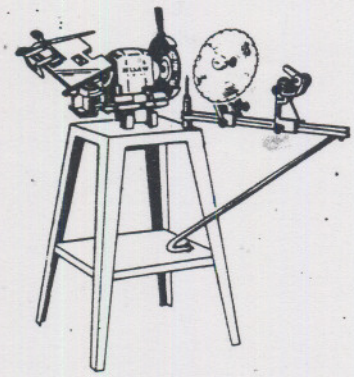
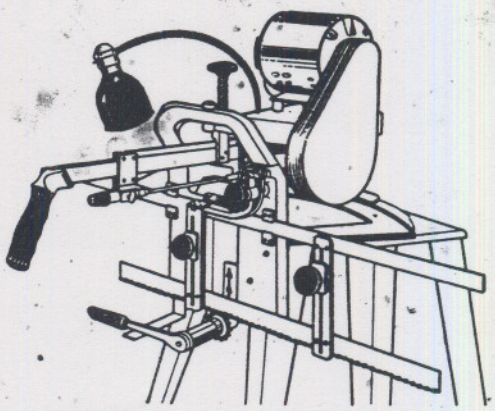
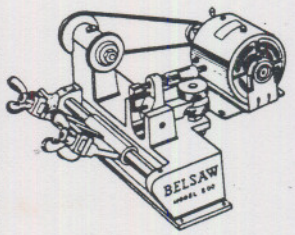
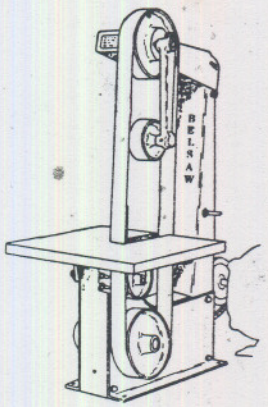
BELSAW

202

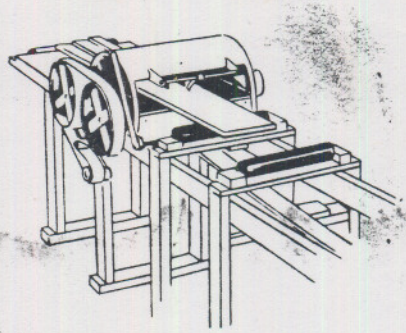


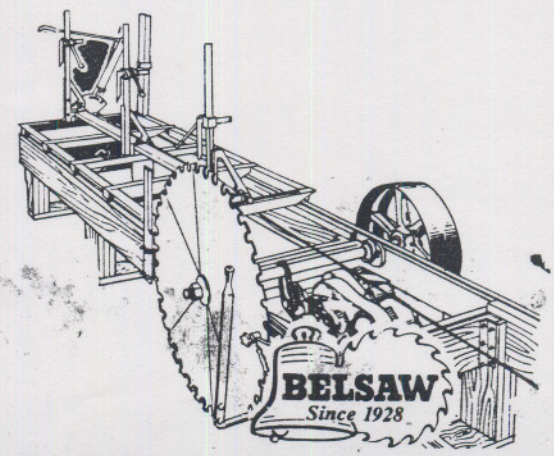


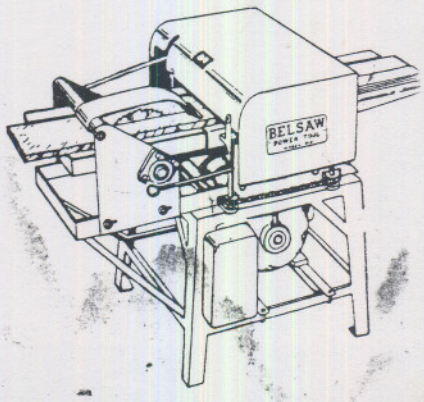




OPERATOR'S MANUAL and REPAIR PARTS LIST

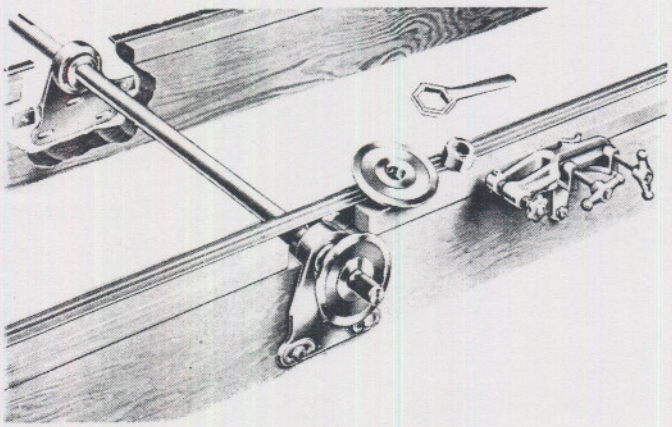






3 Reasons Why the NEW BELSAW Model "M" Sawmill will make money for YOU!

LOOK AT THESE MAJOR IMPROVEMENTS...

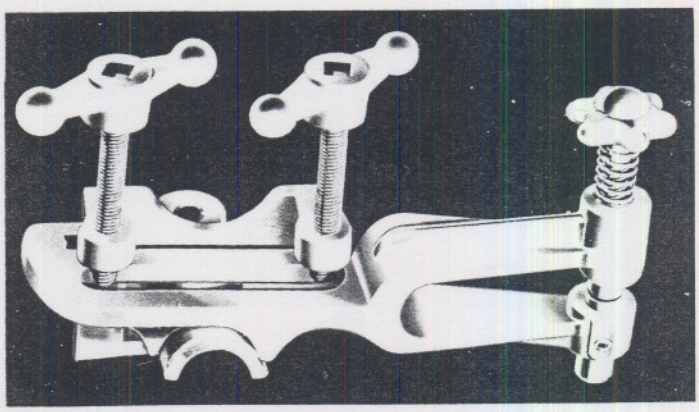


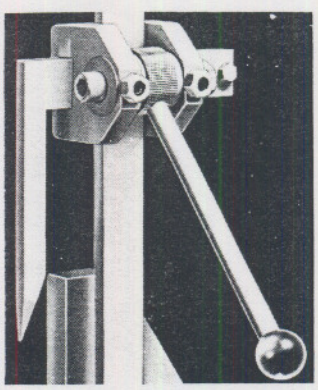
NEW BALL BEARING MANDREL ASSEMBLY

Pictured here at the left is the NEW self-aligning ball bearing Mandrel Assembly supplied with the NEW BELSAW MODEL "M" SAWMILLS featured on the pages in this catalog. The cold rolled steel shaft is 1¾-in. diameter by 56-in. long — transmits up to 50 horsepower — does not bend under normal belt tension. Self-aligning ball bearings are factory lubricated and sealed, requiring no further attention. The 6-in. diameter steel collars have machined outer ring; fixed collar shrunk on shaft. Takes righthand saw with 1⅜-in. arbor hole. Includes NEW safety saw guide, hex nut, and wrench.

NEW SAFETY SAW GUIDE

The NEW Safety Saw Guide pictured here is now furnished on the NEW MODEL "M" SAWMILLS, and can be safely adjusted WITHOUT TOOLS. Simple to adjust — to move the guide IN just loosen the right-hand screw and at the same time, tighten left screw. Big, easy-grip handles keep your hands at safe distance from the saw blade. To move guide OUT tighten right screw and loosen left screw. To adjust outer peg, turn large spring-tension thumb screw on the pin left or right. Easy to remove saw guide — loosen BOTH screws, slide saw guide back, away from saw, and lift UP and off.





NEW STEEL HIGH-SPEED TOP DOGS

Pictured here is the most efficient Top Dog we have developed during the past 30 years. Note the convenient side position of the hand lever. Requires no stretching or climbing to reach BACK OVER big logs. The steel spike slides in-and-out of box to desired position for dogging. Downward stroke of the convenient side lever drives the spike into the log, and locks pawl against post. Upward stroke releases pawl and withdraws spike. When Top Dog is raised clear of the log, gravity action of hand lever holds it in any position. Hardened steel pawl has wide bearing surface area, and is adjustable for normal wear.

THESE OUTSTANDING FEATURES ARE YOURS ON ALL OF THE NEW BELSAW MODEL "M" SAWMILLS

NEW HIGH-SPEED TOP DOGS

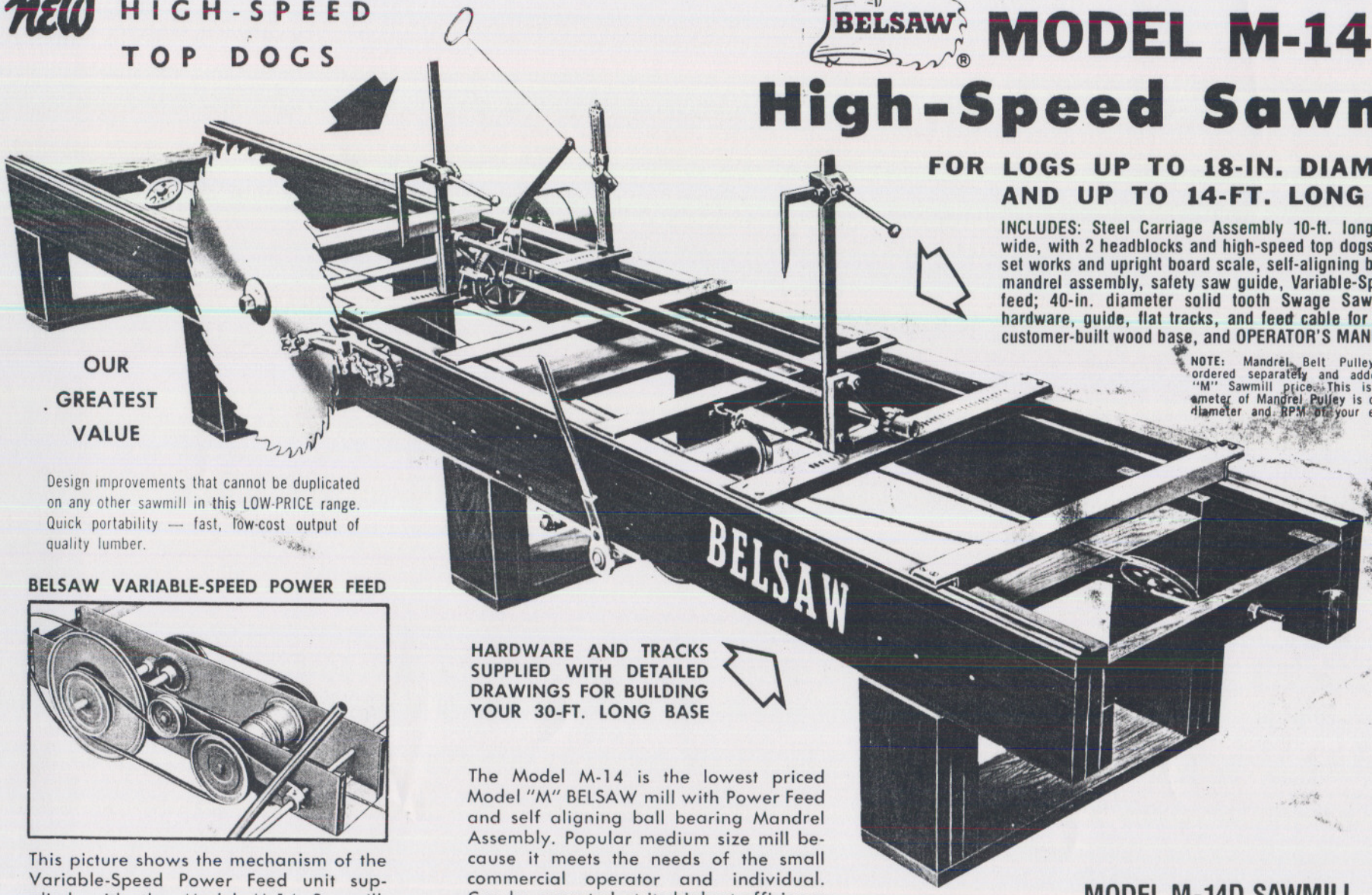
BELSAW®

MODEL M-14 High-Speed Sawmill

FOR LOGS UP TO 18-IN. DIAMETER AND UP TO 14-FT. LONG

INCLUDES: Steel Carriage Assembly 10-ft. long by 40-in. wide, with 2 headblocks and high-speed top dogs, complete set works and upright board scale, self-aligning ball bearing mandrel assembly, safety saw guide, Variable-Speed power feed; 40-in. diameter solid tooth Swage Saw; all base hardware, guide, flat tracks, and feed cable for 30-ft. long customer-built wood base, and OPERATOR'S MANUAL.

NOTE: Mandrel Belt Pulley should be ordered separately and added to Model "M" Sawmill price. This is because diameter of Mandrel Pulley is determined by diameter and RPM of your engine pulley.



OUR GREATEST VALUE

Design improvements that cannot be duplicated on any other sawmill in this LOW-PRICE range. Quick portability — fast, low-cost output of quality lumber.

BELSAW VARIABLE-SPEED POWER FEED

This picture shows the mechanism of the Variable-Speed Power Feed unit supplied with the Model M-14 Sawmill. Recommended for sawing logs of uniform, medium size. Allows you to operate power feed with a minimum of 25 HP. Forward feed variable from 0 to 1-inch each saw revolution. Gigs back at triple speed. Full slipping V-belt feed gets power direct from mandrel. Furnished with M-14 mill, complete with all pulleys, belting, cable, sheaves and attachment bolts.

HARDWARE AND TRACKS SUPPLIED WITH DETAILED DRAWINGS FOR BUILDING YOUR 30-FT. LONG BASE

The Model M-14 is the lowest priced Model "M" BELSAW mill with Power Feed and self aligning ball bearing Mandrel Assembly. Popular medium size mill because it meets the needs of the small commercial operator and individual. Can be operated at its highest efficiency by one or two men, with 25 to 30 horsepower engine. Includes precision set works and ball bearing Mandrel Assembly. Model M-14 gives you a 10-ft. long steel carriage with two New High-Speed Top Dogs, for sawing logs up to 14-ft. long on a 30-ft. long wood base. The 40-in. diameter saw handles logs to 18-in. diameter. Also available with 40-in. **Inserted Tooth Saw.**

MODEL M-14D SAWMILL

Same as M-14 Sawmill, but with 40-in. diameter **Inserted Tooth Saw Blade** and inserting wrench.

MODEL M-14D SAWMILL, Shipping Weight 800 lbs., f.o.b. factory, Pleasant Hill, Missouri

BELSAW MACHINERY CO

315 Westport Road Box 593 • Kansas City, Mo. 64141

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PERMANENT BASE INSTALLATION

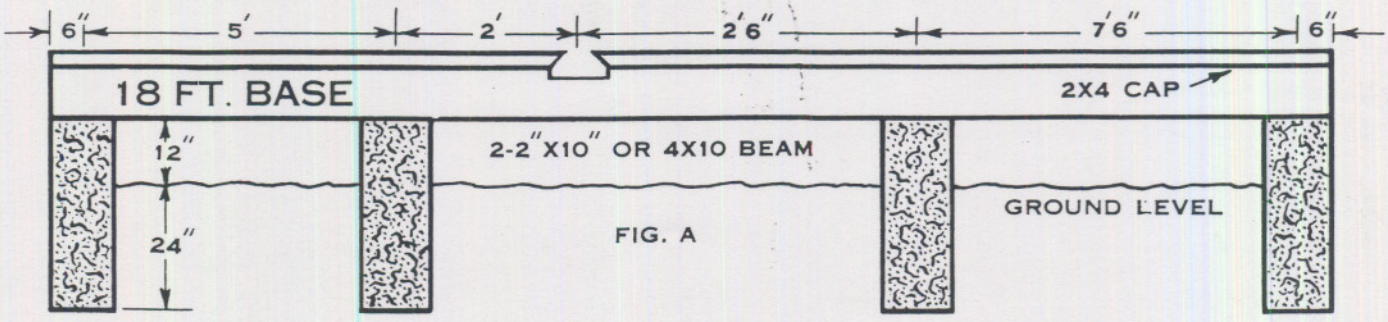


FIG. A

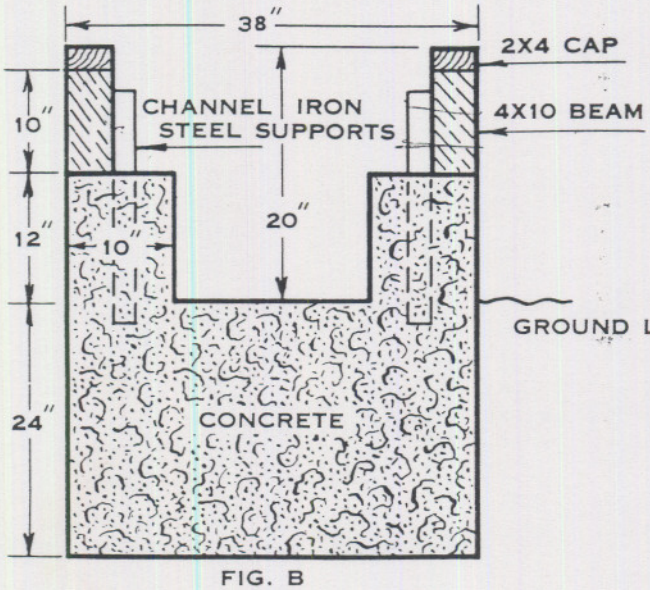


FIG. B

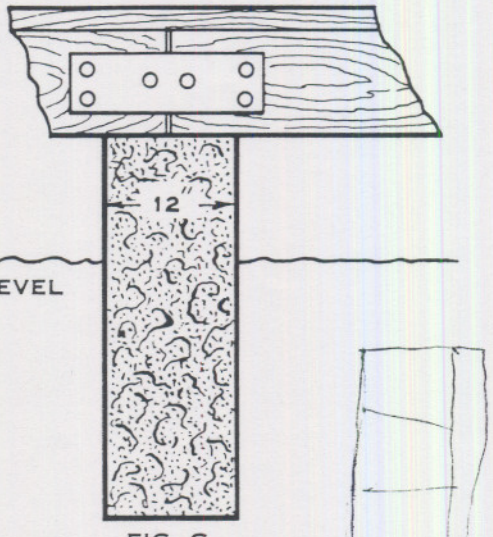


FIG. C

The sawmill base is the most important part of the entire installation and we highly recommend the construction shown above using the concrete footings in place of the legsets as shown on reverse side of this sheet. Footings are set approximately 2' below ground level so that they will not be affected by weather conditions. 4" channel iron or 2"x3" angle iron are set straight and parallel in each footing as shown in Fig. B. If angle is used, place 3" flat side against side beams. Position steel supports so that when side beams are installed they will be exactly 38" outside measurement. Bolt side beams to steel supports. Be sure to keep 20" depth in center of base for clearance of cable and feed. Smallest sawmill base (18') as shown above should have 4 footings centered on the dimensions shown in Fig. A. For longer length bases add one extra footing for each 6 to 8' of length. Base side beams may be made either of 2x10" laminated pieces as shown on reverse side of this sheet or of straight 4"x10" timbers. If 4"x10" timbers are used they can be spliced as shown in Fig. C. Use steel plates approximately 16" long x 4" wide x $\frac{3}{8}$" thick. One plate should be on each side of beam and drawn up tight with $\frac{3}{8}$" machine bolts.

IMPORTANT

Be sure top of all concrete footings is level and all steel supports are straight, lined up and parallel. Very minor leveling can be done by shimming up under 2"x4" caps and shimming up or notching out between base beam and footing.

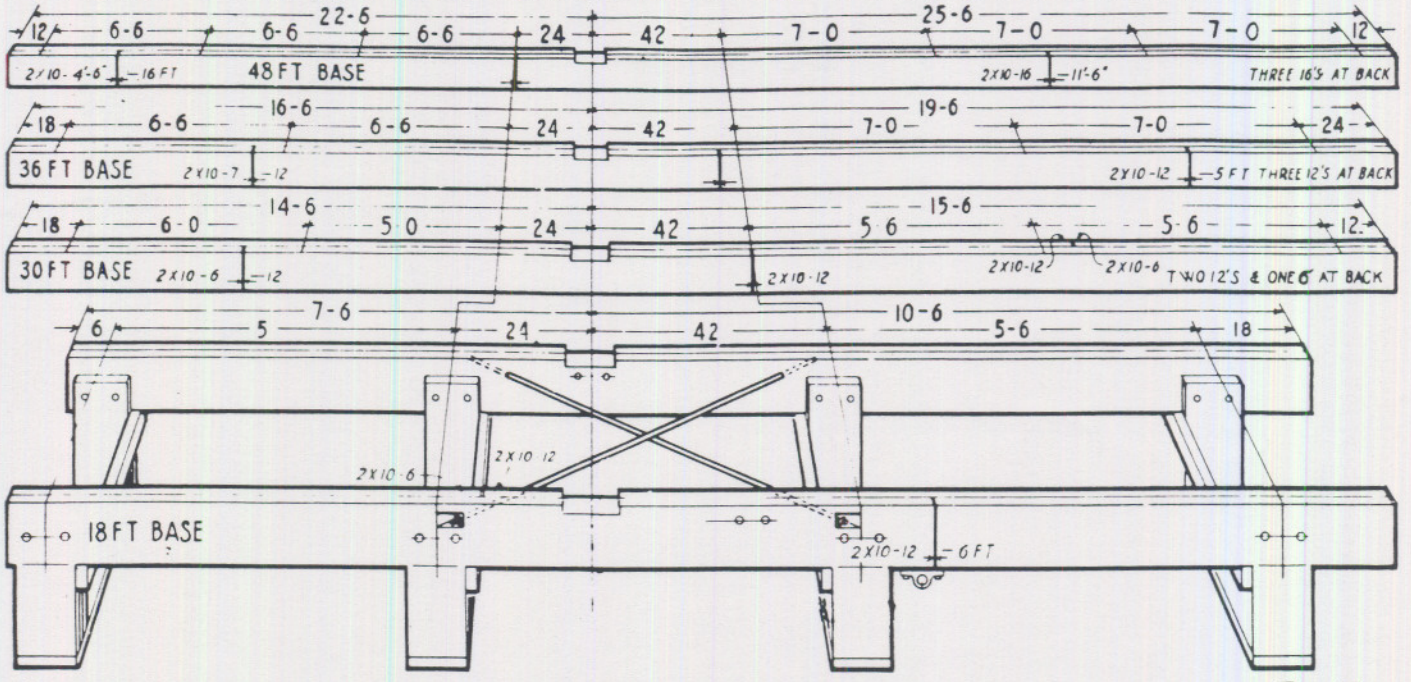
For construction of log ramp, chip screen, saw guard and board table, see separate sheet: "How to Saw Typical Logs."

BELSAW MACHINERY CO 315 Westport Rd., Box 593 • Kansas City, Mo. 64141 Phone 816-561-9155 Cable "BELMACH"

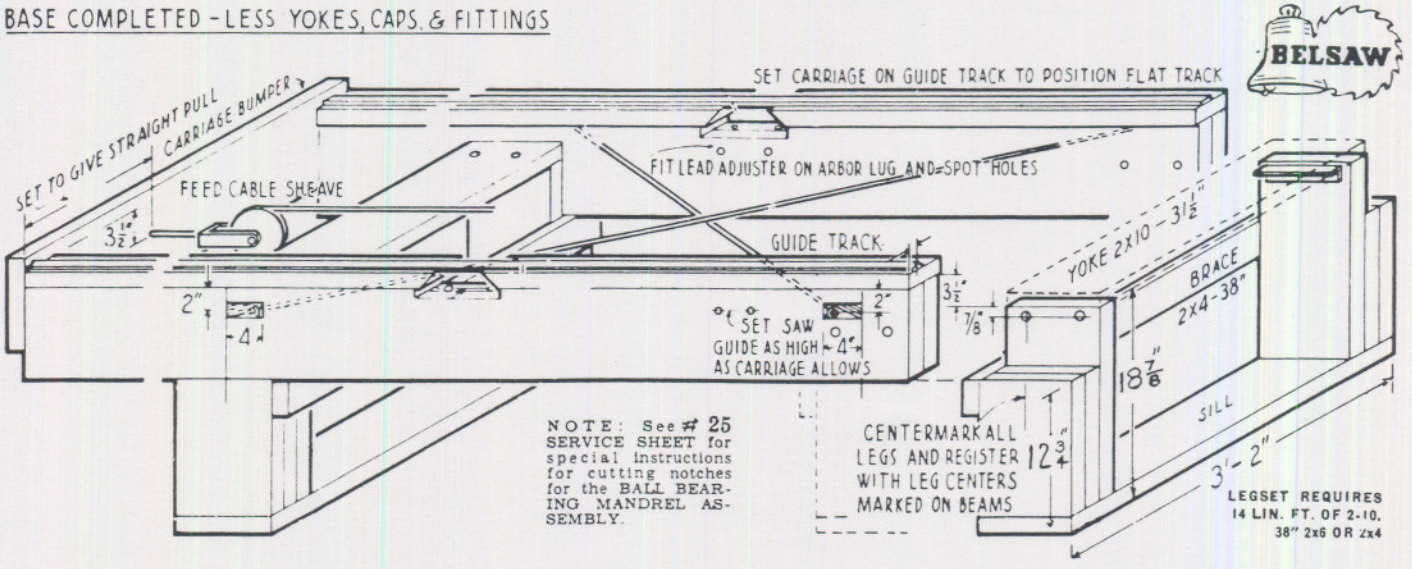
SEMI-PORTABLE INSTALLATION

SAWMILL BASE MATERIALS - CONSTRUCTION - FITTTINGS

BEAM LAYOUT: *CUT PCS. AND SPLICE AS SHOWN ON FACE.* MARK LEGS AND ARBOR CENTERS TO DIMENSIONS GIVEN AT TOP



BASE COMPLETED - LESS YOKES, CAPS, & FITTINGS



NOTE: See # 25 SERVICE SHEET for special instructions for cutting notches for the BALL BEARING MANDREL ASSEMBLY.

MATERIALS REQUIRED

Lumber	Beams	Legsets	Caps
For 18'	6 Pcs. 2x10"-12'	4 Pcs. 2x10"-14'	50' 2x4"
30'	10 Pcs. 2x10"-12'	6 Pcs. 2x10"-14'	80' 2x4"
36'	12 Pcs. 2x10"-12'	6 Pcs. 2x10"-14'	100' 2x4"
48'	12 Pcs. 2x10"-16'	8 Pcs. 2x10"-14'	120' 2x4"

Legset braces included with caps.
Nails: 12d COMMON.

BASE CONSTRUCTION

Following gives directions for minimum base recommendations. Concrete footings and any additional strengthening and bracing will pay dividends in more boards sawed straight and true.

A. Cut 2x10" side beams to proper lengths and assemble so that they overlap as shown in drawing above, or use 4x10" timbers as shown on reverse side of this sheet.

B. If using 2x10", be sure top edges line up straight, then nail securely together.

C. Lay both beams with top edges facing together. Using square, mark both beams with centers for mandrel, legs.

D. Legsets are made as shown but do not nail brace until legs are fitted to beams. Mark centers of legsets. Set beams on legsets with center marks lining up with center marks on beams. Nail legsets to side beams and install 2x10" yoke as shown in drawing. Position angle brackets under yoke and against leg set as shown and mark bolt holes for drilling. 6-inch carriage bolts go through side beam with nut on inside next to angle iron. 2½-inch carriage bolts go down through top of yoke with nuts on bottom side against angle iron. Angle iron ties yoke, side beam and leg set firmly together.

E. MANDREL NOTCHING — See BALL BEARING MANDREL Service Sheet for details of cutting base notch. Lay cross rods on beams across center section and mark for positioning of holes. Chisel angle recess as shown in drawing.

F. Install 2x4" beam caps flush with inside, project over notches as shown. Hang saw on mandrel and lay the guide track end to end on the saw side, but do not screw down. Place the carriage on the track so that it clears saw about ½". Center section of track should be equal distance from both the front and back of the saw. Remove carriage and run tight line over track center. Track should be perfectly straight and level. After guide and flat track are installed, carriage should be placed in position and entire mill leveled in both directions. After base is level it should be securely anchored to the ground. A level and solid base is required for sawing.

Saw guide should be installed as high as possible and still clear the carriage. Lead adjustor installation is covered in the mandrel service sheet.

PARTS LIST

Part No.	Description
h-27	Flat Track, per 6 ft.
h-29	Angle Bracket (Including Bolts and Nuts) Each
h-31	X Rods, Threaded Each End with Washers and Nuts, Pair
h-260	Guide Track—2 pieces angle, 1x1x¼ set back to back 6' length.

BELSAW MODEL M MANDREL ASSEMBLY

For Model M 1¾" ball bearing mandrel installation, follow base sheet for materials required and operations through Step D. Then continue as follows:

CUTTING NOTCHES FOR MANDREL:

Saw Side—Mandrel bearing notch measures 4½" deep from top of cap board and 4⅛" wide.

Back Side—Mandrel bearing notch measures 4" deep from top of cap board and 5" wide.

Saw Guide Installation—Hang saw so that as you face it from outside, (or saw side,) teeth point to right for clockwise rotation of saw. Be sure both collars are clean. Pull nut tight with wrench and then rap wrench sharply with medium-weight hammer to lock nut securely.

Position of bolt holes for 2M2 saw guide from top of base cap is shown in Figure 1. The object is to position saw guide as high as possible on base, but still clear carriage.

Position of guides: Distance between mandrel and saw guide is determined by diameter of saw. Set the guide pins about ¼" below the sockets, or gullets of teeth. This is particularly important with inserted tooth saws, if the guide pins rub or touch the holders, they will turn the holders out of place or crack them. If they are set too far back from the gullets or holders, the guide pins will be less effective.

Use two ⅜" bolts, 4½" long to mount saw guide.

Lead Adjustor Installation—Fasten lead adjustor clip angles to base with ⅜" carriage bolts 4½" long. Correct position for clip angles is in horizontal line with lead adjustor bolts in side of rear bearing housing as shown in Figure 2. Lead adjustor clip angles should be approximately 1" from rear bearing housing.

Installing Cap Boards—Cut 45 degree bevel on cap board ends that go next to bearing. Then lay cap board flush to inside of base. Space between cap board over bearing should be small as possible. On saw side, place cap boards so they touch bearing housing when housing is flush with top of cap board. On rear side, set cap board so there is ½" between cap board and bearing housing on each side to allow for lead adjustment.

Mandrel Installation—Rear Mandrel bearing sets on outside of base of mill. Bearing on saw side sets inside side beams. To adjust bearings to exact width of mill base, they must be released from mandrel shaft. Bearings are locked to mandrel shaft by an eccentric collar. To release eccentric collar, loosen set screw in collar and place end of round-nose punch at an angle in holes in collar. Tap lightly whichever direction is required to loosen collar. When collar is loose, mandrel shaft should slide freely through the bearing.

½ x 5" carriage bolts are for mounting mandrel. Insert bolts so heads are on outside of bearing. These may be loosened on saw side for adjusting mandrel to level. For adjusting lead in saw, loosen bearing bolts on back side of mill.

To set rear bearing, spot holes with dimensions shown in Figure 1 or set top of bearing flush with the top of base cap 2 x 4 and drill holes for ½" bolts in base through center of horizontal slots in rear bearing housing.

On saw side bearing, spot holes at dimensions shown in Figure 1, or place bearing housing ¼" below base cap 2 x 4 and drill holes in base at center of vertical slots in bearing housing.

The reason for having saw side bearing below cap is to use this space for final leveling of mandrel.

After bearings are in position, slide mandrel through bearings to rear until inside of saw is ⅝" from edge of cap board. Now relock bearings to shaft by slipping collar back on to bearing in original position. Turn collar in direction of shaft rotation until its cam drops over the cam on the inner ring. Continue turning until the two cams engage and securely lock bearing on shaft. Tap lightly with punch to lock bearing securely to shaft. Then tighten set screw.

FIG. 1—

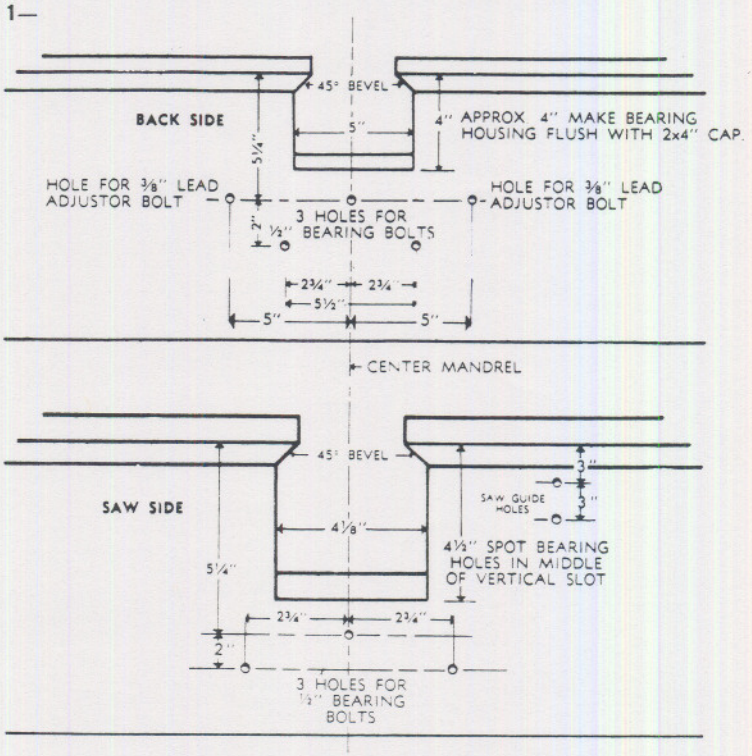
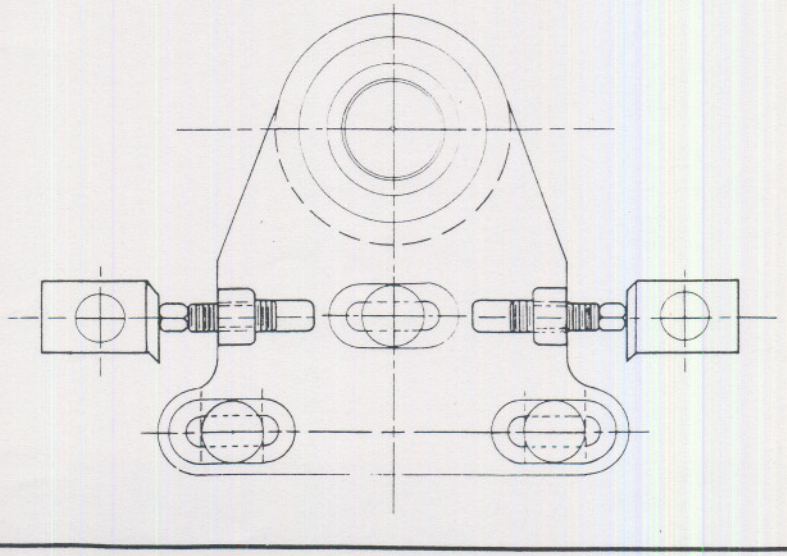


FIG. 2—



Track Installation—With saw on mandrel, place a section of guide track on saw side of base and flat track on back side without screwing it into base. Set carriage so that guide rollers are on track. Position guide track so carriage will clear saw by ½", and flat track so rollers are in center of it. Mark position of both tracks and remove carriage. Stretch taut line over center of positioned piece of guide track. Use line long enough to stretch to both ends of base. Then lay rest of guide track in line with first section by following taut line. Flat track should be checked with guide track when laying to make sure it is parallel with guide track for the entire length of saw base.

GUIDE TRACK MUST BE STRAIGHT AND LEVEL!

Mandrel Pulley Installation—With carriage in place, install mandrel pulley so that pulley clears carriage by approximately 1"

Power Unit and Belt Installation—Install power unit at off bearing end of mill. Align power take-off pulley with mandrel pulley. Distance between pulleys is determined by installing belt.

On most power installations, the power take-off pulley turns counterclockwise and the mandrel pulley must turn clockwise (facing saw from saw side). Therefore, transmission belt must be crossed.

Crossed belt is more efficient than straight, because its greater wrap on pulley gives more grip.

Tension is an important factor that is often disregarded. Belts stretch as they become warmed up in use, and as they dry after having been wet. If a belt is taut when dry, its shrinkage when rained on may be enough to alter adjustment or cause breakage.

Consequently it is not practical to install power units with belt at excessive tension. It is preferable to control tension of belt with gravity type belt tightener, one that will either take up the slack or allow more slack. Idler pulley must be at belt slack side of pulley, never at taut side.

OPERATION:

See "Carriage Operation and Maintenance" on separate sheet.

Mandrel Leveling—Before leveling mandrel, carriage must be placed on track and checked for level. Place carpenter's level on knees of carriage for leveling from saw side to rear side of mill. Level lengthwise on carriage and move carriage along track, checking for level all the way.

To level mandrel with carriage, loosen mandrel bearing housing bolts from vertical slots on saw side. Then raise or lower mandrel by sliding housing up or down on bolts, as necessary.

Lead Adjustor Setting—Before saw can be operated, lead must be set. To adjust lead, loosen bolts that hold rear bearing to base. Turn both adjusting bolts, thus moving mandrel bearing to left or right as desired for correct lead. Then tighten bearing bolts again.

Correct saw lead can be found only from sawing tests. Initial lead should be about 1/32". Clamp a sharp-pointed object on carriage knee touching inside edge of saw tooth on the leading edge of the saw. Give saw ½ turn and advance carriage until pointer is in line with same tooth. For first trial lead, pointer should touch tooth on leading edge of saw and should be 1/32" away from tooth on back side. In other words, saw should have 1/32" lead into log. If the lead into the log is too much, the saw will heat on the rim. If the lead out of the log is too much, the saw will heat at the center.

Soft, tough, fibrous timber usually requires more lead than hard, close-grain or frozen timber.

Watch action of saw in first light cuts. If lead is correct, it should cut true, straight boards. If it veers in either direction when sawing at correct mandrel speed, adjust lead to compensate. Continue such trials in light cuts until saw runs straight and true for the full length of the log.

Saw Guide Operation—Purpose of saw guide is merely to guide the saw back into lead when thrown off by a knot, etc. Do not use guide to "lead" the saw.

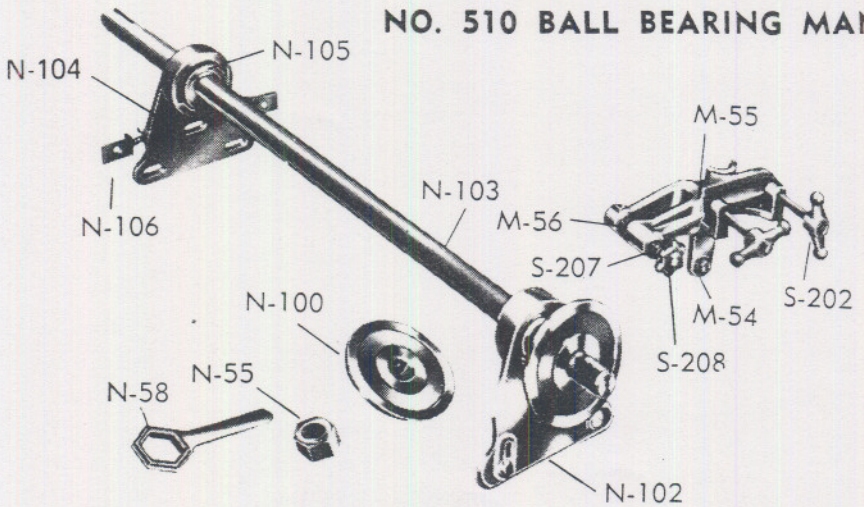
Distance between the wooden pegs should be adjusted only with saw stopped. Bring pegs against saw and then back outside peg off approximately 1/32". Inside peg is held in place with set screw on top.

With saw turning, make visual check of the distance between the pegs and the turning blade. Stop blade and adjust saw guide so that when the blade is running you can check to just see daylight between each saw peg. Adjust the pegs in or out as required by loosening the right hand screw and at the same time tightening the left. This will move the guide in. To move guide out, tighten right hand screw after loosening left. Recheck for proper saw guide distance with the blade running... If the distance is not correct, stop blade and readjust.

To remove guide while changing saws, simply loosen both screws, slide guide back and lift off. **Before sawing, be sure both screws are tight!**

Circular Saw Maintenance—See separate sheet covering filing and fitting of the saw. Be sure to keep your saw teeth SHARP and uniformly SET (or SWAGED). Backs of teeth must NOT be higher than points. Teeth must be filed square across face. Use files with round edges so as not to leave sharp nicks in gullets or throats. Before starting to use your new saw clamp a piece of sheet metal beside three or four teeth and mark their outline exactly. Cut out to give exact size and shape — use this guide when reshaping teeth after they become dull. Good sawyers give their saws a touch-up sharpening twice each morning and afternoon.

NO. 510 BALL BEARING MANDREL



Order Part No.	PARTS
510	**Standard Mandrel Assembly**
N-55	Mandrel Nut
N-100	Loose Saw Collar
N-102	Front Bearing Housing
N-103	Mandrel Shaft (with Fixed Saw Collar)
N-104	Rear Bearing Housing
N-105	Mandrel Ball Bearing (2) ea
N-106	Adjustor Clip Angle (2) ea. Sq. Hd. Lead Adjustor Bolt ½-13x2"
N-58	**Mandrel Wrench**
2M-2	**Steel Saw Guide** (complete)
M-54	Saw Guide Bracket
M-55	Saw Guide Arm
M-56	Hard Wood Plug pair
S-202	Operating Screw Handle
S-207	Adjusting Screw Spring
S-208	Plug Adjusting Handle

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CARRIAGE OPERATION AND MAINTENANCE

HOW LIGHT MILL DIFFERS FROM HEAVY

Light sawmills differ from heavy in two ways. When operated with regard to these differences, the light mill can be expected to give comparative results to costly, heavy mill. BUT IF DISREGARDED, GOOD RESULTS CANNOT BE EXPECTED.

Amateurs usually obtain better results with light mills than do sawyers having heavy mill experience. This is due to the fact that the amateurs will follow our instructions—which apply to the light mill, while the former uses his experience—which does not apply successfully to the light mill.

Experienced sawyers should therefore give particular attention to these two differences.

A LIGHT SAWMILL REQUIRES HIGHER SAW SPEED. When saw is run at slow speed, it exerts excessive thrust on carriage. Therefore, always run saw at hammered speed or slightly above, NEVER LOWER. When the saw is run under hammered speed, the saw tends to lead in or out of log, causing additional strain on carriage. This will cause strain on feed and mandrel too, which will cut down on your power. The reduction of power caused by this additional strain will slow down the saw still more, and result in serious damage.

A LIGHT SAWMILL CANNOT TAKE SHOCK LOADS. When log is rolled gently on carriage from beams level with bed a light mill can take tremendous loads without damage. But repeated shock of logs dropped on it can soon cause serious damage. A light mill is not intended to stand the abuse given a heavy mill, BUT IF CARE IS TAKEN IN HANDLING LOGS, THE LIGHT MILL WILL GIVE A LIFETIME OF GOOD SERVICE.

The BELSAW includes refinements based on over a quarter century of practical experience—our own and that of thousands of customers.

You have in your BELSAW, equipment of which you may well be proud, and from which you may expect highest efficiency.

TRACK & GUIDE ROLLERS: The H-260 guide track is two pieces of 1" x 1" x ¼" angle iron set back to back and offset at the joint. The pair of angles is called one piece of track and must be absolutely straight and level. For track to remain straight, the base must stay rigid, despite load, belt pull, or changes in ground caused by rain, drought, or freezing.

Carriage guide rollers ride track and carry logs straight through saw. Roller bearings in guide rollers must be kept greased. A thorough greasing of the entire mill should be made every morning.

LOG LOADING: The importance of rolling log on carriage bed without shock has been explained. Always recede headblocks full back before loading log. Do not advance before log has been positioned by hand for first slab cut: If log is large, chuck in place with chips instead of using top dogs, particularly if the log is inclined to teeter or roll.

TOP DOGS: The less competent a sawyer is the more dogs he needs, and the tighter he sets them. Able sawyers, those who keep their saw and mill in good shape, don't use over one or two dogs set lightly: when the log is heavy and rests on wide sawed surface they use none until last cuts.

DO NOT CLAMP DOWN HARD ON THE TOP DOGS: It is not necessary, and interferes with proper operation of set works by making load on it excessive, and will greatly shorten the life of the equipment.

When tight dogging is required something is seriously wrong. Saw may not have right lead or enough speed, guide track may be bowed, etc. Find the cause and correct it, instead of ruining mill.

Our new type top dog is highly efficient. With a single stroke of operating lever its head is fixed tightly on post and spike is driven. By reversing stroke, spike is withdrawn and head released so it may be freely moved to any desired position.

SET WORKS: This mechanism is for advancing the log toward saw, required distance to give thickness of cut desired.

The ratchet and pinions are geared to advance the headblocks exactly 1/16 inch for each tooth in ratchet. Thickness of cut is determined by travel distance of headblocks which in turn is regulated by set lever stroke. Gauge stop h-12 is provided to stop the set lever in the back position when rotary pawl is set for headblock advancement. When rotary pawl is set for receding headblock it will bypass h-12 gauge stop. To set h-12 gauge stop for any desired thickness of cut, pull set lever foreward until it hits yoke rod h-22. Since each tooth of ratchet represents 1/16 inch headblock advancement, return set lever and count the number of clicks which will give you the headblock advancement desired. Adjust the gauge stop h-12 so that it contacts rotary pawl. Tighten locking bolt. To check adjustment return set lever until it strikes gauge stop then pull forward as far as possible. Measure amount headblock advanced on one full stroke. Readjust gauge stop if necessary for correct measurement.

Adjust h-16 brake so that ratchet will not turn backwards with the return stroke of h-13 set lever. To adjust brake, tighten set screw at back of headblock h-44L. Set screw presses on bronze brake h-46 that rides against h-45 gearshaft for frictional brake action.

Never use set works and headblocks to advance a log before it is turned on slabbed sawed surface. A log resting on its bark surface is hard to slide and any large knots or bumps on the log will cause it to hang up on carriage frame. It is best to use set works only after the log is squared on 2 sides. With a sawed side down, and another against headblocks, advance by set works to remove third slab, so cut wil be parallel with first, giving pre-edged 3-square bolt.

With fourth side turned toward headblocks unslabbed, there will be no waste on final cut.

Do not rig up home-made taper adjustment on headblocks for tapered logs: Instead, move the smaller end out from block, chuck chip under it, and place top dog with spike in extended position.

Keep holddowns adjusted to prevent blocks lifting too much when dogs are used, but leave sufficient clearance to prevent making headblocks drag.

UP-RIGHT SCALE BOARD: Large easy-to-read board tells exact distance remaining between saw and headblocks. Shows number of 2", 1¼", and 1" boards that can be made from log still on carriage. Markings include allowance of ⅜" saw kerf and planer shave. Extra column left blank for markings of special cuts.

Attach scale to carriage at set-works knee.

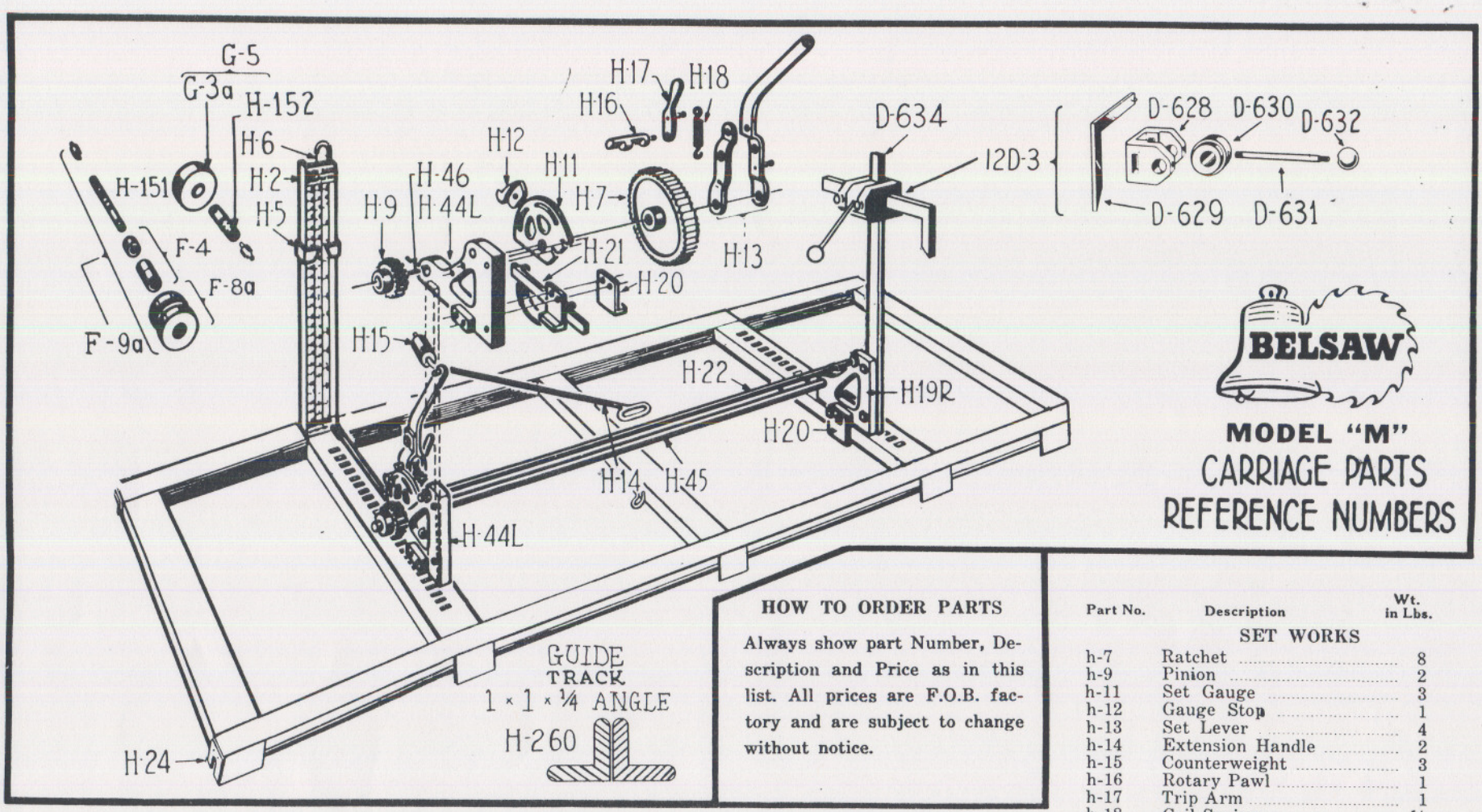
Tie cord to set gauge, run through the bottom tubing, along the back of the scale, through the top tube and tie to the sliding marker. Then set marker at reading corresponding to distance between saw and headblock. Grease sliding marker and add weight if necessary so it will slide easily and remain sensitive.

HELPFUL SAWING SUGGESTIONS

For sawing oversize log do not use top dogs until reduced to squared bolt. Position by hand and chuck with chips to prevent rolling forward. Through saw cut is not necessary: slabs may be removed by undercut followed by splitting unsawed part, or by opposite undercut after turning log end for end. Some sawyers prefer "gunbarreling" their oversize logs; in this process the log is turned just enough following an undercut for next cut to saw thru to former one. This produces a polygon shaped cant that must then be squared.

For edging boards on mill, place flat on carriage bed with bark edge clearing line of saw cut: after this cut turn sawed edge against headblocks, which should have dog posts adjusted in line.

For sawing strips such as lath, etc., first rip to largest dimension from bolt, then place several of these thick cuts in layers and rip to the small dimension with small thin saw. Such work should be trimmed to length only after ripped full length.



BELSAW

MODEL "M"

CARRIAGE PARTS REFERENCE NUMBERS

HOW TO ORDER PARTS

Always show part Number, Description and Price as in this list. All prices are F.O.B. factory and are subject to change without notice.

PARTS LIST MODEL "M" SAWMILLS

Part No.	Description	Wt. in Lbs.
	TRACK AND ROLLER TRUCKS	
f-4	Roller Bearing & Bushing f-6	1
h-151	Axle and Grease Fitting	1
h-260	Guide Track 6' Length	15
f-9a	Guide Roller Assembly	3
f-8a	Guide Roller	1
G-5	Back Roller Assembly for Flat Track	2
g-3b	Back Truck Roller	1
h-152	Axle and Grease Fitting	1

Part No.	Description	Wt. in Lbs.
	TOP DOG	
12D-3	Top Dog Assembly	10
d-628	Top Dog Box	5
d-629	Top Dog Spike	3
d-630	Top Dog Pawl	2
d-631	Top Dog Lever	1
d-632	Top Dog Ball Handle	1
d-634	Post for 12D-3	6
	UPRIGHT SCALE	
H-1	Upringht Scale Assembly	6
h-2	Scale	4
h-5	Indicator	1
h-6	Cord	½

Part No.	Description	Wt. in Lbs.
	SET WORKS	
h-7	Ratchet	8
h-9	Pinion	2
h-11	Set Gauge	3
h-12	Gauge Stop	1
h-13	Set Lever	4
h-14	Extension Handle	2
h-15	Counterweight	3
h-16	Rotary Pawl	1
h-17	Trip Arm	1
h-18	Coil Spring	½
h-19R	Head Block	10
h-20	Holddown	2
h-21	Holddown, Stop and Shield	2
h-22	Yoke Rod	11
h-24	Track Brush	½
h-44L	Headblock	10
h-45	Gear Shaft	17
h-46	Brake	⅛

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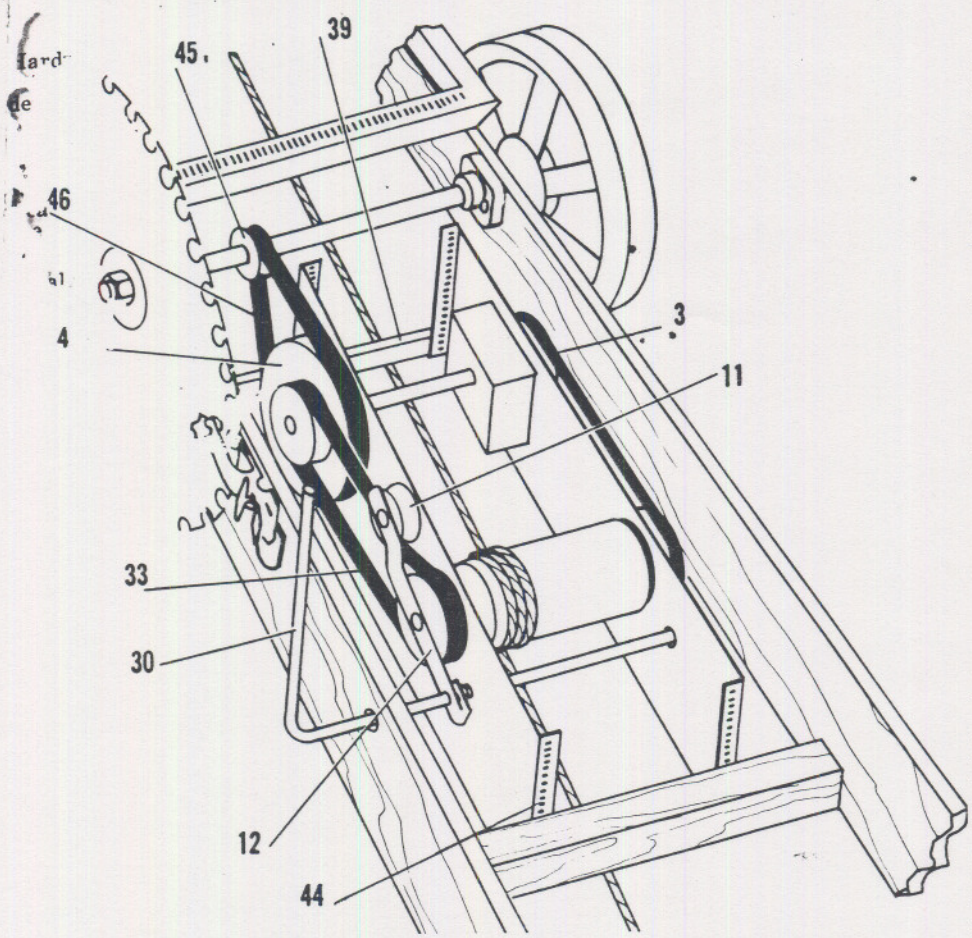
FEED FOR LIGHT SAWMILLS



INSTALLATION

Remove preservative from mandrel shaft with kerosene.

Insert mandrel in bearings by sliding through from the saw side. Before sliding through pulley bearing, assemble #45 V sheave and #46 V belt.

Set feed unit in place with #4 large drive pulley nearest mandrel. Attach #39 cross angle to feed with #40 bolts, #43 nuts and #41 washers. Do not tighten.

Attach #39 cross angle to the bottom of sawmill side beams with #15 lag screws. Use #46 V belt to determine position.

Place 4"x4"—31½" long between side beams, flush to bottom, to support other end of feed. Spot lag screw position using #44 feed housing as template. Attach with #15 lag screws.

Assemble #30 control lever with two #12 tightener arms with the #11 idler sheaves next to #3 and #33 feed belts. Place #3 and #33 feed belts on their respective sheaves.

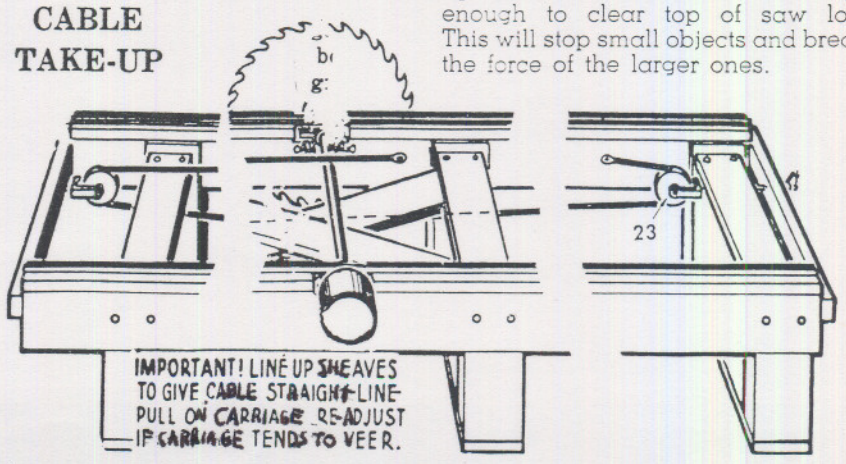
Adjust tightener arms so that a pull on the control handle away from the saw will tighten the slack side of #3 belt.

Adjust tightener arm for carriage return so that a push of the control handle toward saw will tighten slack side of #33 belt.

Attach #34 neutral spring and #28 chain to nearest swing arm and fasten to base with staple so that tension holds control lever in neutral.

Wrap three turns of cable on drum with the cable coming off bottom of drum, pass cable ends over #23 cable sheaves and then to holes provided in carriage. Cable should be tensioned enough to feed but not too tight.

CABLE TAKE-UP



Cable sheave should be placed to give straight-line pull on carriage, if pull is at an angle excessive power is required, and tracks and carriage rollers will become badly worn. Sheaves should also be placed at a height giving clearance of base cross members and of arbor. If the cable drags at any place, the feed will consume excessive power.

Tighten all bolts, make final adjustments and lubricate.

OPERATION

IMPORTANT

Never let a log stand still while saw is revolving in cut—or saw will burn and may be seriously damaged. If you cannot continue to feed forward, then gig back. Keep your eye on the saw. If it shows signs of slowing down, either reduce the rate of feed or gig the log back. But keep the log moving, one way or the other. To feed the log faster than the saw can take it is to invite trouble and expense.

Care must be observed in operation at first, until belts are well broken in. Before using the feed for sawing, run carriage back and forth several times—and keep your hand on control lever. When belts have been run in, this feed gives smooth feed forward at desired speed within capacity by slipping belt action.

You control rate of forward travel of the carriage by the pressure you exert on control lever.

Be sure neutral spring brings swing arm into positive neutral position with both idler pulleys out of action.

SAFETY FIRST

There is always danger of saw hurling sliver or a bit of bark forward with bullet-like force and many sawyers have thus lost an eye or suffered other injury. This may easily be guarded against, as follows: From an incline post suspend a square of hardware cloth—or even fly screen—in front of saw just high enough to clear top of saw log. This will stop small objects and break the force of the larger ones.

SAWMILL POWER REQUIREMENTS

AMOUNT: Sawmill power consumption can not be given by manufacturer, because of several factors:

A—Cut depth and feed speed: Very thick cuts can be taken with very light power—if log is fed slowly enough; very fast feed may be used with very light power—if cut is thin enough. Thick cut fed fast requires tremendous amount of power.

Cut increased 100% increases power load 125%.

Feed 100% faster increases power load 225%.

B—Wood Species: Hardwoods such as oak take 250% more power than soft woods such as white pine.

C—Saw Condition: Insufficient clearance of back of teeth increases power load tremendously; insufficient hook, insufficient set, and incorrect lead also appreciably increase power load.

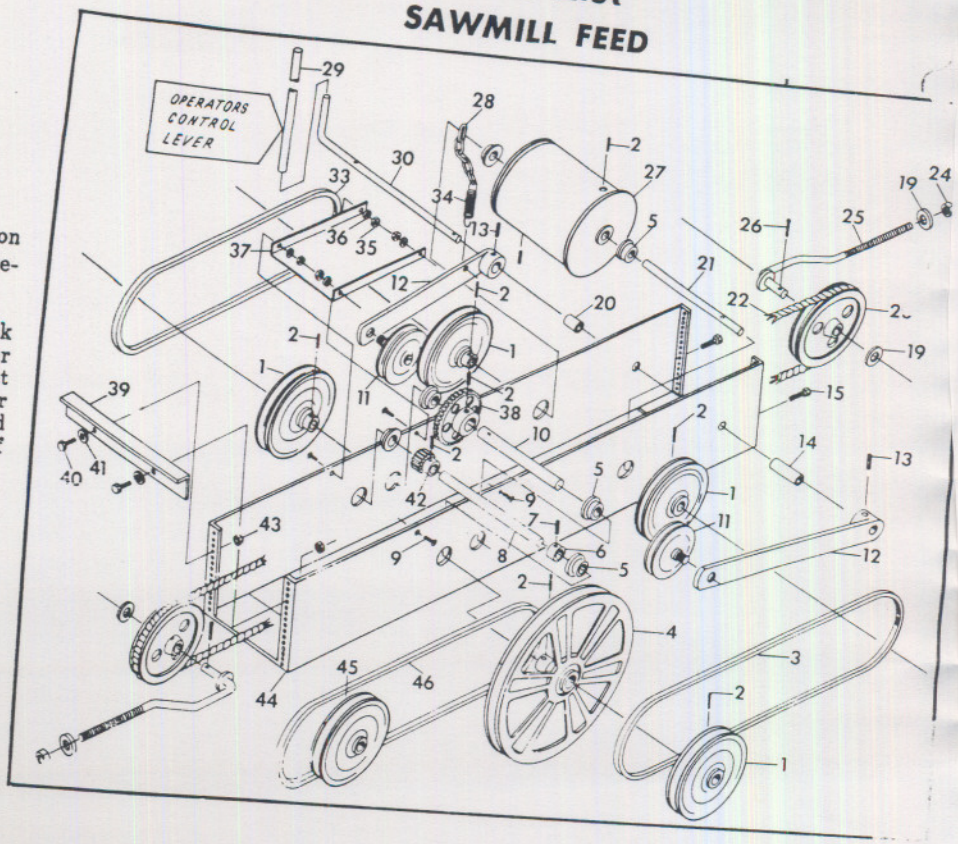
SPEED: Motor must be run at correct speed—which must be constant under load; governor is therefore required for all forms of power except electric. Pulley at motor must be large enough diameter and face to transmit sufficient power; pulley at arbor must be correct size to run saw at speed for which it is tensioned, with drive pulley correct speed.

Note: Use of speed indicator not advised—unless reading is taken when saw is making maximum cut so belt slippage and motor slow-down will figure. The only dependable guide is saw behavior.

HOOK-UP: Power must be belt connected only, never direct connected; belt serves same purpose as wood pitman on mowing machine.

Most efficient belt speed (drive pulley perimeter times r.p.m.) is 4,000 to 4,500 feet per min. Most tractors use 2,600. An 8" pulley at 1,500 gives a speed of 3,150; a 12" gives 4,700. with 6" belting an 8" pulley can transmit only up to 25 h.p.; a 12" pulley can transmit up to 35 h.p. with 6" belting, and up to 50 h.p. with belting 8" wide.

Parts List
SAWMILL FEED



Key No.	Part No.	Description
1	F-312	V-Pulley (8" x 1" bore) B-Sec.
2	*Z-132	Rollpin (¼-1½)
3	F-322	V-Belt #3670
4	F-313	V-Pulley (15" x 1" bore) A-Sec.
5	F-320	Bearing, flange
6	F-303	Lock Collar
7	*Z-95	Set Screw, Soc. Hd. (¼-20-¼)
8	F-307	Input Shaft
9	*Z-128	Bolt, Stove (¼-20-⅝)
10	F-308	Intermediate Shaft
11	F-319	Idler Sheave
12	F-304	Tightener Arm
13	*Z-131	Set Screw Soc. Hd. (⅜-16-⅜)
14	F-315	Spacer (¾ x 2½)
15	*Z-134	Screw, Lag (⅜-2)
16	None	
17	None	
18	None	
19	*Z-108	Washer, Std. (⅝")
20	F-306	Spacer (¾" x 1")
21	F-311	Output Shaft
22	U-16	Cable, (¼" x 66')
23	U-12	Cable Sheave
24	*Z-136	Nut, Hex (⅝-11)
25	U-13	Cable Sheave Arm
26	*Z-135	Cotter Pin ($\frac{3}{16}$")
27	F-310	Drum
28	F-325	Safety Chain (12")
29	F-305	Control Extension Pipe
30	F-309	Control Lever
31	None	
32	None	
33	F-323	V-Belt, #3610
34	F-326	Neutral Spring
35	*Z-129	Nut, Sq. (¼-20)
36	*Z-130	Washer, Lock (¼")
37	F-306	Guard
38	F-318	Gear (12P-60T)
39	F-328	Cross Angle
40	*Z-133	Bolt, (⅜-16-1½)
41	*Z-99	Washer, Plain (⅜")
42	F-317	Gear (12P-20T)
43	*Z-97	Nut, Hex (⅜-16)
44	F-301	Housing
45	F-329	V-Pulley (3¼" x 1¾" bore) A-Sec.
46	F-321	V-Belt, #2600

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HOW TO SAW TYPICAL LOGS

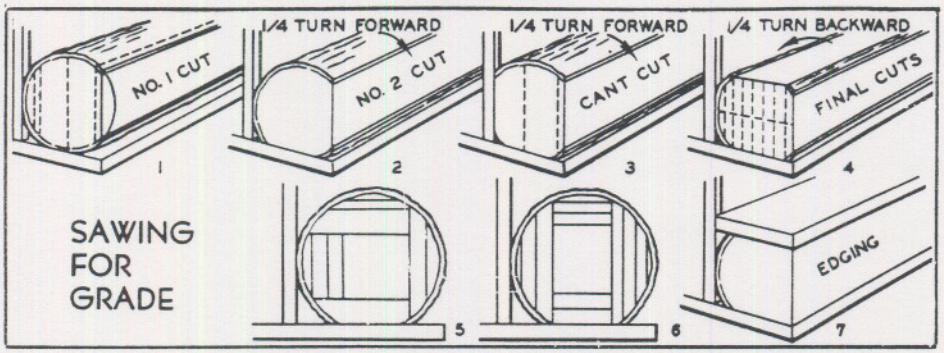
Hardwoods and large soft wood logs are turned on the carriage frequently in order to get all possible better-grade lumber from them. Best grades (clearest boards) are found immediately inside the bark. Thus when a slab is cut off, the sawyer can get a good idea as to whether he can saw additional boards from the same side of the log, or turn it to another side before going into the center.

Small and knotty pine, spruce and hemlock logs, may be sawed through and through into common grade boards or into cross tie, plank and timber.

Cut across the large knots rather than with their grain, because a round knot is not as bad as a spike knot. A knot along the edge of a board, in all lumber, reduces the grade much more than one located well inside the edges of the board.

LOG LOADING: Recede headblocks full back, lift top dogs full height or remove, position carriage to center log. Use cant hooks to roll logs, follow with block to prevent roll back. Roll log gently on the carriage. Repeated shocks of even a light log dropping on the carriage can soon cause damage. No more labor or time is required for easy handling than for rough handling; care in handling logs will add long life to the mill.

SAWING LOGS WITHIN CAPACITY OF HEADBLOCKS AND SAW



Inspect saw blade before sawing . . . keep it sharp and with sufficient clearance so saw body will not rub. Touch up teeth every few hundred feet of sawing. Many perplexing sawing problems are solved by conditioning the saw. Position log for first cut, projecting slightly over front of carriage. Advance headblock against it and block out with chip where small end stands away. Do not use set gear for positioning log not resting on smooth sawed surface.

Set top dogs lightly. If log is not steady chuck chip under it instead of drawing dogs too tight. Excessive dog pressure causes unnecessary load on setworks and interferes with its proper operation.

Fig. 1—Feed log to saw and make first cut, then gig back to leave plenty of space between end of log and saw.

Fig. 2—Turn log to rest on sawed surface left by first cuts, blocking small end out as for first cut. Take off enough this time (slab and boards), to give sufficient squared seating for next position cuts.

Fig. 3—Turn log another quarter turn. Slab off. At this point the sawyer can follow either of three programs to saw the log;

a) Saw the log "through and through" in boards of various thickness ending up with a 2" last cut, boards to be edged.

b) Saw the logs into cants to produce pre-edged boards. If the boards are to be narrow enough for two or more cants in squared log width, mark cants centered on log as shown. This may call for additional first and third position cuts which should be made in lumber thickness. These boards will require edging.

c) Saw for grade turning the log as shown in Fig. 5 and Fig. 6, using care in positioning of knots. These boards will require edging.

Fig. 4—Turn log or cants back a quarter and saw into pre-edged finished boards of the desired dimensions. Sawing "through and through" to get inch boards often produces common grades.

Fig. 5 and 6—Show logs turned to avoid defects and produce thick boards and plank of high grade. The heart produces timbers such as tie and bridge timbers. Boards require edging.

Fig. 7—Boards will require edging, shows how to edge boards without making separate cut, by dogging on top of squared log while making routine cut.

SAWING LARGE LOGS WITH SMALL SAW

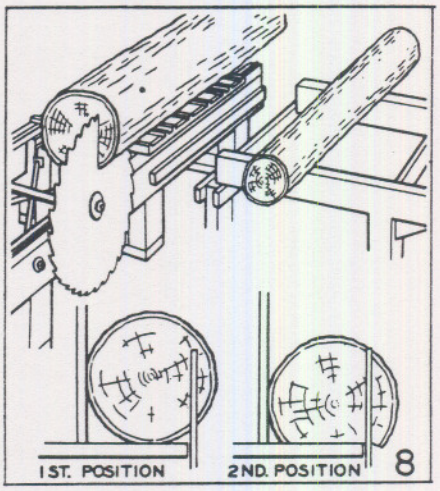


Illustration shows how to handle log oversize to mill and saw. It is inadvisable to have saw larger than required for average size log. Large saw is expensive, takes extra time to keep in condition besides being unnecessary.

Saw consumes power in direct proportion to sawing diameter. By using small saw to undercut large log as shown in Figure 8, operator may save up to half the horsepower required for saw large enough to clear same log.

Position log on carriage as described previously, chuck it steady with chips instead of using top dogs. Since saw will be buried in log, use care in feeding to prevent saw losing speed and jamming in cut. When slot is completed, gig log back and remove slab with axe or wedge. If cant hook or crow bar is used the log should be removed from carriage to prevent damage. Chop the face smooth.

Note that after first slab is removed and log is turned on the sawed surface, the saw stroke is much reduced. This shows why a large saw is not necessary; it would be needed for only one cut even on a large log.

Very large logs may be "gunbarreled", turned ⅛ or ¼ turn each cut, to bring within capacity of saw.

When large logs are to be sawed, make proper provision for handling and use extra care. Due to tneir extreme weight, they are apt to disturb alignments and adjustments, and may easily damage the mill. When proper provisions are made and proper care used, the BEL-SAW will last, performing satisfactorily under overload.

Large cants are often too heavy to be cut off and carried back to the log deck for sawing into boards. As the saw comes to the end of the log, it cuts through the bottom first . . . stop the carriage at this point. This will leave an uncut triangle about 6"x6"x6", which is used to pull the cant back across table saw guard to the log dock by gig back of carriage. Break or chop cant off.

SIMPLE PROVISIONS FOR SAFETY AND EFFICIENCY

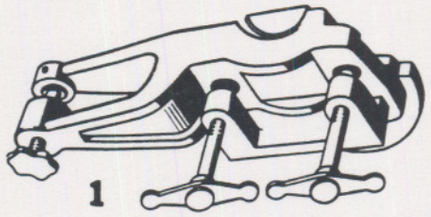
LOG DECK: Required to bring logs level with carriage for safe, easy loading. Make it sturdy. Type shown in Fig. 3 includes access gate hinged 30" back from base. Support access gate at hinge and saw with beams so it does not sag under load. Do NOT attach any part of the log deck to the sawmill base.

LOG TURNERS: Essential to prevent damage to carriage rollers by taking shock of log falling on its sawed face. They transfer the shock to log deck where they are attached. Without turners the slabbed log must be worked far enough back to prevent rolling off the carriage when turned, then it drops heavily. With the turners, you simply turn the log against them, they take the shock, you slide the log back into position with the help of wedge design shown. Design combines log stop, an important safeguard.

Cut ends of skid poles 2" out from the carriage and flatten 2" below bed for turner block seat, flatten at tail side for hinges. See Fig. 3 for dimensions.

CHIP SCREEN: ¼" mesh hardware cloth hung midway between the saw and feed lever protects the sawyer from flying slivers and chips.

SAFETY SAW GUIDE. New type steel saw guide permits accurate adjustments without wrenches. To move the guide IN loosen right hand screw at the same time tightening the left. To move guide OUT loosen left and tighten right screw. To remove tne guide when changing saw, simply loosen both screws, slide guide back and lift off. When replacing, tighten the control screws to bring the guide to its proper setting. Leave thickness of a piece of paper clearance between wood guide pegs and saw. Before sawing, be sure BOTH screws are tight.



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2M-2—Saw Guide,
shipping wt. 10 lbs. $13.95

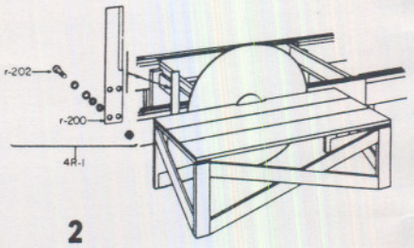
4S-1—Saw Guide, same design as illustrated, much heavier, for big saw blades. Shipping wt. 25½lbs. ... $23.25

BOARD SPLITTER: Wedges the board away from the back of the saw and provides extra clearance for body of the saw. Overall length 24" long, 4" wide, ⅜" thick, milled knife edge 15" down from top. Complete with attachment bolts and face plates. See Fig. 2, 4R-1.

Install onto wood beams 2" beyond saw, not over ⅔ the saw height above mandrel. Using splitter as template bore holes and bolt securely in place. Position inside of splitter in line with inside face of saw. Fasten nuts tightly.

4R-1—Board Splitter,
shipping wt. 12 lbs. $14.35

SAW GUARD: Table type saw guard, Fig. 2, is popular in two man and crew operation. Make it long enough to cover guide and board splitter and from 18" to 24" wide. Allow clearance between saw and table of about ½".

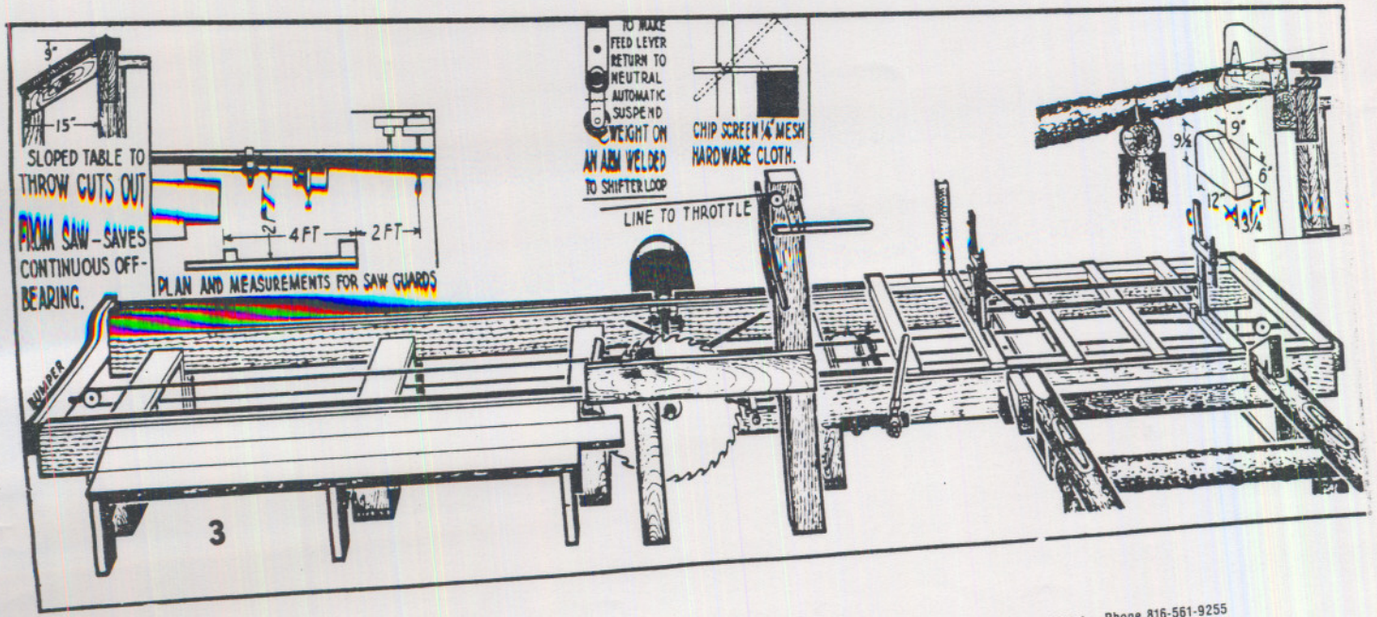


2

Fig. 3 shows saw guard, combined with sloping offbearing table—best design for one-man operation. Saw is always easy to get to, saw guide easy to adjust. Fence prevents accidental contact with saw, heavy post is convenient for attaching chip screen and lever with line to motor.

The board projecting past saw from sloping outfall bench should allow slab scraps to fall clear.

Note suggestion in Fig. 3 for assuring neutral position of feed lever.



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Circular Saw Principles—Operation—Maintenance

To qualify as a sawyer, you must know the principles governing saw behavior, so you can find the cause of inefficiency or of the troubles that commonly occur, and be prepared to apply the proper remedy.

SAW TENSION is the expansion of the metal between the collar and the rim of a saw. Revolving at high speed, the circular saw has a tendency to stretch on the rim. To overcome this rim expansion, the saw is loosened in the center by hammering. The faster the saw runs the more the rim expands and the looser the center must be made.

Tension is put into the saw at the factory by hammering it on an anvil. Of all the skills required of sawmakers and saw repair men, tensioning is the hardest to learn. A skilled smith who tensions large mill saws has served an apprenticeship of five years. It is obvious that the beginner should not attempt to rehammer a circular mill saw, but should have that work done when necessary only by a qualified saw repair expert.

SAW SPEED is governed by the power available. The saw should be run uniformly IN THE LOG at the speed for which it is hammered.

When uncertain of the proper operating speed for a particular mill saw, you can usually determine it by the following experiment. With the saw running idle (out of the log) speed up motor gradually until you find the top speed at which the saw is running straight. This top speed at which the saw is running straight when out of the log, should be maintained when the saw is in the cut. No saw can cut efficiently unless it is straight on the log side when turning at its cutting speed.

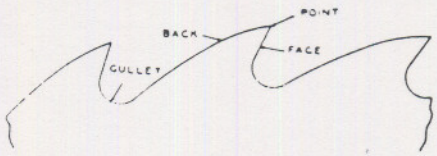
SAW FILING

While tension hammering is a craft that must be learned over a long period of practice, every sawyer can do an expert job of filing and setting the cutting points of his blade with only reasonable care and proper tools.

Keep your saw round, sharp, and uniformly set. Frequent sharpening of saws not only keeps production up, but is economical. For example, when a saw has been run dull for some time, the filer has to remove considerable more metal to bring it back in service than if it were sharpened oftener. The most efficient sawyers give their teeth a touch-up sharpening twice in the morning and twice in the afternoon of each full day's sawing.

SOLID TOOTH SAWS

There are four important operations in sharpening solid tooth mill-saws: rounding, gumming, setting or swaging, and filing.



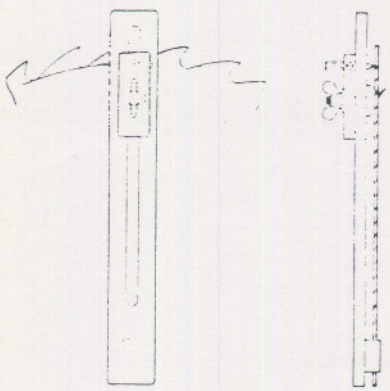
All saw teeth have the same parts names as shown above.

ROUNDING: For the saw to give maximum production every tooth must do its part and that means that the saw must be perfectly round. The best method of rounding or "jointing" a circular saw is by using a machine such as the Belsaw Sharp-All. When such a machine is not available it is necessary to joint the teeth by hand. This can be done by clamping an emery stone to the saw carriage or saw guide in position to press lightly against the points of the teeth while the saw is revolving. Any "high" teeth must be jointed down until they are in the same cutting circle with the "low" teeth.

GUMMING: Before starting to use your new saw, clamp a piece of sheet metal beside three or four teeth and mark their outline on it exactly with a sharp pointed scriber. Cut out to give the exact size and shape of the teeth and keep as a guide for gumming.

A saw does not need to be gummed every time it is sharpended but only when repeated filing has made the teeth gullets too shallow to properly remove sawdust. This is usually necessary whenever jointing or filing has lessened the original tooth length by more than one fourth. Gumming by hand is a very slow and tedious operation. It is much easier accomplished with a machine such as the Belsaw Sharp-All.

If you are forced to gum the saw with a hand file, first make a simple wooden compass as shown in the sketch here.



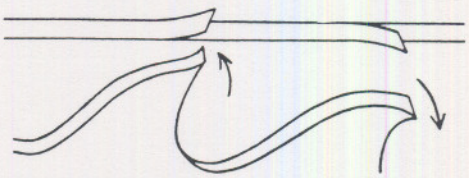
Use your sheet metal tooth outline to determine the proper gullet depth. Then fit a blue pencil into your wooden compass and draw a circle at this proper depth for gullets of all teeth.

Use only files with round edges for gumming. Be sure to avoid any sharp edges or nicks anywhere along the tooth. Shape the gullets exactly as your sheet metal guide and be sure to file straight across.

SETTING TEETH: The cutting points of all circular saw teeth must be wider than the body of the saw to avoid binding, rubbing and burning. This side clearance is given the teeth by either "setting" or "swaging."

IMPORTANT

If you do not have proper tools for setting or swaging your teeth, obtain them before ever starting to use your saw. The points of teeth in large circular rip saws are the only portion of the saw which should come in contact with the wood. THEY MUST BE KEPT SHARP and they must be set by springing or spread by swaging.



SETTING is bending the teeth alternately, right and left, to provide clearance. Uniform even set is essential for an easy running, smooth cutting saw. Unevenly set teeth place a greater strain on some teeth than on others, and may cause them to crack. Too much set not only places an unnecessary strain on the rim of the saw, resulting in cracked gullets or broken teeth, but will also cause the saw to chatter or vibrate, resulting in a rough cut. Not enough set will cause the saw to bind or jam in the cut.

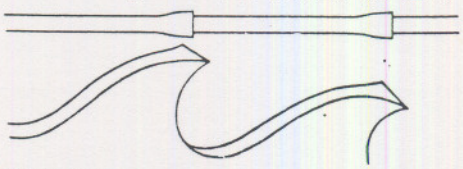
The spring set saw is generally preferred for cutting softwood with a light power unit, because it requires only about half the power of a swage set saw with the same number of teeth. However, a spring set saw does not stand up as well as the swage type in hardwood or with fast power feed.

Saw setting is easily and quickly accomplished with the saw-set attachment on the Belsaw Circular Saw Shop.

Setting may also be accomplished by careful use of the inexpensive Buller Saw Set.

In general, mill saws should be set 1/32-in. to 1/16-in. on each side. The set should not extend down over ⅓ the length of the tooth.

A spring set saw cannot cut smooth and true unless the set is uniform on every tooth and equal on both sides of the saw.



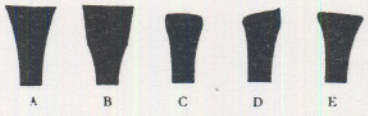
SWAGING is spreading the point of every tooth for clearance. Swaging is done with a "lever swage," "circular saw shaper," or the simple Belsaw "upset swage."

In either setting or swaging it is wise to keep the amount of side clearance that was put into your saw by the factory. A somewhat wider cutting point should be used in softwood logs, than in hardwood and frozen timber. Many experienced sawyers spread the teeth ap-

proximately 1/16-in. on each side for softwood and slightly less for hard or frozen timber.

Before swaging, the point must be brought to proper shape, either with a machine such as the Belsaw Circular Saw Shop or with a file. The point must be square and sharp. The teeth should be slim enough to swage out easily but not so thin as to turn over or bend back. A well prepared tooth is altered very little by swaging.

When using the upset swage, strike it lightly with a hammer weighing not more than ¾ lb.



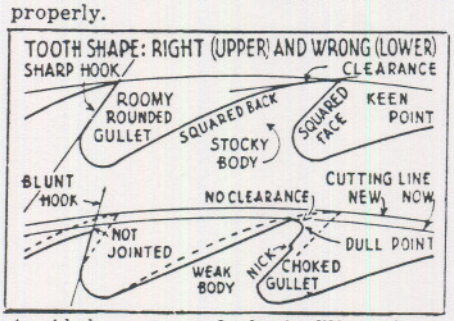
Proper (A and B) and Improper (C, D, and E) Shape of Bits

Watch the corners of the swage or set. They may be fairly sharp to the touch, but on close examination you may find slight roundness on the corners. This will make the saw feed hard and it cannot cut properly.

Full instructions for the use of the Belsaw Upset Swage are packed with each tool.

FINISH FILING: The amateur's test as a sawyer, comes after his first thousand or so feet of sawing—when the saw begins to get dull. Many who start out in high confidence, meet discouragement at this point. Running into trouble, they look everywhere but the right place for its cause, and get into deeper trouble.

The cause of most trouble is neglect to sharpen the saw, or failure to file it properly.

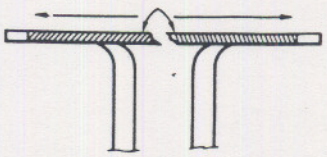


Avoid the common faults in filing, shown here. The upper teeth in this sketch have been correctly filed, while the lower teeth show the errors in filing that cause trouble. The lower tooth at left has been filed below the cutting circle and the hook so blunted as to cause the saw to feed hard.

The lower tooth at right shows how filing has left a dull point and a nick in the gullet. This nick bunches the sawdust, causing it to crowd between saw and log.

BACK CLEARANCE: Always be sure to file as shown in the upper teeth so that points are high enough to provide back clearance . . . remember that **ONLY** the sharpened points can do the cutting so the point must enter the cut first. After saw is jointed to true round, it is necessary to file backs of teeth to slope down from the cutting point.

FILE WITH THE SET

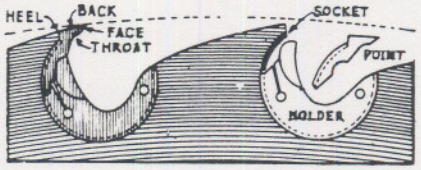


On spring set saws, file every other tooth on one side all around the saw with the set. Then file every other tooth on the opposite side, again with the set. Be careful to maintain the original hook, shape, and angle of the tooth. Do all filing straight across.

On swage saws, file straight across the under side (face) of the tooth, then file the back only enough to give clearance. Be careful not to alter the original hook of the tooth and also avoid round corners. Guard against too thin an edge.

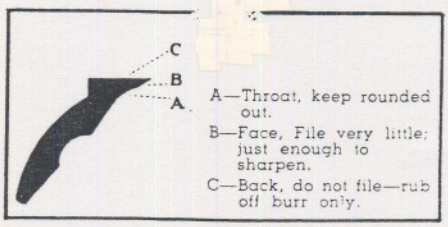
An 8" Mill Bastard file with two round edges is best for all mill saw filing.

INSERTED TOOTH SAWS



All inserted tooth saws are fitted with removable swage bits. These saws require less maintenance than solid tooth saws, because it is never necessary to gum the inserted tooth gullets.

Frequent light filing of the face of the bits to keep the cutting edges square across and the corners sharp will minimize the necessity of swaging. Use an 8" Mill Bastard file with two round edges and file only as indicated in the picture below.



After each filing, carefully inspect the cutting edge to make sure that all are uniformly straight across and swaged enough to give side clearance. When swage is narrowed or corners rounded enough to require reswaging, follow same procedure as for a solid swage saw.

INSERTING AND REMOVING BITS AND HOLDERS: Bits should not be used after the cutting point has been worn back to an extent that will not allow sufficient swage and rounded throat. Some sawyers feel it more economical to discard bits as soon as they are worn enough to require swaging. The average sawing life of inserted points might be figured at about 1,000 ft.

When replacing teeth, always use the Wrench to remove holder from socket. Never hammer the Wrench or bit but place a blunt cold chisel on the heel of the holder, taking care that it does not touch the saw plate, and tamp lightly with a hammer.

Carefully clean and oil the groove and socket. Dip groove of new tooth into oil and place into position on the holder. Hold the new bit evenly with the side of the blade and at the same time, press the wrench downward until the tooth is tight against shoulder of the saw.

Make sure that tooth and holder are in line and that the groove of the holder is properly seated on the apex of the saw socket.

Be sure to keep good tight full throated holders in your saw at all times. Never run saw with loose holders. Replace holders when worn too thin to fit tightly.

SAWING FROZEN LUMBER

During winter sawing, the frost should always be taken out of the saw before it is ever put into a cut. This is easily done by holding a piece of board firmly against the saw and allowing the friction to warm it.

Frozen timber cuts much cleaner, requiring less set or swage. File the teeth perfectly square across, keep good sharp corners, and use as little lead as the saw requires to cut straight.

REHAMMERING

Damage sufficient to change the tension of the saw can be avoided with normal care. Always be sure to keep the log moving—never let the log stand still while saw is revolving in the cut. If saw starts to lead in or out excessively, immediately back log away and determine the trouble. When saw strikes metal or other foreign object, gig back as quickly as possible and remove the obstacle before continuing the cut.

The frequency at which the saw may require tensioning will of course vary with the amount and variety of sawing. Some experienced operators consider it a good practice to have their saws hammered once each year, usually at the beginning of the winter sawing.

The need for rehammering a saw can only be determined after checking all the other factors that could be causing trouble. If, after checking all adjustments on the mill, and making sure that teeth are properly shaped and sharp, a saw that has begun to run snaky and turn out uneven lumber may be in need of retensioning.

COMMON SAW TROUBLES—CAUSES—REMEDIES

If a saw heats it is an indication that something is wrong and should be corrected.

When a saw heats on the RIM the trouble is usually due to: 1. Too much lead into the log. 2. Saw running too fast for tension—too stiff in body for the speed.

3. Cutting points not set or swaged to give proper clearance. 4. Teeth not kept properly sharp.

When the saw heats at the CENTER,

it is usually due to: 1. Mandrel getting too warm—the bearings need attention or belt tension is excessive. 2. Saw does not have enough lead into the log. 3. Saw run too slow for tension—too loose in the body for the speed. 4. Saw has been sprung and needs hammering.

The most common cause of saw trouble is failure to maintain constant correct speed. Pulleys must be in the correct ratio so that the blade will operate at its hammered speed. There must be sufficient power and efficient transmission to get the power thru to the saw.

When a saw behaves well in light cuts but loses speed in heavy cuts, it means that there is not enough power getting to the saw. Check transmisison first as efficiency can often be increased by using a gravity type belt tightner to press on slack side of the belt near the smaller pulley. Always use largest possible pulleys and a high quality rubber belt.

Never keep belt so taught as to spring the mandrel and throw saw out of lead. Remember that if your saw has been cutting satisfactorily and then starts to give trouble, it may be entirely due to dull teeth.

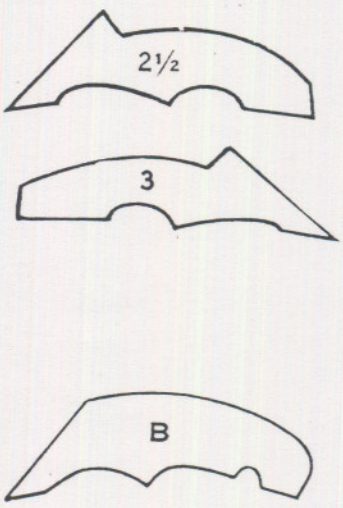
Saw Teeth and Holders

When ordering Teeth and Holders for inserted tooth saws, please give number of boxes (100 teeth in box) wanted, and also give pattern (size and style—gauge and kerf). We can supply almost all styles of teeth and holders on special order. If you are not sure of size and gauge, send sample tooth or holder with order.

Following are the stock sizes of teeth which we can ship immediately upon order. Illustrations are **actual size.**

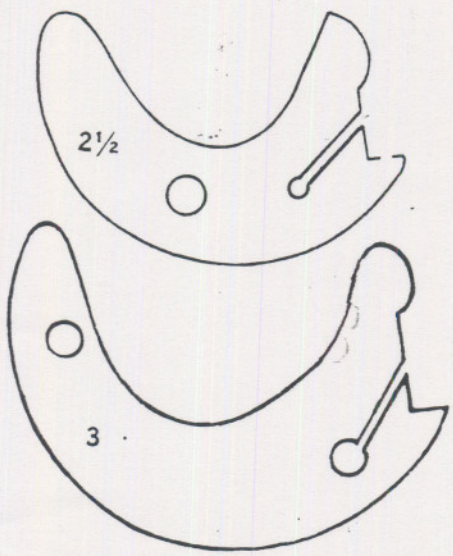
IP TEETH:
2½ — 10 gauge, 1/4-inch kerf
3 — 8/9 gauge, 9/32-inch kerf

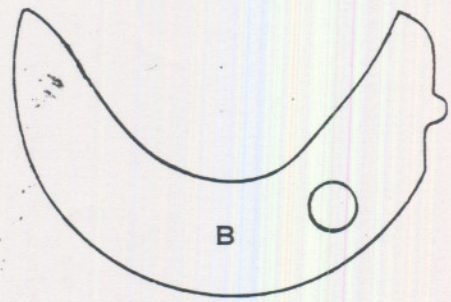
B — 8/9 gauge, 9/32-inch kerf

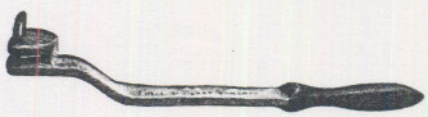


HOLDERS—Replace broken or worn holders with new holders to assure proper fit of teeth and maintain hammered tension of saw. Made of spring steel, precision milled to fit the saw and bit perfectly. Please specify pattern and gauge when ordering.

HOLDERS:
2½—10 gauge;
3 — 8 gauge; 3—9 gauge;
B — 8 gauge; B—9 gauge;







INSERTING WRENCH for IP Teeth
Specify pattern size and style

No. 236
HAND SWAGE

UPSET SWAGE is used for spreading the cutting edges of swaged-tooth saws. Made of highest quality steel with two hardened jaws, or dies. No. 1 convex die spreads and shapes the tooth point. The No. 2 flat die squares the spread edge and finishes shaping the tooth. Each swage comes with complete, easy to follow directions requiring only an ordinary hammer. Since BELSAW is the largest seller of these tools, we are able to offer you our own brand standard #1 Size at little more than one-half the regular list price.

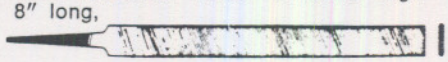
No. 236 HAND SWAGE, No. 1 Size for 6 to 10-gauge circular saws. Wt. 2 lbs..

No. 242 HAND SWAGE, No. 4 Size for saw 11-gauge and lighter, wt. 1 lb

SIMONDS QUALITY FILES

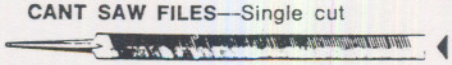
Our files are famous for quality the world over. Scientifically heat-treated for maximum hardness and edge holding . . . individually checked for cutting efficiency and uniformity. Performance and satisfaction guaranteed

MILL BASTARD FILES—2 Round Edge
8" long,



(For Mill Saws)

CANT SAW FILES—Single cut



6" long, For Smallest Circular Saws
8" long, For 24 in. and Larger Saws

BELSAW MACHINERY Co., 3 Vestport Rd., Box 593, Kansas City, Mo. 64141 Phone 816-561-9255 Cable "BELMACH"