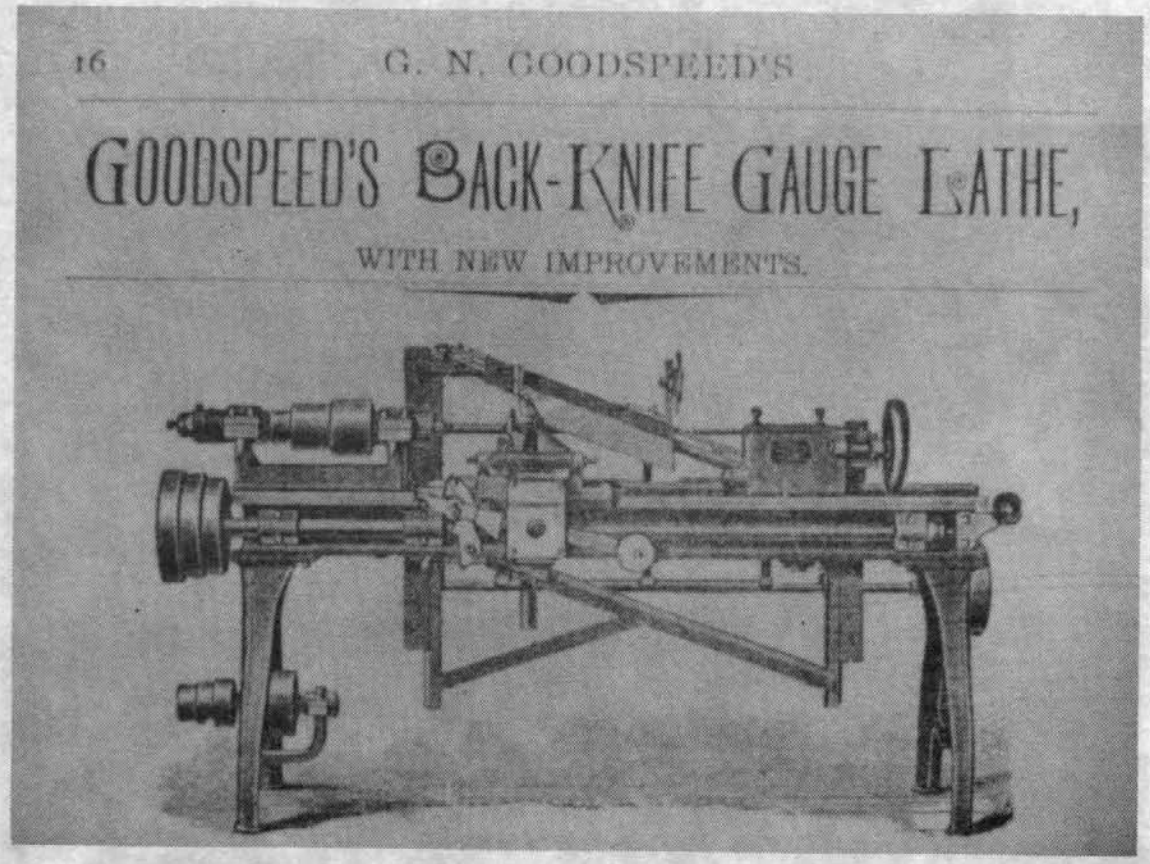
ANTIQUE WOODWORKING POWER TOOL ASSOCIATION



G. N. Goodspeed Back-Knife Gauge Lathe, Circa 1876.

DECEMBER 1989

JOURNAL #15

Well its almost 1990. May I wish you all the best this Christmas Season and next year.

You will notice that I incorrectly numbered the last issue as 13 it should have been fourteen, and that's why this is issue 15.

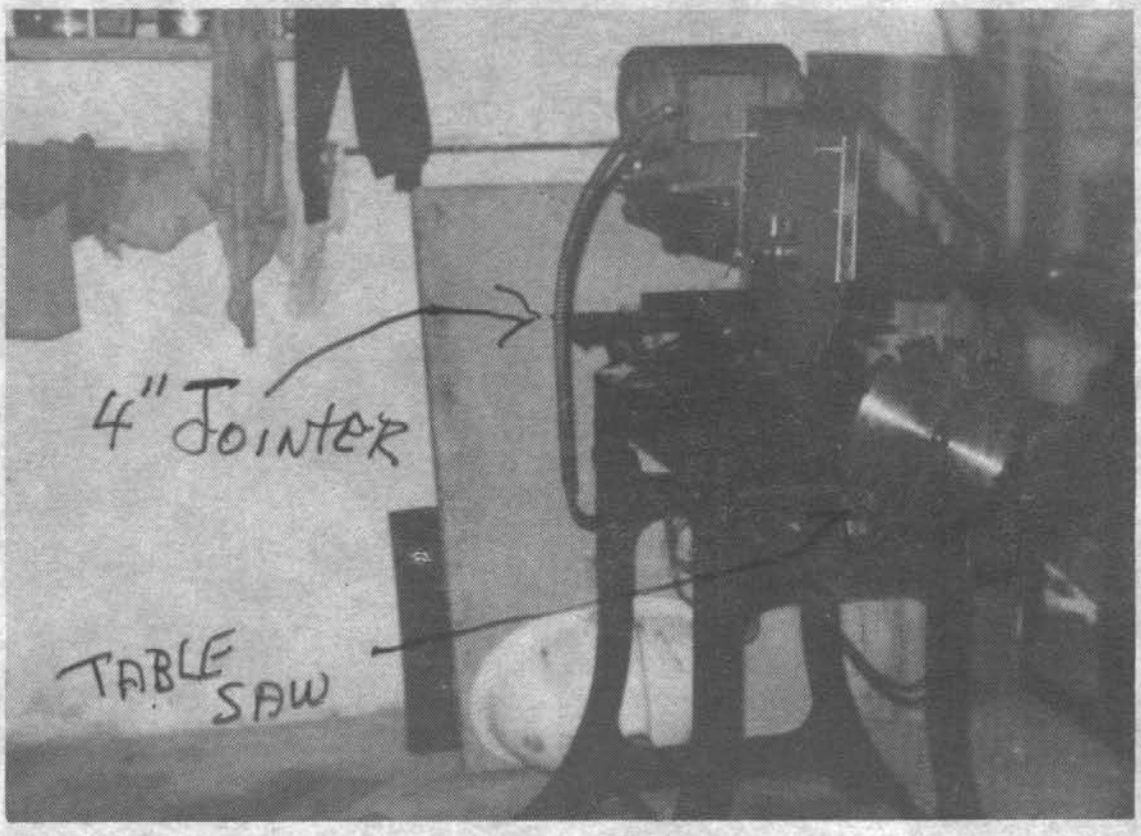
walt

Bob Ochenas is looking for a photo, catalog, or sketch of the Crescent Resaw gage shown on page 16 of Journal #17. He would like to build one. His address along with the current AWPTA members can be found toward the end of this journal.

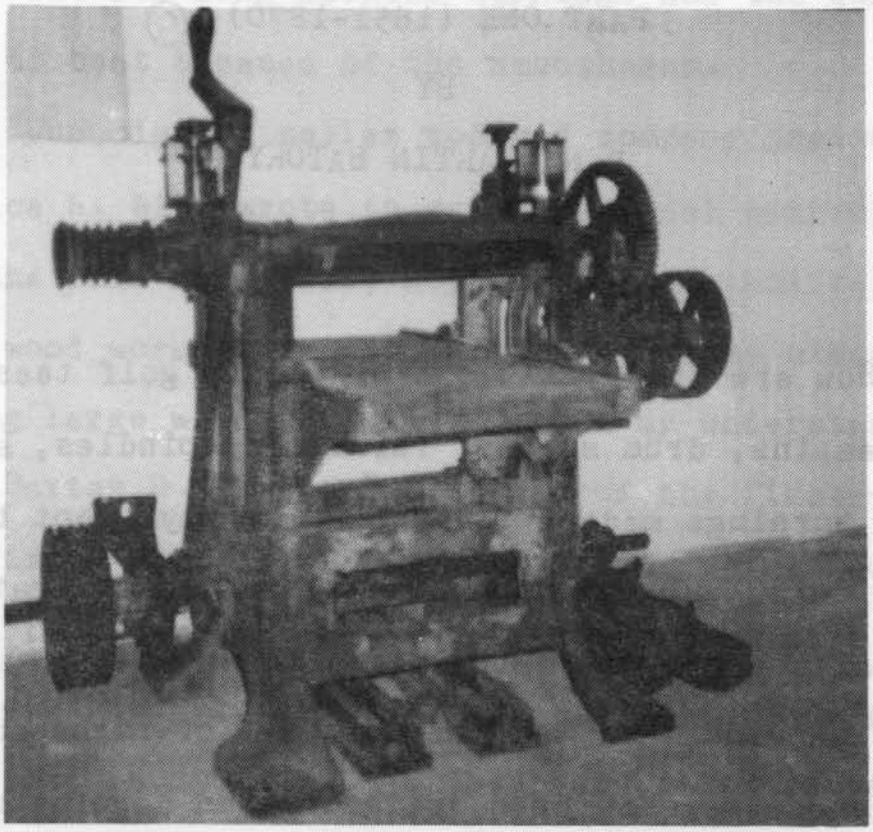
Alan Morrison has inherited a Yates American 2082 table saw, planer, and sanding machine. He is in need of operations manual, to get this beauty going. If you have any info please send it to Alan.

Richard Pearce has two Universal Wood Workers for sell. (406) 363-3456, after 6 o'clock.

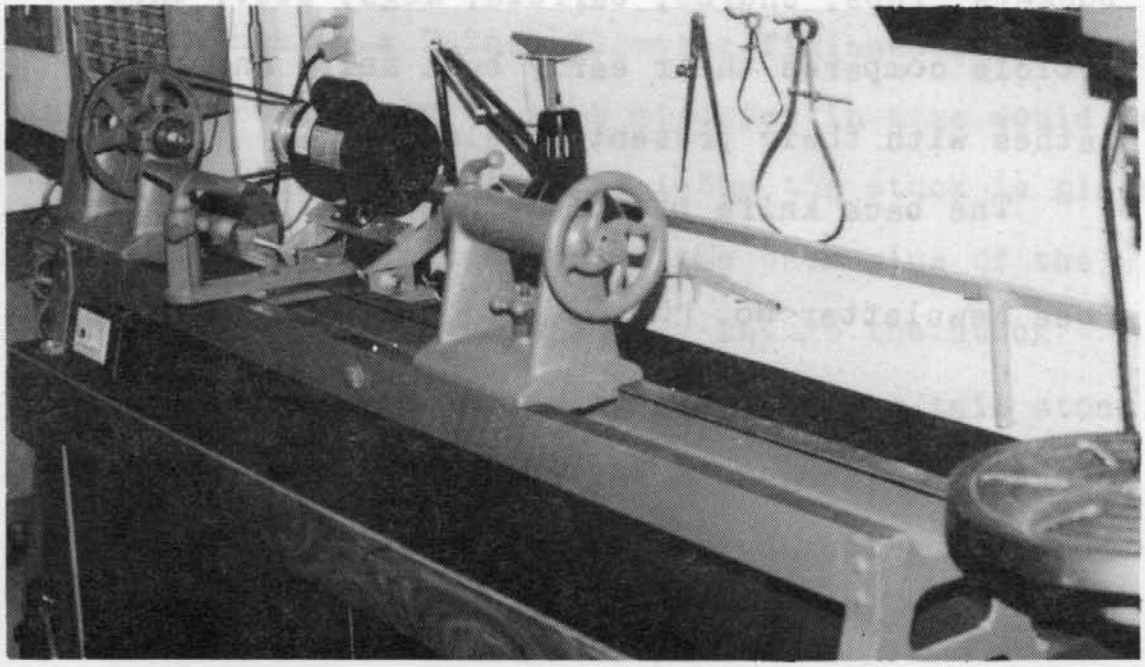
Below you will see a photograph of Al DeNicola's "BEAVER" . yes we'll publish anything! (We have to keep your interest.)



Richard Timmerhoff has an 18 1/4 inch planer for sell. It looks to be very similar to the one Dolphus Harrison of Prattsville, Ark has. The machine has all the parts including spare blades (but no motor). It needs to be disassembled and cleaned. Richard's number is (602) 744-6520 or 794-4269. (I think it is a HALL & BROWN machine) Walt



Dave Parker has did a great job restoring this lathe. It has a 15" swing, 51" between centers, 1 1/8" X 8 thread on the head stock, all cast iron. The spindle is 1 3/8" diameter with Babbitt bearings and oil cups. The drive belt was leather (lap-belt) on wooden pulleys. He converted it to a V-belt set-up which gives him 8 speeds.



GOODSPEED LATHES--PAST AND PRESENT

PART ONE (1851-1870) ©

BY

DANA MARTIN BATORY

How are those millions of wooden golf tees, clothespins, drum sticks, furniture spindles, and other turnings made quickly and cheaply? Not by hand to be sure, but by automatically fed and operated specialized copying lathes. (SEE the FRONT COVER).

The Goodspeed Machine Company* of Winchendon, Massachusetts, has been designing and manufacturing such machines since about 1851. Although Goodspeed also produced a wide selection of lathes for making buckets, tubs, churns, barrels, kegs, etc., this article compares their early back knife and gauge lathes with their present models.

The back knife principle has long proved its

*See Newsletter No. 14 (Issue #13) October 1989

value in terms of economy, high production, identical parts, ease of set-up, and safety. The lathe is excellent for long slender turnings and the quality is hard to beat because of the smoothness.

"Our biggest seller today," company president Maurice W. Witt wrote to me in personal correspondence, "is the full hydraulic, hopper fed back knife lathe. This wood working principle is one of the oldest for making large wood turnings. It is my understanding that Baxter D. Whitney* made one of the first--if not the first--back knife lathes and that we also developed one a few years later. I believe we have been making this machine for 125 to 130 years. The cutting principle is so good that they have never found a better way other than making the machine more rugged and faster operating."

Cut-to-length round or square stock is used. If you were making a 2-inch diameter finished turning stock approximately 2¼-inch diameter in size would be used. On the semi-automatic lathe the stock is placed on stock holders which are on the back side of the machine. The operator manually swings the stock forward between the drive spindle and the tail stock. When the stock is in line the hand wheel is turned bringing the drive center forward engaging the wood

*See Newsletters No. 8 & No. 9

and the operator immediately lets go and the stock starts revolving and the stock arms swing backward out of the way.

The carriage holding two knives starts moving to the left. The first knife (an adjustable roughing knife) is set to cut the wood to 2 1/16-inch in diameter. Right behind this knife is a steady ring or support die which is 2 1/16-inch in diameter. This dowel now fits snugly into the steady ring and as it comes out the other side it comes in contact with a roughing gouge. This gouge swings up and down on pivots as this knife holder is riding on a hardened template made in the shape of the turning required. As this carriage moves to the left these two knives are cutting--one making a dowel and the other roughing the turnings out to approximately 1/16-inch over the finished size.

Now the third knife (the back knife), set at a 20° angle to the axis of the workpiece rotation, starts cutting just behind the roughing gouge. The back knife is a milled-to-pattern knife that extends the full length of the workpiece--only the back is sharpened. The knife is mounted on two vertical slides so that it reciprocates in the manner of a guillotine.

As the back knife moves down it engages the workpiece on the right-hand end immediately following the carriage. Eventually the carriage--with roughing knife, support die, and roughing gouge--passes to the left and the back knife completes its downward stroke having just skimmed off approximately 1/16-inch of wood. The shearing action of the back knife produces a nice smooth turning which requires a minimum of sanding.

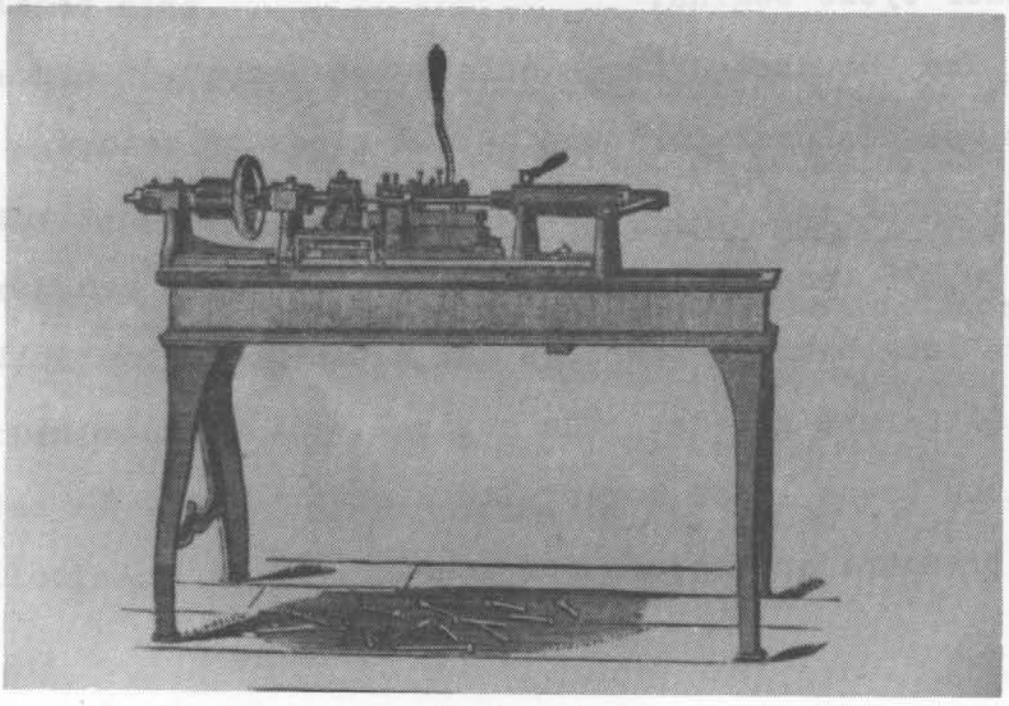
After the back knife has completed doing its work, the operator spins the hand wheel to open up the spindle and the turning falls into the left hand of the operator. Of course, today everything is automatic and the operator doesn't touch the finished turnings at all--only loads the hopper. The knife then rises as the carriage returns to the right before another cycle begins.

The "Goodspeed Back-Knife Gauge Lathe" of circa 1876 was designed for turning all kinds of beaded chair stock and similar work. Offered in four sizes--13, 30, 36, and 48-inches--the large spindle had extra long babbitt bearings and a two-step cone pulley for different speeds. The conical tail spindle ran in long brass lined boxes with a step to take the end pressure and adjust for wear.

The adjustable knife-bar was planed in such a way that once the knife was set it remained correct. The knife-frame had racks cast on each end and gears working in them, so the sash worked up and down square without binding on the ways. It had a centering device for setting both ends of the stock, adjustable to any length diameter.

The gouge holder in front of the die was made to adjust with screws without stopping the lathe. The feed-screw had three bearings so when the feed-belt was tight it would not throw the screw out of alinement. The feed nut was made to open and shut square giving it an equal bearing on all the threads.

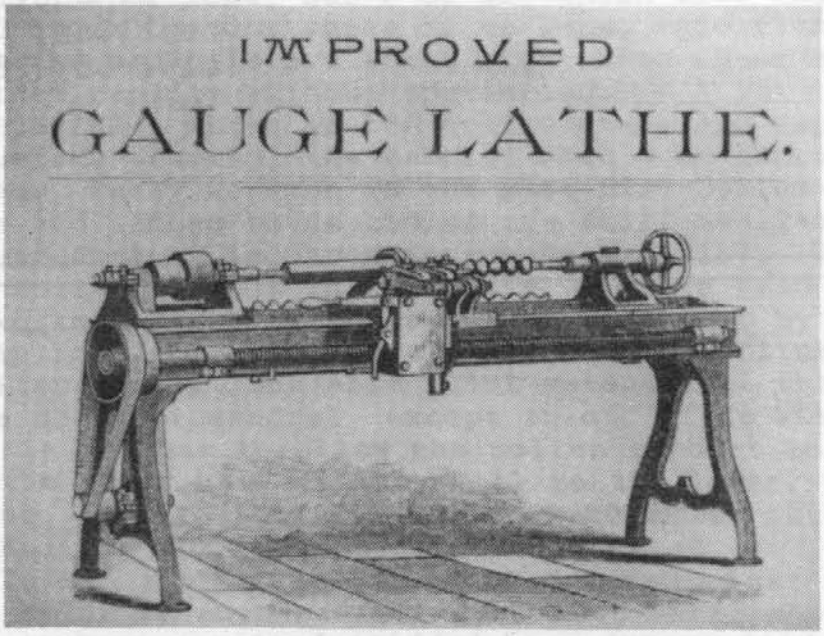
One set of turning tools, six dies, two spur centers, and two cup centers for the tailstock were standard equipment. The 48-inch model cost $375 in 1900.



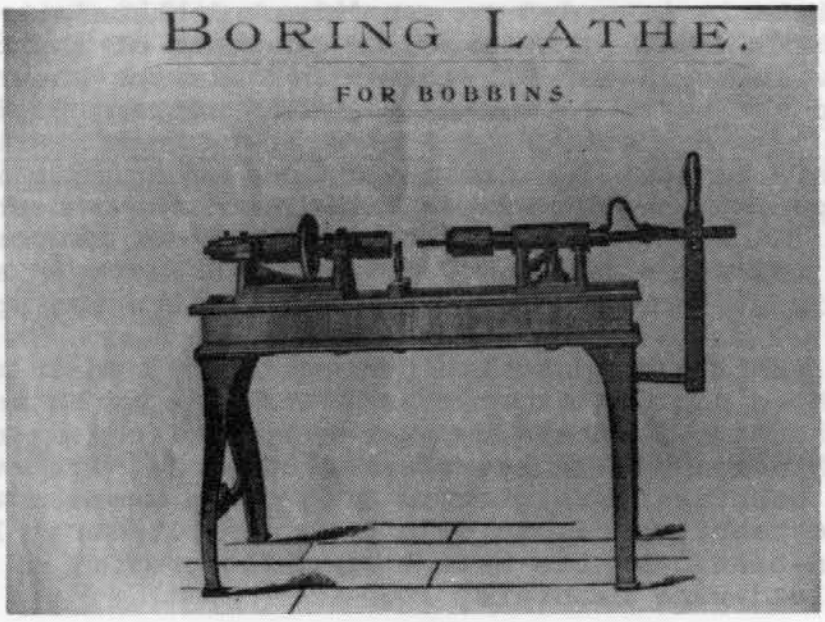
G. N. Goodspeed Bobbin Lathe, Circa 1876.

Advertised as the easiest and quickest operating lathe on the 1870's market, every Goodspeed lathe was started and tested before leaving the shop.

Goodspeed also offered a more modest machine, the "Improved Gauge Lathe" for general use in turning furniture and chair stock, bedstead rolls, balusters, hoe, fork, and broom handles, and all kinds of beaded and plain turnings, using a V-shaped cutter and a



G. N. Goodspeed Gauge Lathe, Circa 1876.



G. N. Goodspeed Boring Lathe, Circa 1876.

gouge. The machine used the same kind of nut and tail stock as the back knife lathe. The machine came in 3, 4½, and 6 foot lengths and special sizes could be made to order. The 6½ foot model sold for $230 in 1900.

(To Be Continued)

Mr. Dana Martin Batory
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Crestline, OH 44827
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MORE ON BABBITT BEARINGS

by Cameron Brown ©1989

The best overview of babbitt bearings to date is Robert Johnson's article in "Fine Woodworking" #38. This article is intended to supplement Johnson's.

BABBITT METAL. The exact composition of the bearing metal devised by Isaac Babbitt in 1839 is not known. It is thought to be approximately 3.6% copper, 89.3% tin, and 7.1% antimony. As a general-purpose bearing metal, this composition has never been materially improved upon, although cheaper substitutes have been devised. An economical lead-base babbitt of composition 10% tin, 15% antimony, and 75% lead will serve in many applications where genuine tin-base babbitts are specified.

How babbitt composition can be determined in the field I have no idea other than to take it to an analytical laboratory. It is my extremely limited experience, with machinery which has weathered 60 years, that the tin-base babbitts retain their brightness whereas the lead-base babbitts become dull like old plumbers' lead. Also, tin-base babbitts have a specific gravity of about 7.4 and lead-base babbitts, 10.

Old proprietary literature warned against mixing babbitts from different sources. Of course, companies wished to sell more babbitt and to avoid liability for the failure of unknown alloys. Johnson claims success for mixing different alloys. It can be seen in reference books that the high-tin babbitts vary in composition within a narrow range. I surmise that they can be mixed without a catastrophic decline in bearing properties, for our purposes. For pounding service in a connecting rod, that is a different matter. Lead-base babbitts vary dramatically in composition, however, and mixing them could realistically result in an alloy with much degraded bearing properties.

POURING TEMPERATURES. Lead-base babbitts have a proper pouring temperature around 630°F. At this temperature white writing paper should enter freely and turn medium brown. Tin-base babbitts have a higher pouring temperature, 800°F or so, which will char a wooden stick but not cause it to burst into flame. Shells and mandrels are about right when water evaporates from them rapidly without sputtering.

POURING. While in the molten state and especially just before pouring, the babbitt should be thoroughly stirred. Fussy workmen in the past used bottom-pour ladles and indeed these ladles are still available from Brodhead-Garrett (address in newsletter #11). Johnson lines split bearings in two pours. I have read that some workmen line split bearings in one pour by bolting the cap in place, with metal shims (called "liners" in old literature). The shim stock extends all the way to the shaft or mandrel, except in one place where a notch is cut out to allow the molten babbitt to flow from the upper half of the shell to the lower. After cooling, the triangular riser of babbitt is cut with a chisel and the bearing halves separated.

In addition to taking precautions against molten metal splashes anyone casting babbitt metal should wear a respirator.

LUBRICATION. The oil grooves shown on p.12 of newsletter #10 basically cover the topic. Some sloppy practitioners in the past would wrap twine around the mandrel to form oil grooves, but this practice is not recommended. The golden rule is <u>to keep the grooves away from the area where the hydrostatic wedge of oil forms under power</u>.

By analogy to electric motors, I suspect SAE 30 oil is a little heavy for shafts rotating faster than 1800 rpm and I would try an SAE 20 nondetergent motor oil or turbine oil (available in electric motor shops). For machines like my stationary belt sander I even use SAE 10 oil. Bearings will run cooler with lighter oils until the oil becomes too thin to maintain the hydrostatic wedge, whereupon perfect lubrication is replaced by boundary lubrication and the temperature commences to rise again. It's a judgement call.

MISCELLANEA. Contrary to what Johnson writes, babbitt can be filed with proper tools. In the past "Vixen" files, with semicircular teeth of a coarser cut than regular (bastard) cut, were available in 12 and 14 inch lengths for filing babbitt. I have seen "Vixen" files offered in machine catalogs of 1919 and 1921. Nowadays the proper file is a "lead float file", having a "short angle" (teeth nearly perpendicular to the edge) and coarse, single-cut, ridgelike teeth that shear metal in thin shavings. A "babbitt file" is also offered by the Federal File Co. of Memphis, TN.

Our newsletter does a great service to publish the case histories of unsuccessful babbitt bearings, such as the letter from Alfred Gunn in issue #1. I hope many more members will come forward with their experiences.

Richard Heine, in issue #2, described an expensive conversion of babbitt to ball bearings. Now, babbitt metal shares many properties with type metal and die--casting alloys. I know for a fact that the Parks Woodworking Machine Co. did not line bore the bearing housings for the cutterhead on a ca. 1979 12 inch planer I owned. The bearings were held by a babbitt-like metal poured into oversized cores in the iron frame. Were I to attempt a conversion of babbitt to ball bearings, I would first determine if there were room within the bearing shell to accept the outer race dimensions of a ball bearing of sufficient capacity to handle the anticipated loads. If so, I would have the shaft machined to press fit into the inner race. For bearing patterns one could either scrounge discarded bearings or have custom patterns machined. In either case some provision must be made to assure that in the finished job the babbitt clasps the outer race only, by building out the patterns in the region of the inner race, grease shield, and shaft.

BIBLIOGRAPHY. Kent's Mechanical Engineers' Handbook. Design. Shop Practice. Apparently out of print. A mine of esoteric information. Twelve ASTM babbitt alloys and standard designs for oil grooves are described.

Machinery's Handbook. An exhaustive reference work with sections on pouring babbitt, SAE babbitt alloys, and bearing theory, showing the hydrostatic wedge.

Marks' Standard Handbook for Mechanical Engineers. Another definitive reference work with a good section on bearing theory and oil grooves.

Materials Handbook. Contains a section on babbitt metal which explains the effects of various alloying elements and the family (high-tin, high-lead) to which various proprietary alloys belong.

The New American Machinist's Handbook. The best treatment of babbitting steel shells I have ever seen, and a deep treatment of files.

B/G J-LINE

J-114 14"
BAND SAW

The J-Line 14" Band Saw is built with a sturdy one-piece frame for vibrationless production work. This machine is ideal for vocational training, cabinet shops, pattern shops, production shops and other similar applications. The construction of this machine makes it readily adaptable for use in cutting all types of wood, plastic, cork, rubber, paper products, insulation, Celotex, masonite or other similar non-metallic materials.

The design of the machine is such that safety features have been made an integral part of the machine. The blade is completely guarded above and below the table except at point of cut.

Adjustments can be made quickly, easily and safely from the operator's position. Hinged doors make the upper and lower wheels accessible, making blade changing safe and fast. The wheel tilting and tension adjustments are located on top of the machine. The use of light weight aluminum wheels makes possible quick accelerating action without undue starting strain on the motor.

- **ADJUSTMENTS**
  conveniently made from operator's position
- **COMPLETELY GUARDED**
  except at point of cut
- **ALUMINUM WHEELS**
  easily adjusted for blade tension and tilt
- **SOLIDLY SUPPORTED**
  upper and lower backing bearings

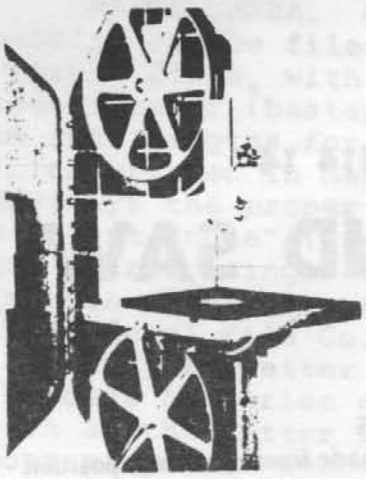
SPECIFICATIONS

Capacity	Blade to frame—13¾"
	Under Guide—6½"
Speed	3850 FPM
Table Size	14" x 14"
Table height from floor (with cabinet)	43¾"
Table tilt to right	45°
Table tilt to left	10°
Maximum blade width	¾"
Maximum blade length	92¾"
Minimum blade length	90¼"
Wheel covers	Hinged
Band saw wheels	Aluminum
Shipping weight with motor	330 lbs.

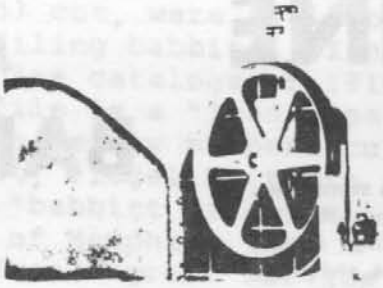
(Over)

Litho in U.S.A.

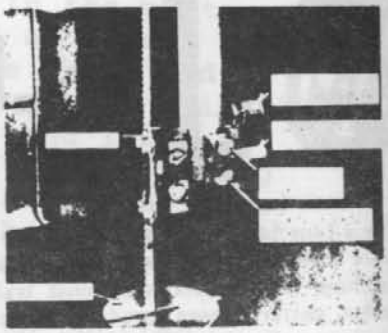
BRODHEAD-GARRETT CO. 4560 East 71st. Street Cleveland, Ohio 44105



The heavily ribbed one piece cast iron frame resists deflection under cut and furnishes a solid support for table and wheels.



The blade tensioning adjustment and the wheel tilting control are located at the top of the machine. In addition, a window in the upper wheel cover allows the operator to check the blade tension at any time. Convenience of the controls and scales permits proper adjustments from operator's position even when the machine is in operation.



Backing bearing shaft is solidly supported by a heavy hexagon steel guide post, so designed that during adjusting it will not drop down and hit the throat plate. The lower backing bearing (not shown) is supported by the cast iron frame.

The upper guide post clamp is adjusted from the operator's position. An exclusive advantage of the J 114 14" Band Saw is a side guide that supports the blade both above and below the ball bearing backing guide. This feature assists tracking of the blade and avoids "snaking" under heavy loads.

The table insert (patented) is so designed that when making a circular cut it will not turn and be in contact with the blade.

CATALOG LISTING

BASIC MACHINE: 14" Band Saw with one ¼" general purpose blade (20W812) and machine pulley. Without cabinet, motor, control, belt and motor pulley. **CAT. NO. 20W299**

BASIC MACHINE WITH CABINET: 14" Band Saw with motor pulley (60W362), belt (60W305), one ¼" blade (20W812). Without motor and control. **CAT. NO. 20W300**

CABINET: With motor support and belt guard. **CAT. NO. 20W850**

MOTORS FOR SINGLE PHASE OPERATION (Specify Operating Voltage)

Motor, ½ HP, 115-230 V, 60 cy, 1725 rpm, open drip-proof. **CAT. NO. 90W138**

MOTOR FOR 3-PHASE OPERATION (Specify Operating Voltage)

Motor, ½ HP, 208-220-440 V, 60 cy, 1725 rpm, open drip-proof. **CAT. NO. 90W137**

STARTERS FOR SINGLE AND 3-PHASE OPERATION

Starter, magnetic complete with low voltage and overload protection, motor cord and fittings. Used with single phase motors. **CAT. NO. 90W866**

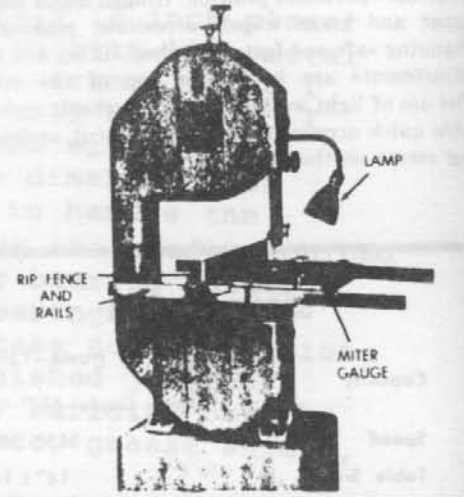
Starter, magnetic complete with low voltage and overload protection, motor cord and fittings. Used with 3-phase motors. **CAT. NO. 90W865**

Starter, manual complete with overload protection, motor cord and fittings. Used with single phase motors. **CAT. NO. 90W861**

Starter, manual complete with overload protection, motor cord and fittings. Used with 3-phase motors. **CAT. NO. 90W862**

Manual Switch without overload protection, complete with mounting plate, motor cord and fittings. Used for single and 3-phase motors. **CAT. NO. 90W864**

Power Cord, 3 wire, 8 foot, complete with twist lock and fittings for use with manual starters. **CAT. NO. 90W879**

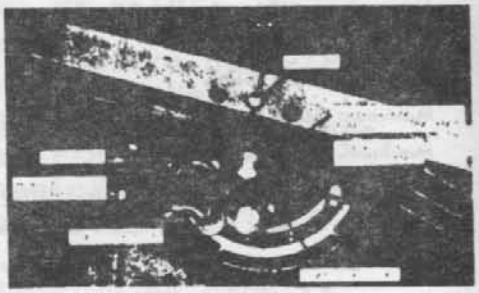


ACCESSORIES

"A" Section V-Belt, 49 3" pitch length	**CAT. NO. 60W305**
Motor Pulley, 3" P.D. – ⅝" dia. bore	**CAT. NO. 60W362**
Miter Gauge	**CAT. NO. 10W883**
Rip fence with guide rails	**CAT. NO. 20W800**
Work Light, 7' cord and plug	**CAT. NO. 21W810**

WOOD CUTTING BLADES FOR GENERAL WORK

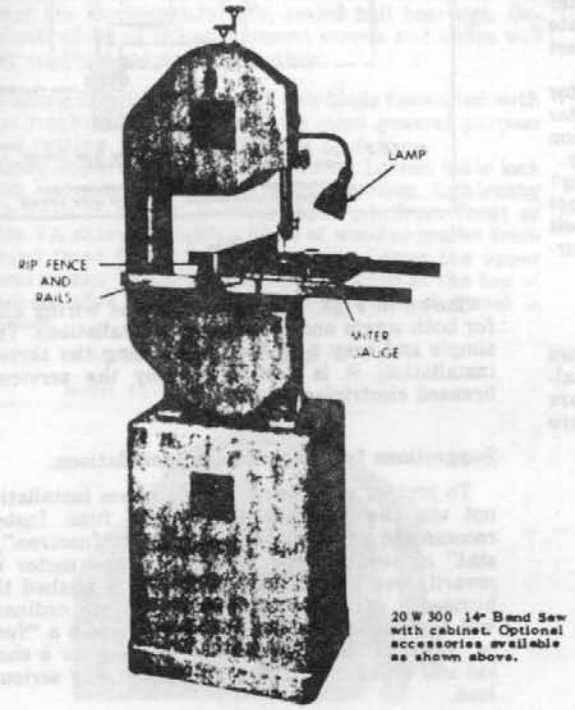
⅛" width	**CAT. NO. 20W810**	½" width	**CAT. NO. 20W813**
3/16" width	**CAT. NO. 20W811**	¾" width	**CAT. NO. 20W814**
¼" width	**CAT. NO. 20W812**	1" width	**CAT. NO. 20W815**



Double table trunnions give solid support and are clamped with one hand knob from the front of the machine so that the operator can make adjustments at point of operation. A stop pin is used to reset the table tilt of 10° to left or 45° to right without making cumbersome adjustments.

INSTRUCTION and PARTS LIST MANUAL

FOR J-114 14" WOODCUTTING BAND SAW



20 W 300 14" Band Saw with cabinet. Optional accessories available as shown above.

Fig. 1

DESCRIPTION

The J-Line 14" Woodcutting Band Saw is designed to turn out precision work with maximum safety and convenience. All moving parts (including saw blade) are guarded except at point of cut, and all operating adjustments are made from the front of the machine; tensioning of the blade is controlled with the wheel cover closed.

For precision cutting the 14" Band Saw has a ball bearing backing guide and double surface side guides for the blade and an accurately ground table with two-way tilt and double-locking trunnions. It has a sturdy one-piece frame and a broad-base cabinet that will not tip under the thrust of heavy cutting.

The machine will cut a full 6½ inch stock with a 13¾ inch clearance to left of blade. A ¼ inch general purpose blade is furnished, and it will accommodate blades from ⅛ inch to ¾ inch wide. Available as accessories are: rip fence with rails, miter gauge, total enclosure saw guards, and lamp attachment.

APPLICATION AND USE

The J-Line 14" Band Saw can be used for cutting all types of woods, or plastics, rubber, paper products, insulation, Celotex, cork, masonite, felt, and similar non-metallic materials. It is ideal for use in production shops, pattern shops, cabinet shops, school shops and vocational training, therapeutics, and in many other applications where accurate production and safe, convenient operation are of prime importance.

ASSEMBLY

NOTE: Check carton thoroughly for loose parts before destroying carton.

The table and other machined surfaces are protected with a high grade rust preventative which can be removed easily by rubbing with a cloth moistened with a solvent such as benzine. For further protection the table is covered with waxed paper. If any paper adhers to the surface, it can be dissolved by solvent or be scraped off with a piece of sharp-edged hardwood.

Mounting Saw on Cabinet. Take off center panels on right and left sides of cabinet by removing four ¼" round head machine screws on each panel. Locate four holes on top of cabinet and four on base of the saw. Place the saw base on cabinet so that corresponding holes match and so that the lower wheel shaft extends over belt opening in top of cabinet. (Note: Do not install belt guard until after motor is installed.) Secure by use of 5 16" hex head cap screws, common washer, lock washer, and hex nut in each of the four sets of holes.

Fig. 2

Installing the Motor

NOTE: A motor support is installed in the cabinet at the factory to accommodate standard NEMA No. 56-6 frame motors only.

First clean off the shaft and attach the motor pulley to the shaft with the key furnished. Loosen the four

3/8"-16 hex head cap screws which secure motor plate to cabinet. Hanger for motor is on a pivot so that, by releasing motor plate fasteners, hanger will swing down and facilitate installation of the motor. Motor should be inserted through opening on right side of cabinet base, and holes in feet of motor base should be placed on motor plate in line up with corresponding holes on plate. Using four 5/16" carriage bolts, common washers, lock washers, and hex nuts, fasten motor loosely to plate.

With a straight edge, align both motor pulleys. After they are properly aligned, tighten motor to motor plate by tightening four carriage bolts; then tighten set screws in pulley.

Vee belt can now be installed by slipping over motor pulleys. To get proper tension of Vee belt, move motor plate up or down on pivot action. When desired tension is obtained, secure four motor plate fasteners tightly.

After motor is wired (See Instructions for Wiring) replace panels on lower right and left sides of cabinet and install belt guard on top of cabinet. Mount belt guard against rear of machine using cap screw furnished.

Wiring the Motor

A choice of single or 3 phase ½ hp 1750 RPM motors is available for the 14" band saw. In making the installation, be sure that all state and local electric codes are followed, and that all ordinances covering wiring are complied with.

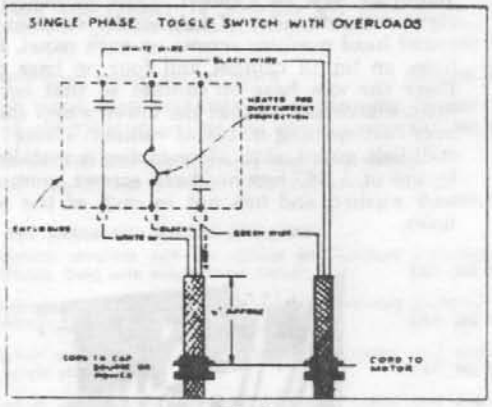


Fig. 3

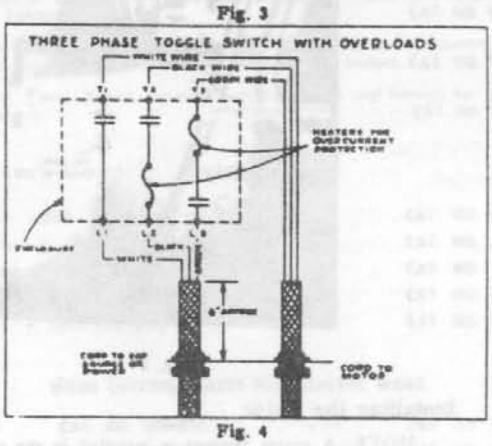


Fig. 4

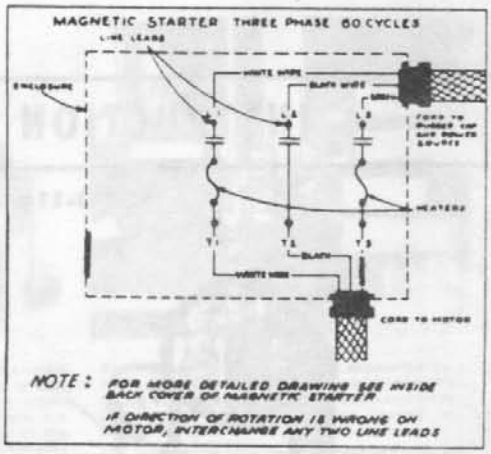


Fig. 5

Shown in Figs. 3, 4, and 5 are the wiring diagram for both single and three phase installations. They ar simple and easy to follow. In making the three phas installation, it is best to employ the services of licensed electrician.

Suggestions for Single Phase Installations.

To protect your line in single phase installations, d not use the ordinary type house fuse. Instead w recommend a time delay fuse such as "fusetron", "fus stat" or similar type unit. When the motor is tem porarily overloaded, as when stock is pushed throug hurriedly, excessive current is used. An ordinary fus will blow under these conditions whereas a "fusetron or "fusestat" will accept this overload for a short pe iod and still protect the line against any serious ove load.

Recommended Extension Cords.

Motors will work satisfactorily on voltages 10 above or below normal. Thus a motor for 115 volt ser ice will work from 105 to 125 volts.

Low voltage causes the greatest amount of troub and damage, the first indication being slow starting failure to start. High voltage on the other hand wi only cause a slight rise in temperature which is ofte beneficial, and no harm is done.

Low voltage is often the result of too long or inad quate size extension cord. It is important, therefor when an extension cord must be used, to see that it of proper size wire, per this table:

WIRE SIZE FOR 115 AND 230 VOLT SINGLE PHASE CIRCUITS

Motor H.P.	DISTANCE—MOTOR TO FUSE OR METER BOX							
	100 Ft.		200 Ft.		300 Ft.		500 Ft.	
	115 V	230 V	115 V	230 V	115 V	230 V	115 V	230
¼	No. 10	No. 12	No. 8	No. 10	No. 6	No. 8	No. 4	No.

If you are certain the motor is in running condition and the extension cord is in accordance with this table, yet starting is slow or motor hums and does not start, indications are that there is improper voltage at the service entrance box. In this case be sure to contact your local electric company and have them supply the correct voltage.

Lubrication. All bearings in the machine and in the motor are lubricated-for-life, sealed ball bearings. Occasional oiling of the adjustment screws and slides will keep controls operating smoothly.

Installing Saw Blade. The ¼" saw blade furnished with your machine is satisfactory for most general purpose wood cutting jobs. To install the blade:

Open upper and lower wheel doors. Loosen table lock knob, and move table to horizontal position, tightening lock knob to secure. Remove taper pin from front of table. (A sharp rap with a block of wood or mallet from behind front flange will loosen pin). Lower the upper wheel carrier by turning tensioning knob at the top of machine (See fig. 6) until bottom limit of travel is reached.

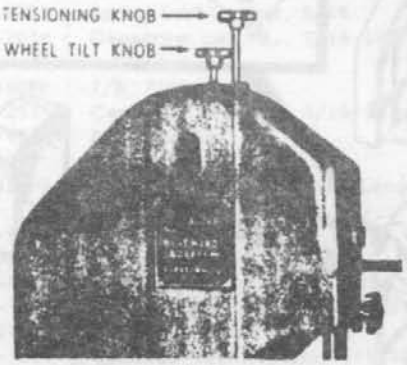


Fig. 6

Then remove saw guards and move the upper and lower side guides and blade backing bearing to extreme back position. To do this, loosen upper side-guide and back bearing lock screws (See fig. 7) (Lower side guides beneath table have special friction locks). Then use saw guide and back bearing adjusting knobs (Fig. 7) to position guides and backing bearing.

Insert saw blade through slot in front of table (from which pin has been removed) and position blade on top and bottom band saw wheels. Make certain that blade lies freely in upper and lower blade guides. Check to be certain that cutting rake of teeth is positioned downward at cutting point. (To reverse direction of cutting rake, simply turn blade inside out).

Now that blade is properly positioned on wheels, adjust tensioning knob until tensioning scale indicates proper tension for ¼" blade. Be sure to use tensions indicated on scale to achieve maximum blade life.

Next, check blade for tracking by manually rotating the upper wheel slowly in a clockwise direction. If untrue tracking is indicated, adjust tilt of wheel by means of the wheel tilt knob at top of machine until blade tracks true on center of the wheel rim for several revolutions.

CAUTION: Never attempt to adjust tracking of blade while saw is running.

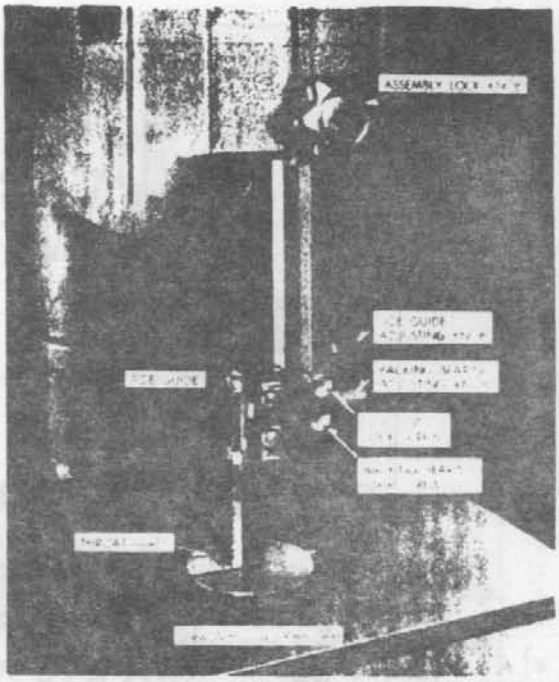


Fig. 7

After blade is properly positioned and adjusted, replace taper pin in front of table. You are now ready to make final adjustments of saw guides and backing bearings.

ADJUSTMENTS

SAW GUIDES (Side guides and backing bearings)

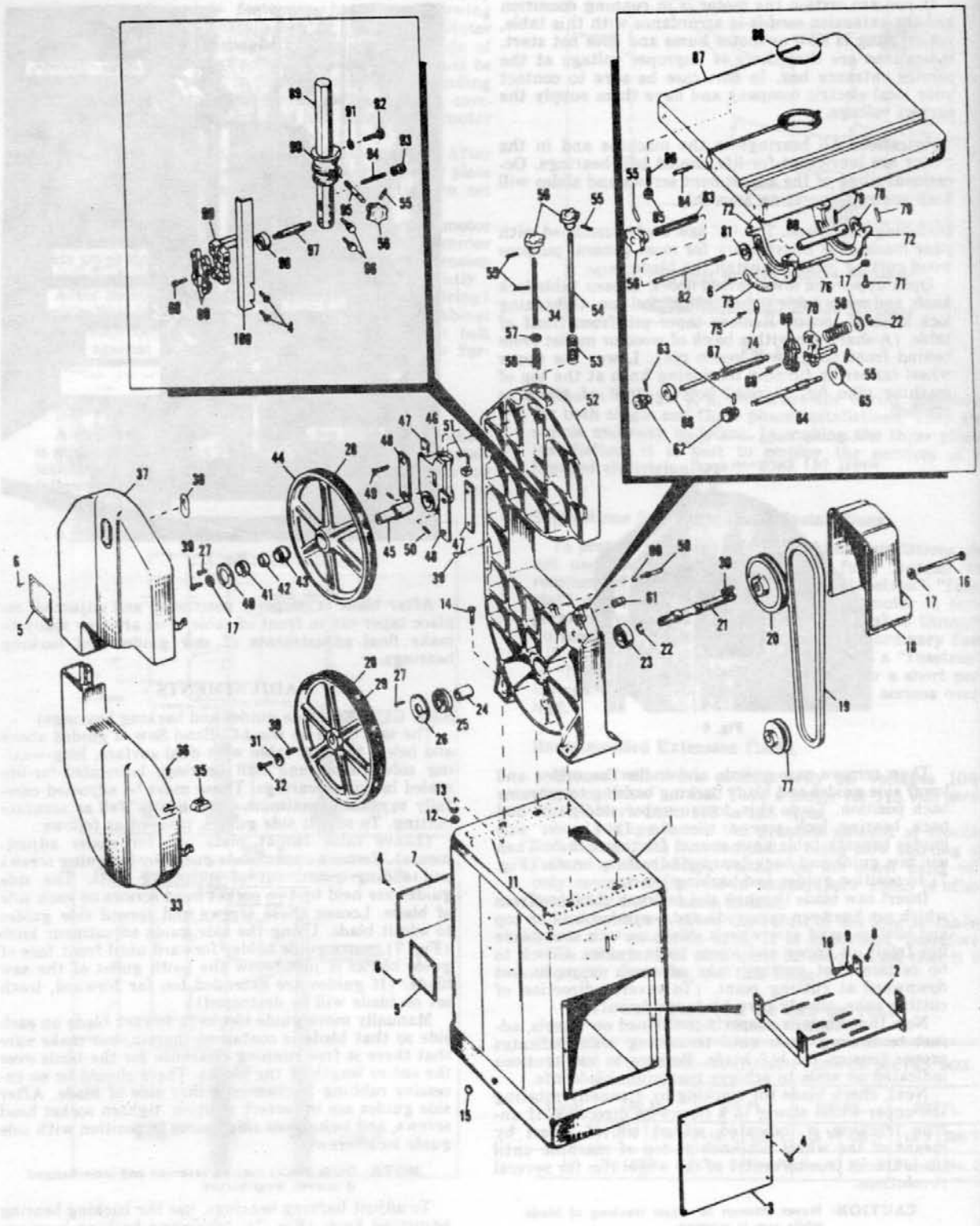
The saw blade on the 14" Band Saw is guided above and below the saw table with dual surface, long-wearing side guides and ball bearing, lubricated-for-life sealed backing bearings. These must be adjusted carefully to obtain maximum blade life as well as accurate cutting. To adjust side guides, proceed as follows:

(Leave table throat plate out for easier adjustments). Remove upper blade guard by loosening screws and sliding guard out of mounting slots. The side guides are held by two socket head screws on each side of blade. Loosen these screws and spread side guides to admit blade. Using the side guide adjustment knob (Fig. 7), move guide holder forward until front face of guide blocks is just below the tooth gullet of the saw blade. (If guides are extended too far forward, tooth set on blade will be destroyed).

Manually move guide blocks in toward blade on each side so that blade is contained therein, but make sure that there is free running clearance for the blade over the entire length of the blocks. There should be no excessive rubbing friction on either side of blade. After side guides are in correct position, tighten socket head screws, and lock upper side guides in position with side guide lock screws.

NOTE: Guide blocks may be reversed and interchanged if uneven wear occurs.

To adjust backing bearings, use the backing bearing adjusting knob (Fig. 7), advancing backing bearings



Key No.	Part No.	Description	Qty. Reqd.
1	4322-S	Cabinet Assembly	1
2	4331	Motor Plate	1
3	4327	Panel, Right Side Center	1
4	P-2208	Mach.screw,rd.hd.1/4-20x3/8	12
5	2082	Name Plate	2
6	P-5200	Type "U" Drive Screw,#2 x 1/4	8
7	6081	Panel, Left Side	1
8	P-4804	Common Washer, 3/8	8
9	P-5000	Lockwasher, 3/8	4
10	P-2004	Capscrew,hex hd.,3/8-16 x 1	4
11	6075	Stiffener	2
12	P-4403	Hex Nut, 5/16-18	4
13	P-5001	Spring Lockwasher, 5/16	4
14	P-2014	Capscrew,hex hd., 5/16-18 x 1 1/4	4
15	3160PP	7/8" Plug Button	1
16	P-2033	Capscrew,hex hd., 5/16-18 x 5	1
17	P-4816	Plain Washer	7
18	6004	Belt Guard	1
19	6036PP	"A" Section, 49.3" Pitch Length V-Belt	1
20	P-9501	Pulley, "A" Section,6 1/2"O.D.	1
21	6065	Drive Shaft	1
22	P-8030	Retaining Ring	2
23	P-9005	Bearing, New Departure#99504	1
24	6064	Bearing Spacer	1
25	P-9004	Bearing, New Departure#499504	1
26	2506	Plate, Retaining	1
27	P-2205	Mach.screw,rd.hd.#10-24 x 3/8	6
28	6074	Tire, Bandsaw Wheel	2
29	6003	Bottom Wheel	1
30	P-5401	Key, 3/16 x 3/16 x 1	2
31	2522	Washer	1
32	P-2013	Capscrew,hex hd.5/16-18 x 3/4	1
33	6050-S	Door Assy., Lower	1
34	6045	Tilt Screw	1
35	6080	Dust Block	1
36		#4 Rd. Hd. Machine Screw	2
37	6049-S	Door Assy., Upper	1
38	6051	Window, Door	1
39	P-2220	Mach.screw,rd.hd.5/16-18x5/8	7
40	2053	Bearing Clamp	1
41	P-9001	Bearing,New Departure#488016	1
42	6040	Spacer,Top Wheel Bearings	1
43	P-9002	Bearing,New Departure#88016	1
44	6002	Wheel, Top	1
45	6039	Shaft, Top Wheel	1
46	6025	Slide, Top Wheel	1
47	6041	Spacer, Gib	2
48	6042	Clamp, Gib	2
49	P-4003	Mach.screw,Truss hd.5/16-18	4
50	P-3222	Set Screw,3/8-16 x 3/4	2
51	6038-S	Pointer Assembly	1

Key No.	Part No.	Description	Qty. Reqd.
52	6000	Frame	1
53	6047	Spring	1
54	6044	Screw, Tension	1
55	P-5302	Roll Pin	6
56	2038	Hand Knob	4
57	P-4814	Plain Washer	1
58	6071	Spring	2
59	4129	Pin, Stop	1
60	P-8018	Retaining Ring	2
61	6054	Guide Plug	1
62	6056	Hand Knob	2
63	P-5310	Roll Pin	2
64	6061	Shaft, Guides	1
65	6055	Disc, Guides Adj.	1
66	P-9003	Bearing,New Departure#299500	1
67	6062	Shaft, Bearing Adj.	1
68	P-3416	Capscrew,Socket Hd.,#10-24 x 5/8	8
69	6020	Guide, Saw	4
70	6024	Guide Carrier, Bottom	1
71	P-2034	Capscrew,hex hd.,5/16-18 x 7/8	4
72	6021	Trunnion	2
73	6057	Tilt Scale	1
74	2043	Pointer	1
75	P-2211	Mach.screw,rd.hd.#8-32x1/4	1
76	6063	Pin, Trunnion Slide	1
77	P-9502	Motor Pulley,"A"section 3 1/2"OD 5/8" Bore	1
78	6053	Washer, Special	1
79	P-5304	Roll Pin	2
80	6058	Pin, Trunnion Lock	1
81	6069	Washer, Special	1
82	6060	Screw, Trunnion Lock	1
83	P-5325	Roll Pin, 1/2 x 4"	1
84	P-5323	Taper Pin, #6 x 1 1/4" long	1
85	P-4402	Hex Jam Nut, 5/16-18	1
86	P-3223	Socket Set Screw,5/16-18 x 1 1/8	1
87	6001	Table	1
88	6070	Plate, Throat	1
89	6036	Post, Guide	1
90	6022	Bracket, Post	1
91	P-4817	Plain Washer	2
92	P-2032	Capscrew,hex hd.,3/8-16 x 1 1/8	2
93	6043	Hand Knob	1
94	P-3220	Socket Set Screw, Headless 1/4-20 x 1 1/2	1
95	6067	Screw, Post Lock	1
96	6037	Screw, Lock	2
97	6046	Shaft, Bearing Adj.	1
98	P-9003	Bearing, New Departure#299500	1
99	6023	Guide Carrier, Top	1
100	6035	Guard, Upper	1

until race of bearing just clears the back edge of the saw blade. This bearing should not contact blade except when sawing stock. Then lock upper backing bearing in position with backing bearing lock screw.

MAKE THESE ADJUSTMENTS FOR BOTH UPPER AND LOWER SAW GUIDES.

Lower saw guides (beneath table) are positioned the same as upper saw guides, except that they are secured by special friction-type locks that are self-locking.

After saw guides are adjusted, manually rotate upper wheel clockwise for several revolutions to make certain blade runs free and true.

The upper saw guide assembly is adjustable vertically from 0 inches to 6½ inches, and is held in position by a lock knob on the right hand side of the machine (Fig. 7). To obtain the best cutting action, make certain that the upper saw guides are positioned as close to stock as possible.

Finally, insert throat plate in table. Small "ear" of plate fits slot in table behind blade to prevent plate from rotating or creeping, and it eliminates undue enlargement of blade clearance slot.

Saw blade is now in position and adjustments are completed. Replace upper and lower saw guards, and tighten screws.

Table tilt. The table of the 14" Band Saw tilts a full 45 degrees to the right and 10 degrees to the left. Follow this simple procedure to obtain desired angle:

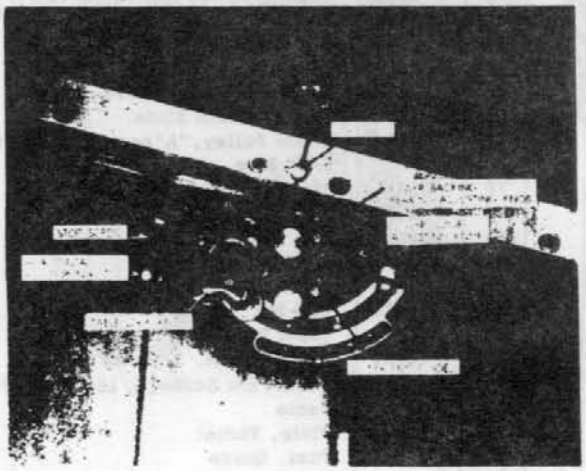


Fig. 8

For right hand tilt, loosen table lock knob (Fig. 8) and lower right edge of table until desired angle is indicated on the tilt scale beneath table. Lock table lock knob to hold in position. This table lock knob controls locks on both front and rear trunnions for superior rigidity.

For left hand tilt, loosen table lock knob and pull horizontal positioning stop forward (Fig. 8). The stop screw under the left-hand side of the table is factory set to automatically index table in horizontal position when stop pin is pushed in). Tilt table to desired angle as indicated on tilt scale, and lock table lock knob.

Selecting Blades. Fine pitch blades produce a cleaner cut on thin stock or when cutting across grain. The coarser pitch blades are more efficient in making long cuts that run with the grain, or when cutting thicker stock. In making curved cuts, or when direction of cut changes in relation to grain, or when an assortment of stock thicknesses is to be cut during normal usage, a general purpose blade (such as furnished with the machine) will produce best results.

Cutting Stock. To obtain highest quality cuts, apply steady pressure and uniform feed. Be careful to feed stock directly into the cutting edge of the blade in order to avoid side thrust on the blade. (This is particularly important in cutting to a curved line). When cutting thicker stock or harder woods, feed stock into blade at a slower rate than when cutting thin stock or softer woods.

In cutting to a curved line, never attempt to crowd a blade around a radius smaller than the width of the blade will allow (i.e., blade should never be twisted). Follow this table for determining blade widths required for minimum cutting radii:

⅛" blade—⅜" radius

¼" blade—⅞" radius

⅜" blade—1⅛" radius

½" blade—1½" radius

¾" blade—2" radius

Extra band saw blades should be stored in a dry place. To inhibit rusting, wipe blades with an oil-soaked rag before storing.

SUGGESTIONS FOR OPERATING YOUR BAND SAW

Adjusting upper and lower side guides. This is of paramount importance in producing quality work. Be sure to follow carefully the directions for making blade guide adjustments found in this manual.

Tilting upper wheel. This adjustment should never be made without first retracting upper and lower guides and backing bearings. Failure to do this may result in blade breakage, excessive wear on blade backing bearings, excessive wear on blade side guides or excessive lead-off of saw blade during cutting.

Correcting saw-blade lead-off. This tendency of a saw blade to lead off to right or left of a cutting line may be due to:

A. Loss of tooth set because of (1) hitting nail with saw or (2) because blade side guides are set too far forward so that they overlap teeth or (3) because of faulty blade sharpening.

B. Improper wheel tilt adjustment which causes excessive "heeling" pressure on back edge of blade against backing bearing.

C. Insufficient tension on blade.

D. Dull saw blade.

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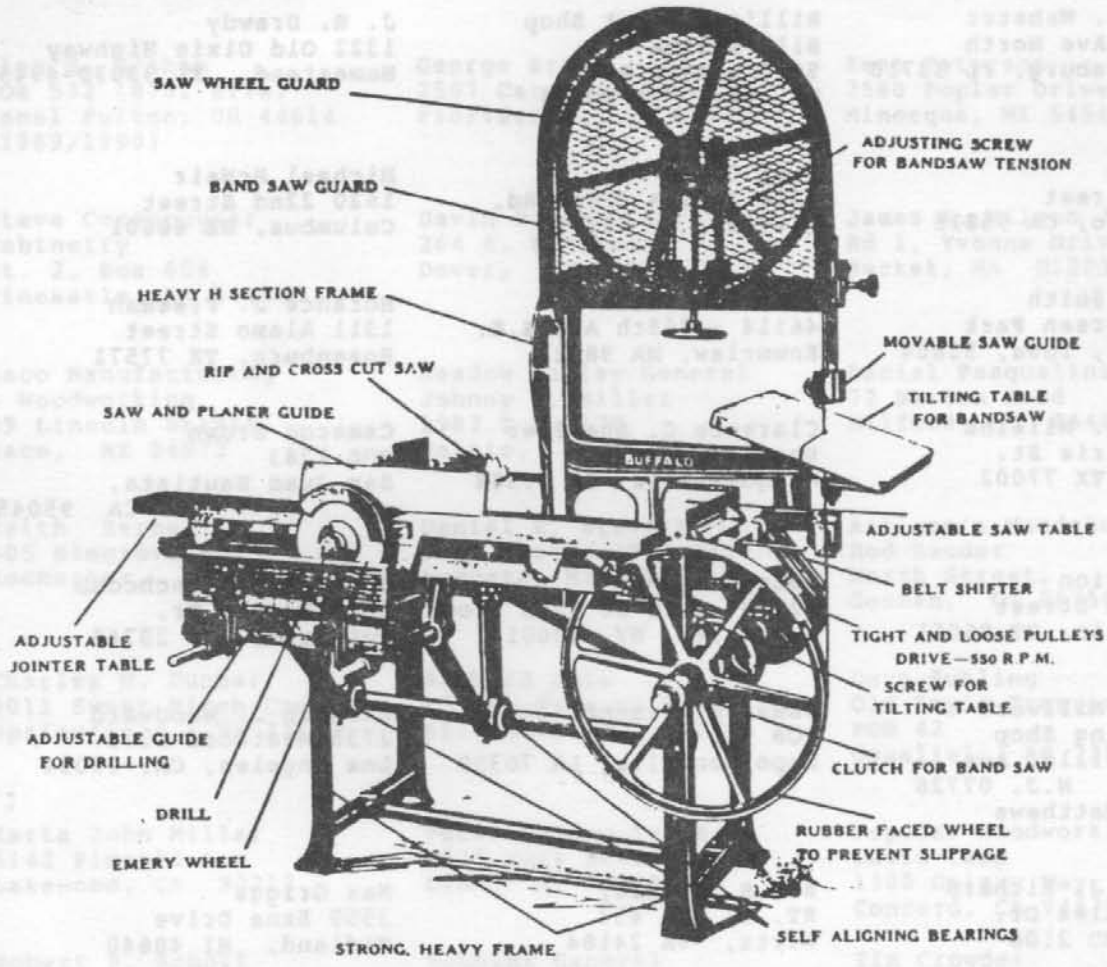
The Combination Buffalo Woodworker No. 2



The entire construction of the Buffalo No. 2 Combination Woodworker, is of the highest grade. The frame proper is made of heavy cast iron and rigidly braced. Bearings throughout are large, and babbitted, with provision for lubricating. Tables are finished perfectly smooth. Band saw wheels are balanced, so as to run safely at high speeds without vibration. Band saw wheel bearings are extra long, and the upper bearing is adjustable by means of the hand wheel shown.

This combination woodworker is adaptable to many different jobs. Contractors find it convenient to take from place to place, or to set up in their shops. Carpenters have found it cuts the labor costs on new buildings to a fraction. In foundries, it is used for making and repairing flasks, core boxes and patterns, as well as for many other jobs, bracing, making bins, etc. Three men can perform different operations at one time without interfering with each other.

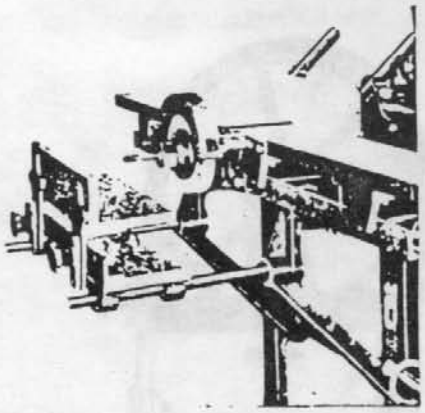
Many shipping rooms find this machine excellent for cutting crating lumber. Blacksmiths and wagon-makers also find the No. 2 Woodworker a very useful machine.

"Buffalo"

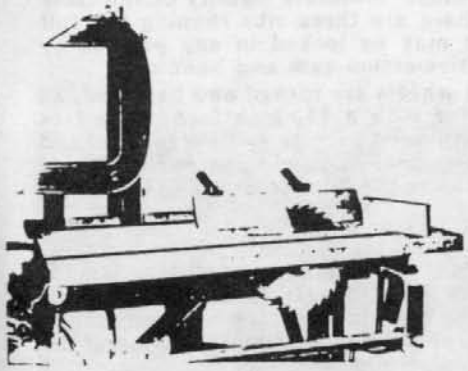
Rip and Crosscut Saw:

The table for the rip and crosscut saw is 37 inches wide, of heavily ribbed cast iron. The saw mandrel is 1 1 16 inches diameter and runs in babbitted and reamed bearings 4¾ inches long and provided with oil grooves. The saw pulley is 2¾ inches diameter, a 2½-inch belt is used, with a speed of 3000 R.P.M. Belt from drive shaft to saw mandrel furnished with machine.

The saw table is hinged at one end for raising and lowering to adjust the depth of the cut. (See illustration.) The cast iron side guide, which will tilt to any angle, may be swung over and used in connection with the jointer. A cast iron cross-cut guide is also furnished which slides in a milled groove in the table and is adjustable for different angles. The saw will make a cut 2¾ inches deep.



Grinder wheel and drill with grinder guard and drilling table. Observe the adjustable feature of the drilling table.



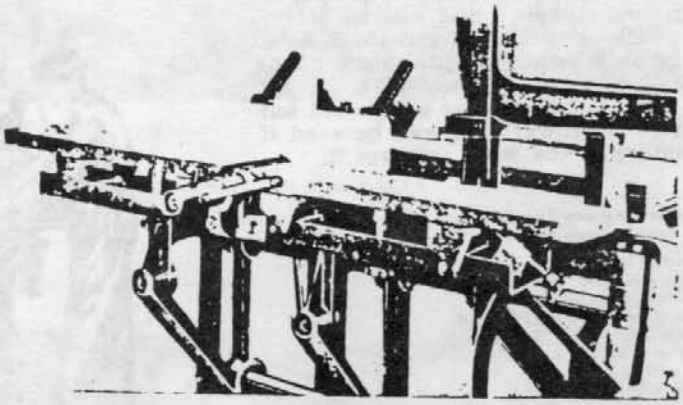
Rip and Cross-Cut Saw—Table tilted. Note smooth even finish and sturdy construction.

Jointer:

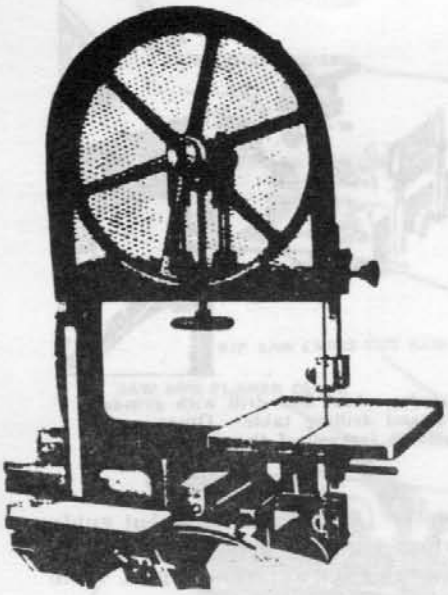
The jointer is fastened on the same spindle as the saw, is 6 inches long and 3 inches in diameter. Our jointer is, of course, of the rounded safety type.

A screw and handwheel arrangement are used to make both sides of the jointer table adjustable.

These tables are 6 inches wide and 24 inches long, each allowing for very accurate work. The jointer shaft has an outboard bearing and outside of this an 8x¾ inch emery wheel may be attached by means of two collars and a nut.



Close-up of the jointer, showing the adjustable tables. At the left front of the machine you will notice the brackets for holding the slide table for drilling.



Close-up of the band saw. The heavy frame, balanced wheels, adjustable bearing and rigid, sturdy guide enable this saw to stand a lot of hard usage.

saw frame, and a hand wheel screw is provided under the bearing for maintaining a tension on the saw.

The saw guide consists of a tempered and ground tool steel disc with an extension which runs in a long reamed hole. The guide is readily adjustable for material up to several inches thick. A ⅜-inch band saw is regular equipment but wider or narrower ones can be used if the nature of the work requires it.

The following are furnished as regular equipment:

A ⅜-inch band saw.
10-inch rip saw.
8x¾-inch emery wheel.
6x3-inch safety planer head.
Wrench for planer head.
Belt for rip saw and planer.
Band saw guide.
Emery wheel guard.
The saw throat is 21½ inches.
2 H.P. required to operate.

Gross Weight, 1027 lbs.
Packed in 3 Boxes: 42x26x9", 38x27x13", 43x28x14".

Drill and Sander:

The shaft end is provided with a ½-inch reamed hole and tap for a headless set screw. This allows straight shank bits to be inserted. In order to facilitate holding work to be drilled, a slide table is provided which is readily adjustable to different heights. The guide bars for this table fit in reamed holes in the bracket of the machine. Thus the guide can easily be removed when not in use.

An 18-inch disc sander may be placed on the threaded drive shaft end if desired.

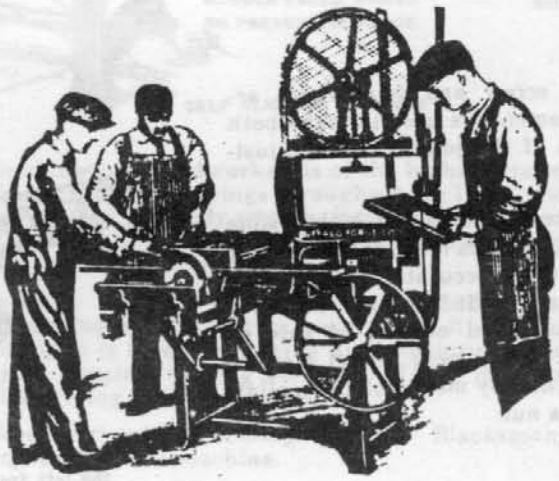
Band Saw:

The band saw on this machine is furnished with a well-finished cast iron tilting table 17½ inches long by 14¼ inches wide. Absolute rigidity of the table is assured, as there are three ribs running the full length of it. It may be locked in any position by means of a positive-action cam and handle.

The band saw wheels are turned and balanced, 22 inches in diameter with a 1½-inch face. The face of each wheel is covered with an endless rubber band on which the saw runs. This eliminates slippage of the saw, and reduces the heat from the blade.

Saw Frame:

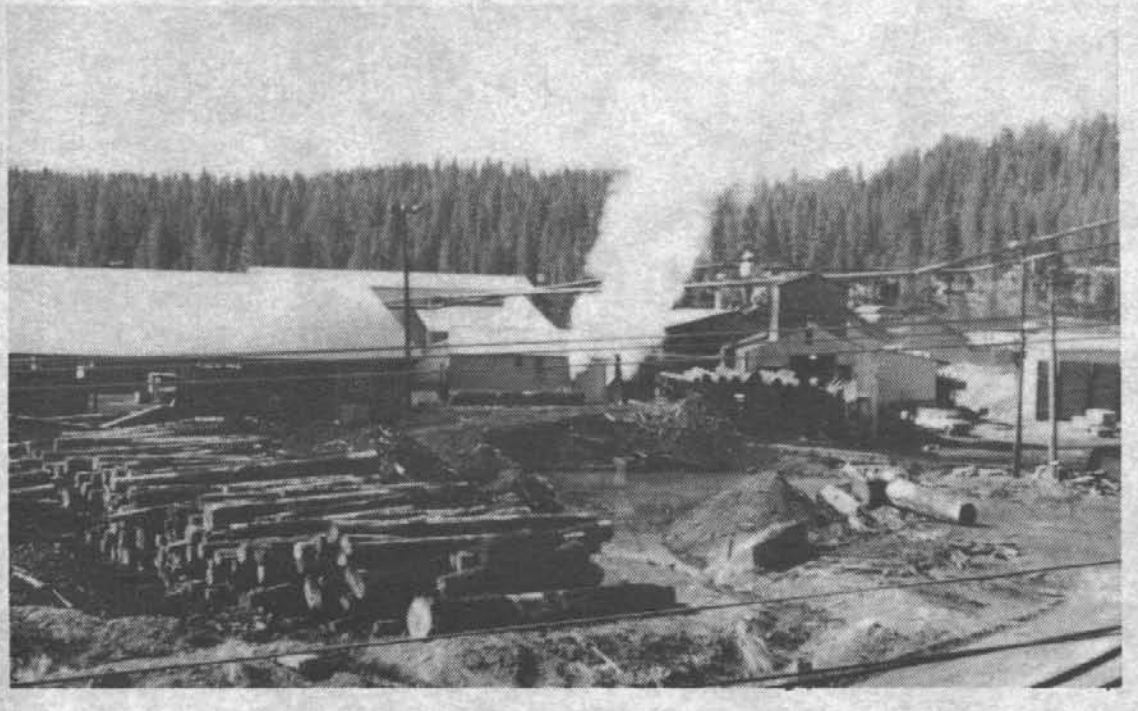
The frame of the saw is made of cast iron in an H section, which is the strongest construction known. The saw throat is 21½ inches deep. An adjustable bearing for the upper wheel is mounted on top of this



These men are busily engaged operating band saw, rip saw and jointer, a common sight in shops where our woodworking machines are used.

"Buffalo"

RECENTLY, I had to go to MARE ISLAND, It's North of SAN FRANCISCO ≈ 1hr. ON ONE weekend EXCURSION (ON the WAY TO RENO) I SAW this SAW MILL IN NEVADA, but close to CALIFORNIA, It's the biggest I've ever seen.



ON ANOTHER weekend excursion. I went to the NAPA WINE VALLEY. We tasted WINES FOR 7 hours.

MERRY CHRISTMAS & HAPPY New Year from the Barringer Winery Courtyard
Walt.

AWPTA
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