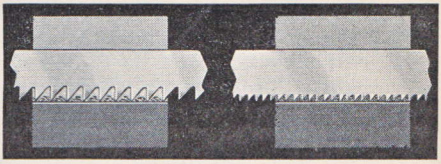
It is very important in cutting metal with hand hack saw blades, for the best efficiency, to use a blade with the proper number of teeth per inch for the material to be cut.

The following diagrams will clearly illustrate to the home workshop enthusiast the proper blade to use for cutting different shapes of metal, such as rounds, squares, angles and tubings.



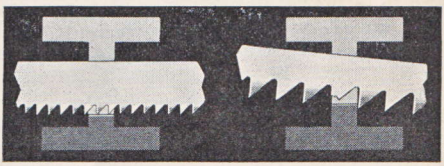
LEFT—Plenty of chip clearance, blade will not clog. RIGHT—Teeth too fine, no chip clearance

For cutting round bars of soft metals or large sections it is best accomplished by using blades with 14 teeth per inch.



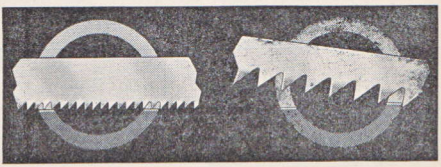
LEFT—Shows plenty of chip clearance. RIGHT—Teeth too fine, teeth clogged, because of no chip clearance

In cutting square bars of steel such as tool steel, high speed steel, etc., it is best to use a blade with 18 teeth per inch.



LEFT—Two or more teeth in direct contact with the work. RIGHT—Coarse teeth straddle the work, causing stripping

For cutting materials such as angle irons, brass, copper, iron pipe, etc., use a blade with 24 teeth per nich.



LEFT—Two or more teeth cutting at all times. RIGHT—Coarse teeth straddles the work with a tendency to strip teeth

Blades with 32 teeth per inch are best for cutting sheet metal, thin tubing, conduit. It is essential to have as many teeth contacting the material as possible on thin metals.

For general work where one frame and blade is used for most all purposes, a blade with 18 teeth per inch is recommended.

Metal Cutting with Circular Saws

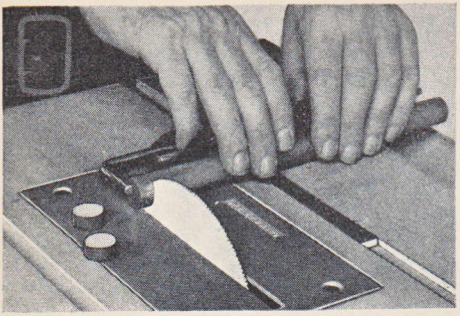


Fig. 51—Table with 6" metal-cutting circular saw

Fig. 51 shows an ATKINS circular metal cutting saw on a modern motor driven saw table in the home workshop, sawing off disks from a thick bar of brass. The saw is driven by a ½ H. P. motor and runs at 3,400 R. P. M., the saw cutting off a disk in eight seconds, making a very smooth square cut.

The saw is mounted in the table in exactly the same manner as a wood cutting circular saw. It fits the mandrel or arbor closely, running without wabble or side play. The cross-cutting or mitre gauge, and the rip gauge may be used in practically the same way as with the wood cutting saw. The mitre gauge may be set at any of the usual angles and cuts made across stock at these angles, or strips of metal may be ripped from a larger piece, using the rip gauge as a guide. Bars of brass, aluminum, copper, and metals of like soft composition up to 1 inch in diameter, may be quickly cut across on the equipment shown, using the mitre gauge. Sheet metals as above up to ¼" thick may be ripped into strips, using the rip gauge.

When using the mitre gauge the work should be held very firmly against the gauge, as the metal is fed up to the saw in order to avoid the work slipping out of line; or, the work should be clamped to the gauge as shown in Fig. 57.

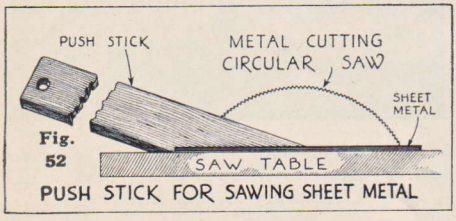


Fig. 52

PUSH STICK FOR SAWING SHEET METAL

Thick or thin walled tubing may be cut at right angles, or at any other angle within the capacity of the mitre gauge. This is a great advantage, as the tubing is in no way damaged or distorted, as it is frequently when held tightly between vise jaws for cutting by hand.

When being ripped, the metal should be held down to the saw table and against the rip gauge, as the work is fed to the saw. Fig. 52 shows how a notched Push Stick should be used to push thin metal up to the saw and at the same time hold it flat on the saw table. It is sometimes rather difficult to feed thin metal to the saw with the fingers, as it projects so little above the saw table. The notched push stick made preferably of hard wood, solves this difficulty. Of course, the push stick should be used in ripping narrow strips when there is not room safely to use the fingers between the saw and the rip guide, as in woodworking.

ATKINS type "K" circular metal cutting saws are hollow ground and if used as specified, cut rapidly and easily,

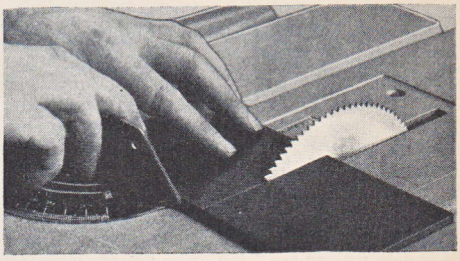


Fig. 53—Circular Saw Cutting Bakelite panel

the teeth holding up for a great many cuts. Metal to be cut should be fed to the saw naturally. Do not force the work against the saw.

These saws may also be used to cut grooves or slots in the under side of soft metals, by raising the saw table so that just enough of the saw is exposed, as in wood-working, or the table may be tilted and slanting cuts taken within capacity of the saw and equipment.

Fig. 53 shows the ATKINS Type "L" Circular Saw cutting a panel of Bakelite ¼" thick and 4" wide, the cut taking twenty seconds, leaving the edges clean and smooth. Bakelite, Formica, fibre, and similar materials quickly dull saws not especially made for cutting them, as many amateur mechanics have found to their cost. This saw handles these materials perfectly and is indispensable in the shop of the experimenter or others working this material to any extent. The saw is mounted and used in practically the same way as any circular saw for wood.

Band Saw Blades for Metal Cutting

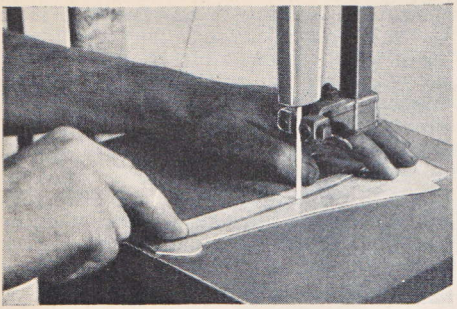


Fig. 54—Band saw cutting a brass hinge strap

SHEET metal projects such as hinges, escutcheon plates, book ends, weather vanes and the like may be cut out quickly and cleanly on band saw machines fitted with metal-cutting blades. Work so accomplished may be sold with a good profit if desired. Model makers also will find that metal cutting band saws will save them endless time and effort when sawing out the many pieces of even quite thick sheet metals frequently used. The clean straight edges so obtained are very desirable in this work, and one has yet to encounter a model maker with more time at his disposal than he knows what to do with.

Fig. 54 shows an ATKINS Metal Cutting Band Saw Blade $\frac{3}{16}$ inch wide, 14 teeth to the inch, being used for cutting out a brass hinge strap from metal 1-16 inch thick. This hinge was 8" long and 2½" wide at the butt, and was sawed out cleanly to a scribed line in two minutes, leaving very little finishing to do on the edges. This saw is made for cutting the softer, thinner metals such as brass, copper, bronze, and aluminum and should not be used on the harder metals such as mild steel or iron. Softer metals up to ¼ inch in thickness may be cut with this type of saw, using a blade ¼ or $\frac{5}{16}$ inch wide on small band saw machines.

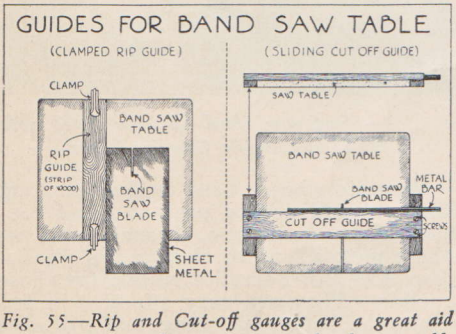


Fig. 55—Rip and Cut-off gauges are a great aid to accurate metal cutting on a band saw table

Fig. 56 shows an ATKINS Flexible Back Metal Cutting Band Saw Blade of the "Hack" type, ¼ inch wide, 18 teeth to the inch. The teeth are staggered or waved and cut rapidly.

This blade is being used to cut out a part of the frame for a model locomotive, cutting an inch in about two seconds, through mild steel, 1/16 inch thick. A similar type of ATKINS blade $\frac{3}{16}$ inch wide, with 24 teeth to the inch, is made for cutting thin hard metals, though not quite so fast as the ATKINS blades designed especially for them, as mentioned above.

These metal cutting blades are mounted on the band saw in just the same way as a wood-cutting blade, using the same precautions in adjusting the blade to see that it runs truly in and against the guides and that the teeth clear these guides. Each blade should be adjusted to get just enough tension to make it run straight and true, exactly as a wood cutting blade is adjusted.

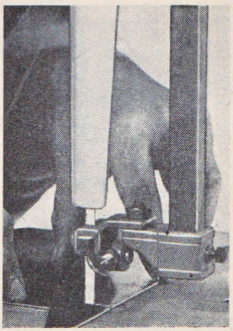


Fig 56—Using Band Saw to cut 1/16" mild steel

Feed the work against the blade naturally, as it cuts into the metal. Do not force the metal against the blade. The width of the blade used should be suited to the curve to be followed; a narrow blade on the sharper curves. Allow the blade to cut a way for itself when following sharp curves. Never twist the blade out of line in making any kind of cut as it may then break.

Fig. 55 shows how simple rip and cut-off guides may be made and used on the band saw table for cutting metals.

Very thin metals may be mounted on a thin piece of wood with thick shellac, (which is placed out of the path of the saw). The reason for this is that extremely thin, soft metal may be drawn down a bit by the blade in action, and catch in the saw slot of the band saw table, if not mounted as above.

Several similar pieces of sheet metal may be cut out at the same time by sticking them together with thick shellac out of the path of the saw, (at the corners, for instance).

Sometimes it is desirable to wipe a light film of lubricating oil over the sheet metal surface to be band sawed, such as long cuts on mild steel or brass.

Bakelite Bonded Wheels to Cut Metal

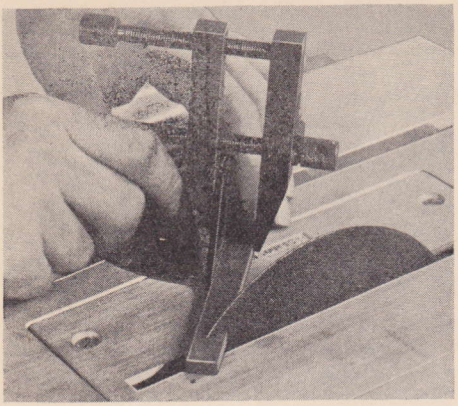


Fig. 57—Saw table fitted with Bakelite Bonded Wheel, cutting tempered tool steel

THE great advantage of using these wheels in a small shop is that with them you may cut off so many different kinds of materials, some of which could not be cut without them.

The wheels are mounted on the saw mandrel in the same way as a circular saw, and are used for the rapid cutting of tempered steel, mild steel, cast iron, pottery, tiles, slate and similar materials which would quickly dull or even ruin ordinary types of circular saws. They may also be used to cut grooves in the under side of these materials in the same manner in which a circular wood saw is used.

Fig. 57 shows a Bakelite Bonded Wheel 1/16 inch thick and 6 inches in diameter, cutting across a piece of hardened tool steel ¼ inch thick and ⅝ inches wide, at an angle of 45°; the work being fed to the wheel gently, not forced against it.

These wheels are very strong, yet somewhat brittle and may break if jammed or twisted. It is easy to avoid this by feeding the work straight to them, and holding it or clamping it to the mitregauge firmly. The saw guard with which most tables are provided, may be used on this type of work by raising it up, over the wheel, with wooden blocks for clearance.

The makers of these wheels recommend that they be run at a speed of 5,000 R. P. M. but they are still very effective when driven at the average speed of 3,400 provided on most saw tables for home work shops.

Fig. 58 shows a ⅛ inch thick wheel, 8 inches in diameter being used to cut a very hard, tough composition tile.

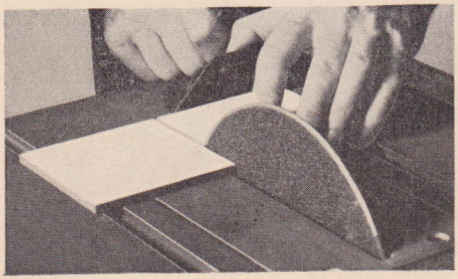


Fig. 58—Cutting asbestos composition tile with Bakelite Bonded Wheel on circular saw table

How to Use Grinding Wheels

Fig. 59 shows an ATKINS Acrolite Grinding Wheel mounted on the head stock spindle of a home work shop lathe, for the quick grinding and sharpening of tools, etc. The wheel is run at the highest speed obtainable on this lathe, about 2,250 R. P. M. for effective cutting . The work should be placed on the tool post rest so that it bears gently against the grinding wheel running toward it, and above the center of the wheel. Many amateurs make the mistake of holding the work against the wheel with too much pressure, causing the wheel to cut less effectively. While these wheels heat the work very little, it is well to provide a jar of cold water in which to dip small tools occasionally to prevent drawing the temper at the edge while grinding.

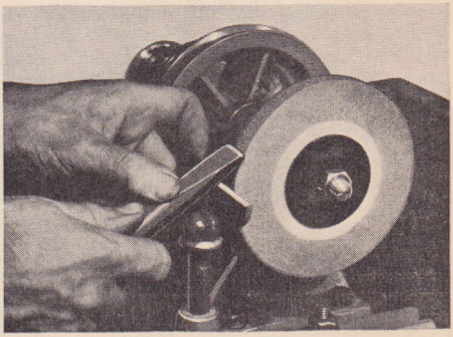


Fig. 59—Sharpening chisel on lathe fitted with ATKINS Acrolite Grinding Wheel

Acrolite wheels, used to **sharpen** steel tools, should not be used to **grind** copper, brass, cast iron, bronze, etc., as these metals tend to clog up the wheels. Use ATKINS Ferrolite wheels for these metals. They are very effective in finishing up before polishing, and will save much filing.

THINGS FOR YOU TO BUILD

450 Suggestions and Where to Get Plans and Data

THIS book deals primarily with starting the home shop and equipping the worker with the basic knowledge he needs to build things successfully in his new shop. From this point he can follow whichever branches of home crafting are best suited to his natural ability. So, instead of describing a great variety of projects similar to the hundreds already published, we list a number of project suggestions, and tell where the home worker can find just the plans he desires.

Key to Numbers Used in Lists Below

The figures which follow each article below designate the publishers who will furnish job plans or working descriptions to aid the reader in building this particular project. For example: "Arm Chair, 1" means that Popular Science Monthly can furnish job plans for this project. All requests for information and prices of these plans or construction details must be sent direct to the publishers and NOT to E. C. ATKINS AND COMPANY. We have no plans for sale.

Key	Publisher of Plans	Address
1	Popular Science Monthly	381 Fourth Ave., New York City.
2	Popular Mechanics Magazine	200 E. Ontario St., Chicago, Ill.
3	Popular Homecraft	737 N. Michigan Ave., Chicago, Ill.
4	LePage's Craft League	725 Essex St., Gloucester, Mass.
5	Wood Utilization Committee	U. S. Department of Commerce, Washington, D. C.
6	National Lumber Manufacturers Association	702 Transportation Building, Washington, D. C.
7	Better Homes and Gardens	Meredith Publishing Company, Des Moines, Ia.
8	Modern Mechanics	529 S. Seventh St., Minneapolis, Minn.
9	Farm Mechanics	407 S. Dearborn St., Chicago, Ill.

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Airplane Model, 1, 2, 7, 8
Airplane Cockpit, toy, 1
Alcove, Dining, 1, 2, 3, 6
Antique Cop. Lantern, 3
Antique Mirror, 1
Animal Toys, 1, 3
Apt. Work-Bench, 1
Aquaplane, 2, 3, 5
Aquarium and Base, 3
Aquarium, Built-in, 2
Arbor and Gate, 1, 2, 3
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Arm Chair, 1
Ash Tray, 2, 3
Ash Tray, Stand, 2, 3
Auto, Boys' Electric, 8
Automobile Trunk, 7

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Bedside Table, 3
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Bench Hook and Mitre Block, 1
Bench Model Plane, 2
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Cabinet, Stove, 2
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Colonial Desk, 1
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Copper, Hammered, Pipe Rack, 2
Copper Match Box Holder, 3
Copper Trays, 2
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Electric Clock Case, 2
Electric Exerciser, 2
Electric Heater and Soldering Iron, 2
Electric Train Station (14"), 7
Electric Train Signals, 2
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Folding Table, 2, 7
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Inlaid Bowls, 2
Inlaid Glove Box, 2
Inlaid Tray, 3
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Model Helicopter, 2
Model Horiz. Steam Eng., 2
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Model Ships, 1, 2, 3, 8
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Modern Lamp, 3
Modern Screen, 1
Modern Stand, 1, 3
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Table, Dropleaf, 2, 3
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Table, Tavern, 1
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Welsh Dresser, 1
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Wrought Iron Floor Lamp and Table, 2
Wrought Iron Projects, 2

Yacht Models, 1, 2, 3
Yard Furniture, 2, 3

HOME WORKER'S BIBLIOGRAPHY

The publishers, listed below, will gladly send full information on books for home workers, upon application. Prices are subject to change without notice.

Manipulation of Tools and Wood

Elements of Woodwork, Chas. A. King, American Book Company, Chicago, Ill. $1.08
Principles of Wood-working, H. Hjorth, Bruce Pub., Co., Milwaukee, Wis. 1.76
Handwork in Wood, William Noyes, Manual Arts Press, Peoria, Ill. 3.85
Essentials in Wood-working, Ira S. Griffiths, Manual Arts Press, Peoria, Ill. 1.25
100 Problems in Woodwork, W. A. Devette, Bruce Publishing Co., Milwaukee, Wis. 2.00
Coping Saw Work, E. F. Worst, Bruce Publishing Co., Milwaukee, Wis. 2.40
Practical Wood Carving, E. Rowe, Bruce Publishing Co., Milwaukee, Wis. 1.25
A Course in Wood Turning, Milton & Wohlers, Bruce Pub. Co., Milwaukee, Wis. 1.50
Instructions in Wood Finishing, McGee & Brown, Bruce Pub. Co., Milwaukee, Wis. 1.60
Constructive Carpentry, Chas. A. King, American Book Co., Chicago, Ill. ..... .84
Inside Finishing, Chas. A. King, American Book Co., Chicago, Ill. ..... .96

Furniture Making

Cedar Chests, Ralph H. Windoes, Popular Homecraft, Chicago, Ill. 1.25
Projects in Furniture Making, Adams, Bruce Pub. Co., Milwaukee, Wis. 1.45
Built-in Furniture, Popular Mechanics, Chicago, Ill. 2.50
Make Your Own Furniture, Popular Mechanics, Chicago, Ill. 1.00
Furniture Inlaying, Frost & Fullerton, Popular Homecraft, Chicago, Ill. 2.50

Making Things

Home Workshop Manual, Popular Science 5.00
Boys' Mechanics Library, Popular Mechanics, Chicago, Ill. 8.00
Make It Yourself, Popular Mechanics 3.00
How to Build It, Modern Mechanics, Minneapolis, Minn. ..... .50

U. S. Government Bulletins

How to Judge a House, U. S. Department of Commerce, Washington, D. C. ..... .10
Care and Repair of a House, Supt. of Documents, Washington, D. C. ..... .20

The following Government Bulletins are for sale by Supt. of Documents, Washington, D. C., 5 cents each:

927 Home Conveniences
1044 City Home Garden
1194 Home Heating Plant, Using a
1209 Care of Street Trees
1219 Floors and Covernings
1318 Greenhouse Construction
1460 Plumbing Repairs in Home
1513 Convenient Kitchens
1554 Poultry Houses and Fixtures
1597 Shipping Containers, Fruits, Vegetables
15 Rabbit Houses (Leaflet)
64 Egg Case Making (Leaflet)

TYPES OF SAWS AND USES

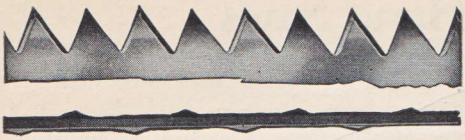


Fig. 60—Side and top views of CROSS CUT teeth of a hand saw

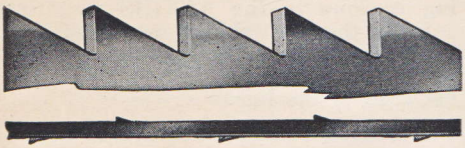


Fig. 61—Side and top views of RIP Teeth of a hand saw

HAND SAWS—Cross-cut, to cut **across** the grain of the wood. The teeth are like two parallel lines of sharp knife points to cut the wood fibers. See Fig. 60. **Rip Saw,** to cut **with** the grain of the wood. Teeth are shaped like chisel points and they virtually chisel out the wood. See Fig. 61. See Page 33.

MITRE SAWS—For use in the mitre box, to cut frames, mouldings, etc. Stiff back and fine teeth. See page 34.

BACK SAWS—Similar to mitre saws, but smaller. Square at both ends. Used with or without mitre box, to cut fine joints or small stock. See page 34.

DOVETAIL SAWS—A small light back saw with extra small teeth for very fine work, as in dovetailing, pattern-making, etc. See page 34.

COMPASS SAWS—For sawing straight or curved cuts from a hole in the wood. Narrow, tapered blades of extra tough steel. See page 34.

KEYHOLE SAWS—Similar to compass saws, but blades are shorter and narrower. Extra strong and sharp. See page 34.

COPING SAWS—For cutting thin stock on curved lines, such as moulding joints, scroll work, brackets, wood toys, etc. Blade cuts at any desired angle, by simple adjustment. See page 34.

NEST OF SAWS—A combination of three saws—keyhole, compass and metal cutting blades—to fit in one handle. See page 34.

HACK SAWS—For cutting all kinds of metal. Rigid metal frame, adjustable to take blades of different lengths. Two types of blades—the old style alloy steel blades and the newer high speed steel blades. See page 37.

CIRCULAR SAWS—For cutting wood, are made in cross-cut or rip saw types; also, combination saws which cross-cut, rip or mitre equally well. The smaller sizes are widely used in workshops on motor-driven bench or portable sawing outfits. See page 36. **Circular Mitre Saws** are especially made for smooth cutting, as in fine cabinet work, etc. See page 36.

DADO HEADS—For cutting grooves of any width from ⅛ to 4 inches. Set consists of two outside cutters and as many inside cutters as width of groove requires. Cuts with or across the grain, or diagonally, and leaves a very smooth, even groove. See page 36.

BAND SAWS—For use on power machines. Saws 2" or more wide, are used in lumber mills; the narrower saws are for use in woodworking factories and home shops. Blades are as narrow as ⅛"; lengths to fit various machines. See page 36.

SCRAPER BLADES—For hand use in scraping floors, finishing surfaces, removing paint, etc. See page 35.

FILES—For sharpening saws and other cutting tools, for finishing wood or metal surfaces, etc. Many types—mill, flat, square, round, half-round, slim taper, hand saw, rasps, etc. See page 38.

SAW TOOLS—Saw Clamps, to hold saws when sharpening the teeth. **Saw sets,** to use in setting saw teeth accurately. **Hand Saw Filers** make filing a hand saw virtually automatic. See page 35.

E. C. ATKINS AND COMPANY make "A Perfect Saw for Every Purpose," therefore the home worker or the professional will find just the saw for any required work upon wood, fibre, bone, or metal.

MACHINE KNIVES—Small sizes are used on small home-workshop machines, such as planers, shapers, jointers, mortisers, etc. See page 36.

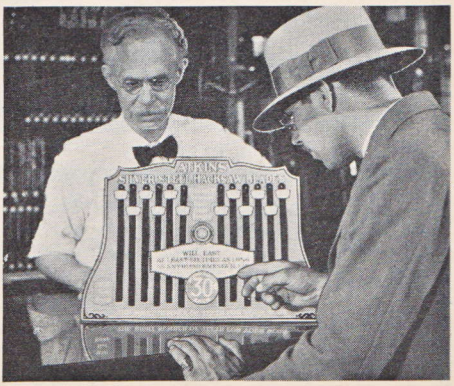


Fig. 62—You can cut SIX TIMES more metal with ATKINS Silver Steel Hack Saw Blades

Special Features of ATKINS Silver Steel Hand Saws

The Story of SILVER STEEL

SILVER STEEL is the invention of Mr. E. C. Atkins, the founder of E. C. ATKINS AND COMPANY. It is manufactured exclusively for ATKINS under a special secret formula. Nothing but the finest virgin ore is used, and when combined with the other expensive ingredients of the formula, the result is the finest steel ever made into saw blades—actually of as high quality as the finest RAZOR steel.

Gas Tempering

SILVER STEEL receives our special process of Gas Tempering, which makes the saw blade **uniformly** tough and hard, without being brittle. This is the reason why a SILVER STEEL Saw will hold its keen cutting edge far longer than any other, and also why it is easier to file a SILVER STEEL Saw and to make each tooth uniform.

Two-Way Taper Grinding

After tempering, the SILVER STEEL blades for ATKINS Hand Saws are cooled and then sent to the grinding room where they are two-way Taper Ground. The blade is so ground that it actually tapers (1) from tooth edge, the widest part, throughout the entire blade towards the back of saw which is the thinnest part; and (2) gradually tapers from the handle to point of the saw. See Fig. 63. The tooth edge is of uniform thickness over entire length of blade. This two-way Taper Grinding is found only in a genuine SILVER STEEL Saw. It prevents binding or buckling and thus makes the saw run freely and easily in the cut.

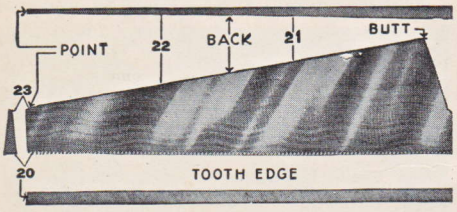


Fig. 63—Showing how ATKINS Hand Saws are Taper Ground. (Exaggerated for sake of clearness.) Figures are gauges—higher the figure, the thinner the saw

Blades Are Hand Smithed

All SILVER STEEL Saws are smithed by hand. This is a vitally important process, often slighted or even omitted in making other brands of saws. Smithing is done in the ATKINS factories only by the most skilled men, and is a process of careful hammering to remove all unevenness, so the blade will cut true to the line.

Perfection Handle for Hand Saws

With the Improved Perfection Handle, used only on the finest ATKINS Hand Saws, every ounce of power exerted by the user is directed upon the cutting edge of the blade. See Fig. 64. This type of handle eliminates wrist strain and makes every ounce of pressure count along the entire length of the cutting edge. The handle itself is a thing of beauty, being made of fine woods, handsomely carved and polished.

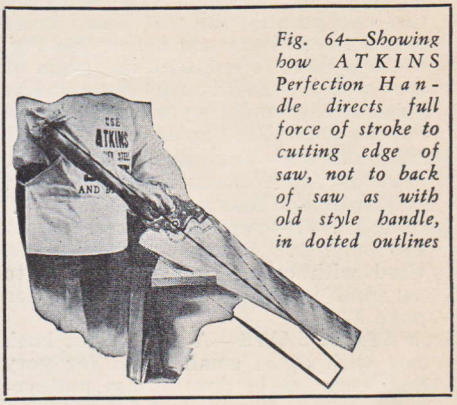


Fig. 64—Showing how ATKINS Perfection Handle directs full force of stroke to cutting edge of saw, not to back of saw as with old style handle, in dotted outlines

ATKINS also makes the old-style, straight-across handle for those who prefer this type, and it is furnished regularly on certain numbers of ATKINS Hand Saws.

Beauty of Finish

ATKINS SILVER STEEL Saws may be easily distinguished by the beauty and fineness of their polish. The famous Damaskeen and Mirror finishes were originated by ATKINS, and are used only on SILVER STEEL Saws.

Popular Patterns of Hand Saws

On the following pages, many of the most popular patterns of ATKINS Hand and Small Saws are shown and described briefly, so that you can readily select the type of handle or style of blade you prefer.

Atkins Silver Steel Saws for Your Shop

The No. 401—Straight Back, Ship Point

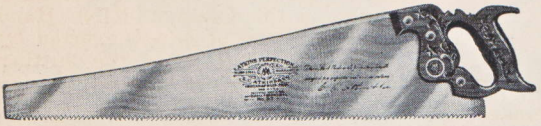
No. 401—Straight Back, Ship Point

A saw of extraordinary quality, workmanship and finish. Recommended for the critical artisan who purchases the finest tools. Genuine SILVER STEEL blade. FIVE gauges taper ground. MIRROR polish. Solid ROSEWOOD handle of Atkins Improved Perfection Pattern which prevents wrist strain. Nickel plated screws. Made straight back, regular and ship pattern.

Length, inches ---------- 22″ 24″ 26″

Hand—22″ and 24″ 10 point; 26″ regular and ship 7 to 11 point; 24″ and 26″ ship rip 5½ points.

No. 400 identical in quality, workmanship, appearance; is same as the No. 401 except skew back.



The No. 53—Skew Back, Ship Pattern

No. 53—Skew Back, Ship Pattern

This saw appeals to all high-class mechanics for general carpentry and the home workshop. The most popular saw on the market today. Genuine SILVER STEEL, taper ground blade with the ATKINS exclusive Damaskeen Finish. Fitted with Atkins Improved Perfection handle of applewood, embossed and polished, which prevents wrist strain. Made in both regular and ship patterns.

Length, inches ---------- 18″ 20″ 22″ 24″ 26″

Hand—18″ 9-10 point; 20″ 8 to 11 point; 22″ and 24″ 7 to 11 point; 26″ 5 to 11 point; 26″ ship 7 to 11 point.

Rip—22″ 7 point; 24″ 5½-6 point; 26″ 5 to 6 point; 26″ ship 5½-6 point.

The No. 65—Straight Back, Ship Point

No. 65—Straight Back, Ship Point

This is another of our most popular pattern saws for the home workshop mechanic; the companion saw to No. 53, excepting the straight back. SILVER STEEL, Damaskeen Finish, Embossed and polished applewood handle. Improved Perfection Pattern prevents wrist strain. Made in both regular and ship patterns.

Length, inches ---------- 18″ 20″ 22″ 24″ 26″

Hand—18″ 9-10 point; 20″ 8 to 11 point; 22″ and 24″ 7 to 11 point; 26″ 5 to 11 point; 26″ ship 7 to 11 point.

Rip—22″ 7 point; 24″ 5½-6 point; 26″ 5 to 6 point; 26″ ship 5½-6 point.

The No. 51—Skew Back, Ship Pattern

No. 51—Skew Back, Ship Pattern

Similar to No. 53 in general specifications except it is fitted with a straight across pattern handle of applewood, highly polished; has four nickeled screws and medallions. Recommended for the home craftsman. Made in both regular and ship patterns.

Length, inches ---------- 18″ 20″ 22″ 24″ 26″

Hand—18″ 9 to 11 point; 20″ and 22″ 8 to 11 point; 24″ 7 to 11 points; 26″ 5 to 11 point; 26″ ship 7 to 10 point.

Rip—22″ 7 point; 24″ 5½-6 point; 26″ 4½ to 5½ point; 26″ ship 5½ point.

The No. 9—"The Home Builder"

No. 9—"The Home Builder"

A high grade special steel hand saw for the man about the home who makes things. Nicely polished blade and evenly tempered throughout. Skew back. Seasoned beech handle, not carved.

Length, inches ---------- 24″

Hand—24″ 8 point.

Atkins No. 59—Skew Back, Ship Pattern

Made of special steel, Taper Ground and highly polished. Skew Back in Regular and Narrow Point patterns. Fitted with old style block pattern, lacquered and highly polished beech handle. Dark finish, not carved. Fastened to blade with three nickel screws and one medallion. A medium priced high quality saw for home workshop.
Length, inches ____18″ 20″ 22″ 24″ 26″
Hand—18″ 9 to 11 point; 20″ and 22″ 8 to 11 point; 24″ 7 to 11 point; 26″ 5 to 11 point; 26″ ship 7 to 10 point.
Rip—22″ 7 point; 24″ 5½-6 point; 26″ 4½ to 5 point; 26″ ship 5½ point.

Atkins Junior Mechanic Hand Saw

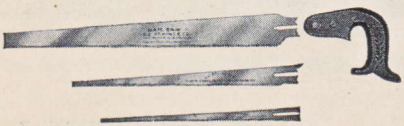
Made of genuine SILVER STEEL. Skew back, taper ground blade, highly polished and beautifully etched. Beech handle, coffee stained, full carved, with two nickel-plated screws and a medallion. This is a high grade home workshop saw for the young or older amateur mechanic desiring a small, light saw. Packed individually.
Length, inches _____20″
Hand—20″ 9 point.

Atkins No. 11—Adjustable Compass Saw

Here is a SILVER STEEL Compass saw that will be found most convenient for general use. The blade is notched to fit into an adjustable handle at various angles. This saw is necessary in every home workshop set of tools.
Length, Inches _____ 10″ 12″ 14″ 16″
Points per inch, any length_____8

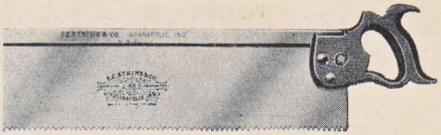
Atkins No. 6—Keyhole Saw

The finest keyhole saw in the world. SILVER STEEL adapts itself to this class of saw most admirably. Because of its extreme toughness, the blade holds its sharp cutting edge and is not easily broken. Especially adapted for home workshop owner's kit. Applewood handle, varnished and polished edges. Blade fastened to handle with saw screw and medallion.
Length, inches _____ 10″ 12″
Points per inch, any length _____10



Atkins No. 3—Nest of Saws

ATKINS No. 3 Nest of Saws contains a SILVER STEEL keyhole and compass blade; also an 18-inch special nail-cutting blade. When nails or other metals are encountered, you may easily cut through the metal with the nail-cutting blade and proceed with your regular hand saw. Roomy adjustable pattern handle.
Length, inches, Keyhole Blade _____10″
Length, inches, Compass Blade _____14″
Length, inches, Nail Cutting Blade _____18″



Atkins No. 1 Mitre Box Saw

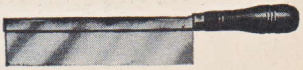
In the manufacture of this saw we use genuine Atkins SILVER STEEL. The back is of extra heavy spring steel, clamped in place to hold the blade rigid. The handle is of applewood with polished edge. Made either 4, 5, or 6 inches under back.
Length, inches—
18″ 20″ 22″ 24″ 26″ 28″ 30″ 32″
Points per inch—
18″—12 pts. 20″ to 32″—11 pts.

Atkins No. 2—Back Saw

ATKINS No. 2 Back Saw is made of genuine SILVER STEEL and fitted with an applewood handle, handsomely lacquered. The handle is fastened to the blade with two brass screws, and medallion. The back is made of first quality blued steel, pressed on back of blade, making it stiff and rigid. This saw is used for fine work where a larger saw is not practical.
Points per inch, any length _____14
Length, inches ____ 8″ 10″ 12″ 14″ 16″

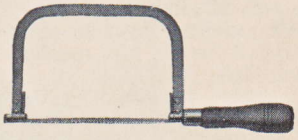
Atkins No. 100—Flooring Saw

Designed for sawing into flat surfaces, such as floors, without necessity of boring or using chisel. The point is toothed on both edges so that out-of-the-way spots may be reached with ease. Made of Atkins SILVER STEEL, beautifully polished and etched. Applewood handle, highly polished, specially designed. Has two saw screws and one medallion.
Length, inches _____18″
Points per inch _____10



Atkins No. 25—Dovetail Saw

This saw is made for light, fine work and in our famous SILVER STEEL quality only. The steel back makes it rigid and strong, yet very light. They are recommended for fine cabinet work where a Back Saw is not practical. These saws are 1½ inches wide under the back. Hardwood handle.
Length, inches _____ 6″ 8″ 10″ 12″
Points per inch, any length _____17



Atkins No. 50—Coping Saw

A strictly high-grade tool for the critical artisan; strong, durable, and efficient. Frame ⅜-inch wide, 3-16-inch thick; made of cold-rolled steel, nickeled and buffed, 7¼x4⅛ inches deep. Blade cuts at any angle. Frame fastened to the handle by malleable iron threaded ferrule; handle strong and rigid.

Atkins No. 0—Scraper Blades

SILVER STEEL is admirably adapted for this purpose and the craftsman will find it the best scraper blade he has ever used. Atkins Cabinet Scrapers are far superior in edge holding qualities to those ordinarily used. Fully appreciated by the mechanic accustomed to using fine tools. Each blade packed in wax paper cartons.

Standard sizes—

Size	Size	Size	Size
2 "x4"	4 "x4"	4 "x5"	3 "x6"
2½"x4"	2 "x5"	4½"x5"	3½"x6"
3 "x4"	2½"x5"	2 "x6"	4 "x6"
3½"x4"	3 "x5"	2½"x6"	4½"x6"
	3½"x5"		5 "x6"

Atkins No. 4—Rams Horn Floor Scraper

Hardwood frame, varnished and smoothly polished; it fits the hand and will not chatter.

Size of blade _____ 3½"x3". Overall 12"

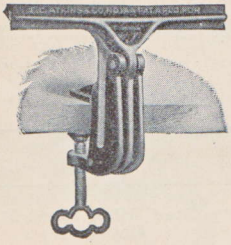
Atkins No. 5—Floor Scraper

Made of solid metal, 11 inches long. Two thumb-screws hold blade securely in place. Center thumb-screw presses blade into convex form to hug the work closely. SILVER STEEL Blade, beveled edges. Extra fine japaned finish.

Size of blade _____ 2⅜"x2½"

Atkins "AAA" Saw Clamp No. 2

Atkins "AAA" Saw Clamp holds the saw by an eccentric roller running between the two connecting arches instead of thumb-screws. When pressure is applied to blade, it is held securely, and will not chatter. Attached by wood screw or loose lug. This Saw Clamp is practically indispensable in a well equipped home workshop.

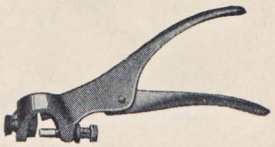


Atkins "AAA" Saw Vise

The principal advantages lie in its easy adjustment, strong construction and satisfactory service. A slight pressure on the outer jaw holds the saw firmly in place. This vise operates on the lock lever principle, which prevents overstraining as in the case where the screw is used. The jaws are lined with rubber which makes them noiseless. Made of best malleable iron, finely finished in black enamel.

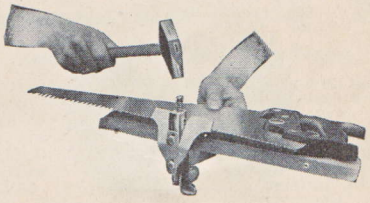
Atkins No. 15—"AAA" Hand Saw Jointer

Atkins "AAA" Hand Saw Jointer is an essential tool in filing hand, rip, and panel saws. Its use adds to the efficiency of the saw by making the teeth uniform in length. This is a practical tool for the home workshop owner who appreciates accurately fitted Hand, Rip and Panel Saws.



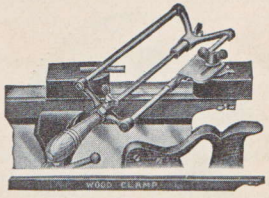
Atkins No. 395—Saw Set

Atkins No. 395 Saw Set has a revolving anvil with indicator dial. Lever placed below the body of set. Gauge screw has check nut, which prevents it from coming loose. The revolving anvil gives the required bevel and depth of set of teeth from 4 to 16 teeth per inch. Hardened anvil and plunger. Finely tempered steel spring. Nickel plated.



Atkins "AAA" Saw Set No. 5

Atkins "AAA" No. 5 Saw Sets are of high quality plunger type, used for Hand Saw setting which has many advantages over other sets of this type. They not only prevent breaking of the teeth, but assure absolute uniform set and avoid the possibility of setting the teeth too far down on the blade. A hammer blow reaches the tooth through a plunger. Amount of set easily and accurately adjusted. A very practical tool for the home workshop owner.



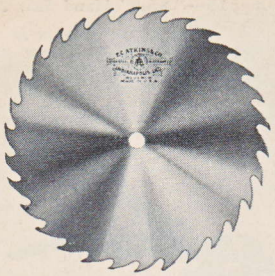
Atkins No. 8—Hand Saw Filer

Atkins No. 8 Hand Saw Filer. This saw filing devise is the most perfect tool for the purpose ever produced. By following directions the most inexperienced boy can file a saw correctly, bringing each tooth to the same bevel and pitch. It can be used with wood clamp in an ordinary vise or with an iron saw clamp. A favorite with home workshop owners.

Atkins Grinding Wheels

Atkins ACROLITE Grinding Wheels are made of Crystalline Alumina, almost as hard as the diamond for cutting hardest steel. Quicker and better than ordinary wheels for grinding woodworking tools, knives, saws, etc. All sizes and shapes; prices on request. Also, Atkins FERROLITE Wheels for grinding cast iron, copper, bronze, etc.

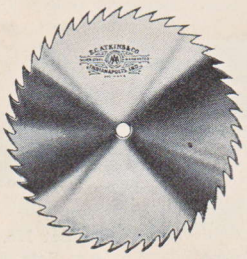
Diameter, Inches _____ 8"—½" thick



Atkins No. 2—Solid Tooth Circular Rip Saw

This saw is especially designed for ripping; flat ground; 18 gauge; made in standard sizes for all portable and bench machines; furnished filed and set. Atkins SILVER STEEL Circular Saws are recommended for your workshop.

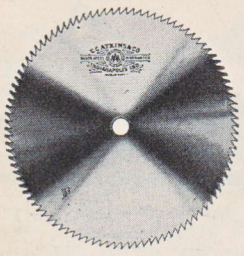
Diameter, inches	6″	8″
Gauge	18	18
Hole	¾″	⅞″



Atkins No. 7—Solid Tooth Combination Circular Saw

This Atkins SILVER STEEL Saw when properly fitted, both crosscuts and rips, flat ground; 18 gauge; furnished filed and set. You need this combination Saw for your outfit.

Diameter, inches	6″	8″
Gauge	18	18
Hole	¾″	⅞″



Atkins No. 8—Solid Tooth Circular Cutoff Saw

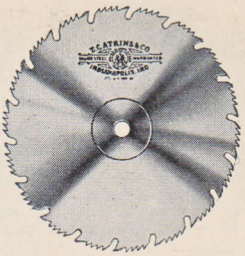
This pattern is SILVER STEEL designed for cutting across the grain. We carry a stock in all standard sizes for portable and bench machines. Furnished filed and set. A home workshop necessity.

Diameter, inches	6″	8″
Gauge	18	18
Hole	¾″	⅞″

Atkins "Jig" and Scroll Saws

Atkins Felloe Webs and Fay's Patent Scroll Saw Blades are unexcelled for fast, fine cutting on Jig Saw Machine. Made of SILVER STEEL, in widths ranging from 3-16″ to ½″.

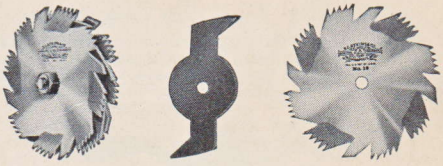
Length, inches	6″	8″



Atkins No. 37—Mitre Saw

Efficient where a smooth cut is desired. The first cleaner tooth on this circular mitre saw is bevel filed alternately in each section. Mitre Saws are special hollow ground to run without set, for smooth cutting for fine cabinet work. Highly recommended for the home workshop. Made in standard sizes and carried in stock for all portable and bench machines.

Diameter, inches	6″	8″
Hole	¾″	⅞″



Atkins Dado Heads or Groovers

Made from genuine SILVER STEEL with a capacity for cutting any width groove from ⅛-inch to 4 inches, and can be made to cut wider grooves if necessary. Made in six different sets, each set consisting of two outside saws, each of which is a groover in itself. Furnished with as many inside cutters as the width of desired maximum groove requires. Inside cutters are made from 1-16-inch to ¼-inch thick; outside cutters are ⅛-inch thick. Will cut a perfect groove exceedingly smooth, either with or across the grain. All standard sizes carried in stock, fitted ready for use.

No. 2 set to cut to ⅝″ wide.

Diameter, inches	6″	8″

Atkins Narrow Band Saws

The quality work produced by Atkins Silver Steel Band Saws in thousands of home workshops and by large industrial users demonstrates their superiority over ordinary saws. Made in any length. Specify length and width in ordering.

Points per inch, any width 3, 4, 5, 6, 7

Width—							
⅛″	3-16″	¼″	⅜″	½″	⅝″	¾″	1″

MACHINE KNIVES

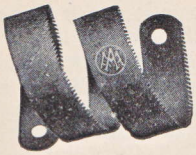
Atkins "Blue Star" High Speed Steel Planer Knives

Atkins Knives are made from genuine High Speed Steel. A scientific heat treating process results in steel having toughness combined with maximum edge-holding qualities. Atkins "BLUE STAR" High Speed Steel PLANER KNIVES to do fast, clean, smooth cutting. Absolutely dependable for the home workshop mechanic. These knives can be had in standard sizes to fit any machine. Template paper will be furnished on request. Data and prices on Knives for all machines sent on request.

Atkins Silver Steel Hack Saw Blades

Made of the same high quality steel as Atkins SILVER STEEL Saws—Atkins exclusive formula. Wonderful cutting qualities. Atkins SILVER STEEL Hand Hack Saw Blades, if used in a first-class frame are guaranteed to cut SIX TIMES more metal than any alloy steel blade of the same dimensions. They will lower cost and save money. Look for the "Blue End."

Length, inches	10"	12"
Teeth per inch	18-24-32	14-18-24-32

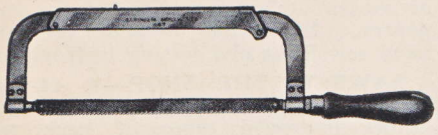


Atkins Non-Breakable Hack Saw Blades

Atkins Non-Breakable Hack Saw Blades are made with the usual hard edge, but with a soft back that practically prevents breakage. They should not be confused with any so-called "flexible" blades.

The edge is tempered to insure a cutting capacity equal to all-hard blades. Therefore, while the blade will cut fully as fast and hold its cutting edge as long as the all-hard blade, the liability to break or snap off is practically eliminated.

Length, inches—	8"	10"	12"
Teeth per inch—	18-24-32	14-18-24-32	14-18-24-32



Atkins No. 7—Hack Saw Frame

Atkins No. 7 Extension Hack Saw Frame is very strong and rigid, taking 8 to 12-inch blades. Peg on the under side of the frame fits into a series of holes on the upper or outer side. Handle turns to adjust tension. Can be set to four different angles. Nickel-plated, finely buffed and polished. Depth, 3 inches; width, 11-16-inch; thickness, 3-16-inch.

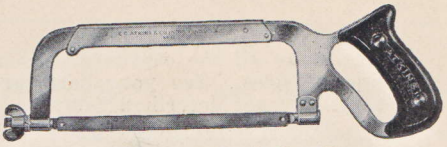
Selected hardwood handle, finely finished, mahogany colored.

Adjustable lengths ---------- 8" 9" 10" 12"

Atkins No. 8—Hack Saw Frame

Atkins No. 8 Hack Saw is a one-piece frame and not an extension frame as the No. 7. Very stiff and rigid. 11/16 inch wide, 3/16-inch thick, rounded edge, 3 inches deep.

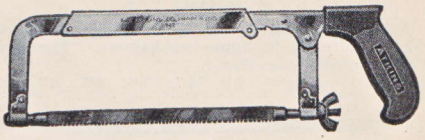
Lengths, inches ---------- 8" 9" 10" 12"



Atkins No. 10—Hack Saw Frame

Hard Rubber Non-Breakable Handle, "Easy Grip" pattern; hung low, directing entire force of stroke on the cutting edge of blade, increasing the cutting power, assures better control, and prevents injury to the hand should blade break. Frame of cold rolled steel 5-16-inch thick and ¾-inch wide. Nickeled and highly polished; adjustable for 8 to 12-inch blades. Depth under back to cutting edge of blade, 3 inches. Packed one in a box with blade.

Adjustable lengths, inches ----- 8" 9" 10" 12"



Atkins No. 11—Hack Saw Frame

Hard rubber, non-breakable, open grip handle. This handle gives the operator complete control of the saw at all times. Frame is made of extra high grade steel, ¾-inch wide and 5-32-inch thick. Very strong and stiff but light. Adjustable from 8 to 12 inches. Nickeled and highly polished. Depth under back to cutting edge, 4 inches. Packed one in a box with blade.

Adjustable lengths ---------- 8" 9" 10" 12"

Atkins Type K—Circular Metal Cutting Saw

For Illustration See Page 26

Particularly recommended for cutting soft metals such as aluminum, brass, copper, etc. Semi-high speed special ground for clearance. 10,000 feet per minute on rim is best cutting speed.

Diameter, inches	6"	8"
Hole	½"	⅞"

Atkins Type L—Circular Metal Cutting Saw

For Illustration See Page 26

Semi-high speed, special ground for clearance. Produces smooth cutting. Recommended for bakelite, formica, fibre, etc. Operates best at 10,000 feet per minute on rim.

Diameter, inches	6"	8"
Hole	½"	⅞"

Atkins Home Craftsman Aprons

ATKINS Home Craftsman Apron, made of extra heavy duck material has folded edges, strongly sewed with wide neck strap and has extra long web strings, strongly stitched to the apron.

It has two large pockets, triple stitched and bound on the edges, for nails and a pocket for a rule and pencil. ATKINS carpenter Pencil furnished with each apron.

Retail price, each ---------- $ .25

Atkins Silver Steel Files

Atkins make all the standard files in all standard sizes. See your hardware dealer for any not described below.

Mill Bastard File

Atkins SILVER STEEL Mill Bastard Files are the most generally used of any file for a greater variety of work in many machine and home workshops.
Length inches—
3″ 4″ 5″ 6″ 7″ 8″ 9″ 10″

Flat Bastard File

Atkins SILVER STEEL Flat Bastard Files are commonly used in home workshops. The quality is beyond question.
Length, inches 4″ 5″ 6″ 7″ 8″ 9″ 10″

Slim Taper File

Atkins SILVER STEEL Slim Taper Files for saw filing are as accurate as brains and skill can produce. Atkins SILVER STEEL Files will out-last files the same size of other brands.
Length, inches ____ 3″ 4″ 5″ 6″ 7″ 8″

Half-Round Bastard File

Atkins SILVER STEEL Half-Round Bastard and Half-Round Smooth Files are made for general machine shop work. The quality of work and length of service obtained is superior to any other make of Half-Round files.
Length, inches _____ 4″ 5″ 6″ 7″ 8″

Half-Round Wood Rasp

Atkins SILVER STEEL Half-Round Wood Rasp Files are of remarkable efficiency due to the quality of workmanship. A favorite among home workshop owners.
Length, inches _____ 8″ 10″ 12″

Tapered Knife File

Atkins SILVER STEEL Knife Files are of high quality finely tapered, thick on the back, taper to edge on front forming a wedge shape file.
Length, inches _____ 4″ 5″ 6″ 8″ 10″

Round File

Atkins SILVER STEEL Round Files are commonly used for all kinds of machine shop work. This file is very useful in home workshops.
Length, inches 4″ 5″ 6″ 7″ 8″ 9″ 10″

"Hand Saw Special" File

Atkins SILVER STEEL "Hand Saw Special" Files are preferred by expert mechanics for filing hand and small saws.
Length, inches _____ 5½″ 7″ 8″

FREE BOKLETS TO AID YOU

Copies of these helpful, practical booklets will be sent gladly to home craftsmen, upon requests sent to E. C. ATKINS and COMPANY, Indianapolis, Ind. Some of these booklets may be obtained at local hardware stores, and it is suggested that the reader first inquire at his dealers for any booklets he desires. Only three free booklets to each reader.

SAW SENSE—A 48-page booklet, full of practical information for the carpenter, mechanic, or home worker. Tells about many ATKINS products, and gives other helpful information. Illustrated instructions for filing Hand, Rip and Panel Saws.

MILL (CIRCULAR) SAWS—Shows a wide range of small and narrow band saws for use on shop machines, mandrels; also many small tools for use with these saws. Tells about tooth patterns; best types and sizes to use.

DADO HEADS—Deals with power types of circular groovers to cut any width of groove from ⅛″ to 4″, with or across the grain, or diagonally. Shows sizes of sets and prices.

CARE OF SMALL BAND AND CIRCULAR SAWS—Gives the most complete, yet simple instructions to follow on how to joint, file and set these saws; also how to braze band saws. Illustrated.

SAWS ON THE FARM—Shows the most complete line of saws for the farm, of any book ever issued. Thirty-two pages of practical information on wood or metal-cutting saws, and farm carpentry. Illustrated crosscut saw and hand saw filing and setting instructions.

SAWS IN THE SHOP—A 44-page book telling all about metal-cutting. Shows improved types of hack saw frames, metal cutting machines. A valuable book to every man who cuts metal.

PRUNING SAWS—A reliable guide to success in all kinds of pruning. Shows complete line of saws for pruning. Valuable to every man who grows fruit.

MACHINE KNIVES—Gives information on ATKINS Machine Knives for a great variety of machines; used in home shops and large industrial plants.

HACK SAW BLADES—Shows how the new SILVER STEEL Blades have revolutionized hack saw practice—why they cut at least SIX times more metal than any ordinary so-called Tungsten Alloy blade.

CROSS-CUT SAWS—Tells all about these saws for farms and woods; shows various tooth designs, and gives illustrated instructions for filing cross-cuts.

GRINDING WHEELS—Shows sizes, shapes, prices of ATKINS Grinding Wheels and power Grinders.

FOR PROMPT SERVICE — USE THESE FORMS

This form is for your convenience in ordering any ATKINS saws and tools that you can not obtain from your local dealer; or, for use in requesting additional information on any ATKINS products.

Fill out the reverse side of this form, mail it to us, and we will see that you are supplied promptly.

E. C. ATKINS AND COMPANY
402 So. Illinois St.,
Indianapolis, Ind.

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Indianapolis, Ind.

E. C. ATKINS AND COMPANY
402 So. Illinois St.
Indianapolis, Ind.

_____ 193__

I have been unable to get the Atkins products listed below from my local dealer. Please see that I am supplied promptly.

(Give number, name, size, and all specifications and information)

_____

_____

I need the following information on Atkins No. _____
that my local dealer cannot supply:

_____

My dealer's name is _____

Street_____ City_____ State _____

My Name is _____

Street_____ City_____ State _____

E. C. ATKINS AND COMPANY
402 So. Illinois St.
Indianapolis, Ind.

_____ 193__

I have been unable to get the Atkins products listed below from my local dealer. Please see that I am supplied promptly.

(Give number, name, size, and all specifications and information)

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My dealer's name is _____

Street _____ City _____ State _____

My Name is _____

Street _____ City _____ State _____

E. C. ATKINS AND COMPANY
402 So. Illinois St.
Indianapolis, Ind.

_____ 193__

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(Give number, name, size, and all specifications and information)

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_____

I need the following information on Atkins No. _____
that my local dealer cannot supply:

_____

My dealer's name is _____

Street_____ City_____ State _____

My Name is _____

Street_____ City_____ State_____

E. C. ATKINS AND COMPANY

Established 1857

"The Silver Steel Saw People"

Manufacturers of Saws, Saw Tools, Machine Knives, Files and Grinding Wheels

Home Office and Factory, INDIANAPOLIS, IND.

Machine Knife Factory, Lancaster, N. Y.

Branches Carrying Complete Stocks in the Following Cities:

Atlanta, Ga. Chicago, Ill. New Orleans, La. New York City, N. Y. Memphis, Tenn.
Portland, Ore. Klamath Falls, Ore. San Francisco, Cal. Seattle, Wash. Paris, France

In Canada

Shurly-Dietrich-Atkins Company, Ltd.

Factory—Galt, Ontario

Branch—Vancouver, B. C.


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