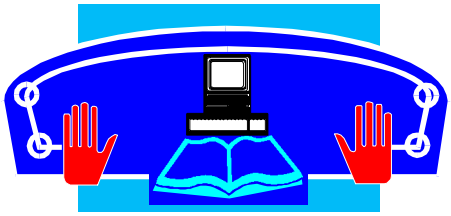


Arctic Development
Library

Production Handbook; Forest Industries
Date of Report: 0
Author: Forest Industries
Catalogue Number: 4-9-10

COMBINING Timberman Lumberman
forest industries

PRODUCTION HANDBOOK

Compiled and Published by

forest industries

portland • seattle • san francisco • los angeles • chicago
new york • cleveland • atlanta • vancouver, b. c. • london, england

CIRCULATION DEPARTMENT . 500 Howard street, San Francisco 5, California

mf A MILLER FREEMAN PUBLICATION

Mill site is in **hollow, adjoining stream,** providing an excellent 8-acre mill pond **location.** Sorting chain is at right, planer in center foreground, main mill in center, background, chip loading **and** barker at extreme **left** and lumber storage **and** railroad trackage **at** right.

Production Shortcuts and efficient material flow allow output of *65,000* board feet of surface dimension daily with *4* men on mill floor.

Clear Lumber Co. sawmill features . . .

Riderless carriage.

No tailsawyer on headrig.

Man directing flow of cant from headrig to: edger, refuse chain, resaw or deck.

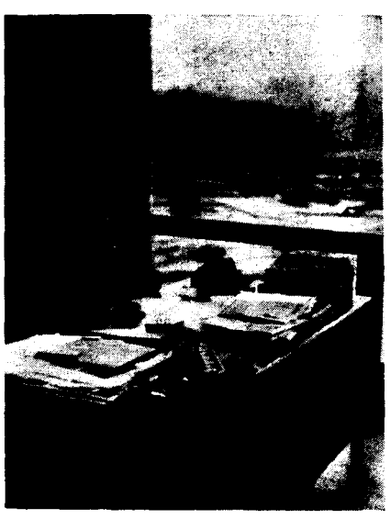
Electric-controlled hydraulic stub edger with ganged saws on one side for 2x4 production and selective saws on other.

Electric-controlled linebar on resaw.

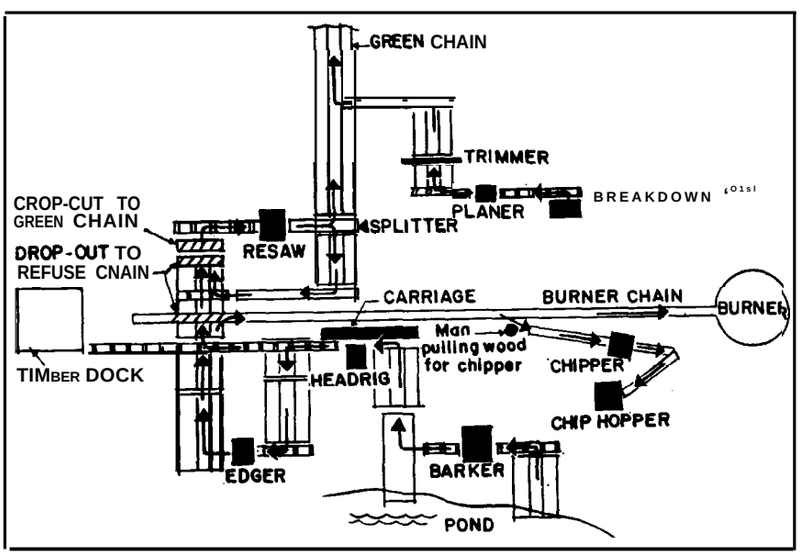
Resawyer-operated splitter on offbear end of resow to direct resawn pieces to proper destination.

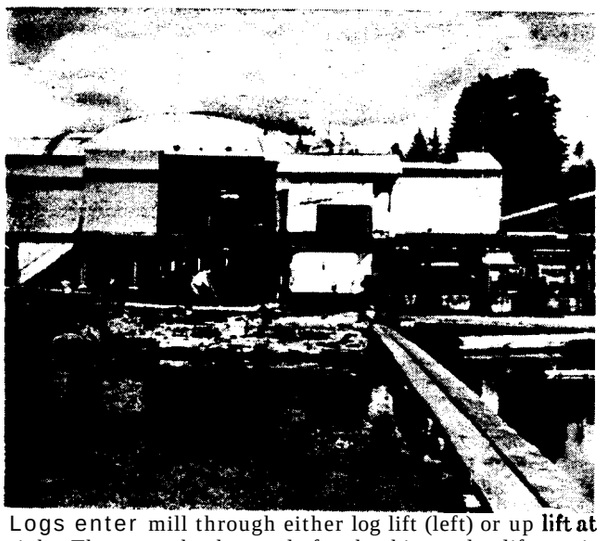
Trimsaws operated by grader-trimmerman with floor switches.

Both rough sorting and surfaced sorting performed on same green chain.

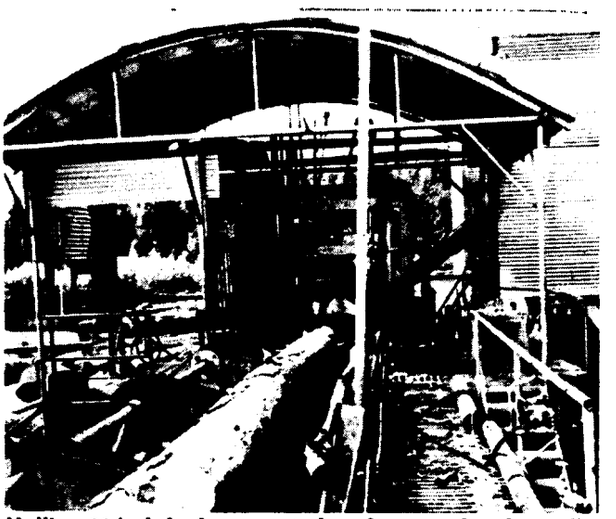


Owner James E. Stock has office overlooking entire operation.





Logs enter mill through either log lift (left) or up lift at right. They go to barker and after harking to log lift serving mill deck.



Mullis 36-inch barker accepts logs from pond and can discharge either to lift serving log deck or back into pond. Barkerman bucks logs to length at this station.

Low cost production in these days of rising costs is the goal of nearly every sawmill operation. Clear Lumber Co., Sweet Home, Ore., has accomplished this goal with hut four men on the mill floor and only a doaen men in the entire production end cutting 65,000 board feet in one daily shift.

Much of the mill's equipment and labor-saving devices were company-designed and huilt to provide the low-cost production.

A deck saw is mounted at the one-man barker operation, enabling the barkerman to buck logs to length. The mill's maximum log length is 16 feet. The dual-purpose barker usually feeds harked logs directly onto the log lift serving the live mill deck, hut barked logs can also be fed back into the pond for storage.

The lineup on the mill floor is:

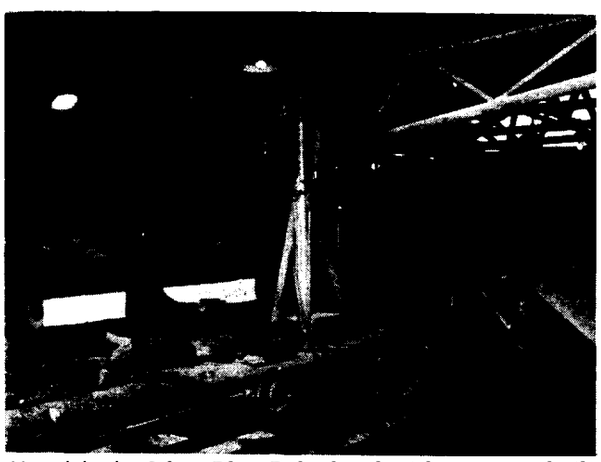
1. sawyer
2. hutton pusher who directs cants
3. edgerman
4. resawyer

After sawing (the hcadrig cants for the edger and resaw) cants offbear down the main rollcase with a "hutton pusher". stationed on a catwalk above the operation. He directs the flow of cants and is also available to straighten any difficulty at the offbear side of the headrig. There is no offbearer.

He controls a tilting table which takes cants from the rollcase t.o the edger transfer table. He can also direct slabs on across to the refuse conveyor, or timbers directly down the main rollcase to the timber dock.

In addition, he can direct cants to the reeaw.

An ingenious splitter-kicker at the end of the resaw's offbear belt is the key to the automation of the resaw. This air-operated wedge is controlled by the resawyer and will swing both ways or maintain a center position which will split a resawn piece so that half will go to the green chain and the other half will be directed back to the resaw by way of a merry-go-round. When kicked one way it will drop both pieces to the green chain — che other way, to the resaw merry-go-round.



Headrig is 6-foot Blue Babe band with company-built %block carriage with electric controlled hydraulic setworks. Carriage frame of 8-inch wekfed steel pipe is air reservoir Lines are carried on pantograph arm.

Sawyer controls setworks by buttons on company-built control console. Carriage feed is controlled by foot-operated floor buttons to free sawyer's hands for setworks. Deck is equipped with air loader.

Cants offbear from headrig down roll caae at left of catwalk. Man on walk can transfer them to edger, refuse chain or resaw. Here, tilting transfer picks up edger cant from roll case. Flipper in trough turns them as necessary.

H g

Rough-sorting is done on the green chain and then stacks are delivered to the planer by lift truck. Ml stock is surfaced.

Campany-built trimmer at the offbear side of the planer has floor mounted trim saw control buttons. The comparatively small number of standard lengths makes this possible. There are seven saws on the trimmer.

The surfaced lumber of fbears back onto the green chain, past a grade stamper, for sorting on the far end of the green chain.

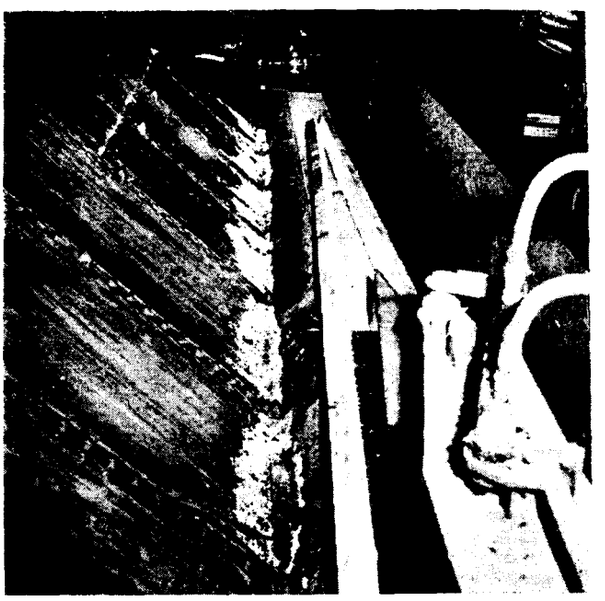
Clear Lumber Co. is located at the lower end of the heavily-timbered North Santiam canyon which produces LL good share of Oregon's logs. Tbc company does most of its own logging and is equipped with a full Iinc of tractors, loaders and logging trucks.

Both salvage and thinning sales are on the increase r-m the federal Iand up the canyon and the mill's location provides a favorable bidding base for these sales.

The mill is equipped to handle fairly large timber — a necessity in such a market — although a good deal of production is from comparatively small logs. Camp run logs are sawn down to 6 inches diameter.

The firm saws about 60% Douglas fir and about 40$'& hemlock. Nearly all of this material is obtained from

Wedge-shaped splitter divides resaw stock on offbear of resaw. Stock offbears on belt. Splitter here kicks acceptable piece clown drop to green chain under floor at left while other segment goes up to merry-go-round.



Merry-go-round transfer takes pieces for further resawing at left. .4ccept stock goes down at right to green chain. Splitter is air-operated. It is controlled by resawyer who can also direct both pieces to green chain.

Resaw is Blue Babe 6-foot vertical band. Operator has a drop-out to green chain and another to refuse chain, both ahead of reaaw. Skate wheels *are* mounted on drop-outs. Resaw haa merry-go-round for return for further resawing.

Resaw compan ectri controlled nebar
Operat sets al at set cu
esi erhead chain-cou ed
ng

the higher elevations, providing a fine-grained product.

Production is in popular sizes, loading random-length **as** it comes. They don't shoot for specialties. Lumber is shipped by both rail and truck, with all sales made on **the** open market.

Lumber production is all surfaced. It is **all** dimension, and **4x4** and **4x6** are the moat popular.

Chippable wood is pulled from the refuse. chain and chipped in a Norman 50 chipper, conveyed to a chip storage bin from where trucks are gravity-fried. **Chip sales are** made to Cascades Plywood Corp., Lebanon, Ore., for its **Lebanite** board.

Equipment

MULLIS 36 inch barker; BLUE BABE 6-foot band headrig with company-built ekotronic-controlhxf **hydraulic** setworks; company-built carriage; SPEE-D steam feed converted to air;. ALBANY IRON **WORKS** 8-inch edger with company-built zetworks; BLUE BABE 5-foot band resaw with company-built electronic-controlled linebar; **company-built** trimmer; **GARDNER-DENVER** air compressor driven by GE **75-hp** induotion motor; WOODS **404B** planer; CM&E NORMAN 60 chipper driven by **WESTINGHOUSE 125-hp** motor; two **GERLINGER** forklifts; two HYSTER lumber carriers; **MACK** lumber trucks; **GENERAL** MOTORS and **CHEVROLET** chip trucks; **PHELPS** 40-foot burner.

Planer is Woods 404B. It is served by breakdown hoist at left which delivers stock to feed rolls. Sorted stock from green chain is moved by Hyster fork lift to the breakdown hoist. The planer is housed in a wing adjacent to green chain.

G der mme ma gra eces passmg his sta-
feed H sets trim saws
foot fbears trans tabl
belt

Heedrig refuse conveyor. This Carrier unit takes all residue and sawdust from the main band rig. In the process of material transfer, sawdust and smaU pieces drop out into special conveyors and are segregated from chunks and pieces.

How and where

Vibrating, Conveyors

fit into mill use and how they work

By LUD KAESER, P. E. President
1. H. Kaeser Company
Portland, Oregon

The first large scrde installation of vibrating conveyors in the lumber industry was at Simpson Timber Co.'s Shelton, Wash., mill, completed over a year ago. Carrier vibrating conveyors are used there for nearly all refuse conveying; under the log deck, barker, band saw, gang saw, edgers, resaw, trimmers and cutoff saws.

The vibrating conveyors have a natural or resonant frequency. This means they use a minimum of horsepower; the motors are necessary only to overcome windage and friction losses. Once the machine is put in motion, the springs do the rest of the work.

Speed of most refuse travel is between 60 and 70 fpm. For larger pieces and chunks the speed is approximately 50 fpm. At one point on a sawdust refuse conveyor there is a 9?4" incline with no loss of speed.

Utilizing the natural frequency and flexible link between the drive and conveyor pan, conveyors up to 500 feet long can be handled with one drive. The limitation is the width available to attach the drive, not the length. The flexible link helps overcome inertia of large loads at start-up, without damage to bearings or shafts. The flexible link is designed to collapse at a given stress, which means the pan is given a series of. bumps to get it in motion. Longest conveyor at Simpson, however, is 95 feet. A more recent installation, at Weyerhaeuser Co., uses a 110'-long vibrating conveyor with one drive.

c1eerance space for vibrating conveyors is negligible since there is no clearance needed for return chain nor for head or tail pulleys. If more clearance is desirable it is easily provided. At Simpson, pieces of wood eight feet long are being turned 90" between two conveyors. Here a vertical clearance of approximately three feet between pans was desirable. As long pieces are conveyed over the end of one conveyor, beyond their center of gravity, they tip down to a lower conveyor and the vibrating motion carries them along.

There are many economies in using vibrating conveyors. Since there is no need for space for head pulleys, returns and takeups, the entire mill working area may be lowered by three or four feet, resulting in savings in construction. Constant flow of material, without jam-ups or spillage at transfer points and with reduced friction because there are no rubbing surfaces, requires less horsepower and lowers maintenance and downtime costs. At the Simpson mill, in operation since November, 1960, there is no indication of wear on the pans and no sign of abrasive action to the pans developed by movement of the refuse material.

Costwise, vibrating conveyors require a greater initial investment than do standard conveying systems. However, installation is simple. Pans are lined up and welded together. The bases are then bolted and grouted down. When all pieces have been welded, the conveyor is complete and ail that remains to be done is adjustment of a variable speed pulley on the motor to the proper speed for natural frequency.

Both balanced and balanced isolated vibrating conveyors are suitable for flakes, chips and other low density material of 10 lbs. per cu. ft., maximum. The gentle action of these conveyors will not damage fine flakes and may be placed overhead without racking the structure.

Balanced conveyors have a counterbalance weight equal to the pan and

Conveyor **system:** (1) takes material from headrig; (2) takes material from the deck saw; (3) beyond chutes, picks up material from the gang saw. Conveyors 2-3 empty into cross conveyor (4).

Conveyor (1) is the 95'-long conveyor taking end trims and sawdust from the trimmer chute (2) in the background. It empties into common conveyor taking edger material. Openings along **way'** are for cleanup of transfers.

load, with a separate spring system. This counterbalance operates 180" out-of-phase with the conveying pan and absorbs **90%** of the reaction.

Isolated balancing is placing the balanced conveyor on either air mounts or coil springs of known spring density that eliminates an additional 890 of the remaining reaction.

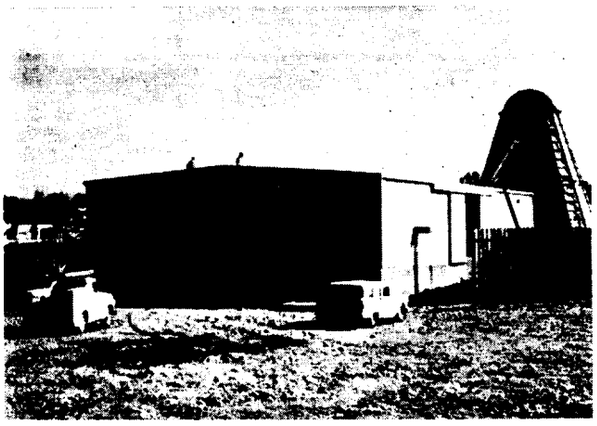
Balancing adds approximately 75% to the conveyor cost and isolation another 20%. There are, however, many instances where the added cost is well justified; protection of the material, situations where racking action would be an important maintenance factor, added flexibility to the flow arrangement and conveyor location. The balanced and isolated conveyors come in standard 10'-lengths with trough widths of 12", 24" and 30" and 8" deep. The stroke is 1" and frequency is 500-cpm with conveying speeds from 60 to 70-fpm.

Most standard vibrating conveyors come in 10' lengths with squared or flared sides, the latter from 4" to 18" high, depending upon carrying capacity needed. **For** instance, a unit 18" wide at the base and with 6" flared sides at 45*, is 30" wide at the top and has a 144 sq. in. cross sectional area. With 6" squared sides it would provide 108 sq. in. of cross sectional area.

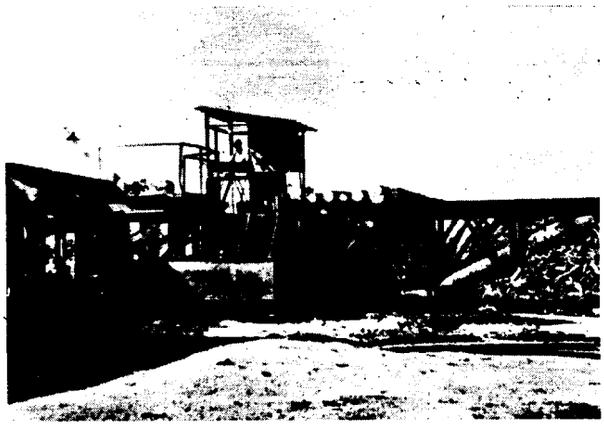
Experience with the vibrating conveyors in the Simpson sawmill has demonstrated that the equipment require9 a minimum of maintenance. Also, many new ideaa, applications and design consideration have been developed.

Right conveyor (1) is from the trimmers. It empties into conveyor taking edgings from chute (2), serving both edgers. Vibration keeps conveyors open and flow smooth.

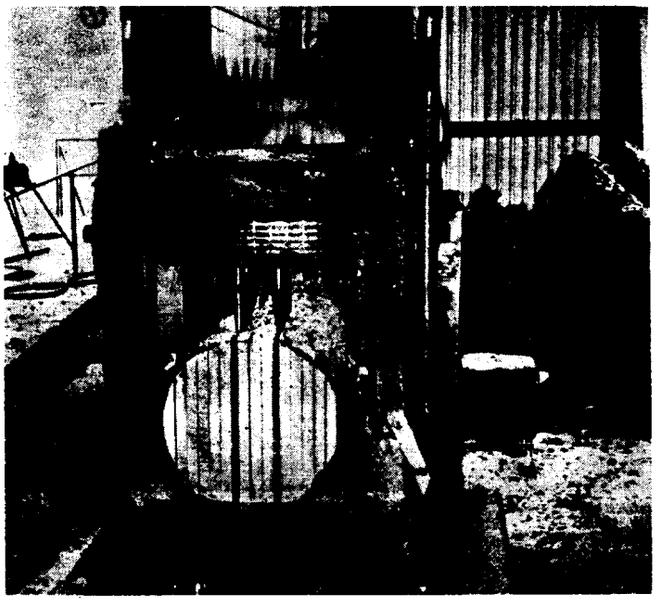
Slabs, edgings and chunks are conveyed across grizzly rolls (1) to chippers. Sawdust is dropped out onto lower conveyor, here showing 9%0 rise. Direction is to the right.



Compact and neatly designed State Box Co., mill is evident in the photo. It is housed in a Stransteel building.



L-M deck-saw in action, with logs of typical size on the deck beyond. Debarker is being added.



Pine is the primary species going through this heavy duty HD-30 Esterer 30" gang, to be cut into box lumber. Other species cut are white fir, red fir, cedar and some Douglas fir. The fir and cedar are cut into dimension lumber.

Compact, Efficient Small Mill

Here is an efficient, new, small-log gang mill, built to handle logs down to 9-inch tops. The plant is at Oroville, Calif., and is operated by the sawmill division of State Box Company of Sacramento, Calif.

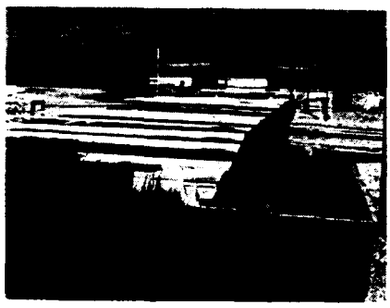
Cutting 55M bd. ft. daily with a single heavy duty gang, the output is expected to exceed 60M ft. daily with the addition of a Soderhamn Cambio barker. A chipping plant will also be added and bark will be sold to obtain better utilization.

Lumber from the gang travels low to floor transfer chains to lift chains for the edger feed table. Center cabinets house edger setworks.

Scoopmobile LD-8A does ail the decking and undecking and feeds the mill. Takes over after crane unloads trucks.

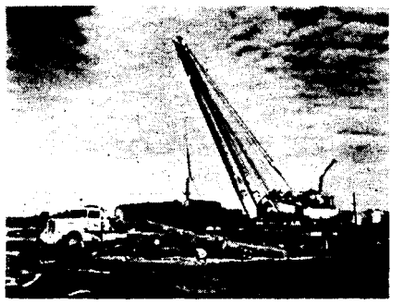
Edger is 4-saw Albany, 48-in., with C&D Lumber CO. Air-Electro setworks. Control panel is at right, at comfortable level, slightly above waist level.

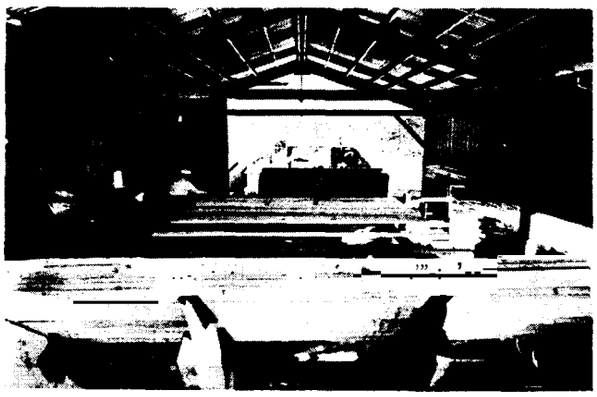
Mill trims with the two 24-in. jump saws. Mill personnel includes a deck sawyer, sawyer, tail sawyer, edgerman, edger picker, two spotters and two pullers.

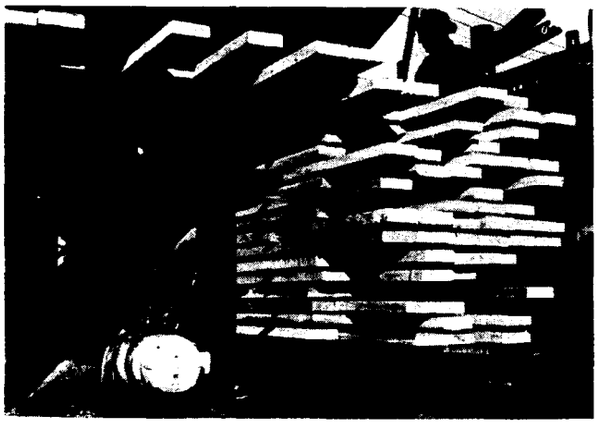


Dip vat is just outside the building perimeter. Green chain is relatively short. Walkways for pullers are made of expanded steel. Lumber is air dried at mill.

165-hp Cummins engine powers this crane handling log unloading job. Truck is an Autocar Diesel owned by one of the five contract loggers.







Stacker Saves Mill $48,000 Annually

James Hambridge, president of Everett Lumber Co., Everett, Wash., received a lot of extra benefits. when he installed a low-budget, Stetson-Ross FaStacker recently.

It help cut his employees from 13 down to 4 to handle total daily output of 100,OOO feet and he estimates he will save **2½** times purchase price of the machine in a year.

The FaStacker is installed at the end of the green chain. Sorted for length, rough timber comes by carrier from the sawmill. A Stetson tilting hoist breaks down the load onto storage chain. Lumber moves along to loading chains for placement, one layer at a time. Stickers are hand placed between each row. As each row is completed it is lowered' from the feed table until stack is completely stickered for lift truck movement to the kilns.

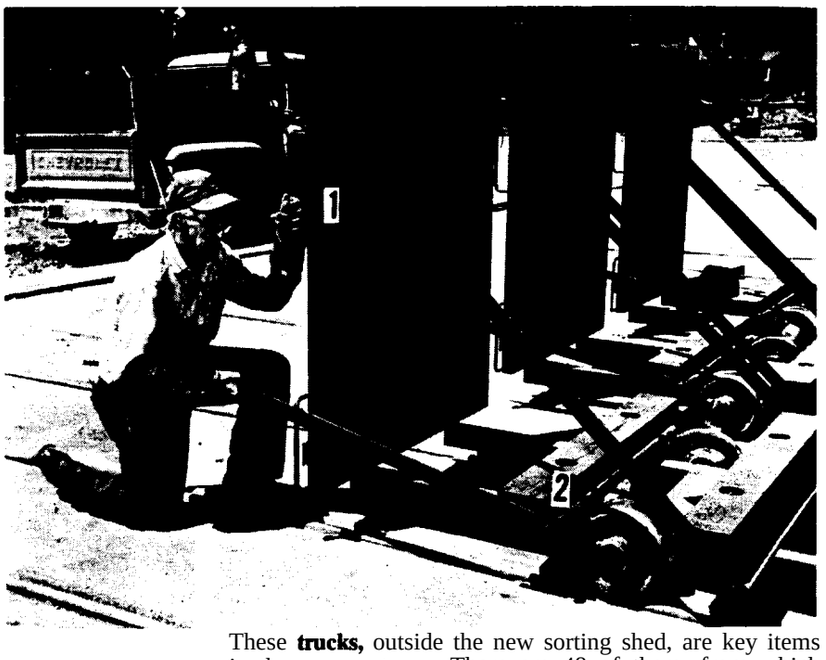
Top left shows breakdown and snickering in background. Below left shows a course being lowered to the stack formed on carry away chains.

Plant gears to all-fork lift operation

A remanufacturing plant makes the transition, with these -two major results: a thoroughly weatherproof operation and a gradually increasing sorting footage per shift.

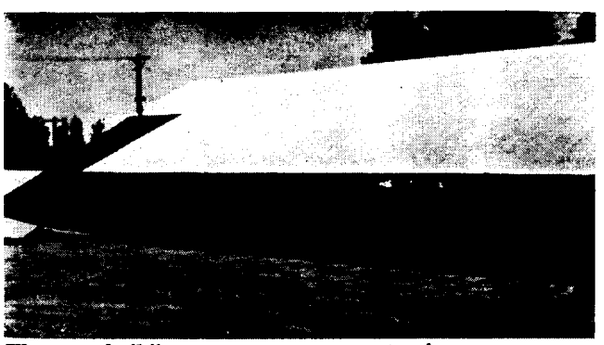
The Hughes Bros. Lumber Co. operation at ForesthiU, Calif., was, for a long time, completely an air drying operation. When the company decided to change to a kiln operation it knew it would have to sort regardless of weather, but did not have the facilities to do this properly. The present system of all-lift truck operation resulted.

There was not sufficient cover for carriers and sorting and with both lift trucks and carriers being used, there were times when packages of lumber were subjected to adverse weather between handlings. The new sorting shed was built as a part of the system that uses lift trucks and the shop-built trucks at right. The operation is weatherproof. The rate of sorting is 90 to 100M feet a shift. The company has hit 15M an hour on 6/4 stock, but the rate drops slightly on 4/4 partner Joe Hughes reports.



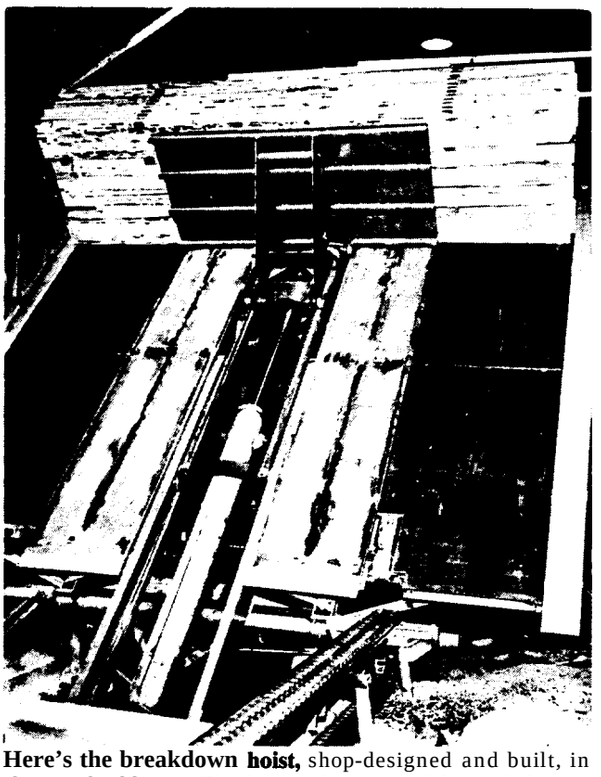
These **trucks,** outside the new sorting shed, are key items in the new system. There are 48 of them, from which lift trucks easily lift lumber packages. There are 24 here at the dry sort, six on a minority sorting chain and 18 at the planer. They were built by millwright Wm. McCollum, who is pointing out recent modifications he made: the handles (1) which save bumped fingers and which afford a surer grip, and (2) the simple friction brake. Formerly the cars were braked with wood blocks. Backboards help create straight packages and form barriers against weather, helping reduce degrade and damage.

This Gerlinger lift truck is delivering stock to the feed chain at the breakdown hoist in the new sorting shed. The other trucks are two Gerlingers and a Clark. In the new system the company first used two carriers and two lifts, then one carrier and three lifts. It found four lifts to be the most efficient number and, at the same time, found maintenance simplified.



The building tru ks

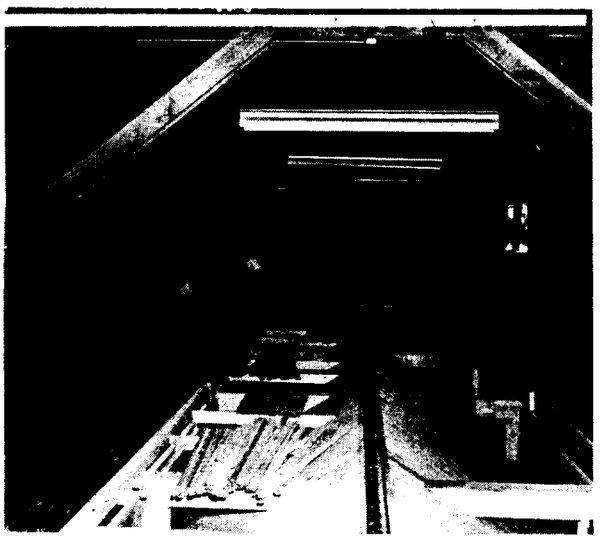
A shop-built breakdown hoist serves this new sorting chain



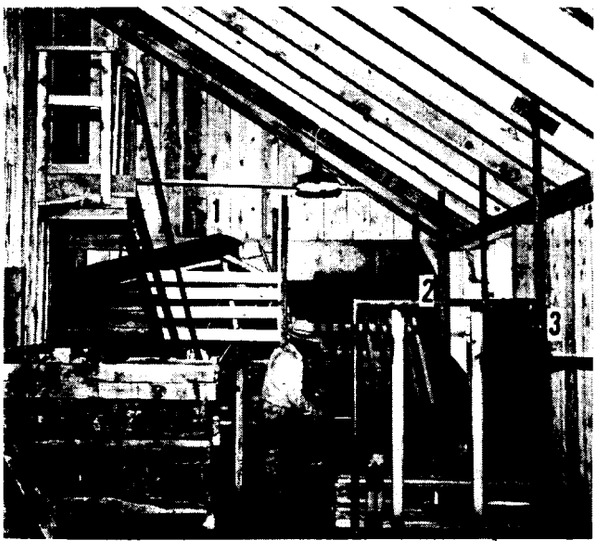
Here's the breakdown hoist, shop-designed and built, in the new building. The heart of this is a lift truck frame. While recognizing that the conversion of a lift truck frame into a hoist is not unique in the industry, the company emphasizes that this hoist does a fine job.

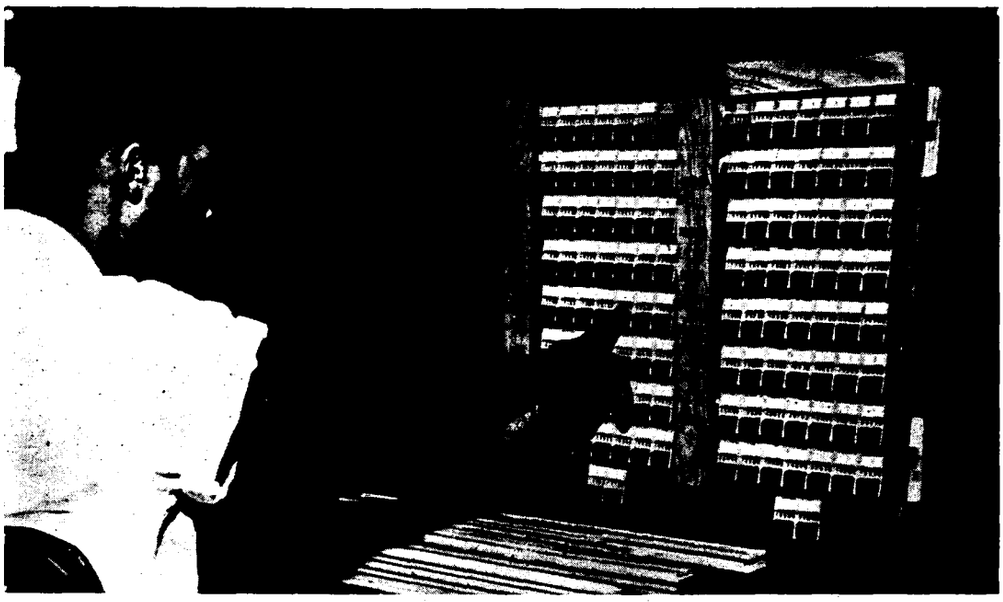
This is the I-beam and angle iron framework behind the steel facing shown in the picture at left. The hoist tilts three packages at a time. Only one change was made after the initial installation. An 8-inch hydraulic cylinder replaced a less husky one.

The new sorting shed is one of several buildings erected during transition to the new system. In here are four pullers, a grader, a feeder, and a sticker man. Note roller chains, fluorescent lighting, and sticker storage on cross beams beneath the chains. Area at far end is darker because roof line over breakdown hoist drops as it extends over hoist feed chains.



This is the sticker **recovery bin.** Endless belt is at (l). Downslide, of wood and steel, was modified to prevent sticker tumbling. At (2) is swinging gate, of pipe and channel iron, which swings on pipe (3) and has simple lift pin lock. When gate opens, the load of stickers moves on roll case by gravity feed. Case end is behind lift truck in photo on opposite page.





Two batteries of Veeder-Root Inc., counters (Hartford, Corm.) are located in front of the strapping machine operator who uses them to record, by length and grade, the number of bundles of flooring manufactured, Sold under the trade name "Vary-Tally," these are multiple reset mechanical counters which register counts at finger tips pressure on lever.

BATTERY FOR TALLYING RED OAK FLOORING

Grade	Length of Bundles						
	2'	3'	4'	5'	6'	7'	8'
Clear Qtd	X	X	X	X	X	X	X
Clear Plain	X	X	X	X	X	X	X
Select Qtd	X	X	X	X	X	X	X
No. 1 Common	X	X	X	X	X	X	X
No. 2 Common	X	X	X	X	X	X	X

"X" Indicates a counter

The mechanical tally system has counters for the 42 combinations of grade and length for a given species and width. Strapping operator has only to push the lever to register a bundle for any given combination. For example: when 25/32x21% Red and White Oak are run, two batteries are set up as follows: (one Red Oak; and the other for White).

Length	Grade	Grade
	No. I Corn & Btr Shorts	No. 2 Corn Shorts
All 1¼'		
	X	X

A small counter panel beneath the battery for single length grades set up as in chart above. When not being used for oak, the same counters are used for other sizes as well as species such as Beech and Pecan. On completion of day's work, supervisor tabulates totals from face of **counters**. No recheck is necessary. Grade total **simply** consists of multiplying number of bundles of each length by number of board feet in each length bundle.

Tally Machine Saves $3,000 Annually

One man does the work of two with a new counting system at Mobile River Saw Mill Co., Mt. Vernon, Ala. According to the management of the hardwood lumber company, since the counting system was installed on the production line a savings of $3,000 annually has been achieved.

Problem solved is familiar not only to the lumber industry, but to any industry selling products in pieces which have to be counted. Mobile River's own production consists of high-quality Oak, Beech and Pecan flooring (Mount Vernon Brand) sold in varying length bundles.

Keeping track of bundles of different grades and lengths was a tedious, full-time job, subject to natural inaccuracies, with additional labor on production as well as in the office computing each day's total.

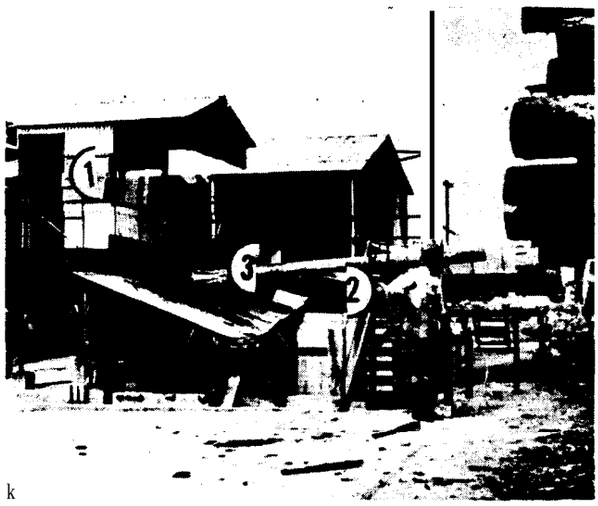
The new counting system is part of a recent modernization of the entire plant.

After end-matching, the flooring is graded. Workers lift boards from a conveyor and. stack in overgrown open-end boxes marked for grade and length. When the box is filled, pieces are bundled, stacked and conveyed 10 to 15 ft. to the strapping machine. Here production is recorded.

Before the system, the old-fashioned "dot-tally" was used.

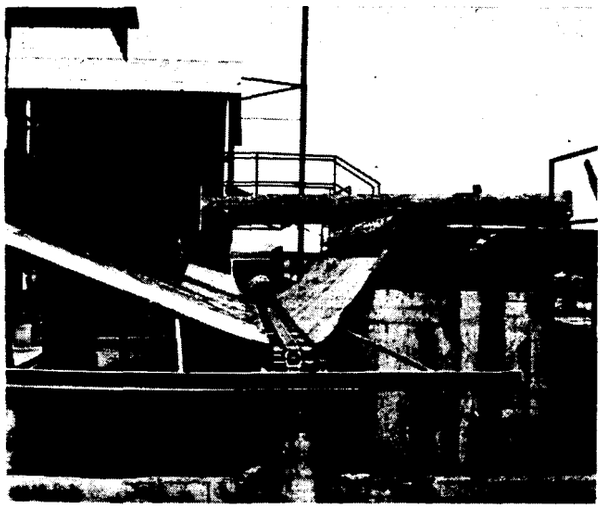
All Mount Vernon Brand flooring is uniquely palletized so that each pallet of each grade has exactly the same 'footage.

Also, the average length of each layer of bundles within the pallet is equal to, or greater than, that required by the National Oak Flooring Manufacturer's Assoc., rules for the grade.



k

Elevated log turner system showing control house (1) and log feeding across spiked roll (2) into rudder-shaped turner (3). Operator controls storage decks, main central feed chains to spiked rolls and turner conveyor chain. Turner will flip log in either direction, small end first.



Close turn in As sse rn

log Turner Saves Time

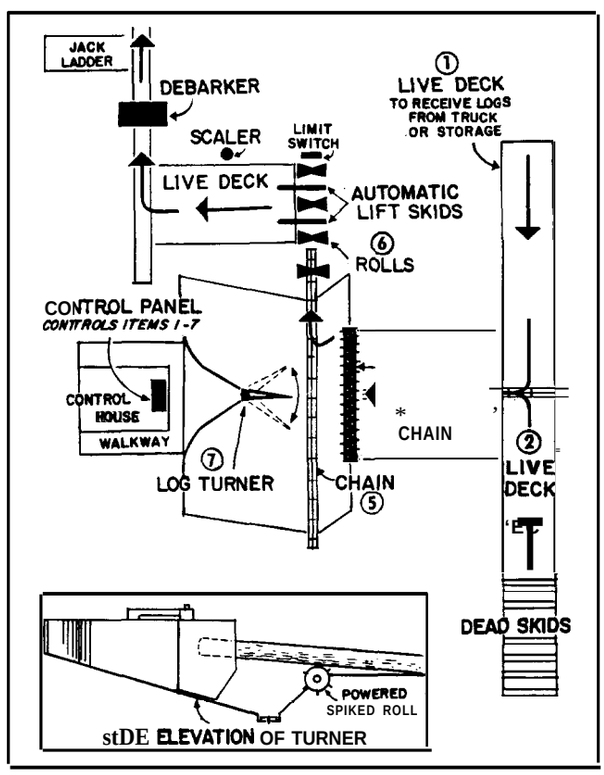
in putting through 2000 logs per day

Block setter is in remote position across deck from band mill.

A unique and effective log turner and handling system that enables feeding of all logs small end first to the debarker and butt end to the band mill, has proven to be a real time and cost saver for Ozan Lumber Co., Prescott, Ark. (Complete mill story THE LUMBERMAN 11/58 pg. 34). The mill has a main band rig and three gangs.

Purpose of the turner is to get away from tieups and handling of the small logs. The fully automated push-button operation handles every log that goes into the mill. Logs are carried from side decks to a central feed chain, pass end-wise over a powered spiked roll into the flipper. The turner pushes the end in either direction desired as the log drops onto a flight feed chain, small end first. The scaler first marks the scale on the small end as the log passes by him, headed for the debarker, then up a jackladder into the mill.

The deck turning and handling system was designed by plant engineer William Oates and owner James Bemis.

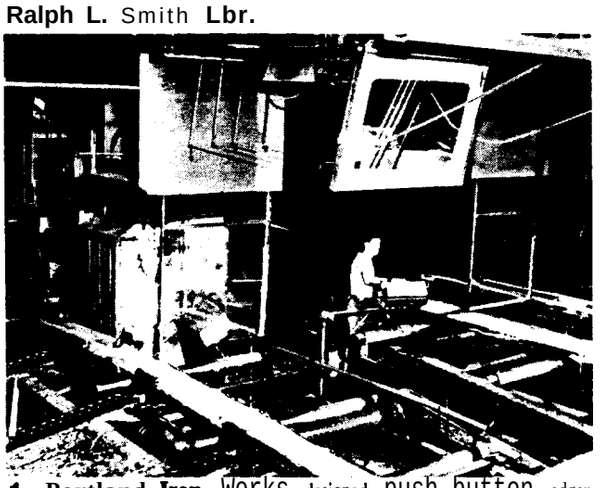


At right is sketch of the complete log handling system before the log enters the mill. Trucks are unloaded by two rail cranes onto decks or onto a dry storage deck not shown in sketch. Purpose of the turner is to head logs small end first into the barker. When they reach the mill floor, the butt end is then positioned right to feed into the main band headrig.

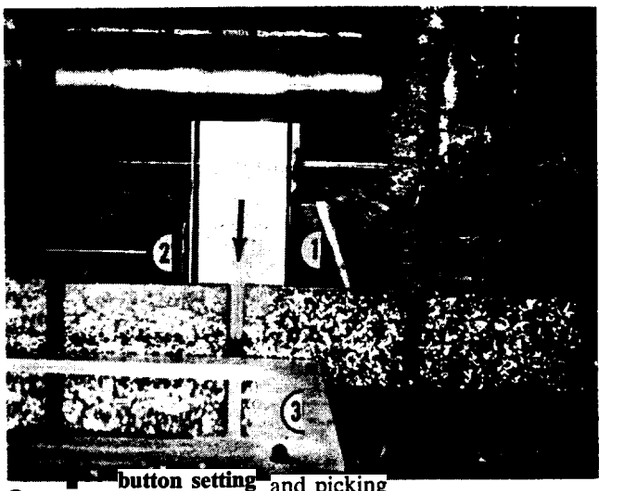
Another Step in Mill Automation

Here are two pine mill applications of automatic edger pickers that save time, reduce costs and increase efficiency for Ralph L. Smith Lumber Co., Anderson, Calif. and Brooks-Scanlon, Inc., Bend, Ore.

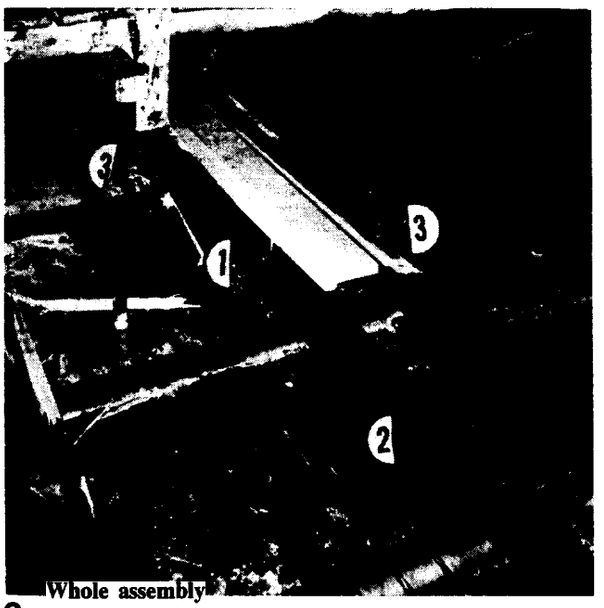
Ralph L. Smith **Lbr.**



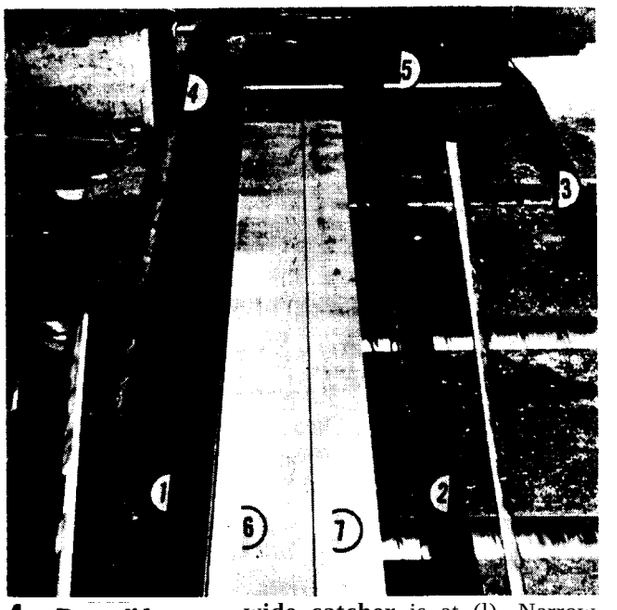
1. **Portland Iron** Works **designed** push-button edger picker with electric circuits and air power at Ralph L. Smith Lumber Co. Note master control panels at each edgerman's station. Hanging frames of clear plastic in front of edgerman are for safety; mirror is part of visual of off-bear side. Shadowline guides are used. Edgers are both Klamath Machine & Locomotive Works, 60" and 72" units handling mill output.



button setting and picking **2.** **are combined in this** dual operation. Edger settings are easier, faster and more accurate. Stock emerging from edger meets these two strip catchers (1)—(2), which move with saw settings. Imer fences of catchers match kerfs from outer saws. Outer fences, 6' long, control edgings until drop off. Mirror (3) is part of monitored view of picker and edger outfeed side.



Whole assembly **3.** **moves with sets, but narrow catcher** is hinged at (1) and (2) to better handle stock width changes. Other catcher is rigid full length. Outef fences taper down at (3). Edgings from wide catcher fall onto slasher chains; those on narrow catcher first hit spiral rolls and drop off.

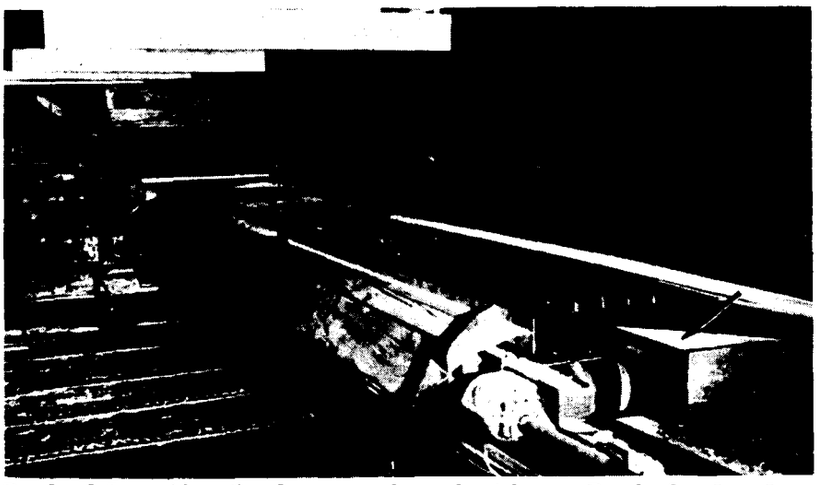


4. **Downslide from wide catcher** is at (l). Narrow catcher is at (2) and downslide for this, from spiral rolls, is at (3). At (4) and (5) are recurved fences to force off edgings which reach that far. Prevents movement onto trimmer transfer. Note two pieces edged stock on this edging cut.

... Automatic Edger Pickers

Brooks-Scanlon, Inc.

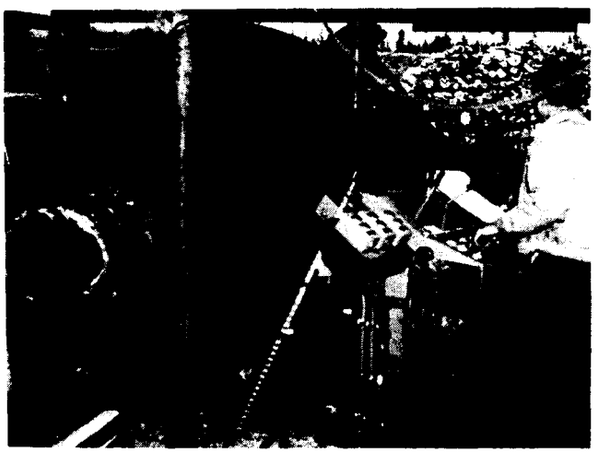
Edgerman **operates** pushbutton control for setworks. Operating rods run under machine to air control in enclosed room.



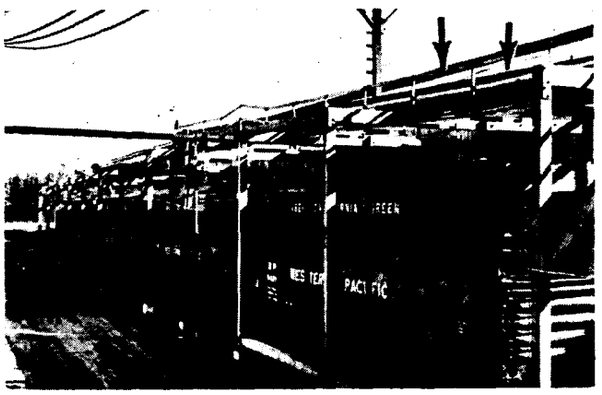
Portland Iron Airmatic edger setworks and, picker at Brooks-Scanlon, Inc., Bend, Ore.? has resulted in improved grade recovery as well as eliminated hand-picking. Photo above shows fixed fence in foreground which diverts one edging to slasher transfer below. Counterweighted jointed picker (arrow) rides with outside traveling saw. Setworks is calibrated to 4%", **6¼",** 8%", **10½", 12½", 14¾", 18¾", 20¾", 2234" and 25".**

Chipper System loads Four Cars At Once

Wood superstructure, serving four chip cars at one time is at Lorenz Lumber Co., Burney, Calif. The framework supports a steel conveyor in which rides a flight chain. Chip flow through the drop-outs is controlled by flat steel sliding in plates, which are positioned by simple, direct linkage with a hand brake-type level. Arrows at upper right mark locations of two such levers. Plant ships 10 carloads of chips per week.



Barker recently installed is a **60"** Nicholson right type. The mill cuts 180 M ft. a day, cutting ponderosa pine, sugar pine, Douglas fir and white fir and cedar.



Chipper is a 24" Fiier & Stowell unit powered by a 125-hp Century motor. Conveyor and loader system is at left of building. Refuse **transfer** overhead from mill to chipper.

How to have clean, dry compressed air

Why it is necessary and what to do about it in mills and plywood plants

By DON W. **BENNER,** General Sales Manager
Wilkereon Corporation, Englewaod, Colo.

There are more than 75,000 air compressors in use in wood products plants in the U. S. When plant managers and machinery builders each do their part to provide clean, regulated and lubricated compressed air, they will both enjoy the optimum benefits of air power. Machinery manufacturers have no control over their customer's air system beyond the point where air is connected to their machine. Management should investigate its own air systems thoroughly with engineers and maintenance personnel.

The place to start an analysis is at the system intake:

- Does the compressor suck in heated air?
- Does it bring in corrosive fumes from nearby sources?
- Does it bring in extra moisture from steam sources?
- Does it suck in dirt from inside or outside sources?
- Has it an efficient filter? Is it cleaned regularly?

There are 865 million dirt particles in a cubic foot of atmospheric air. These things are seldom considered, yet they all cause untold troubles in compressed air lines.

The compressor tank. Contaminates are sucked in as if by a big vacuum cleaner. Every 9½ cu. ft. of atmospheric dirty air is squeezed down to make one cubic foot of adiabatic compressed air. The temperature is raised to as much as 485"F. at 100 psi in a single-stage compressor. Added to this cubic foot of compressed dirt, fumes, oxygen, nitrogen and argon at high temperature, is moisture.

The atmospheric air you are now breathing contains millions of particles of water. On a day when relative humidity is 60%, and room temperature is 70"F. each cubic foot of atmospheric air will contain about 5 grains of these particles. A horrible mess results when the moisture is mixed with the dirt and fumes at high temperature. If permitted to get equipment, it is damaging.

The place to start getting rid of this "goo" is at the tank after everything possible is done to prevent compounding it at the compressor intake. Put an automatic tank drain on the tank to insure that, as these elements accumulate, the tank will be purged. If the tank is not drained several times a day, air storage capacity is forfeited and the compressor runs long and more often, consuming unnecessary power and causing undue wear.

Not all the moisture and contaminants are removed at this point. Some remains in suspension and moves on out to the main lines. Aftercoolers are usually not the cure-all for compressed air system troubles of this kind. Experience has shown that usually they are only some help, and therefore are expensive additions. They do not remove micronic particles and fumes or compressor oils, and so permit these, in their worse form (dry), to circulate to the machines.

Air is composed of a mixture of gases, chieflv oxygen and nitrogen. All air carries some water as vapor. The amount of water vapor that any given volume of air can carry is mainly dependent upon the temperature. and to some degree upon the pressure. For all practical purposes the pressure factor may be disregarded here, except to point out that at 100 **psi,** it takes 9.65 cubic **feet of** atmospheric **air** to make **1 cubic foot of compressed air.**

The amount of water vapor that is carried by a volume of air at a certain temperature is expressed as the relative humidity of the air. It naturally follows that at any given temperature, when a volume of air is carrying ita maximum amount of water as vapor, it is said to be **saturated** or to have a relative humidity of 100%. If more water is present than this amount, the excess over 100% will condense and be present as free water when the air is cooled. It is this free water that is detrimental to the working parts of air powered equipment.

The actual **amount of water vapor per cubic foot at 1007o relative humidity will vary with the temperature; e.g.:** 1 cubic foot of air at 100% relative humidity at **60°F.** temperature can carry 53/4 grains of water as vapor, whereas 1 cubic foot of air at 100% relative humidity at 100"F. can carry 193? grains of water vapor. Actually, the capacity of air for carrying water approximately doubles for every 20"F. temperature rise.

By purely mechanical means only the free water of that amount in excess of 100% relative humidity is all that can be extracted. To extract water from air that is below saturation or 1007o relative humidity, chemical or refrigerating air driers must be used. For most industrial purposes, all air **below saturation is considered dry air.** If not further cooled, it is called "practical" air.

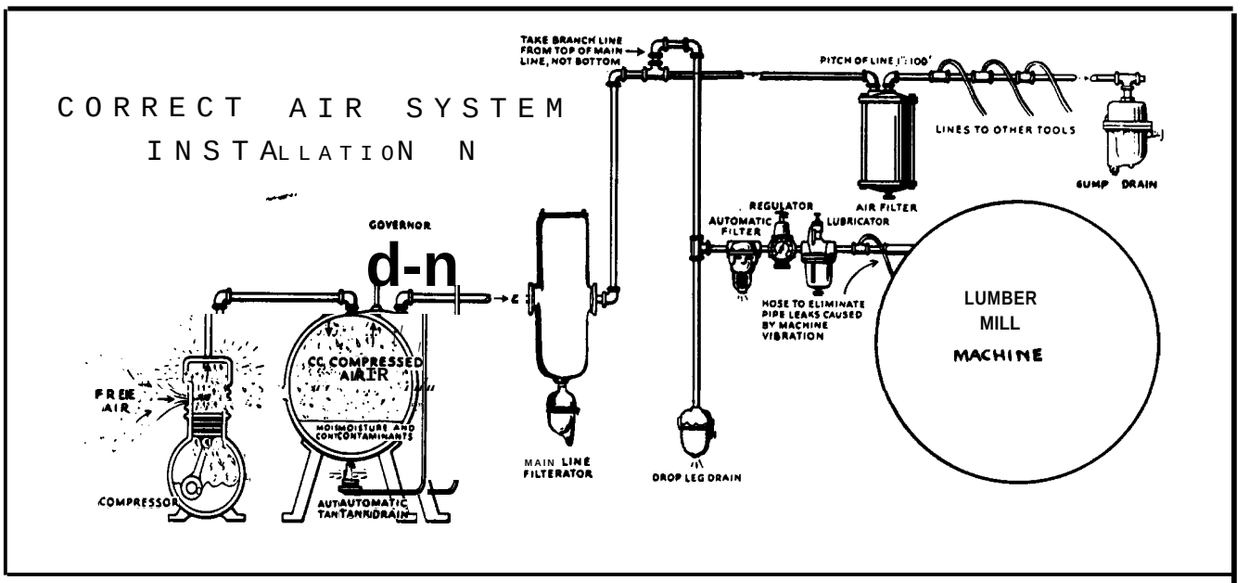
Due to natural temperature variations within any compressed air system, free water will exist at many stages within the pipes and other parts of the system.

Recommendations for best service from your air system

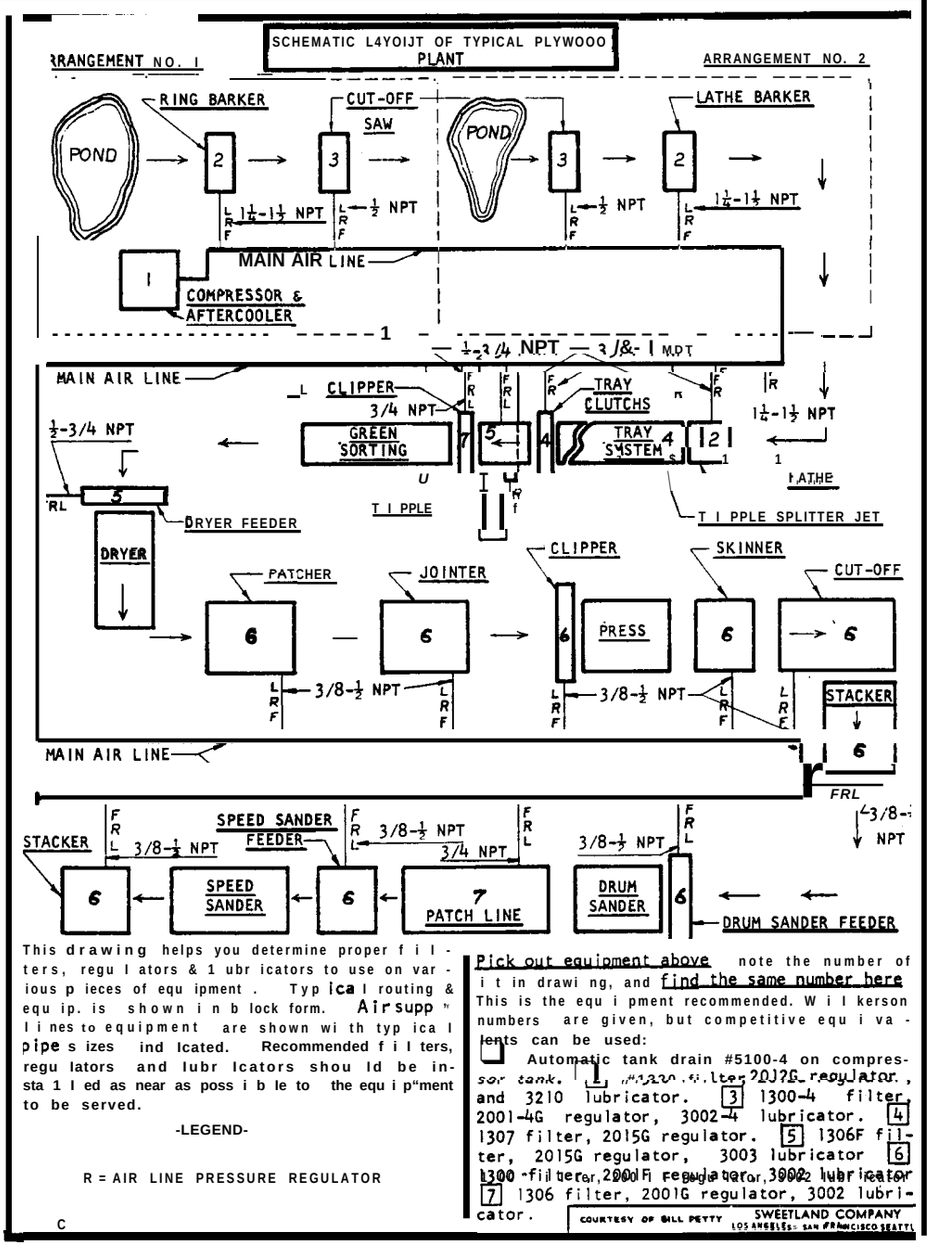
A typical air system is ahown in mill plan No. 1. In that illustration, free water can collect in the tank, the main air line and the drop lines. It is assumed that the installation is housed in a building where the room temperature **near** floor level is 70"F. where there is a relative humidity of 70%. **The** intake air will be at 70"F. and 70% humidity.

The following things will happen in this system:

One cubic foot of intake air at 70"F. and 70970 relative humidity contains 5.59 grains of moisture. If it is assumed that the receiver tank pressure is 100 P. S.I.A. and at a temperature of 100"F., it will take 9.65 cubic feet of the free air to make 1 cubic foot of compressed air.



Typical mill plan for compressed air **system,** showing proper filter and drain installations to obtain maximum use of the available air power provided.



This drawing helps you determine proper filters, regulators & lubricators to use on various pieces of equipment. Typical routing & equip. is shown in block form. Air supply lines to equipment are shown with typical pipe sizes indicated. Recommended filters, regulators and lubricators should be installed as near as possible to the equipment to be served.

-LEGEND-

R = AIR LINE PRESSURE REGULATOR

Pick out equipment above note the number of it in drawing, and find the same number here This is the equipment recommended. Wilkerson numbers are given, but competitive equivalents can be used:

Automatic tank drain #5100-4 on compressor tank. 1 [illegible] filter, 2015G regulator, and 3210 lubricator. 3 1300-4 filter, 2001-4G regulator, 3002-4 lubricator. 4 1307 filter, 2015G regulator. 5 1306F filter, 2015G regulator, 3003 lubricator 6 1300 filter, 2001G regulator, 3002 lubricator 7 1306 filter, 2001G regulator, 3002 lubricator.

COURTESY OF BILL PETTY SWEETLAND COMPANY LOS ANGELES SAN FRANCISCO SEATTLE

Schematic layout of typical plywood plant arrangement of installed compressed air accessories for optimum care of the air.

10SS OF AIR PRESSURE DUE TO FRICTION -CHART 1

(100 PSI initial pressure per100 ft. of pipe.)

CFM Free Air	Equivalent CFM Comp. Air	NOMINAL PIPE DIAMEIER IN INCHES ½	¾	1	1¼	1½	2	2½	3	4	5
10	1.28	.38	.09	.03	.W71	. . . . .					
20	2.56	1.42	.34	.10	.026	.012	. . . . .				
30	3.84	3.13	.74	.23	.058	.026	. . . . .				
40	5.13	5.55	1.28	.38	.096	.043	.013	. . . . .			
50	6.41	8.65	2.00	.60	.146	.067-	.020	.008	. . . . .		
60	7.69	. . . .	2.84	.84	.21	.095	.027	.011	. . . . .		
70	8.97	. . . . .	3.85	1.12	.2s	.13	.036	.015	. . . . .		
80	10.25	. . . . .	5.01	1.44	.36	.16	.046	.019	. . . . .		
90	11.53	. . . . .	6.40	1.85	.45	.20	.058	.024	. . . . .		
100	12.82	. . . . .	7.80	2.21	.55	.25	.069	.029	.010	. . . . .	
125	16.02	. . . . .	12.4	3.41	.85	.38	.107	.043	.015	. . . .	
150	19.22	. . . . .	18.1	4.91	1.20	.54	.15	.061	.021	. . . . .	
175	22.43	. . . . .	. . . .	6.80	1.64	.73	.20	.081	.028	. . . . .	
200	25.63	. . . . .	. . . .	8.79	2.12	.95	.26	.105	.036	. . . . .	
250	32.04	. . . . .	. . . .	. . . .	3.30	1.48	.40	.160	.054	.014	. . . . .
300	38.45	. . . . .	. . . .	. . . .	4.71	2.10	.57	.23	.075	.020	. . . . .
350	44.86	. . . . .	. . . .	. . . .	6.45	2.86	.77	.31	.101	.026	. . . . .
400	51.26	. . . . .	. . . .	. . . .	8.20	3.70	.99	.40	.131	.034	. . . . .
450	57.67	. . . . .	. . . .	. . . .	. . . .	4.65	1.27	.50	.165	.042	. . . . .
500	64.08	. . . . .	. . . .	. . . .	. . . .	5.79	1s.5	.62	.20	.051,	. . . . .
600	76.90	. . . . .	. . . .	. . . .	. . . .	8.45	2.23	.89	,29	.073	.....
700	89.71	. . . . .	. . . .	. . . .	. . . .	. . . .	3.00	1.18	.39	.098	. . . .
800	102.5	. . . . .	. . . .	. . . .	. . . .	. . . .	4.00	1.54	.50	.126	. . . . .
900	115.3	. . . . .	. . . .	. . . .	. . . .	. . . .	5.05	1.95	.63	.159	. . . . .
1,000	128.2	. . . . .	.....	. . . .	. . . .	. . . .	6.20	2.37	.7a	.19	.062

CHART OF WATER VAPOR IN AIR LINES–CHART 2

These figures represent gallons of water.

Temp. of Air	PRESSURE OF COMPRESSED AIR, PSI 30	40	so	60	70	80	90	100	110	120	130	150
32	.575	.432	.36	.28	.25	.23	.21	.18	.17	.14	.13	.12
40	.75	.60	.50	.43	.38	.33	.30	.29	.26	.24	.23	.21
50	1.15	.s9	.76	.65	.55	.4&	.43	.40	.37	.34	.32	.29
60	1.58	1.29	1.07	.93	.82	.71	.63	.55	.47	.45	.43	.40
70	2.17	1.73	1.50	1.30	1.15	1.03	.94	.86	.77	.72	.69	.57
So	2.90	2.39	2.00	1.78	1.58	1.43	1.27	1.15	1.03	.98	.92	.81
90	4.03	3.28	2.76	2.42	2.16	1.96	1.73	1.58	1.44	1.35	1.25	1.10
100	5.33	4.43	3.74	3.22	2.88	2.58	2.20	2.16	2.00	1.84	1.73	1.56
110	7.00	5.75	4.90	4.25	3.75	3.34	3.02	2.76	2.60	2.36	2.18	1.95
120	9.50	7.45	6.55	5.57	4.87	4.37	4.02	3.68	3.34	3.16	2.94	2.59

This chart shows in gallons the amount of water which will accumulate every 8 hours in a compressed air system using 100 CFM of compressed air at different air temperatures and air pressures.

For example, at 100 PSI, with a temperature of 90°, a compressed air system would contain 1.58 gallons of water in vapor form every 8 hours for every IW cubic feet of air passing through the system.

CHART OF CFM THROUGH ORIFICE-CHART 3

● For pressure below atmospheric use Standard Adiabatic Formula.

Supply Pressure PSI	ORIFICE SIZE 1/32	1/16	3/32	1/8	5/32	3/16	7/32	1/4	9/31 ""	5/16	11/32	3/8	13/32	7/16	1S/32	1/2	3/4	1
2	.17	.62	1.44	2.55	3.93	5.74	771	102	130	15.9	19.2	23.2	27.1	31.5	35.9	41.0	92.0	164.0
s	.25	.94	2.19	3.77	5.95	8.70		11154	19.6	24.0	29.0	35.0	40.9	47.6	54.3	62.0	139.0	248.0
10	.39	1.48	3.41	6.10	9.31	13.6	18.2	24.1	30.6	37.5	45.4	54.8	64.0	74.5	85.0	97.0	218.5	388.0
1s	.41	1.62	3.63	6.44	10.0	15.4	19.6	25.8	32.6	40.0	48.7	58.2	68.1	78.8	90.7	103.1	227.9	412.5
20	.49	1.90	4.28	7.59	11.8	17.0	23.1	30.4	38.4	47:2	57.4	68.6	80.2	92.9	106.9	121.5	268.7	486.3
25	.56	2.18	4.93	8.74	13.6	19.6	26.6	35.0	44.2	54.3	66.1	79.0	92.4	107.0	122.1	140,0	309.4	560.0
30	.63	2.47	5.58	9.89	15.4	22.2	30.4	39.6	50.1	61.5	74,8	89.4	104.6	121.1	138.3	158,4	350.2	633.8
3s	.71	2.76	6.23	11.0	17.2	24.8	34.0	44.2	55.9	68.6	83.5	99.8	116.8	135.1	154.5	176.8	390.9	707.6
40	.78	3.05	6.88	12.2	19,0	27.3	37.5	48.8	61.7	75.8	92.2	110.2	128.9	149.2	170.7	195.3	431.7	781.4
4s	.85	3.34	7.53	13.3	20.8	29.9	41.0	53.4	66.6	82.9	100.9	120.6	141.1	163.3	186.9	213.8	472.5	855.1
so	.92	3.62	8.17	14.5	22.6	32.5	44.6	57.0	,72.4	90.1	109.6	131.0	153,3	177,4	203.1	232.2	513.2	928.9
55	1,00	3.91	8.82	15.6	24.4	35.1	48.1	62.7	78.2	97.3	118.3	141.4	165.4	191.5	219.3	250.5	554.0	1002.7
60	1.07	4.20	9.47	16.8	26.2	37.7	51.6	67.2	84.1	104.4	127.0	151.8	177.6	205.6	235.5	268.9	594.7	1075.4
65	1.15	4.49	10.1	17.9	27.9	40.3	55.2	71.8	89.9	111.7	135.7	162.2	189.8	219.7	251.7	287.3	634.8	1149.2
70	1.21	4.77	10.8	19.1	29.7	42.8	58.8	76.4	95.7	118.8	144.4	172,6	202.0	233.8	267.9	305.8	675.7	1223.0
7s	1.30	5.06	11.4	20.2	31.5	45.4	62.3	81.0	105.5	126,0	153.1	183.0	214.1	247,9	284.1	324.2	716.4	1296.7
80	1.37	5.35	12.1	21.4	33.3	48,0	65.8	85.6	107.4	133.1	161.8	193,4	226.3	262.0	3003	342 .6	757.2	1370.5
8S	1.44	5.64	12.7	22.5	35.1	50.6	69.4	90.3	113.2	140,3	170.5	203.8	238.5	276.1	31655	361 .1	797.9	1444.3
90	1.52	5.92	13.4	23.7	36.9	53.2	72.9	94.8	I 19.0	147.5	179,2	214.2	250.6	290.1	332.7	379.4	838.7	1518.1
9s	1.59	6.21	14.0	24.8	38.7	55.7	.76.5	99.4	124.9	154.6	188.0	224,6	262.8	304.2	358.9"	3983	879.4	2591.8
100	1.66	6,50	14.7	26.0	40.5	58.3	80.0	104.6	130.7	161.8	196.7	235.0	275.0	318.3	375.1	416.2	920.2	1664,2
125	2.03	7.94	17,9	31.7	49.5	71.4	97.7	127.1	159.8	197.5	240.2	287.0	335.8	388.8	464.8	508.3	124.0	2033,2
150	2.40	9,28	21.2	37.5	58.4	84.4	115.4	150.1	189,0	233.3	283.7	339.0	396.7	459.2	545.2	600.4	1327.8	2401.5

The high temperature in the receiver tank is attributed to the heat of compression.

The one cubic foot of compressed air contains a total of 9.65 cubic feet of free air, each foot of which contains 5.59 grains of water at the 70"F. temperature. Thus, 53.9 grains of moisture will move into the receiver tank. (Amount of water in 1 cubic foot of compressed air = amount of free air in 1 cubic foot compressed air X amount of water in each foot of free air.)

Now, once in the receiver tank (100 psi at 100"F.) 1 cubic foot of air at 100"F. and 100Yo relative humidity contains 19.75 grains of moisture. Therefore 53.9 — 19.75 = 34.15, which is the grains of moisture that will be dropped in the system as free water for each cubic foot.

Therefore, 4.88 pounds of water will be dropped for each 1,000 cubic feet of compressed air which passes through the tank. Install an automatic tank drabs.

Using the vapor chart (Chart No. 2) to eliminate the mathematics, you can see that with air at 90° and at 100 psi, there will be 1.58 gallons of water accumulating every 8 hours for every 100 cubic feet of air used.

From the receiver tank the air flows through a line at ceiling level where the surrounding temperature is 90" F. The temperature of the air within the pipe will drop to 90"F. To make the example simple, it will be assumed in this installation that there will be no pressure drop from the receiver tank to the point of use. Volumetric changes due to temperature variations will also be disregarded.

One cubic foot of air flowing through the main supply line at 90"F. and 100% relative humidity can carry 14.75 grains of moisture whereas the same cubic foot at 100"F. in the receiver tank carried 19.75 grains. Therefore in this line each 1 cubic foot will further drop out 5 grains of water (19.75 minus 14.75), or each 1,000 cubic feet of compremed air will drop out .7 **of a pound of water inside the main line.**

From this main supply line a take-off is brought down to the floor level for use. Here the temperature is 70"F. again. At this temperature 1 cubic foot of air at 100% relative humidity can carry 8 grains of moisture (or 14.75 – 8 = 6.75 grains of free water which will further drop out between the main supply line and the point of use). This is equivalent to .96 pounds of water dropping out inside this drop line for each 1,000 cubic feet of compressed air.

The .7 pounds of water per 1,000 cubic feet that dropped out in the main supply line will carry through to the point of use as a "river" of free water unless eliminated there. Because the main line is slanted, and the drop line comes off the top of it, the water in the main line will run to the end where it can be drained off automatically with a line drain. The water accumulating in the drop line will fall to the bottom of the line, where another line drain can keep it automatically removed as it accumulates. A moisture separator or filter should then be installed where the flexible line goes from the pipe to the machine or tool. Use an intermittent-type automatic draining separator, if the air is for intermittent service. If the use of air is continuous at this point, or if flow is uninterrupted for long periods, use a float type automatic draining separator. Use a filter with 2-stage action and a Micro-Pruf cartridge before uses of air where oil fumes must also be eliminated.

Recommendations to be made for this type system are:

(1) Install a tank drain at the receiver tank to drain off the large accumulation of water in the tank.

(2) Install a large filter as far from compressor tank as possible, but ahead of the first branch off of air line.

(3) Install a main line dram. It will take out water dropping out in the main supply line at the ceiling, but will not take out water between ceiling and use point.

(4) Install a line drain at the bottom of the drop line.

(5) Install either an intermittent or float type unit at or near the point of use. This is a must as a great amount of water comes out in traveling from the ceiling down to the point of use. This is essential even though a main line separator has been installed. "Practical," dry air cannot be had at the point of use without this separator, so **do not attempt to avoid its use.** An air regulator and lubricator should also be installed when required.

Electrical, lubricant, coolant, hydraulic and pneumatic circuits adorn modem machinery like well-arranged spaghetti. Each is self-contained except the pneumatic and electrical ones. These must be plugged into the customer's main source.

The pneumatic circuit should be laid out so only one connection is necessary. A filter should be installed on the machine at that point.

If it is a large machine, such as a transfer machine, supplementary small filters for removing additional condensed moisture could be required at different stations because of the further cooling of the air by radiation while traveling long distances through the air lines. The filter at the main air connection of a multiple station machine should always be a float operated automatic drain type. The supplemental ones could be less costly piston-operated "spitter" type automatic drain units (if air is used intermittently beyond them).

1. Tamper-proof adjustment type of air pressure regulator is best to prevent unauthorized personnel from changing settings.

2. **Regulators control the speeds** of air cylinders and feeds and the pressures of clamps and chucks. They reduce the consumption of air at blow-gun operations and prevent accidents caused by chips and dirt being blown too forcibly through the air. Only low pressure is required for cleaning.

3. Air **regulators should be set** by the machine user at a pressure equal to the lowest shop main line pressure so it will remain at that pressure even though shop air pressure rises during low air consumption periods. This will eliminate fluctuations in machining and other operations controlled by the air.

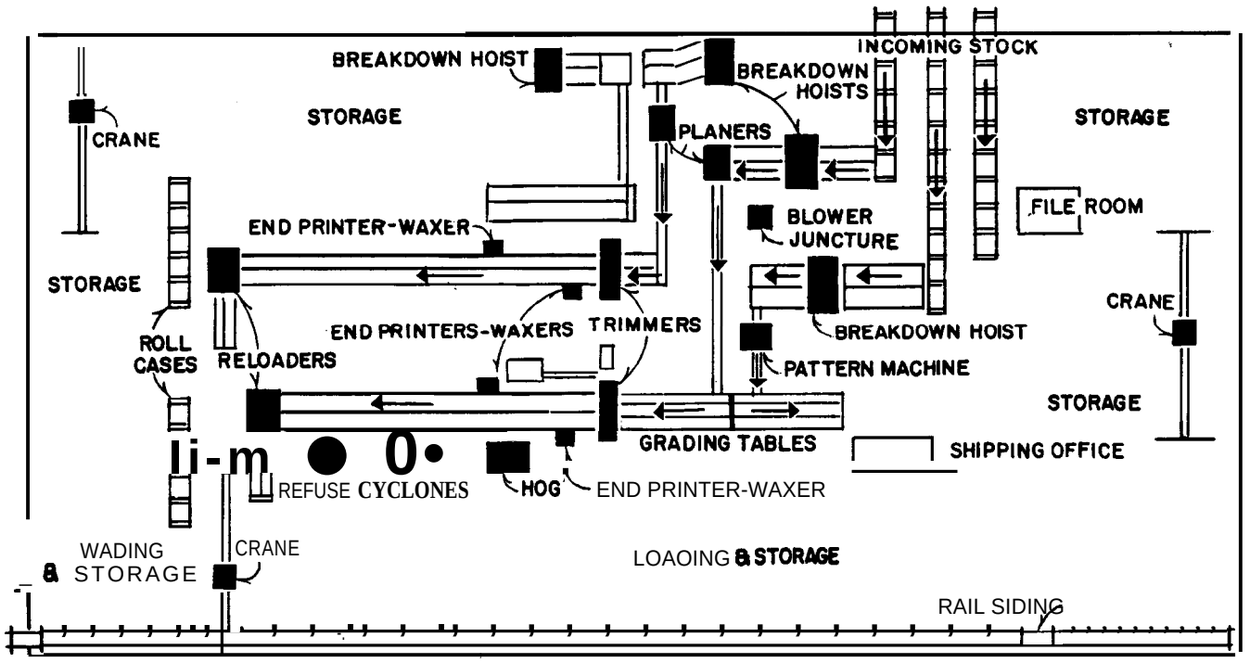
4. Air line **lubricators** should be included in a pneumatic circuit which includes air cylinders, clamps, chucks, feed mechanisms and positioners, to keep them operating freely, reduce wear, keep packings pliable, and protectively coat metal surfaces against corrosion.

An air line lubricator should be of the type that can be filled without shutting off the air line. It should have a sight flow gauge so the operator can see if lubricant is entering the air line, and at what rate. The lubricator should have a fill hole that can be located handily for filling. Because there are so many small cylinders and clamps operated by air, the ideal lubricator would be one that gives lubrication even on flows of air as low as 1 cfm to insure proper lubrication. A petcock should be in the bowl of the lubricator so any moisture that collects in the bottom can be drained out before getting siphoned up into the air system. Tamper-proof adjustment is best.

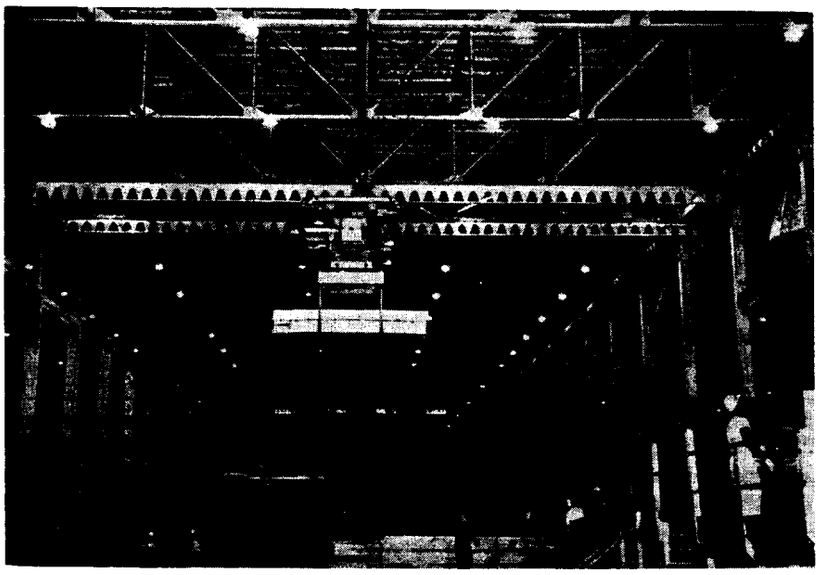
When plant management and machinery builders each do their part to provide clean, regulated and lubricated compressed air, they will both enjoy the many total benefits of air power.

How New Equipment and Improvements

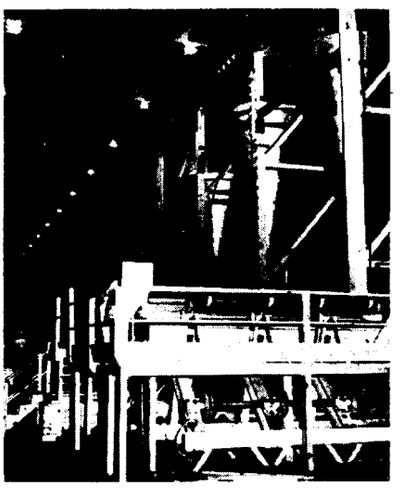
- Inter-plant radio
- Refuse cyclone collector
- New modern equipment
- Powered car loader
- Automatic feeders
- High visual lighting
- Push button controls
- Charting production
- Ample storage areas



Flow chart of planing mill floor showing equipment arrangement and flow pattern of material handling.



Center bay of the building. Traibeam crane is one of three working in the building, all with radio contact with each. other and with the shipping office. Trimmers are at either side, resaw in the center. Workman at right is on platform at reloader. Note double line of columns at right, within which are set refuse "collection cyclones. Further back is the 2-level shipping office and washroom facilities. Each of the cranes has a 7.5 ton capacity and spans 80 ft. Building and equipment is arranged for efficiency in smooth handling of lumber.



Klamath Iron Works reloader for stock coming from Irvington 20' trimmer. Note refuse cyclones mounted at right which handle all refuse and keep mill exceptionally clean.

cut costs

EQUIPMENT

Whiting Trambeam cranes
Stetson Ross planers and pattern machines
Irvington trimmers, printers, waxers
Turner 54" resaw
Klamath **Iron** Works breakdown hoists and reloaders
Woods 10" moulder
Westinghouse mercury vapor lamps
Motorola radio
Klamath Iron Works rolls, conveyors
Sumner #45 hog
Louis-Allis **Select-A-Spede** drive on trimmer
Allen automatic sprinkler system
Archer Blower air conveyor system
Sutobilt high pressure blower

in the former mill, **17** cars could be handled on the siding but there was no storage room. Here, there are 12 cars under cover and there is plenty of elbow room for storage. All loading is ground level and in an emergency fork lifts can keep things moving. Three power loaders are used at car doors. Note caged cyclonea, left. Lighting from 70()-watt mercury lamps.

International Paper Co.'s ncw planing mill at Weed, Calif., is an excellent example of how investment in new equipment and modernization can cut costs. **Put** into operation in 1960, the new planing mill handles with two machines, a greater volume than formerly handled by three machines and does it easier, faster, and better.

Two Stetson Ross **612** planers are the heart of the new mill. Both machines are 25-inch, 14-knife, double profile. They produce more volume than the former 30-inch, **25** inch and 10-inch planers.

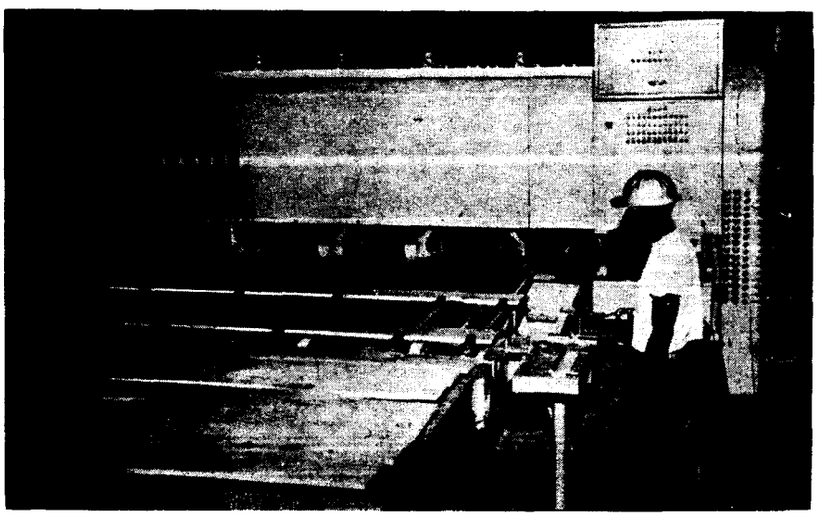
Further, these machines now feed to two automatic **20-foot** Irvington trimmers and beyond these are automatic end-printers and waxers.

The planers are being run at 450-500 lineal feet per minute and average about **250M** feet per day.

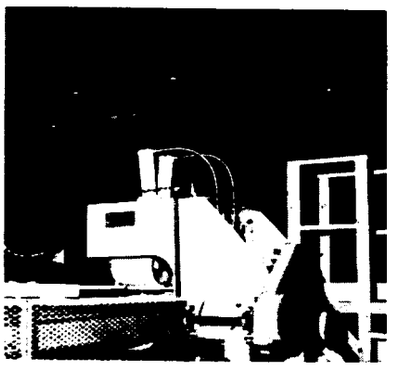
Because the planing mill supplies the company's sash and door plant, it handles from 90 to 100M ft. of sash and door stock per day. Also, all box factor, stock must pass through the planing mill, though the box factory does its own planing.

The new mill is geared to an annual capacity of 60 million bd. ft. and utilizes a 36-man crew. As a safety factor, all mill hands, and all visitors must wear hard hats.

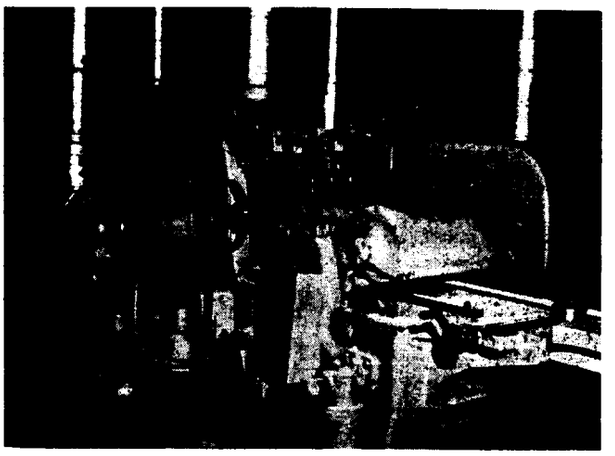
The International Planing mill is part of the company's broad plan of upgrading their operations by improving their **plants** an dinstalling new, fast modern equipment that will reduce operating costs per board foot produced. Many of the ideas used are as applicable and essential to smaller as well as large companies.



The two Irvington 20' trimmers are equipped with automatic, all-width, feeders and back of each trimmer is pair of Irvington end printers and waxers. Right, for a closer look at the operator's control panel. the toggle switches, push buttons and piano keys are clearly outlined.

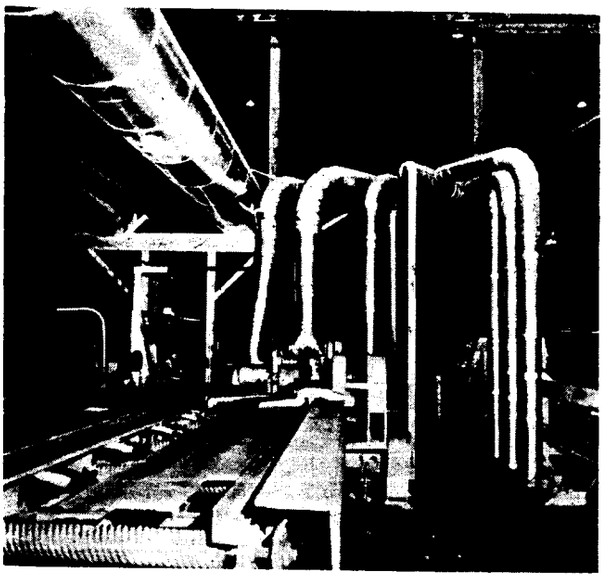


Typical mounting of an Irvington end printer and waxer in the new plant. Note safety cover on right side of unit and the expanded steel safety screen alongside the transfer table.

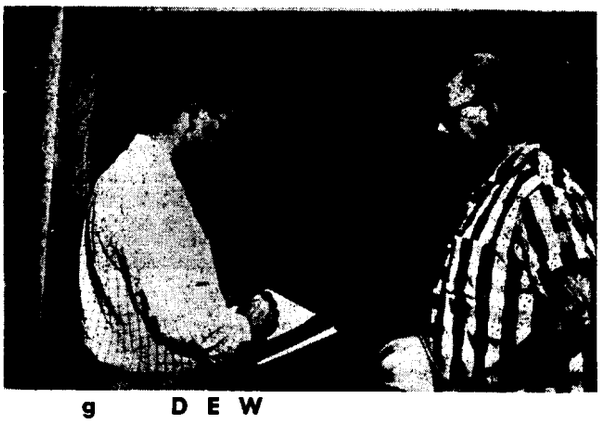


Ross

R pe



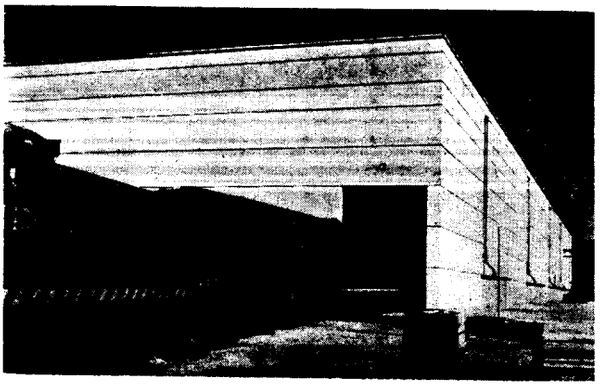
Patterns are run ou a Stetson Ross 6-1%41 10 knife, double profile unit. Feed end is shown here. Dimly seen in background, are pipes rising to the tops of the refuse cyclones.



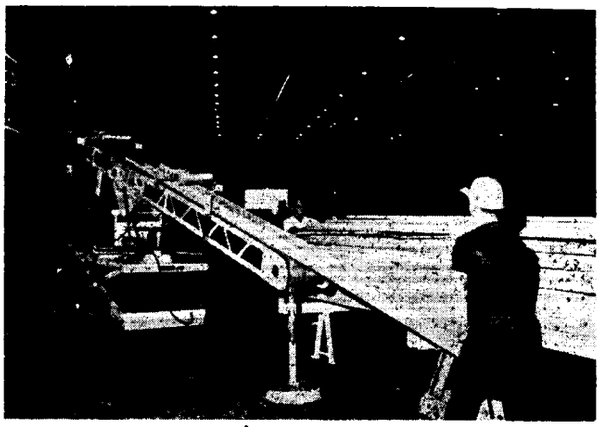
g D E W

pe

M



The new building is immediately adjacent to the old one. The latter now for storage, supplies stock to the new planning mill. Built-up roof is plywood as is siding. .Trusses are steel. Truck entrance, hidden by rail car.



de

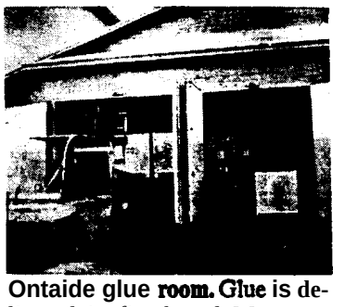
oad

po

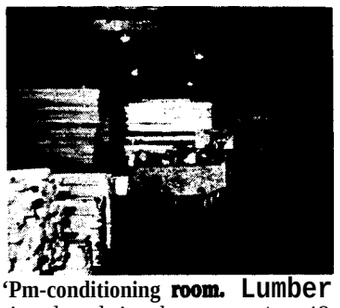
po

FOUR BASIC FACTORS IN ELECTRONIC GLUING

1. Uniform surface, no skips.
2. Uniform glue temperature.
3. Low wood moisture content, 12% maximum, 7-8% desirable.
4. Equalization of moistur'i?'content in the wood. Preconditioning is essential.



Ontaide glue room. Glue is delivered in five-barrel Monsanto tote bins and loaded into place by lift truck. **Room** is refrigerated in summer, warmed in winter to keep glue at uniform temperature. Mixed glue is pumped through pipea to end and edge gluing sections.



'Pm-conditioning room. Lumber is placed in the room **tor** 48 hours before layup. Room average temperature is 80 deg. Rail crane cab is air conditioned. Here all pieces are brought to relative moisture content and evenly warmed through.

Testing lumber for moiature content just before layup is Carroll Foster, quality control man, using Weston meter. Each load is checked before **layup,** with 1270 M.C. acceptable, **7%** to **8%** preferred.

The **Mann-Russell electronic hot presses are used** by Potlatch at Lewiston. First two presses, left, have 12 in. platens and right unit a 14 in. platen for larger beams and decking. View is from offbear. LoC-Deck is being made.

How **Potlatch is**

Developing Specialty Items

from standard lumber by end and edge gluing

Growth in demand for, and number of end products from glued-up wood is becoming an important factor on the balance sheet of Potlatch Forests, Inc., Lewiston, Idaho.

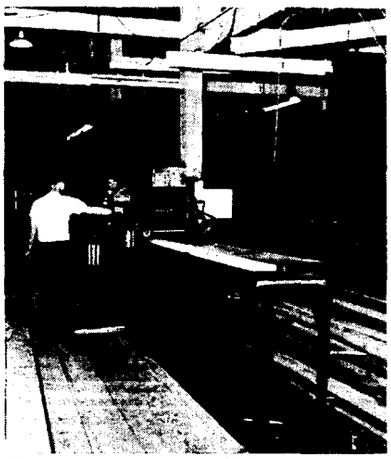
Four principal products are showing steady growth: (1) Laminated Loc-**Deck,** a glued-up planking for roof decking and for thick walls; (2) straight glued-laminated beams in standard or specified lengths from 16 in. wide to 32 ft. long; (3) wide boards made up of either uppers or utility grades in specified or random lengths from 4 ft. to 16 ft. long and 16 in. to 24 in. wide. **Fast-on is** made up of No. **4** or better into a utility product for shelving, lining, industrial boxing, barn **siding, cabinet** backs, sheathing, sub flooring and other such applications; (4) laminated 2x4's made up from finger jointed and edge glued shorts, a quality product available in 8 ft. lengths.

Loc-Deck planks are made up of three pieces 4/4 or 8/4, surfaced and center and end matched. A re-finish machine smooths and eases the edges of the tongue and makes a tight edge and matched V-groove joint. Phenol formaldehyde resin glues are used in making Loc-Deck and the product is stress rated in three grades. Production is 1,000,000 feet per month.

Wide boards are made from random 4/4 stock, blanked and s2s to 29/32 in. After glue-up, stock is surfaced and straightline ripped. End gluing is done with a Stetson-Ross finger jointer and a Mann-Russell high frequency gluing machine. Production is more than 600,000 feet per month.

Glued-up 2 x 4's are end jointed and glued up in special equipment. Studs are glued to specific or random lengths from 7 ft. to 12 ft.

Glued-laminated roof beams are made up on the same Mann-Russell presses used for Loc-Deck. All beams are made of Douglas fir and larch. Beams longer than 32 ft. are available on orders which are subject to confirmation.

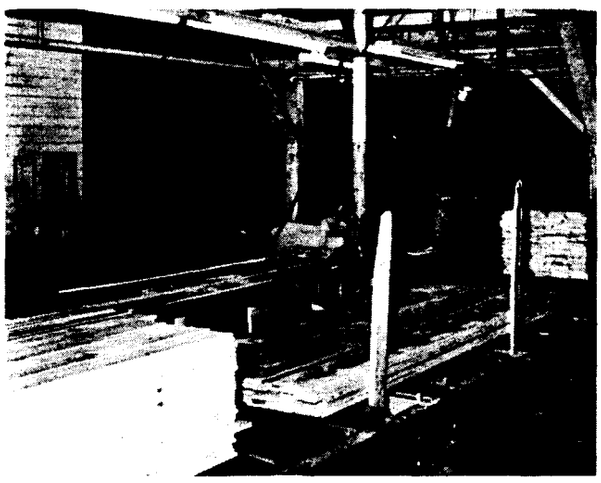


Glue is applied to finished lumber used for laminated beams and **Loc-Deck** by running it through this glue spreader.

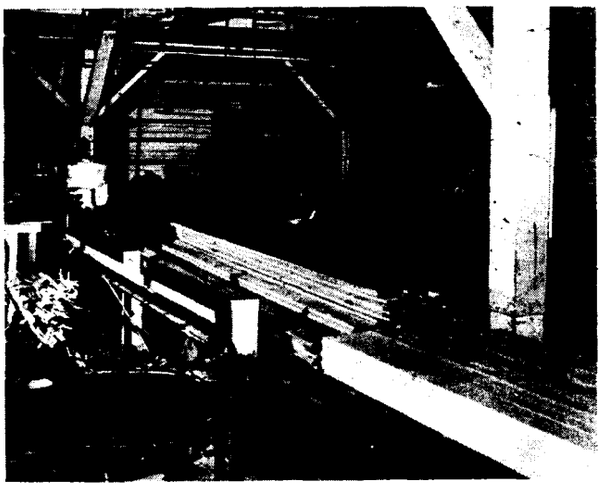
Jig **layup table** has metal jig at end. Offset jig provides for fast layup and correct offset at ends and edges of Lee-Deck. Full width lumber is used.

Jigs used to set T&G pattern in sides rides through press with stock. They keep stock away from electrodes, prevent slippage. Jigs are of plywood.

Batch edge gluing of wide boards



Batch edge-glue room. Here lumber for wide panels is ripsawn with Mattison straight line ripsaw at left. Prepared stock is then stacked on the conveyor at right and moved to layup section.



Lumber is mn through glue applicator at left, crosses over to be laid up on the table at right background. This stock then goes through an old steam press at right to set the glue. Stock here is 4/4, used in making 24 in. Sterling grade Idaho white pine far quality wide board. **Fast-On** lumber sheathing is also laid up on this line, using No. 4 and better, 24 in. random length.

Making laminated 2x4s

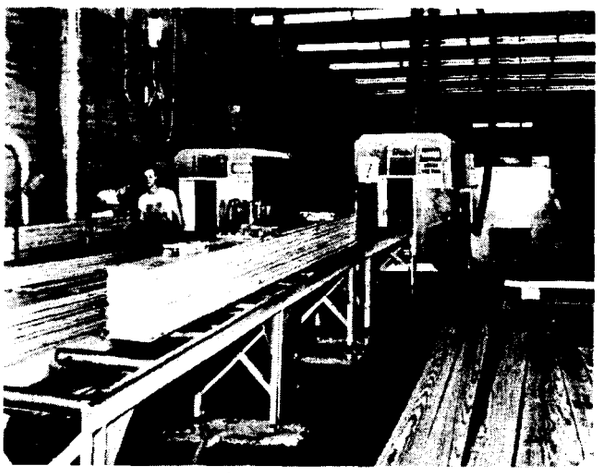
Unique 2 x 4 laminator, right. Finger jointed and 525 stock is first fed through the Calrod heater section (1) where it is preheated. Heated lumber then passes through a spreader and is laid up. It feeds by belt onto a butterfly which drops the stock into the open clamp of the hydraulic cylinder press. As the press turns it drops out a completed 2 x 4 at the bottom and receives another at the top. Since the wood is preheated, the cylinder press requires no heat, only pressure to set the glue.

Laminating at Bradley-Southern division

The Bradley Southern division of Potlatch Forests, Inc., Warren, Ark., has an electronic edge gluing systein similar to that at Lewiston. Southem division also produces LoC-Deck, laminated beams and 2 x 4's.

This plant uses two Mann-Russell electronic presses with 14 in. openings. Glue is Borden's standard resin phenolic. Plant operates three shifts, six days a week and turns out an average of 1000 bd. ft. per hour, depending upon product being produced. Products go to both retailers and fabricators.

Lumber surfaced on two sidea is first run through the glue spreader and laid up to proper thickness on a jig-table. Two men handle gIuing and two on Iayup.



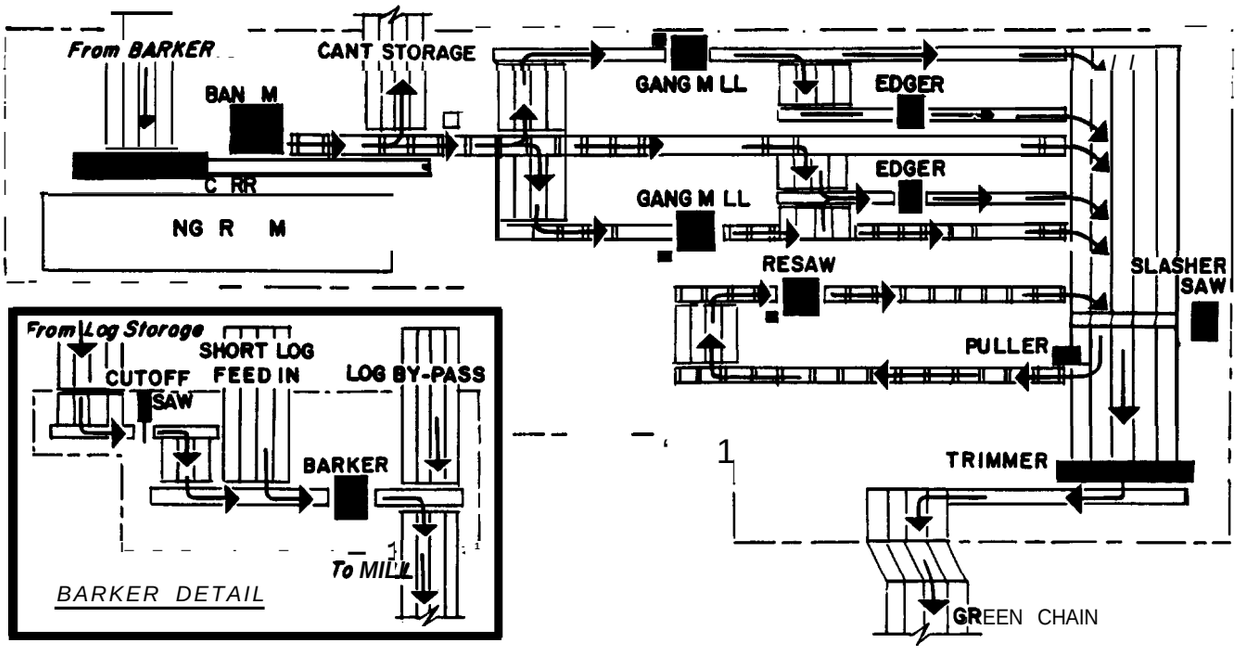
Loc-Deck emerging from the two Mann-Russell 40KW 12 x 14 electronic presses. Deck lengths are up to 20 ft. and laminated beams run up to 32 ft.; 2 x 4's are 8-foot.

Plylumber flooring–new first in laminating

Potlatch Forests *recently* introduced Plylumber flooring to the market. It is an entirely new product. This is a high quality glued-laminated structural member as well as a decorative flooring. It is a three-ply, cross-laminated wood product with hardwood face of red oak, pecan or elm. Plylumber makes the subflooring and hardwood surface available in a single plank, permitting installation of entire floor in one application.

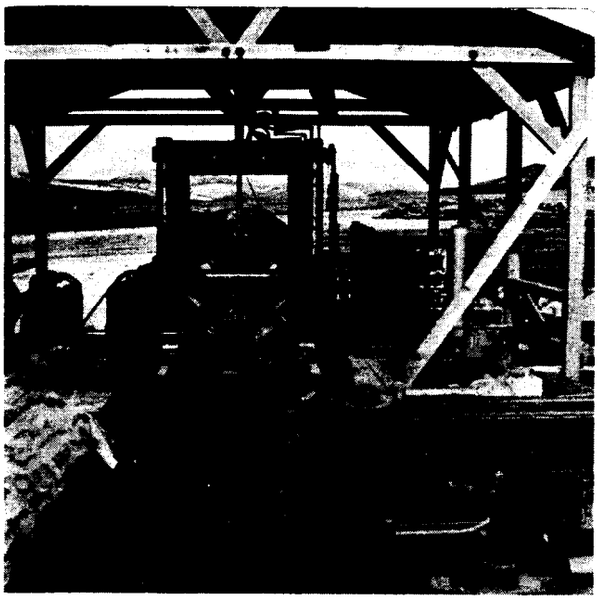
Exterior type adhesives are used to insure a waterproof glue line and Plylumber is laid up and cured in a steam heated press. The product is dimensionally stable. It is manufactured in two sizes: 7/8 in. x 12 in. and 1-5/16 in. x 12 in., and in lengths of 8, 12, 16 and 20 feet. Sixteen-foot lengths are standard.

Machined to size at the factory, it is a full 12 in. wide and has tight-fitting T&G joints to transmit load between planks. It is finish sanded on the job site in usual way after laying. The 7/8 in. is normally used on 32 in. to 36 in. center joists, and the 1-5/ 16 in. on 48 in. centers, and will span up to 6 ft. centers. Product is FHA approved.

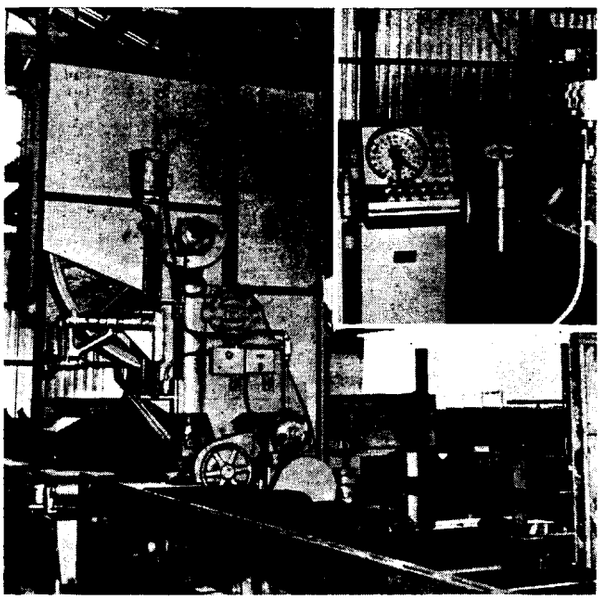


Saw logs averaging 9½ in diameter

will be cut at a new band and sash gang mill in western Montana



Nicholson barker is backed up by an L-M bucking saw. Barked logs are kicked left and moved to the mill on level transfer chains. Level transfer requires less hp and reduces motor cost, yet is more efficient than an inclined system. From barker straight through, the mill is designed for maximum utilization and return: power plant has solid fuel injection, suspended boiler; all lumber is dried, in one double track and two single track kilns; overs from chip screen are sent back for re-chipping.



Though logs are small, the headrig, a Sumner, is a 7' unit. This size was required in order to get sufficient saw surface and speed. Generally, the mill will break small logs down for the two gangs and highgrade the larger logs. The inset is a view of the sawyer's pit, with his controls for the Salem automatic setworks for the 4-block, 24' Salem carriage. The drive is a 250 hp Consolidated AC-DC unit which affords power for the mill to cut a line every five seconds.

Montana Forest Products. Inc., at **Philipsburg,** is designed to cut 30 to 35 million feet a year 'and **will** take **logs** down to 5%" tops.

Based 70 percent on Iodgepole pine processing, the new operation brings industrial activity to the nearly untouched small timber area of Deer Lodge National Forest. Other species rounding out the full production will be alpine fir, spruce and some-Douglas fir.

The new plant is made up of sawmill, planing mill, barker and chipper system, dry kilns and dry storage. In the mill are a 7' band and two 26" sash gangs, two edgers, a resaw and a trimmer. A Butler building, 200' x 400', provides inside storage space.

Equipment in the mill is remotely controlled, with individual control panels and transfer light-indicator systems. There is no physical handling of logs or lumber from the barker to the green chain.

As indicated on the flow chart, left, the mill has straight production flow, no turn backs. An important economic feature is single level flow; no inclines.

Because of climatic conditions, lumber will be stored under ***cover.*** The planing mill, adjoining the sawmill, feeds directly into the storage sheds.

Site preparation to fit the plant design was extensive and called for a substantial investment. For example, the hill area was leveled to a 1 percent grade to provide solid footing and a level operating area. And, in time, the entire operating area will be blacktopped to gain maximum operational efficiency. There are separate road systems at the site for log trucks and for other vehicles.

Log storage is all dry decking. All log handling is done with a Michigan and with a Wagner loader and logs are delivered to the barker on level **transfers.**

Montana Forest Products, Inc., was built by experienced Oregon lumbermen. The mill represents a **$2½** million investment. Duane Autzen, Portland Lumber Mills, is president. William Birkenfeld, logger and lumberman, is vice president and Henry A. Buehner, Portland attorney and lumberman, is secretary. Thompson & Holmberg Inc., of Portland, Ore., designed and constructed the plant.

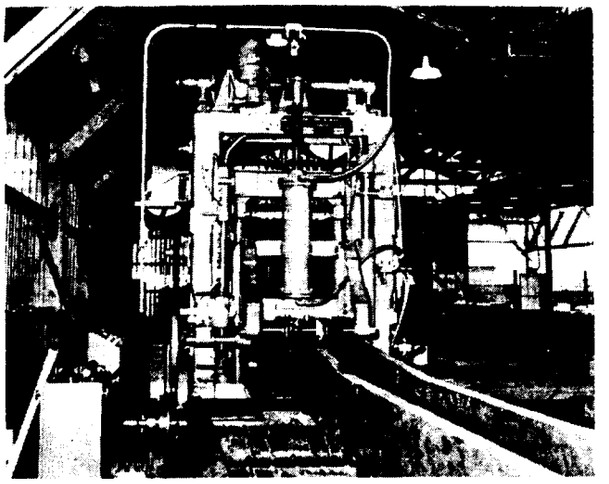
The mill is supplied with logs from four and five-man sides, of which there were 20 at the start. Later, there may be as many as 60 sides operating, to match three-shift operation of the sawmill. In full production, the mill will employ 83 men and there will be up to 200 at work in the woods.

In addition to timber from national forest sales, the mill has 15,000 acres of its own timberland. The cut will run about one-third private and two-thirds Forest Service. All logs will be handled in 48' lengths from the woods and will be taken by weight, rather than by log scale.

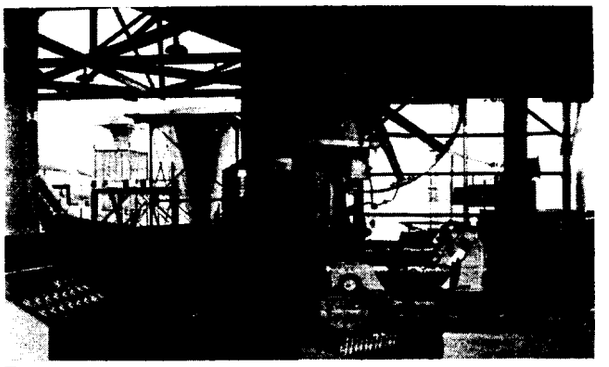
Twenty-five to 30 miles of main line road will be built annually, and the whole operation will be a hot deck one, with fast cutting, hauling and processing to prevent formation of stain. Radio communications will be used extensively to keep the show running smoothly. Everett Miller is the woods manager, and Knut Ness is plant

EQUIPMENT

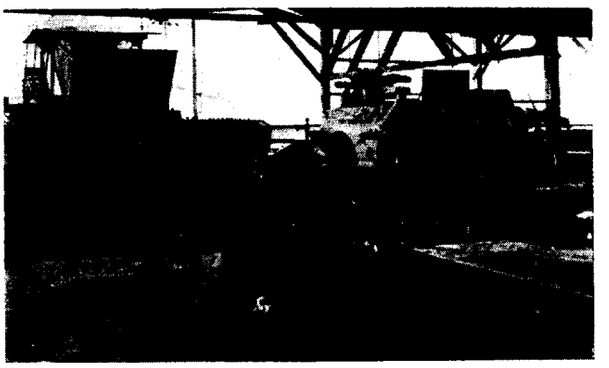
Erie boiler: **Lovsted** dry kilns; **Carthage** chipper; **Rotex** screen; **Rader** blower system: **American Sheet Metal** refuse blower system; **Mill Engineering** sash gangs; Sumner headrig; **Salem** carriage; Niclsotson barker; **L-M** bucking saw; Moore Dry Kiln electric swede; Stetson-Ross 6-12-A1 planer; Portland Iron Works trimmers; Irvington end printer; **Butler** building; **Consolidated** carriage drive.



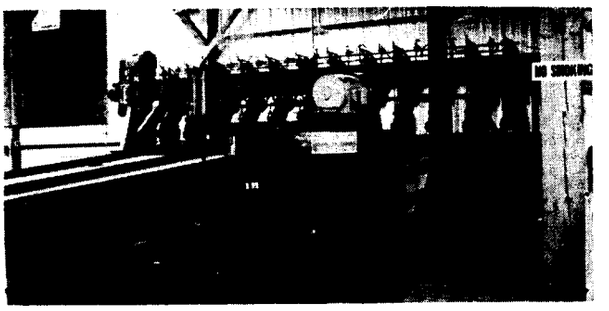
as angs



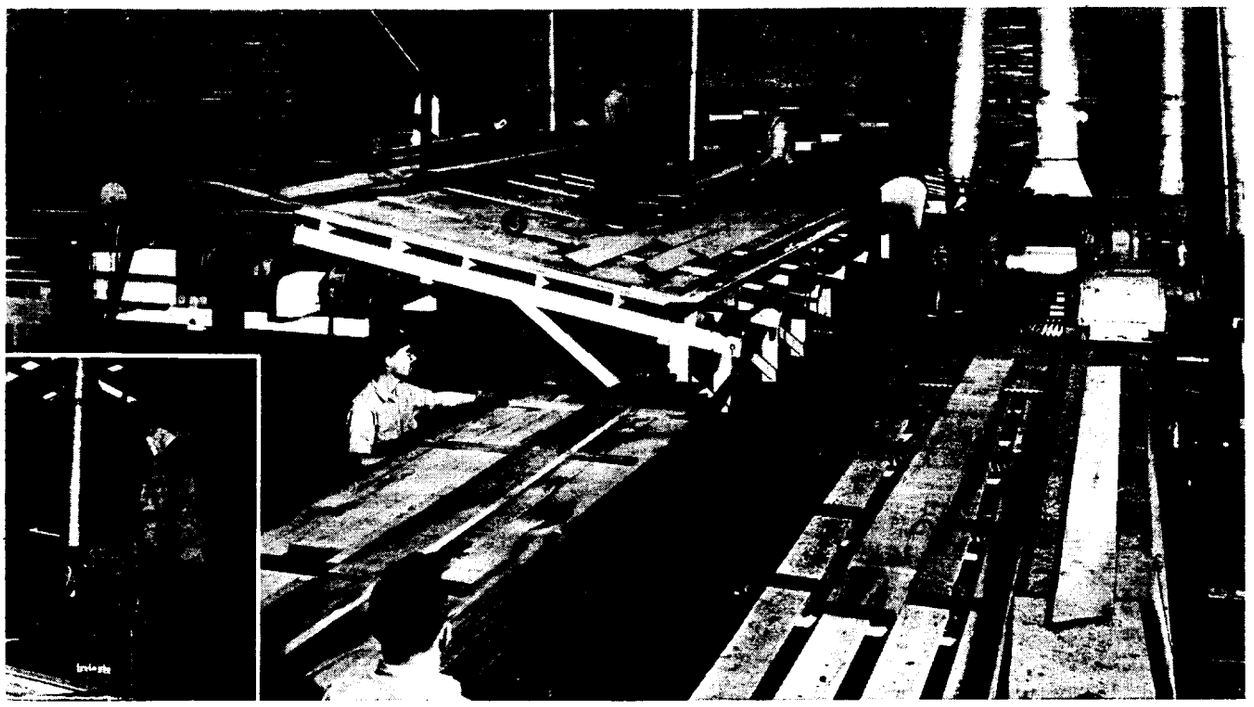
R



B



mm



Blanking section. Process begins at the Woods planer at right. Short cross-transfer (1) moves surfaced stock to feed belt (2), which delivers it to inclined storage table (3). Three cutoff operators (4) pull stock from table for Irvington air saws. As trimmed pieces drop to sbrting conveyor belt, operator pushes button actuating kickoff for proper bin. Sort is made for color and grain. Industrial Components electrical control system has a 5-key pneumatic selector keyboard (insert) at each station. Pressing key automatically cancels out previous sort and actuates kickoff from conveyor belt. At (5) is trimmed load on tilt hoist feeding jointing line.

Specified length cedar lumber

Five sorting **bins,** below and beyond battery of cutoff saws. One man handles the stacking of the pre-sorted stock onto pallets for fork lift delivery to the finger jointing line. Gates back of bins open out,

Washington mill, gearing product

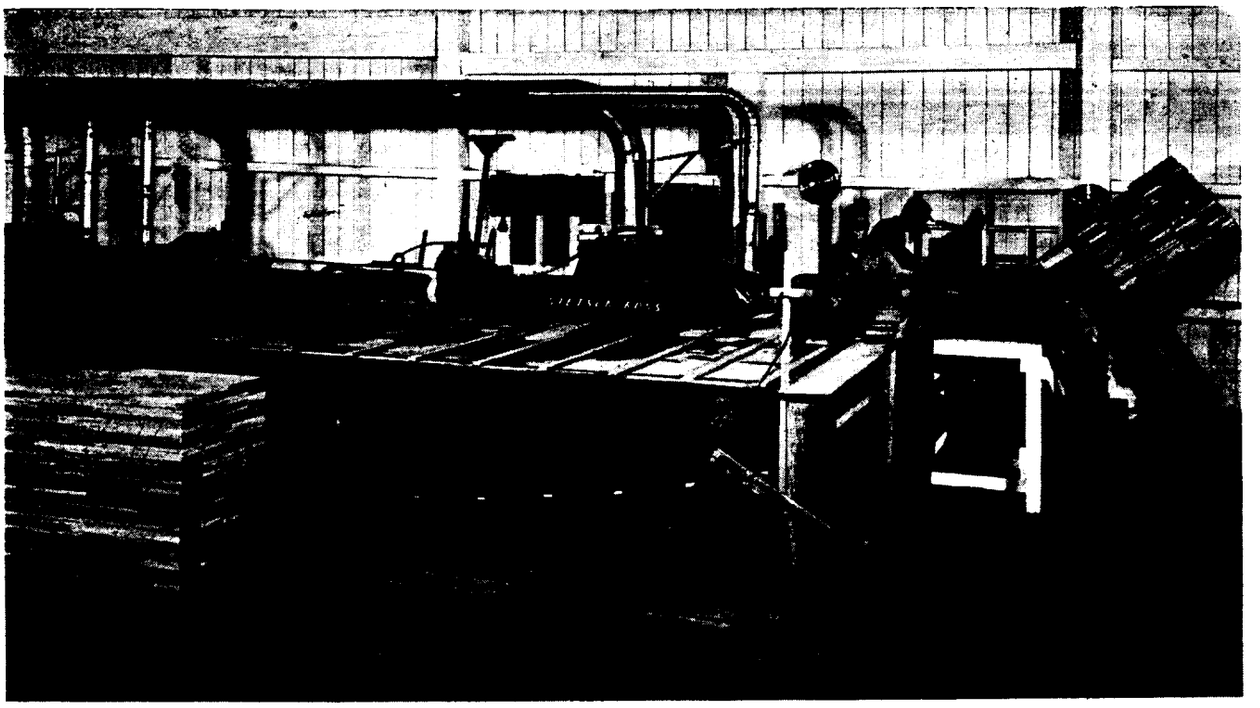
10,000 board feet a day in a new,

Demands for straight, precision-cut cedar lumber for siding and moulding, free from defect, are increasing and the E. C. Miller Lumber Co., Aberdeen, put in this high-production finger jointing line to supply current demand and to meet future increases.

Not only does the company, which specializes in cedar lumber, manufacture a specific product for a specific market, it also boosts its own degree of utilization as it uses up previously troublesome short lengths.

In view of these two important economic factors, the outlay by the company of more than a quarter million dollars was a planned investment in the future, according to president Robert M. Ingram, Sr.

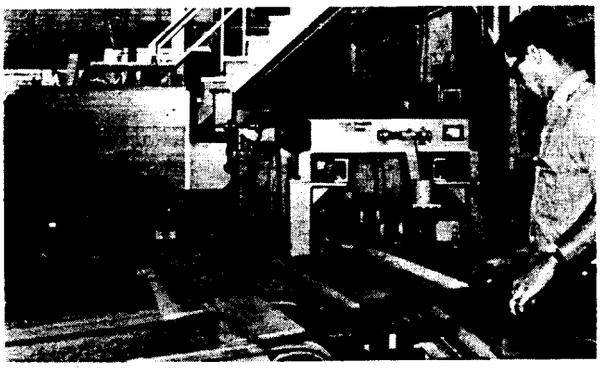
Seven men handle the blanking in the plant and four handle the jointing. Short lengths, ranging from 11 inches seven feet, are used. Everything longer than seven feet goes back to the sawmill. Most of the short lengths which develop and which go into the finished product are from 14 inches to five and a half feet long.



Jointing line, with its dual Stetson-Ross 746 machines, receives stock from tilt lift breakdown. The assorted lengths are put on the slat feed belt, which insures perfect alignment of the material as it goes through the cutting action. Out of the first jointer, the stock then is kicked by rubber wheel (arrow) onto the adjoining slat feed for jointing of the opposite end. Here, also, the glue is applied automatically.

to he market, turns ou

$300,000 end gluing plant



Each piece is examined for color and grain by the man feeding the Mann-Russell electronic gluer. The crowder rolls take over after he has put the end joints together and the continuous ribbon of defect-free lumber takes form and moves on through the gluer.

The Stetson-Ross jointing line was designed for fine milling of cedar. The four-knife head turns at 6,000 rpm rather than at the normal 3,600 rpm. Knives are jointed to a perfect cutting circle and follow precision saws that pre-score the cutting area.

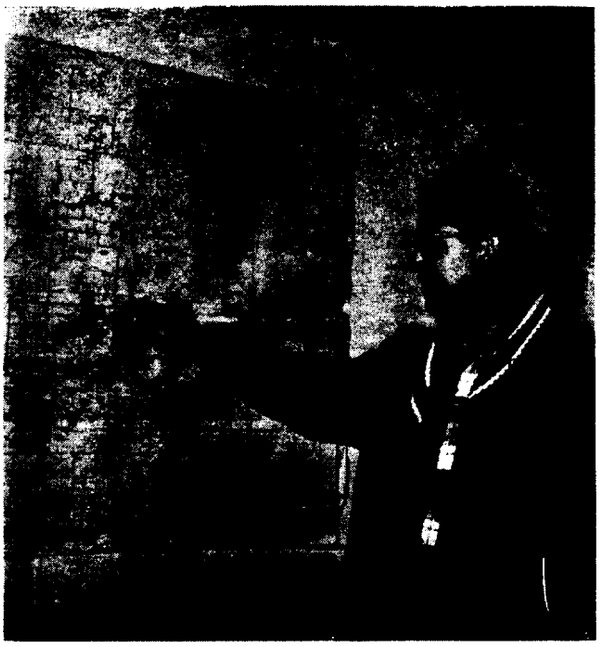
This precision manufacture results in fits of close tolerances on edges of the joint surfaces and in uniform widths, depths and thicknesses internally. Thus a glued piece of lumber can later be resawn without a void. A patented doctor-roll glue applicator is timed so that its application rate matches the speed of travel of the stock, insuring 100 percent glue coverage.

The end product, which the company has named **Miller-Loc,** is clear, flat, uniform lumber which is treated with Protection Products' Woodlife. When finished, the lumber can be machined for siding, mouldings, or other specified items. Except for uses calling for structural grades, Miller-Loc can be used interchangeably with regular lumber for both interior and exterior applications.

Mann-Russell flying saw (arrow) mounted at the outfeed side of the gluer cuts pre-determined lengths from the continuous stream of lumber. Cut pieces are kicked off onto skate rolls, then stacked for length and width. From here, lumber is processed for specific uses.

"Get competitive," says small operator, "by taking material big mills can't use."

Homer Lumber Co. cuts 48M daily with 13 men



Raw material source, large second-growth area, is shown on map by mill manager Amos Homer. He designed mill, including many special features.

"This whole operation is predicated on the fact that it is virtually impossible for the small operator to compete with the big outfits who have timber of their own. We must get material they can't use."

This is how Amos Homer, president of the Homer Lumber Co., Cascadia, Ore., explains his operation and his location — deep in the heart of a main Cascade mountain drainage. His mill is surrounded by thousands of acres of an old burn — re-established with a healthy 80-year-old second growth stand badly in need of thinning.

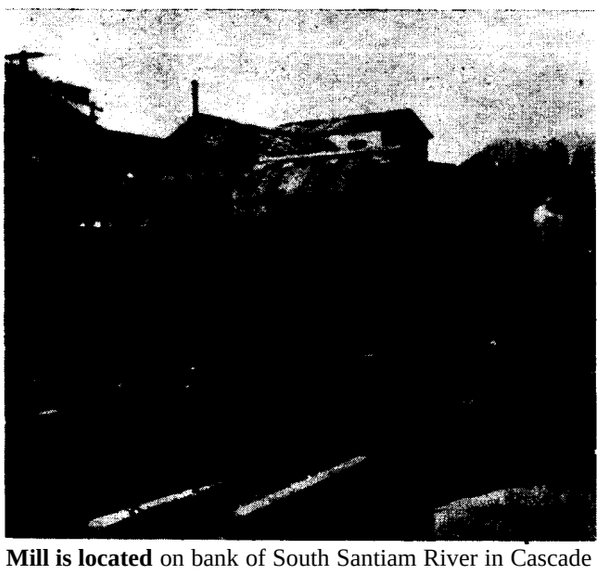
It's from these thinnings that he hopes to obtain a large share of his future timber supply. At present, he is obtaining 20 percent or less of his logs from thinnings, but he hopes for increased U. S. Forest Service thinning sales as forest management becomes more intense.

His location — close to the forest — provides him with a favorable bidding edge on the sales.

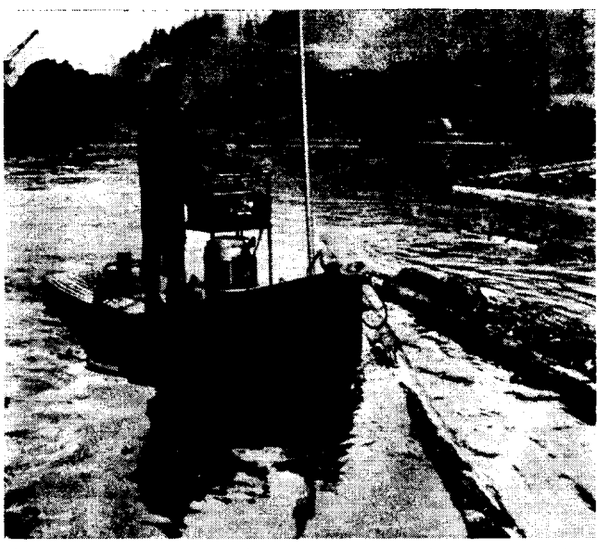
Mr. Homer is buying about 60 percent of his log supply from the larger operators. These are small logs the larger operators find more profitable to sell than to saw.

The 24-foot mill can take logs up, to 36" in diameter, but the average log is 16". Minimum top diameter under U. S. Forest Service timber sale specifications is five inches.

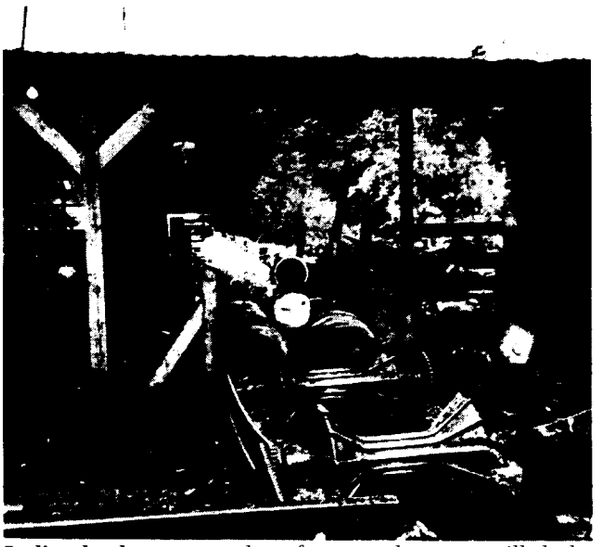
The small logs require a good percentage of overrun for a profitable



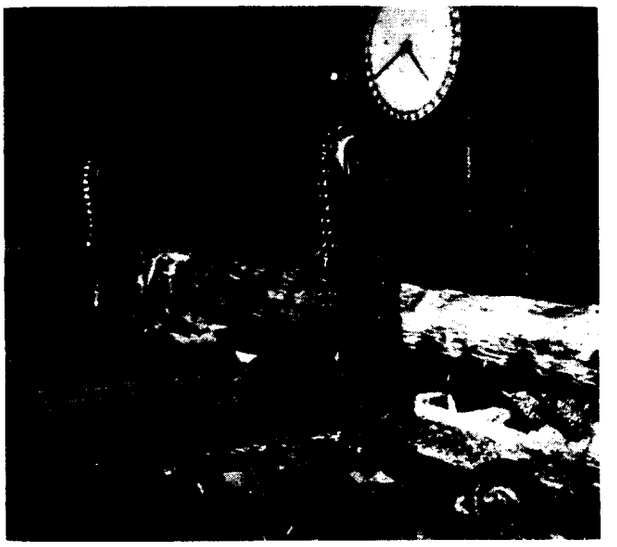
Mill is located on bank of South Santiam River in Cascade mountains. Log lift serves barker, center, Chip loading bunker is at left, main sawmill at right.



Pond boat makes possible one-man sorting and moving of logs to mill. Nelson Log Bronc has Mercury engine. Motor operates in well, allowing full swing in tight places.



In-line barker accepts logs from pond, serves mill deck. Nicholson Coon Hound machine will bark 24-in. log. Average log sawn is 13-in., minimum is 5-in.



og turn

operation. The 5/32" kerf on the headrig, a former Mershon five-foot resaw, contributes to a high overrun—45 percent.

Mr. Homer says, "I think this course is safer than competing with the bigger operator on bidding for sales. We don't get a high percentage of uppers in our lumber, but we also don't get lower grades. Merchantability is good."

"This smaller log produces lumber with soft texture and small knots, yet it isn't the type of log that fits medium or high production operations," he said.

Mr. Homer is a firm believer in upgrading his product. "We have to think more toward further manufacture — a small moulding operation perhaps," he said.

He started with his bandmill, cutting an average 48,000 board feet daily, and then added a barker and chipper.

The mill cuts 60 percent hemlock. Mr. Homer's operation is mainly in dimension stock as a rough-green mill — leaning toward special orders. Railroad ties, hemlock cross-arms and cedar 3x6 and 4x6 roof decking are some of the specialities.

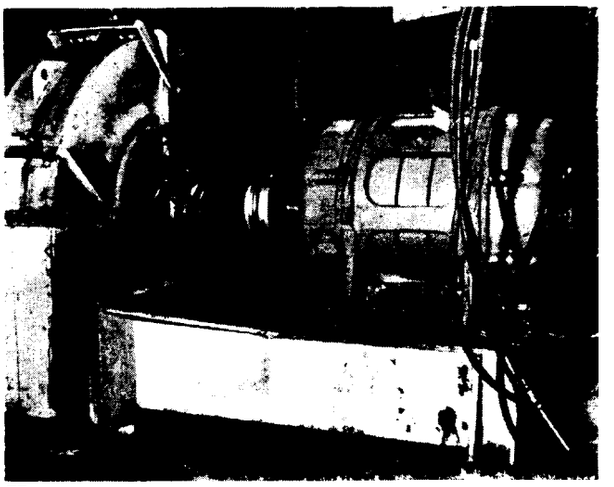
In operation, logs are fed by the log lift to the barker, routed to a short deck and onto the 4-block air-dogged carriage. Sawed cants are usually channeled to the edger, but clean cants are also routed directly to the resaw or directly to the sorting chain.

There are 13 men in the entire operation. The production crew consists of: pond boat operator; pond-saw and log lift feeder; barkerman; sawyer; edgerman; drop-sorter and slab puller between edger and resaw; resawyer; trimmerman; grader; three sorters; and filer.

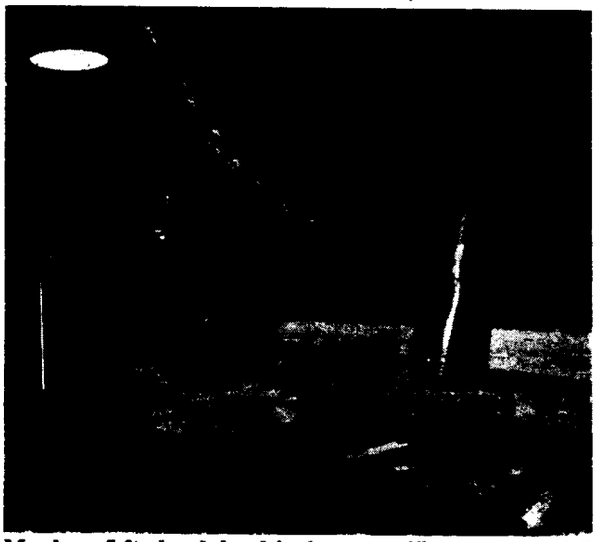
EQUIPMENT

Nelson Log Bronc pond boat; Nicholson 24-inch barker; company-designed carriage with air dogs, electric setworks; **Zidell** cable feed; **Albany Machine** Works 6x36 edger powered by Allis-Chalmers 50-hp motor; **Link-Belt** sorting chain; Hansel chipper; **Westinghouse** 125-hp motor; Mershon five-foot band headrig; Quaker **Pioneer Rubber Mills** rubber belt; **Webster Electric Teletalk** intercom system; Gardner-Denver air compressor driven by Brook 50-hp motor.

Trimming is by jump-saw on table behind resaw. Rough green stock is final-trimmed when dried and surfaced. Little green trimming is required.



Ha

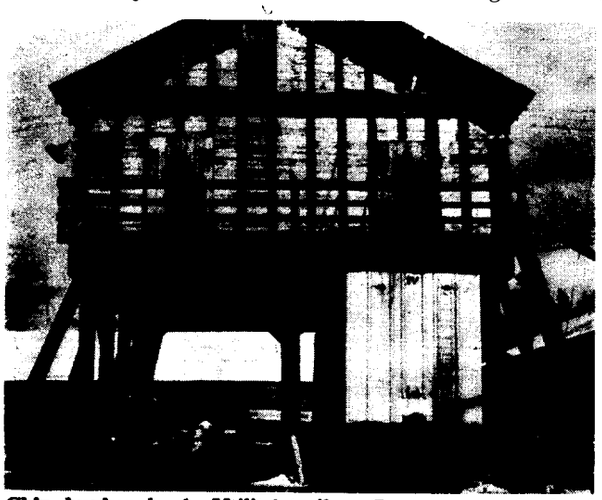


Mershon 5-ft. band headrig has no offbear. Cants fall against heavy weight, drop squarely onto rollcase. Spiraled rolls provide any further squaring needed.

Air-operated transfer table from main offbear **rollcase** picks up cants for the Albany 4-saw edger. Edgerman controls the machine by remote control.

Automatic table on offbear side of edger transfers stock to drop-sorter who drops slabs, edgings to chipper feed, directs cants to resaw and manufactured lumber to Quaker Pioneer rubber belt in foreground to green chain.

Circular resaw has company-built setworks. Webster Electric **Teletalk** instructs sawyer, resawyer, edgerman.



Chip bunker loads Utility trailer. Company trucks haul fir chips to U. S. Plywood, Lebanon, Ore., for hardboard production, and hemlock chips to Crown Zellerbach.

Gerlinger fork lift loads lumber on Utility trailer for trucking to planer operation at the Bauman Lumber Co., Sweet Home, Oregon.

10 Men with Push Buttons

operate this king-size small-log mill

Here is the most advanced application of electronics to a sawmill to date. It has ideas galore for small and large plants: Cuts 120M board feet per day.

Control panel for Nicholson .%" barker.

Lumber produced in the Simpson Timber Co. small-log mill at Shelton, Wash.. emerges onto the green chain nearly "untouched by human hands."

In a showcase for automation 10 men produce 120,000 hoard feet of lumber per shift from logs 6" to 30" in diameter. Logs are barked, bucked, gang and bandsawn, edged, trimmed and resawn, guided by a button-push-er.

Everyone in the mill controls the lumber flow and makes decisions at the flick of a button. Offbearing is automatic, except at the bandsaw which has an off bearer.

Workmen are spotted as follows: man feeding the side-lift at the pond, barkerman, cutoff sawyer, gang-sawyer bandsawyer, offbearer, two edgermen, grader, trimmer and resawyer.

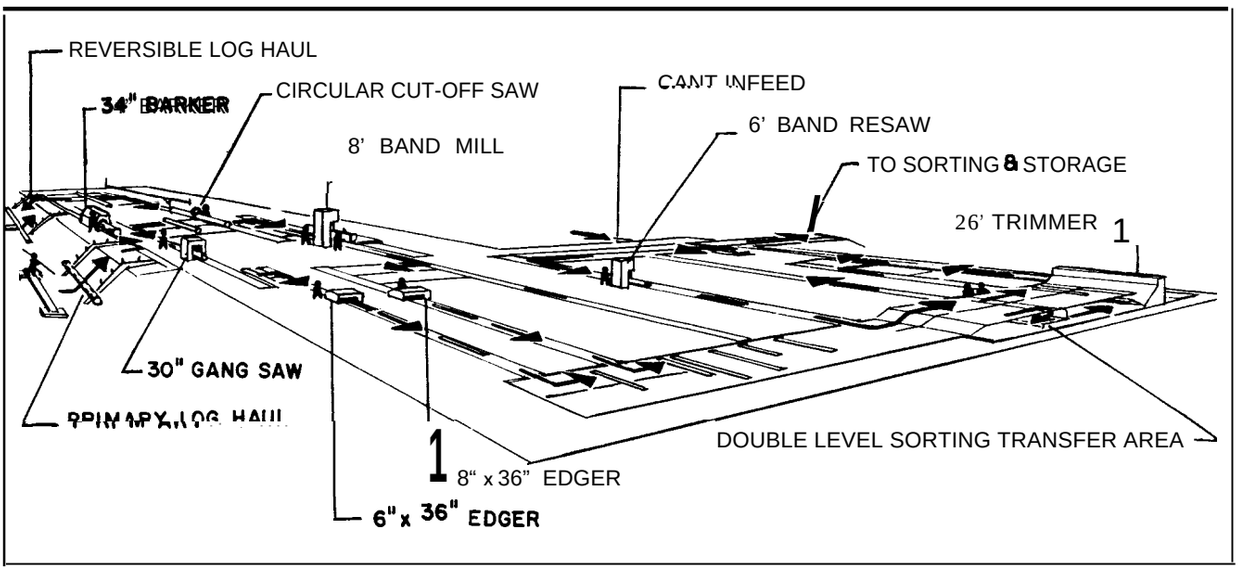
The mill was specially designed to handle the smaller logs developed from the firm's thinnings on its own tree farm lands as well as to saw small purchased logs. It is expected to use 40 million board feet annually, on a two-shift basis. of fir and hemlock. Simpson had been cutting these logs in its larger mills-consequently losing production.

This $1 million plus installation is tailor-made for the smaller logs, but versatility is built in. The gang takes medium-sized, medium-grade logs, while the bandrig saws the largest logs and those with defect. The bandrig also takes a slab on each side of the smallest logs and passes them to the edger.

This is the operating procedure.

Lags enter the mill by way of an automatic side-lift with a pondman channeling them toward the lift—virtually the last manual operation until the lumber discharges onto the green chain for sorting. The plant uses fir and hemlock logs from 8 to 42 feet long.

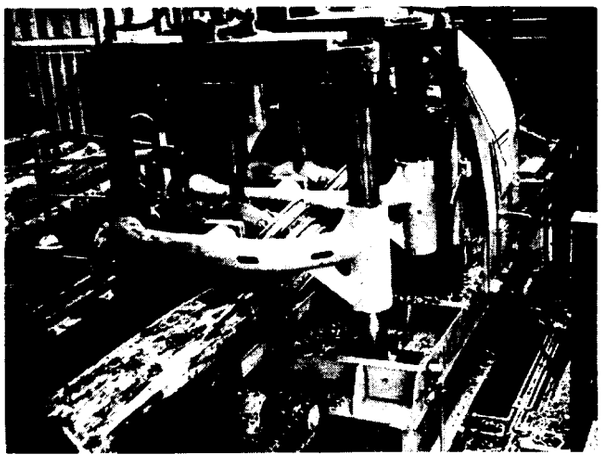
After barking, the logs can be kicked back into the pond for storage or directed to the automatic dccksaw installation. As a log proceeds down the log haul to tbe deck



New Simpson Mill is a Showcase for Controlled Power and production Ideas

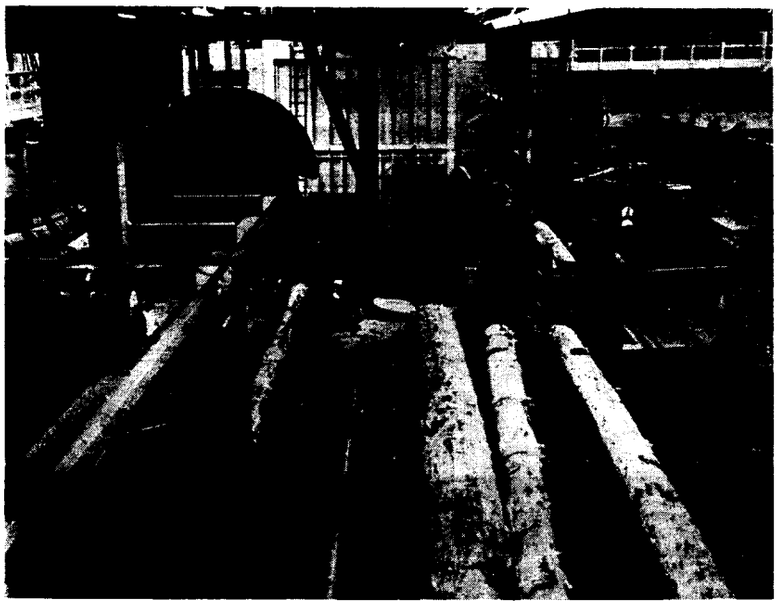
The Barker . . .

Nicholson Accumat 34" barker with four hydraulic hold-downs, receives logs from far side and offbears in foreground. Operator at control panel at right. Barked logs can go either to bucking saw to back into pond for storage.

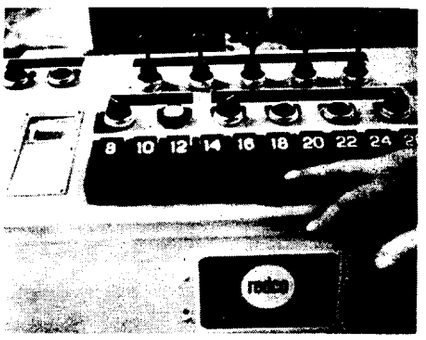


The Log Deck . . .

Automatic bucking (below) . Arrow points out flap which follows behind log, gives bucker length on coupled tape on control box of REDCO system. Trims ends, then presses button making automatic cut. Bandmill at left, gang at right.



Control panel for bucking saw enables operator to automatically buck logs by pressing desired length button. Reads log length on window dial at left on the REDCO control system.



saw, a paddle operating from an overhead monorail follows behind the log. The DC-powered paddle operates a Selsyn system operating a tape mounted on the deck-sawyer's control stand.

The deck sawyer reads the log's exact length through a window on his console. He brings the log to position, engages the dogging jaws and squares off the end. He then determines the length of the first cut he desires and pushes a button for that length. He also turns a switch designating the piece's destination—gangsaw or bandmill.

The log then, automatically, proceeds through the saw until the proper length is reached. A series of photo-cells mounted at two-foot intervals on the offbear side of the saw stop the log at the required length, from 8 to 26 feet. The clamps engage, the cut is made, and the two-way kicker kicks the piece off toward the proper manufacturing unit. The deck sawyer then indicates the next cut through by pressing a button.

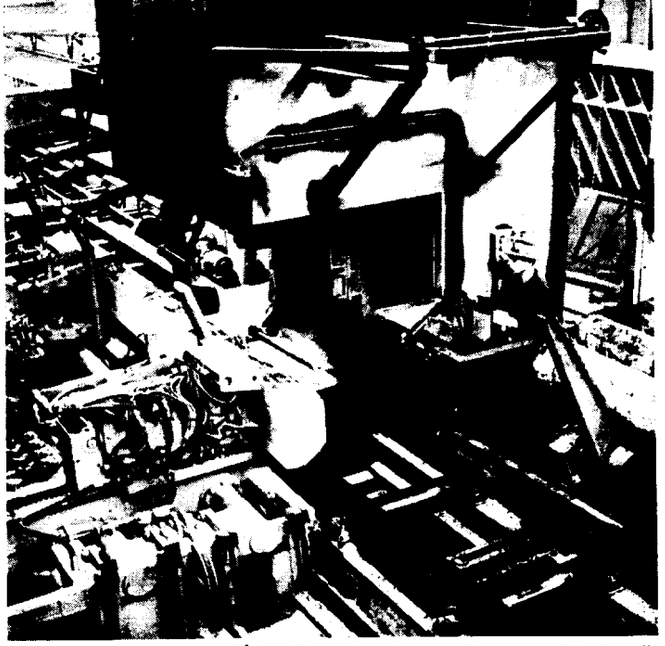
The system was designed to eliminate as much trimming as possible, through accurate bucking. This can gain increased utilization. The sawyer tries to take half of the trim at each end of the piece. The cutoff saw is set for the lumber's exact length (example: %4-foot log is cut 24'3") .

Gangsaw logs are kicked onto a W-foot live deck serving the gangsaw carriage. The autornatic-offbearing gang has overhead jaws which offbear with the sawn log, holding the sawn lumber together until it clears the saws. A claw operated by an air piston, then kicks the stack onto its side from where it is fed under the board separator, a simple device which employs five weighted toothed wheels.

The separator, operating at a slightly slower pace than the transfer chains feeding the gang edger feed table, pulls the lumber apart—releasing a piece at a time. The chain-

The Band and Gang . . .

Feed side of Esterer HD-30 gangmill, powered by an A-C 200-hp motor. DC feed. Has 11 saws and cuts 2" stock. Gang takes medium sized logs and small logs without defect.



Headrig is Sumner 8' doublecut band with Sumner 3-block 36" opening carriage. Has C&D automatic setworks. Knees have air dogs with linkage so dogs move vertically. Each headblock and track is single unit. Pipe frame has air storage. Total weight with setworks is 15,000 lbs. Feed works are GE-REDCO.

Offbear side of gangmill shows C&D tongs offbearing. When piece is clear of the gang, air-operated claws release and air-operated claw (arrow) in roll case kicks piece onto offbear chain.

Lumber separator on gang edger transfer has 5 weighted toothed wheels which ride on stack and separate' pieces. When the edger feed needs stock, limit switch starts wheel. Automatic separator speeds operation, avoids tieups.

driven separator wheels only turn when the feed table is clear, calling for boards through release of a limit switch on the feed table.

A 20-foot live deck on the opposite side of the two-way kicker from the decksaw serves the eight-foot double-cut bandmill which is the grade recovery unit in the production line. The specially-built three-block carriage, a riderless unit, is built for fast travel.

The carriage has a maximum speed of 900 feet per minute with an acceleration of 23½ feet per second^2. From a speed of 600 feet per minute, it can be brought to a full stop in 2½ feet.

The sawyer makes his basic set when he loads the log and then twists his operating level to subtraot the next set he desires. He pushes a button on the handle to actuate the set.

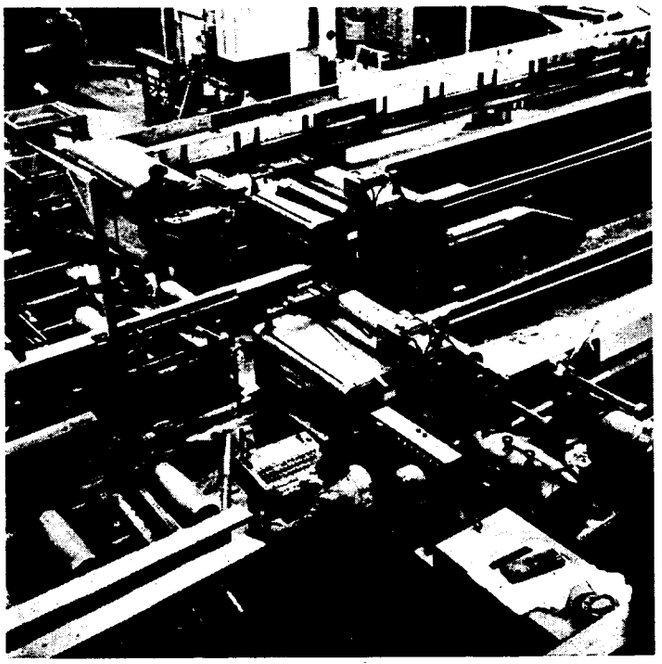
The edgers, which handle the output of both the gang and the bandmill, have air-operated slab turners to enable the edgermen to turn cants as required before feeding them to the edger. The side-by-side edgers feed onto the transfer table to the sorting area through hydraulic edger pickers which channel the edgings onto the chipper conveyors below.

The major "decision area" is the double deck grading table where a grader, operating with three control buttons, directs stock to the resaw, trimmer, or directly to the green chain. Lumber designated for the trimmer goes down a decline to the trimmer located directly below.

The lumber proceeds across a rollcase where it is even-ended against a stop. It then passes the trimmerman's position 20 feet ahead of the trimmer. A magnetic memory system actuates the saws at the proper time.

The trimmerman also has a drop-out to send stock to the resaw. The resaw feeds back onto the grading area. Carrier loads of purchased cants can be introduced to the resaw on bunk transfer chains from outside the mill.

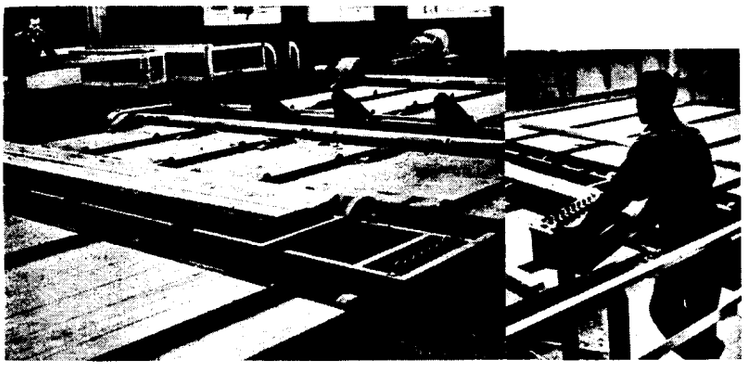
. . . Edgers and Dropouts



Sumner 4-saw edger installation shows 6x36" gang edger in foreground, 8x36" bandmill edger in center. Sumner 6' resaw at mar. Edgers and resaw have C&D automatic setworks and feed tables. Edgers equipped with cant turners. Operators control all infeed and outfeed transfers and rollcases.

Upper deck (below) at back end of mill shows grader at control panel with lumber proceeding onto Irvington separator. Gate is open to drop piece onto trimmer transfer. Next dropout gate to resaw with decline at rear be4t to green chain.

Hydraulic edger-pickers (below) on offbear side of Sumner edgers. Slab is dropping onto chipper conveyor. Dodge variable speed sheaves offbear stock from offbearing belts to transfer chain in foreground. Gangmill at right. Westinghouse fluorescent lights provide brilliant lighting in the mill.



Gmder works at the REDCO panel (center) separating stock for the trimmer, resaw and green chain. He also controls all chains and transfers within his area of responsibility. Control panel operates dropout sorts to send lumber to proper machine or green chain sort.

Trimmed stock offbears onto a green chain where it is pulled into 48 sorts after grading and tallying.

Residues are handled in a vibrating conveyor system which allows complete separation of the sawdust from the heavier residue through shake-out rolls which allow larger material to drop onto the chipper conveyor. The sawdust, bark and other fines go to the hog.

Chips are fed across a Weightometer which gives a current check on chip production. A sampler which takes a small sample, every three minutes is tapped hourly to obtain a running check on weight and moisture content of the chips.

The new mill produces about 60 units of chips daily.

A control console in the mill superintendent's office controls the five Rader high pressure blower systems which disperse chips from this and the other two sawmills about the plant site. From the firm's three mills, chips are channeled to outdoor storage, to the Simpson insulating board plant, or to barge shipment. They are also segregated by species.

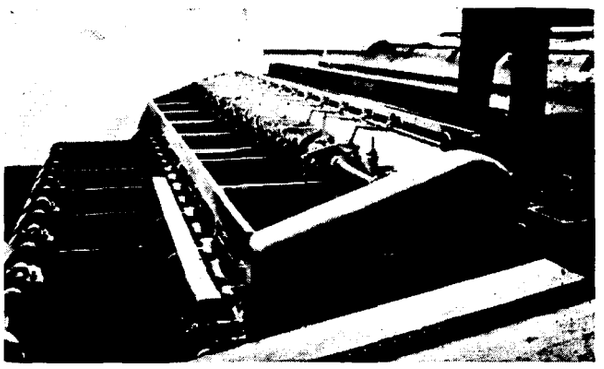
With the new mill operating the firm will produce a total daily cutting capacity of 700,000 board feet daily, in the Shelton area, according to Howard A. Aldskog, manager of the company's fir and hemlock sawmill division.

The initial engineering of the mill, including the intricate control systems, was accomplished by Simpson engineers. Oliver Ashford is Simpson resident engineer, Ivan Myers is projeet engineer and Ernest Runnion is electrical engineer. The firm also built most of the DC electric drives which are used extensively

The detailed engineering for the mill was by Tracy, Cook, Brunstrom & Dudley, Seattle, Wash., who assisted the engineering group throughout the planning stage

Hugh McKay is sawmill plant manager and L. D. Sergeant, "superintendent.

Trimmer - Resaw - Other Features



Irvington trimmer has 14 saws, (above) individually motor-controlled with mechanical lift. Table chains are DC driven. Trimmerman has decision area 20' back from trimmer. REDCO magnetic memory controls saws. Offbear to resaw or green chain.

Resawyer controls entire resaw operation from feed side of saw. (left). C&D automatic setworks buttons in the panel at head height. He also controls infeed and outfeed rolls.

Green chain is of Link-Belt roller top chain. Allis-Chalmers motors drive through Foote Radieon gearmotors. In all, 48 sorts are made on the 180' long green chain with six men, a tallyman and a marker. Mostly 2-inch dimension is produced by the mill, although some boards develop on the resaw.

Carrier vibrating conveyor takes refuse from trimmer at right a n d edger at rear. Conveyors operate at 50-80 FPM. Mill has 10, totalling 50.5', driven by 65-hp (total) motors.

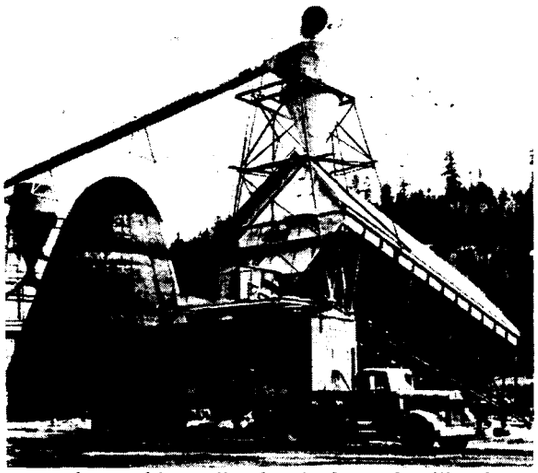
The new Simpson small log mill becomes a part of a well integrated forest products operation. The plant itself is an outstanding example of capital investment in modern equipment especially adapted to do a specific job that both increased production and reduced operating costs. The small-log mill relieves the larger band mills of cutting the time-consuming smaller logs now a part of today's timber economy.

At the Shelton, Wash., integrated center are 3 band mills cutting 31OM bd. ft. per shift, a plywood plant and insulation board plant and laboratories. At nearby McCleary and Olympia arc two other Simpson plywood plants. Other company plywood plants are in Portland, Lyons and Albany. Ore., and in Eureka, Calif. Sawmills are located also in Korbel, and Klamath, Calif., and remanufacturing at Arcata, Calif. The company's pulp and paper plant is in Everett, Wash.

One of the pioneer Oregon lumber companies, it has grown to be a major privately owned operation with an outstanding reputation for its forestry practices and manufactured products.

EQUIPMENT

PORTLAND CHAIN & MFG. log deck stops, kickers and loaders. CARRIER vibrating conveyors. LINK-BELT transmission equipment. BETHLEHEM STEEL work. NICHOLSON MFG. barker with VICKERS hydraulic system: RADICON head drive. SUMNER IRON WKS. cutoff saw, headrig, carriage, nigger with Esco bar, edgers, pickers, resaw. GANG SAW SALES the ESTERER gang. C&D LUMBER Co. C&D setworks for the headrig, edger, resaw; the gang splitter, lumber separator, edger and resaw feed tables, resaw press roll control. REPUBLIC ELECTRIC REDCO controls for automatic log measurement, bucking saw, trimmer and sorting memory systems, carriage drive. IRVINGTON board separator and trimmer. ALLIS-CHALMERS motors. WESTINGHOUSE gearmotors. RENS metal detectors. , ROTEX chip screen. MERRICK Weightometer. HANNA air cylinders. VALVAIR and HANNA air valves. ELECTRONICS CORP. OF AMERICA Autotron photocells. ALLEN-BRADLEY limit switches. ARMSTRONG filing room equipment. NORTON and PACIFIC grinding wheels. DISSTON and SPEAR & JACKSON saws. TIMBER STRUCTURES laminated beams. SIMPSON plywood panels with FLINTKOTE plastic-asphalt coating. LINK-BELT vibrating conveyor.



Product refinement for A. J. Frank consists of drying and surfacing all stock. Moore 66′ oil-fired kilns are two double and two single units at left. Residue utilization is important. Pierce chip trailer heads for pulpmill. Planer shavings bunker in background. Shavings are sold to farmers. Plant produces 1,000 units of chips per month.

Processing high-cost timber efficiently

The A. J. Frank Lumber Co. does not look the same way now that it did *ten years* ago, nor *even* seven, five or three. Changes have been made all along the line in order to process public timber and operate a going concern.

Mr. Frank has made a success in the business by constantly keeping his operation in tune with the times-slowly expanding, but at the same time incorporating the latest utilization and automation features.

His current operation probably draws its success principally from four points:

. Keeping manpower limited but productive.
. Standardizing products on a few high-demand items.
. Drying and surfacing all products.
. Good utilization of the high-value raw material.

Mr. Frank's gangmill near Mill City, Ore., cuts strictly dimension lumber — 2x4s to 2x6s from logs bought mainly on the open market. About 70 per cent of the raw material is hemlock, with the balance Douglas fir.

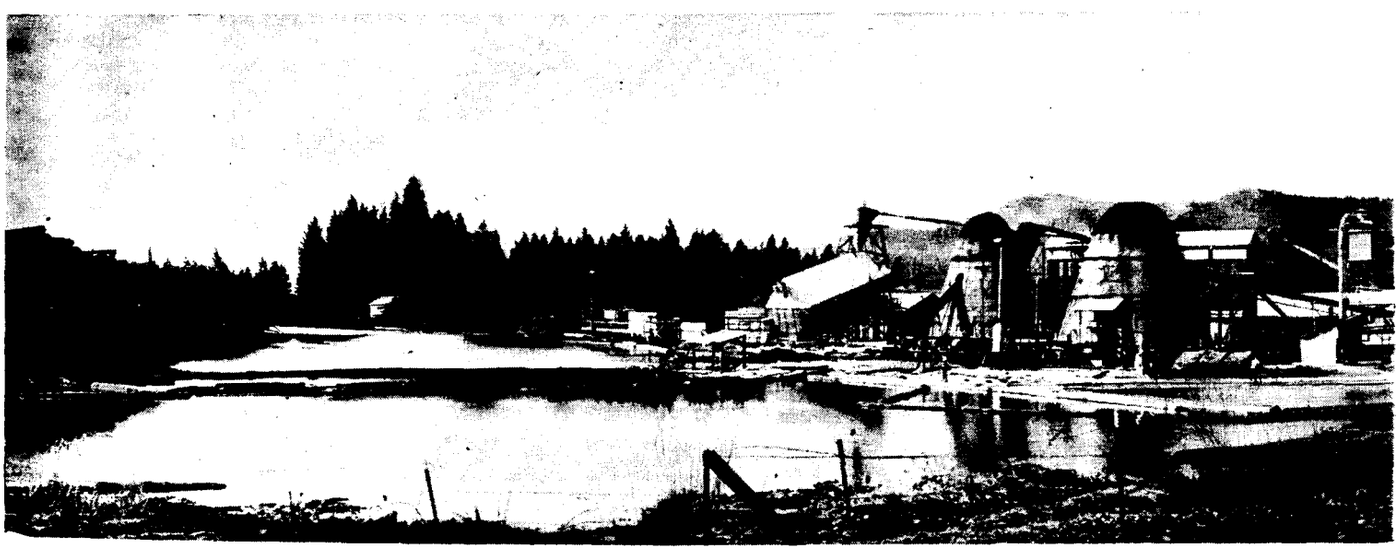
He said, "Good engineering is the key to a good operation. The money I spent for engineering this operation was some of the best money spent in the mill."

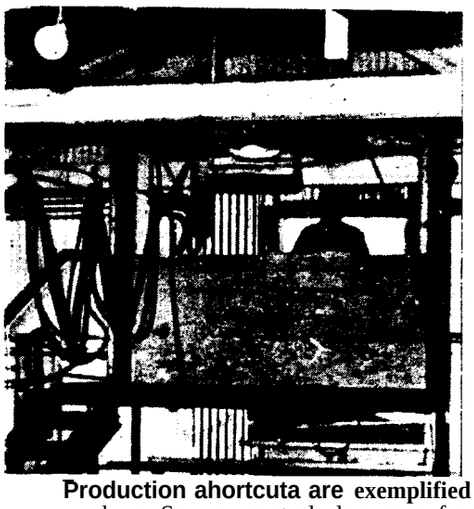
Development Plan Necessary

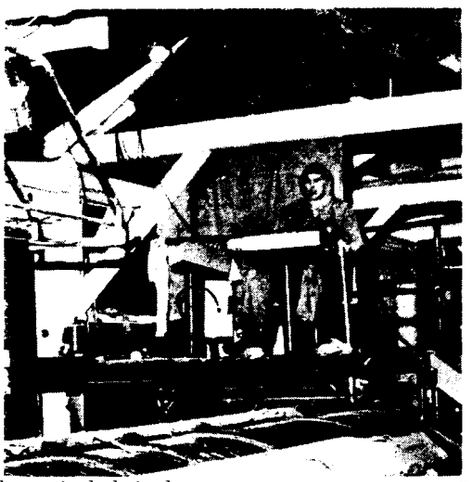
An over-all development plan was necessary, but the plan had to be flexible to allow for technological advances as the industry progressed. Tom Haley of Timberman's Engineering, Portland, Ore., engineered the plant from the start in 1955.

Mr. Haley said, "With reasonable planning, a sawmill can be built and operated to make money. These days, a production objective approaching 20,0Q0 board feet per shift per man on the mill floor can enable you to stay in business. We have it up to about 18,500 board feet in the Frank mill."

In over-all manpower, this cut is approaching 3,000 board feet per man. There are 40 men in the entire crew, with six men on the mill floor with a one-shift production averaging 107,000 to 110,000 board feet and

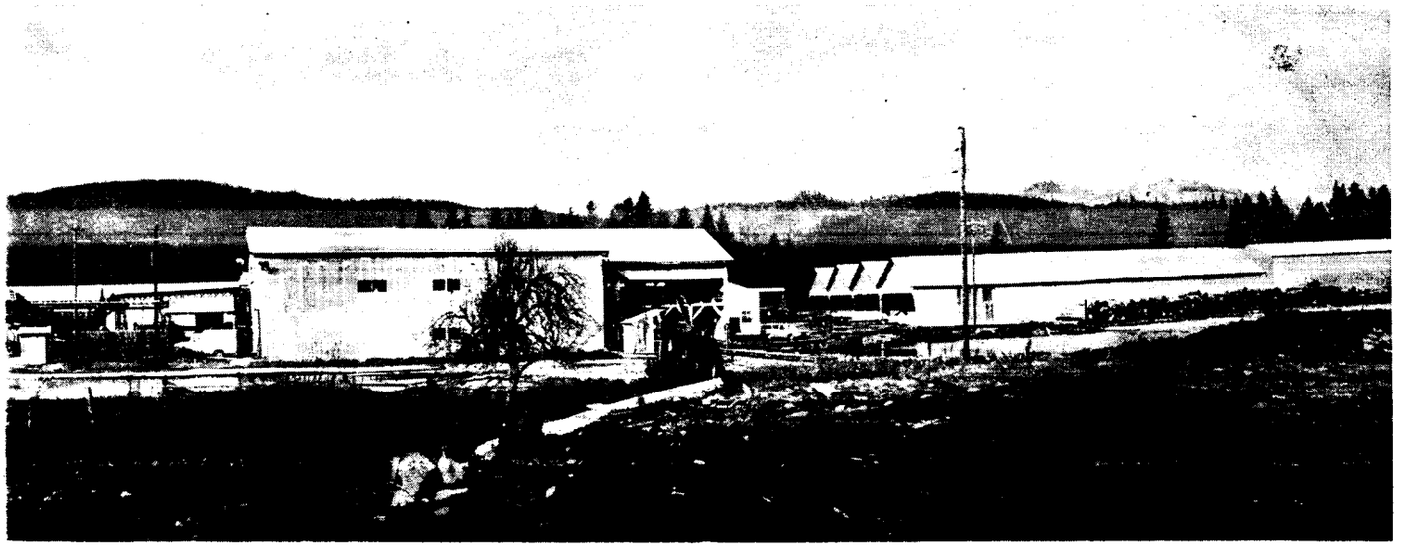


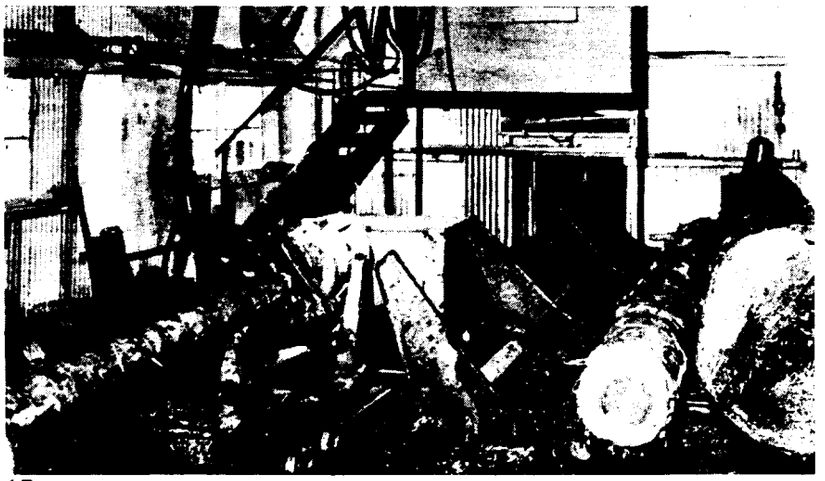




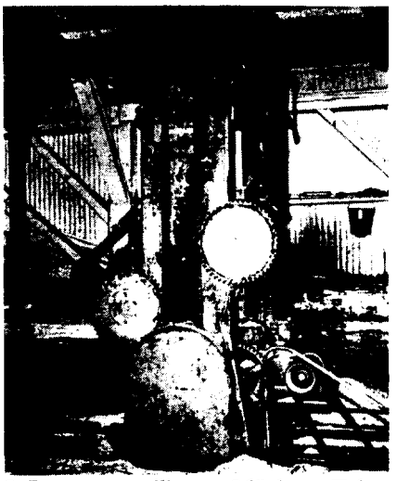
Production ahortcuta are exemplified by swivel-chaired workers. Sawyer controls log gang from cage at end of carriage travel. Edgerman sets remote-control edger and sorts cants at center. Spotter traps out slabs and edgings while trimmerman controls trim saws. Only log gang off-bearer and sash gang sawyer operate standing.

Logs are barked in Carnbio 35” barker (left) after they come up sidelift to log haul feeding bucking saw. **One** operator controls sidelift, haul, saw, barker, Barked logs kicked back “into pond automatically. ‘Logs” **enter** mill through sidelift at right. Logs from 12’ to 26’ long processed in two sorts-60” to 18” and 19” to 35”.





1 **Logs are delivered across** deck to log gang where air-loader kicks them onto Mill Engineering carriage. Log gangsawyer operates from cage at one end and above carriage travel where he can observe deck and gangsaw.



2 **Log gang will saw 36″ logs. Takes 4″ cant from smaller logs. Larger logs set for 6″ cant or two 4″ cants.**

Sharp engineering, standardized products, better utilization combined in processing public timber

25½ million board feet per year, one shift basis. A second shift has just been added.

Minimum Physical labor

Mr. Haley said, "In this operation we let the machinery do the work instead of the men. No one is working too hard physically, but they do have their **wits** about them. They're all in a position to see what's going on — to produce the best possible manufacture of the logs."

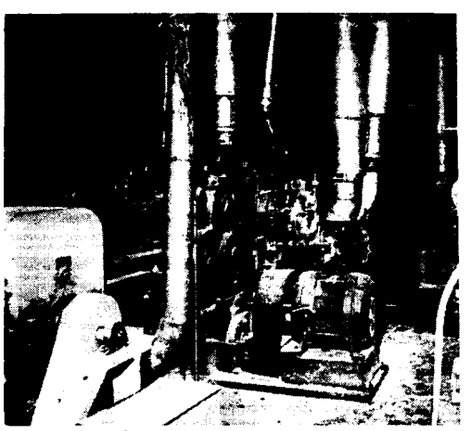
Mr. Frank had an outmoded steam circular mill which he shut down in 1953. He started in 1955 with the **gangmill** cutting 45,000 board feet per shift with three men on the mill floor. Major equipment items were log gang, edger and trimmer.

As the mill paid its way, part of the earnings were re-invested to keep the plant modern. The whole thinking in planing improvements was to make the product more salable or produce it more economically. Each improvement has had to stand on its own, financially.

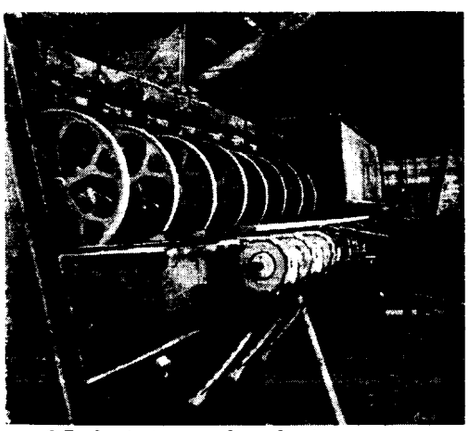
The next step was the planer in 1956, then dry kilns in 1957, barker and chipper in 1958, cant gang in 1959 and more dry storage in 1960.

Further Utilization

What's next? Maybe some kind of unitized handling or packaging of the standardized products for easier handling in shipping. Mr. Frank looks at the bark and sawdust still going into the burner, but so far has found no practical income available from it. Shipping costs are too expensive to put it into the retail garden market. Chips are marketed for pulp and board production.



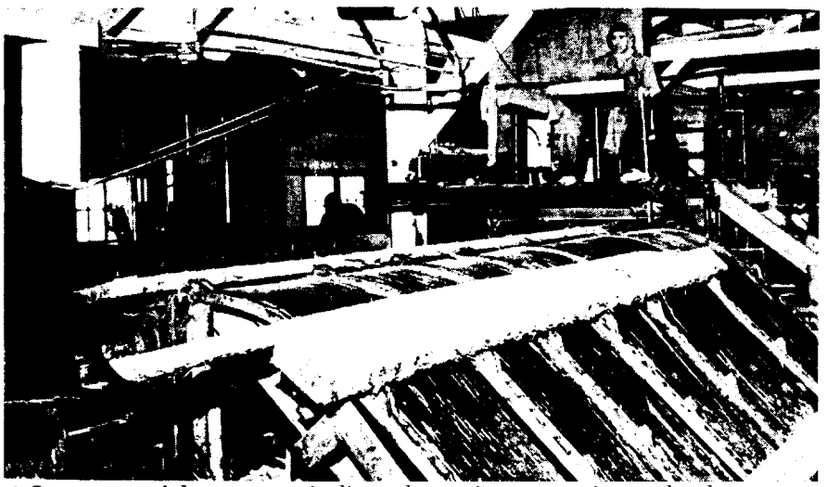
7 **After seasoning,** all stock is surfaced by Stetson-Ross 17A1 8-knife planer-matcher. Irvington hula saw upgrades. Hysters handle stock.



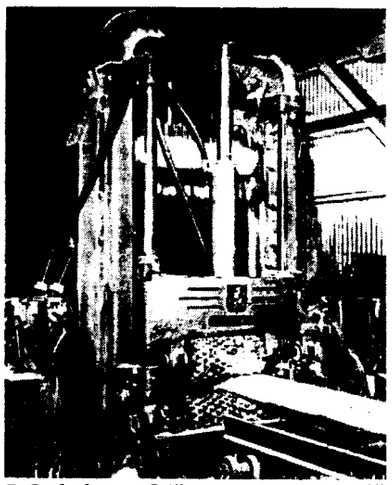
8 **Irvington** smooth-end trimmer provides finish trim to lumber after planing. Printing and waxing equipment will soon be installed.

Ra m

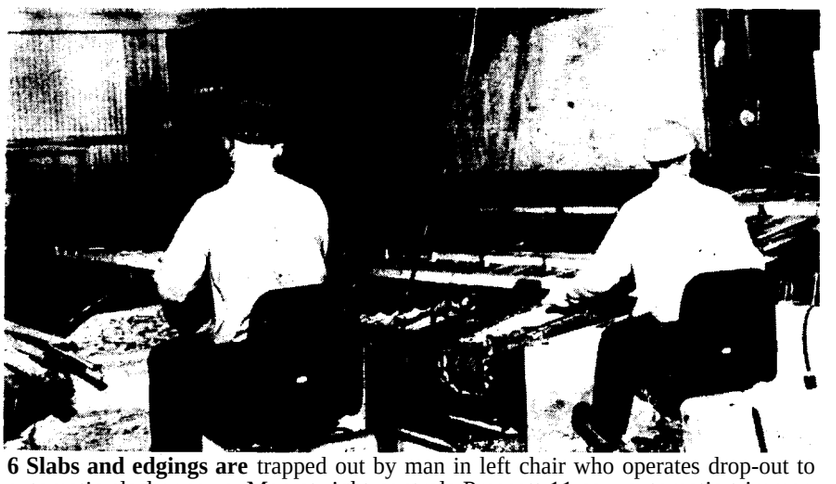
3 Claw offbearer on log gang is self-centering unit designed by Timberman's Engineering. Single cylinder controls both claws, gives alignment.



4 **Sawn material** comes up incline where trimmerman in overhead cage can flip pieces. He sorts out 4" cants to drop-out to conveyor to cant gang. He edges processed 2" cants in Portland Iron Works 6"x48° remote control 6-saw edger. .



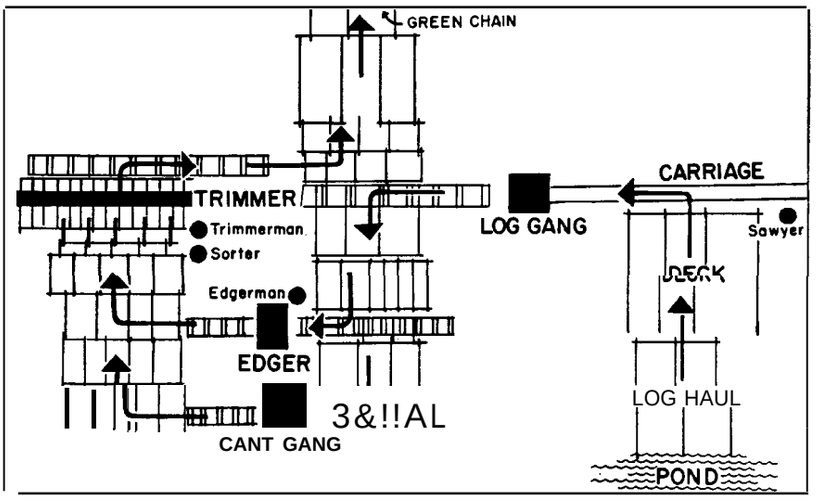
5 Soderhamn 34" cant gang saws 4" cants into dimension lumber. Gang offbears onto transfer table feeding trimmer feed table.



6 Slabs and edgings are trapped out by man in left chair who operates drop-out to automatic slasher saws. Man at right controls Prescott 11-saw automatic trimmer. Stock goes to 140' green chain with 20 sorts. Stock is stickered for drying.

EQUIPMENT

Soderhanm Csmbio barker; Mill Engineering log gang; Soderhanm sash gang; Portland Iron Works edger; Prescott trimmer; Gardner-Denver and Chicago-Pneumatic air compressor; Moore dry kilns; Hyster lift truck and carrier; Stet-**son-Rosa** planer; Irvington smooth end trimmer and hula trimmer; Sumner chipper; American Sheet Metal **Works** cyclone; SaIem Iron **Works** log hauls, conveyors, transfers, feeder, surge bin; **Peters** shaker screen, chip load leveler; Johnson oil burner; Cleaver Brooks boiler; Peerless chip trailer.



Dry end shows Coe dryers with Sweed offbearers at left, offbearing through Laucks Sentry moisture meters to dry sorting chains. Veneer and plywood storage at center. Baldwin hot press at right center with Globe spreaders,

Latest ideas in plywood production

Newest machinery and methods, combined with labor-saving devices to simplify many traditional plywood production steps, save costly manpower at Medford Corp.'s new plywood plant at Medford, Ore.

The plant was engineered from start to finish to produce plywood in the most efficient way possible, according to Russ J. Hogue, the firm's assistant manager. Help in planning and engineering was supplied by U. S. Plywood Corp., which will sell 75910 of the output for Medco.

With two dryers and a single press, the plant is producing 5 million square feet of plywood a month, %" basis. Eventually, **85%** to 90% of the output will be in sanded stock.

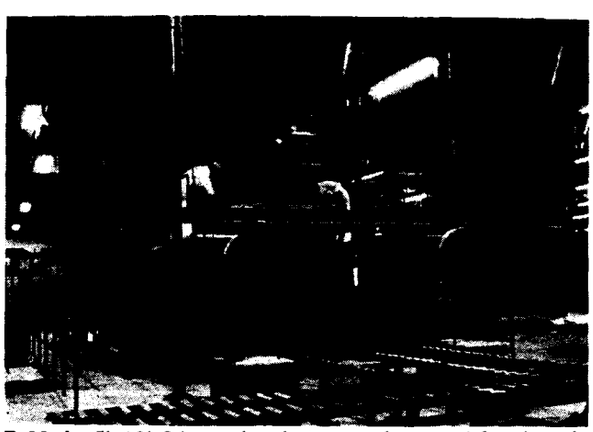
Room has been provided for addition of a third dryer and a second press. With these additions, capacity will be 81/2 to 9 million square feet per month.

The plant **is** operating with a single green-end shift, two shifts on spreaders and three on the dryer, with 154 men in the entire operation. There are 85 on the day shift.

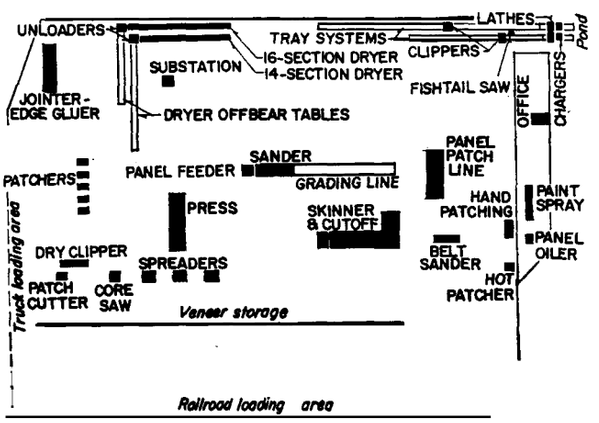
The 10' and 8' lathes and the efficient block-sorting ahead of these lathes, allow the best block utilization and production rates. The large diameter blocks are bucked for the 10' lathe and the smaller, faster, lathe takes the smaller blocks.

The new panel sorting line for the Smithway wide-belt sander will be an important addition. The line, designed by Cargate Industries, Vancouver, B. C., was supplied through Tallman Machinery Co., of Seattle, Wash., and is under construction by Kimwood Machine Works, Cottage Grove, Ore. It will make the sander's full speed available.

The addition of a panel grading line and a pre-press, schedufed for



Baldwin 5'x10' 24-opening hot press is served by American charger and receiver. Double American package saws trim both ends to give easier handling in charger. Two Globe spreaders, with Globe levels and Scougal rolls, serve press. Third spreader is in reserve for exterior.



Flow chart shows straightforward layout of plant. From pond, raw material flows through lathes toward dryer, patching, edge-gluing, pressing, sawing, sanding, patching and shipping. Flow plan was designed by Robert Cox, U. S, Plywood Corp. Car-loading area holds seven 50' cars.

Sweed core saw and Victor dry clipper at far right. Five Raimann patchers in foreground. Glue loft overhead. Construction Fabricators, Portland, built 200,000 sq. ft. plant. Thomas Hunt Const. Co., Portland, erected machinery.

in Medford Corporation's new plant

completion late in November, will round-out the initial construction. A single grader will operate the line which will provide five sorts: grade, upgrade, downgrade, patch and fixed patch.

Most of the engineering was done by Eric Strom of J. W. Minder Chain & Gear Co., Portland, Ore. The building is of timber construction with a 130' center span. The roof trusses were fabricated on the ground. Duraply wall sheathing and exterior plywood roof sheathing, covered by Fiberglas roofing coated with white granules to reflect heat, comprise the walls and roof of the huge plant.

Plant manager personnel are: B. L. Nutting, general manager; Mike Oreskevic, plant superintendent; Anton Bjorne, green-end foreman; Jack Hansen, maintenance superintendent. Mr. Hansen was construction engineer for the plant.

THIS IS NEW AT MEDCO

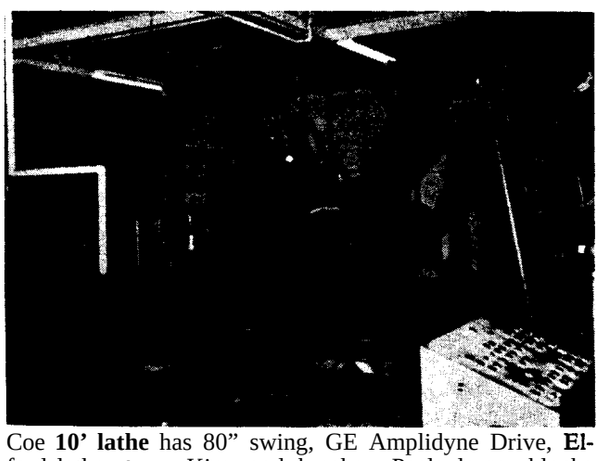
An entirely automatic lathe charger, the industry's first, allows a continuous flow of blocks to the 8-foot lathe side. Only one man and the scaler work on the deck between the two lathes.

Another late development, the dryer offbearers, saves veneer breakage as well as eliminates manpower requirements for straightening veneer ahead of the moisture meters. The offbearers handle all lengths of stock.

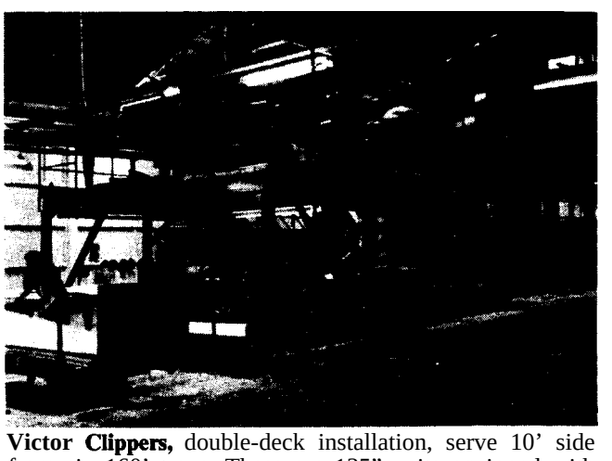
The fast saws and the feeding setup and offbearing bins provide a continuous sawing operation. A lift ahead of the feeder "feeder" and removes sawed stacks from one of the two offbearing bins.

With completion of the sander grading line, panel sanding will be an automatic operation.

(More MEDCO next page)

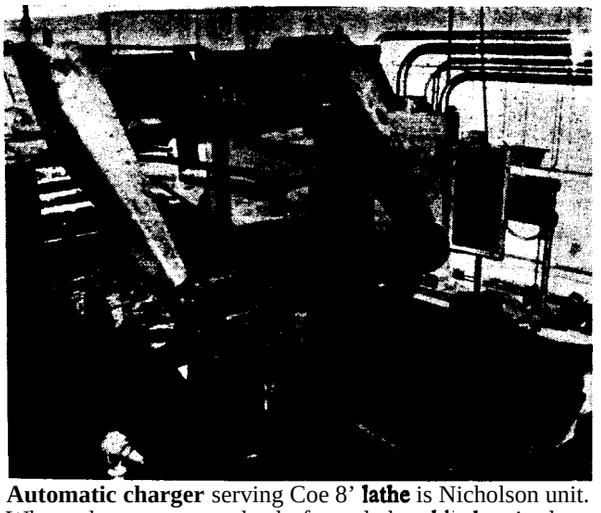


Coe **10' lathe** has 80" swing, GE Amplidyne Drive, Elford lathe clamp, Kimwood breaker. Peels larger blocks down to 9". The 8' lathe, with Durand backup roll, peels down to 6". Nicholson charger. Twin 15" propellers under water provide current to bring blocks from pond.

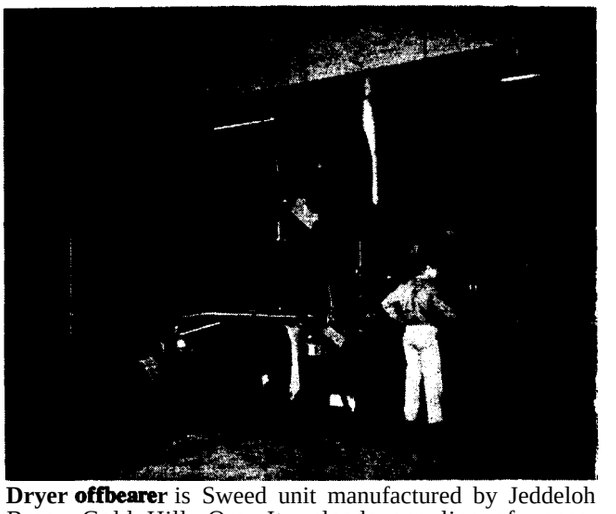


Victor Clippers, double-deck installation, serve 10' side from six 160' trays. These are 135" units equipped with Prentice photocell timers. The 8' side has a single 113" Victor clipper with photocell timing. Trays, lathe tipples, are GE-controlled with Dodge air clutches.

Medco plant incorporates automatic charging,

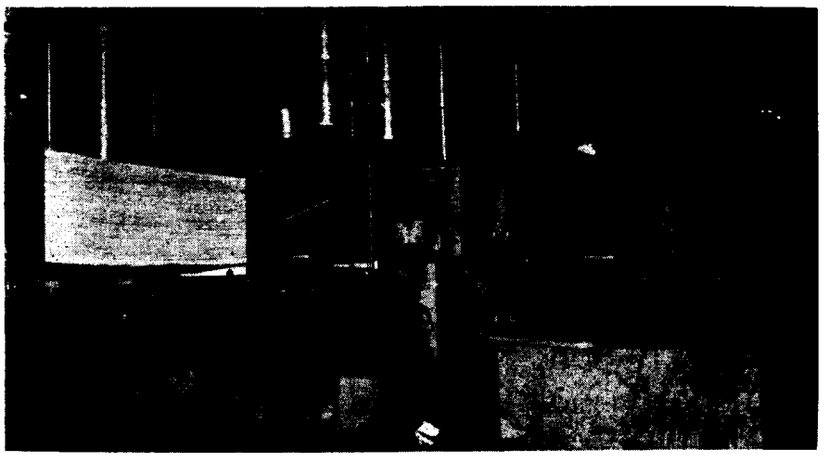


Automatic charger serving Coe 8' **lathe** is Nicholson unit. When charger comes back from lathe, **block** raised on yokes with sensor yokes and overhead sensors (arrows) actuating hydraulic controls until balance is obtained, leveling and geometrically centering block. Charger arms grasp and sensors retract. Charger rolls up just ahead of lathe. Lathe operator presses button, block is charged, charger rolls back to receive next block.



Dryer offbearer is Sweed unit manufactured by Jeddeloh Bros., Gold Hill, Ore. It unloads one line of veneer at a time, using a tipple-like arrangement. Offbearer delivers veneer to Laucks moisture meter without requiring straightening. Coe dryers are 14-section 5-line and 16-section 5-line. Both have double air systems, are steam-heated with two forced draft cooling systems. Sweed Storage ramps and hoists serve Sweed feeders on both.

Smithway sander handles plant's entire sanded output. Provides feed speeds of up to 200 fpm. Kirnwood Machine Works is fabricating automatic sorting line which will allow machine to run at fast speeds. When line is installed, one lift truck will serve both sander, saws. Cardwell feeder, left, is served by forklift feeder, same as saws.



EQUIPMENT

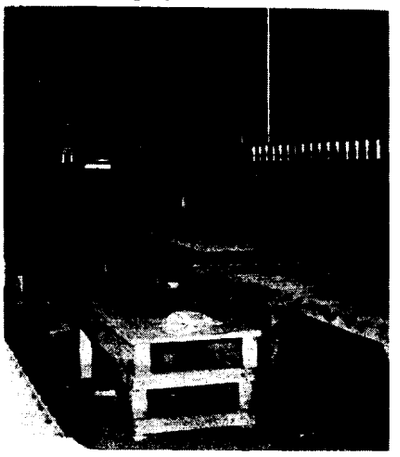
Nicholson 60" side - retracting ring barker with GE DC drive; **Blue Babe** deck saws; **Simonda 108"** inserted-tooth circular bucking saw; two Nicholson No. 601C hydraulic lathe chargers, one automatic, served by **Vickers** hydraulic pump; Coe Model 244 80" x 135" lathe; Coe Model 242 56" x 109" lathe with Durand backup roll; **Weatem Gear** reducers and Elford knife clamps on both lathes; GE Amplidyne lathe drives; GE automatic tipples; Kimwood veneer breakers with GE-controlled tipples; Dodge air-operated drives and clutches with Skinner electric air valves; Victor clippers and **tim**rs; Keystone fishtail saw; U. S. Synchrogear motors; Sumner 72" 8-knife vertical veneer chipper powered by U. S. 200-hp motor; **Moline** chain; **Sweed** dryer feeders and hoists; Coe 14-section 5-line and 16-section 5-line steam-heated roller veneer dryers; Sweed dryer unloaders; GE substation; **Ingersoll-Rand** air compressor; Glohe 10' traveling head rotary clamp veneer jointer; Victor edge-gluer and clipper; Victor dry clipper; five Raimann patchers with Victor patch strip loaders; Andms gang ripsaw; American press package saws; Baldwin 5'x1O' 24-opening hot press with American charger and receiver; three Globe glue spreaders with Globe glue levels and **Scougal** rolls; Globe glue mixers; **Peninsula** 30" hog; 15 **Globe** scissorlifts; Globe saws with **Cardwell** feeder; **Smithway 60"** 4-belt sander with **Cardwell** feeder; Globe 10' belt sander and hot patcher; **Sweed** model VEW core saw; **Sweed** panel patchline; **Keystone** panel oiler; **American Sheet Metal** Works blower systems; Rader high pressure system and carloader; six Hyster 3-ton LP gas-operated forklifts; Clark l-ton LP gas operated lift truck; **Wayne** Model 705 power floor s w e e p e r, transmission equipment designed and supplied by **J. W. Minder Chain & Gear Co.; M. A. Ward Construction Co.** fabrication and erection of log transmission from pond through barker to plywood pond.

off bearing, sanding and other special features

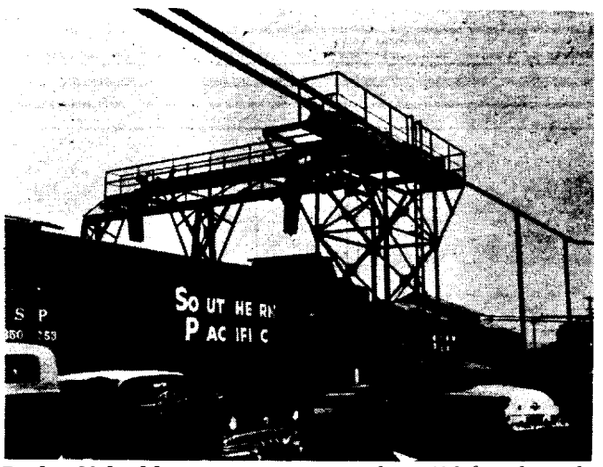
Fastest saws in the west-is how these Globe skinner-cutoff units are described. Forklift type feeder, left, keeps **Cardwell** panel feeder supplied, allowing seven loads to be automatically fed to saws. One man supervises system which is entirely automatic from the storage chain through stacking. Line has sawed **7,000** panels in eight hours. Hopper ahead of cutoff saw accumulates from one to four **panels,** depending upon thickness, to go through cutoff saw to balance production. When stacking bin is filled, tipple automatically sends panels to other stacker while first is unloaded. Rough grades printed ahead of skinner.

Return chain under green chain is in pit with concrete deck cantilevered over. No step required for sorting. Moline chain.

Panel oiler is Keystone package installation. Oiler will take 4' or 5' panels of any length. Housed in separate room with sprayer.

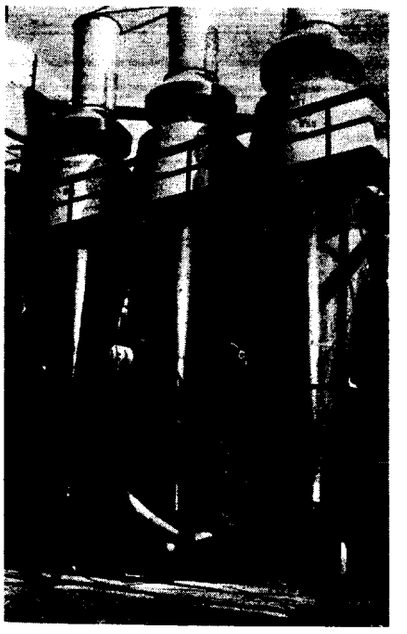


Overhead conveyor takes blocks from Nicholson barker to plywood plant, where 500,000 feet of blocks are stored. Eight sorting lanes in pond.



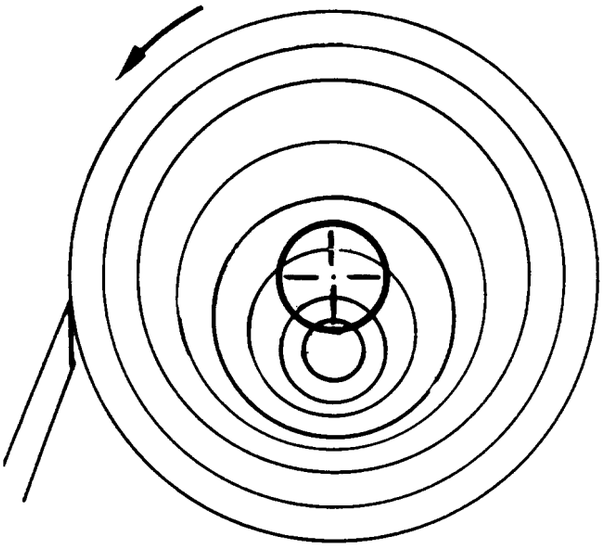
Rader 60-hp blower system moves chips 420 feet through **6⅝" pipe** from Sumner 72", 8-knife chipper, El-Jay **shaker** screen, to Rader impact loader. Plyplant produces 30 units a day. Portland Iron Works carpuller has U. S. 5-hp motor, American Shaft King speed reduction unit.

Dry residues are handled by American Sheet Metal Works vacuum "pull-through" system. Material doesn't go through fan, saves wear on fan. Pulls material from farthest distance of 670 feet. Peninsula 30" R.H. hog used in plant. American system serves Rader 50-hp unit which blows residues to fuel house through 950 feet or 6%" pipe at rate of 8 units an hour.

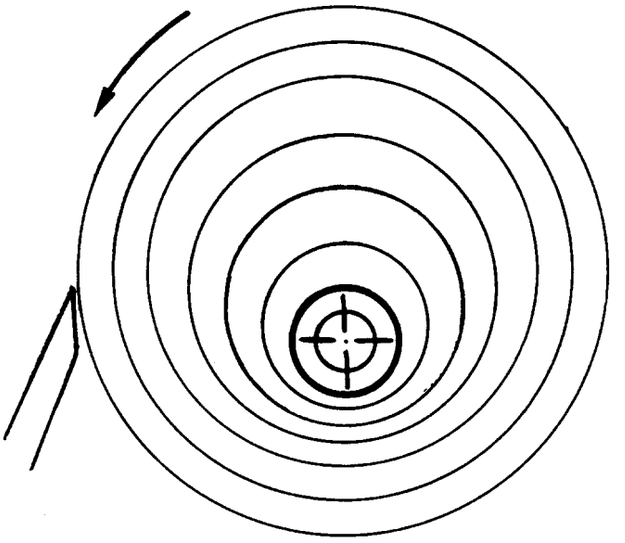


Heres how to peel more dollars from your peeler blocks...

Chuck Them:



In the geometric center



... instead of in the pith

Dollar recovery in veneer can be increased through chucking peeler blocks in the geometric center, rather than in the pith when there is an eccentricity from the center in the block.

This is the finding of Alex E. Creswell, Edward Hines Lumber Co., and Marvin F. Bengelsdorf, Douglas Fir Plywood Assn. The study resulting in the findings was sponsored jointly by Hines and DFPA.

In an average production mill where 10% of the blocks have eccentric piths, this increased income could amount to $16,000 per year, according to the report of the two plywood experts.

The total recovery of eight-foot 1/10" veneer on the main lathe, through geometrically-centered peeling was **5-¾ % greater** — a 430-square-foot difference per thousand board feet — with a 4% % value increase in the eight-foot veneer.

Geometric Peeling Gives Higher **Recovery**

The study showed a greater overall veneer recovery through geometric peeling and a greater percentage of face stock recovery. A slightly less amount of A-face veneer was recovered, but a greater amount of B-face more than overcame the A-face deficiency.

The geometric peeling also produced more C and D stock. Increased roundup in the pith-centering naturally produced more B and C fishtails and there was also more 3/16" C and D core stock from the core lathe through pith centering. This was caused, to a large degree, by the greater number of core breakups in the geometric centered system. The loss in roundup appeared to be the greatest single factor accounting for the difference in the total yield between the two chucking systems.

Bonus Value Obtained

A bonus value was the larger number of full-size sheets recovered in the geometric system, also because of less roundup. Mr. Creswell and Mr. Bengelsdorf calculated that 40% more cubic footage was peeled in roundup in the pith-centered peeling.

Pith-chucking produced a greater yield of half-width sheets and greater square footage of random width veneer.

The test was made at the Westtir, Ore., plant of Edward Hines Lumber Co. Blocks were an average 32" in diameter, cut from Special Mill and No. 3 Peeler grade logs. Block selection was based entirely on the eccentricity of pith from geometric center. The average eccentricity (distance between the pith and the block's geometric center) was slightly less than three inches.

The slow-grown soft-textured old growth Douglas fir timber was cut from the west slopes of the Cascade mountains.

Block Position Alternated

To average out inherent deviation, the position of the test blocks within the logs was alternated and butt blocks were not included so as to eliminate excessive variation in eccentricity and taper.

Fifty pairs of matched blocks were used in the test run and standard peeling, clipping and grading practices were followed. An Irvington Machine Works lumber marker was adapted to provide continuous number marking of the veneer. In this reamer, the veneer could be traced back to the original blocks.

All the eight-foot cores were bucked to four-foot lengths and further peeled on a core lathe equipped with an unlubricated solid nosebar. A continuous clipper produced 26" tailor-made core.

Relative Values Assessed

To assess monetary values to the comparisons, the researchers set up a table of relative veneer values, ranging from the base of 1.00 for 1/10" 24" width D veneer to

2.04 for full A-face sheet. Based on these values, they computed a .386 relative index value advantage per thousand board feet net log scale for geometric chucking.

A typical value computation showing value recovery is as follows:

Assumed value of veneer based on 1/ 10" 24" D index grade veneer per 1,000 square feet, approximately $10.00

Drying cost per 1,000 square feet, approximately 2.50

Veneer value out of the dryer, approximately 12.50

Daily production, based on two-shift operation in MBFM log scale (typical example) 150

0.38x$12.50=$4,45 per MFBM net log scale, maximum difference.

$4.45x150=$667.50 per day maximum difference.

Should 10% of a plant's blocks have eccentric piths, this could amount to $66.75 per day, or over $16,000 per year.

In the geometrically-centered peel, the knife cuts through the outer faces at a favorable angle, because the normal old-growth tree's outer growth is put on at an equal rate all around the tree. Growth eccentricity generally occurs at an early age when the younger tree is attempting to overcome a lean. After the tree strengthens itself, it generally continues with even growth.

Knife Crosses Rings

As the knife moves toward the block's heart, it starts to cross growth rings more frequently, operating at a more unfavorable angle, producing rougher peeling. The concern for smooth peels in the lower grades is usually not as strong as in smooth face stock, but the lower grades do cause problems at the spreader where a heavier glue spread is required to entirely coat the rougher surface.

The roughness can also be a factor in causing splits in the radial portion of veneer peeled on the core lathe from the geometrically-chucked blocks.

Quality Improves

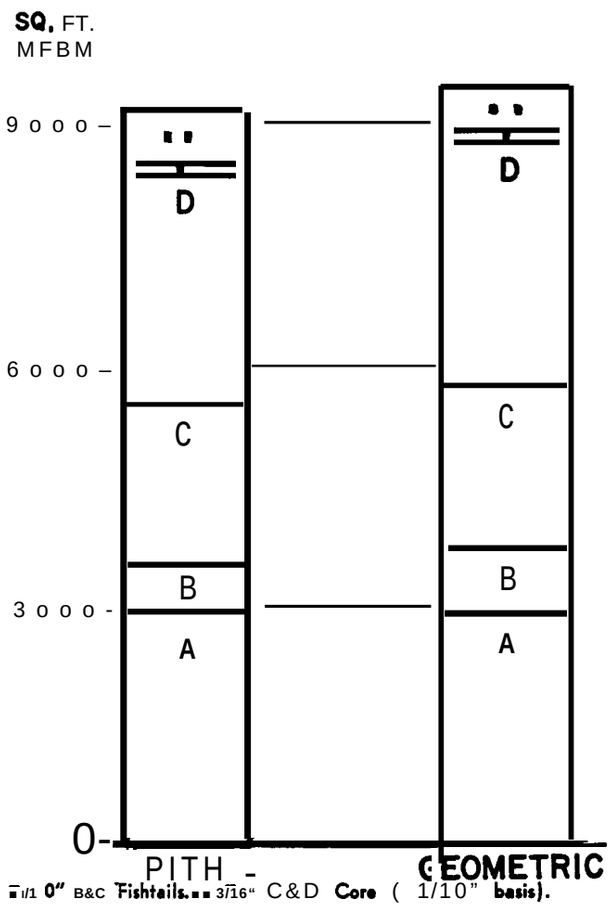
Conversely, in the pith-centered peeling, the veneer has a tendency to improve in quality as the diameter becomes more favorable to peeling.

In the geometric system, the rougher veneer was in the lower grades, showing less stock degraded for roughness, but a much greater amount was degraded from A to B grade because of check-like splits and a combination of check-like splits and roughness.

The report suggested, that to realize the advantages of each method, blocks with eccentric pith might be chucked in the geometric center on the main lathe and peeled until the veneer begins to roughen excessively, then dropped and re-chucked in the pith, if economical, or chucked in the pith in the core lathe.

Grade Recovery in Square Feet

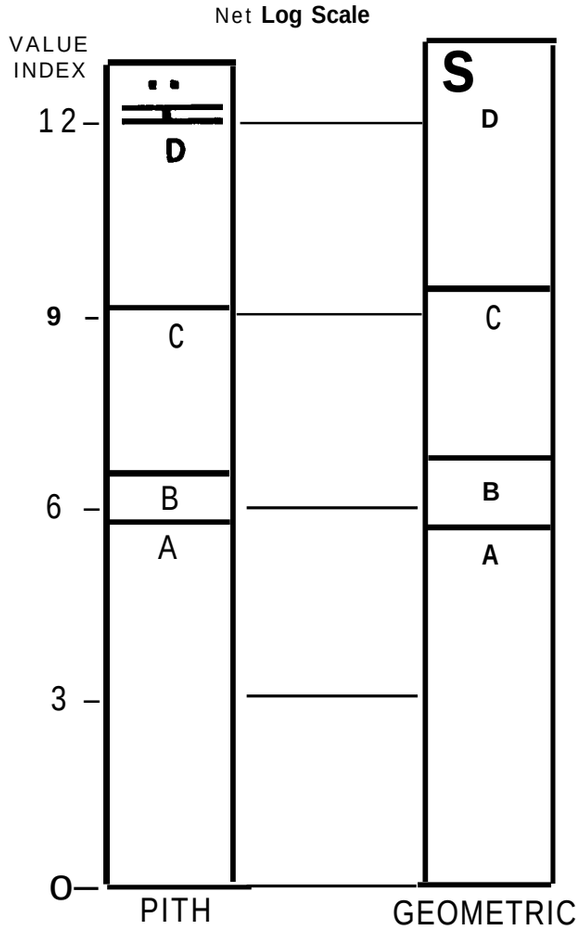
1/10" **Basis** per MBFM Log Scale



1/1 0" B&C Fishtails. 3/16" C&D Core (1/10" basis).

Value Index Per **MBFM**

Net **Log Scale**

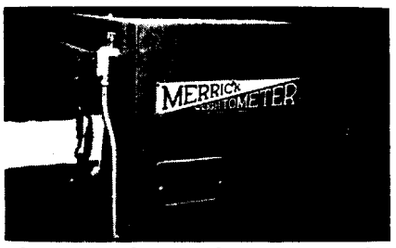


Weigh Belt Saves 15% on Resin Costs

The new system has electronic accuracy and speed

This is how the weighing mechanism was installed on the conveyor belt. Circle marks one of the rollers on which the belt rides. Rollers are mounted in the framework (I) which is suspended so that weight variations are sensed continuously and recorded.

Installation of the weigh-belt on the Novoply production line at the U. S. Plywood Corp. plant at Anderson, Calif., has resulted in a saving of 15% in resin costs. Continuous proportioning of resin and core material has resulted from introduction of the Weightometer and its signaling and controlling components. Quality control is simplified and quality is improved, for there now is an extremely narrow range of tolerances within

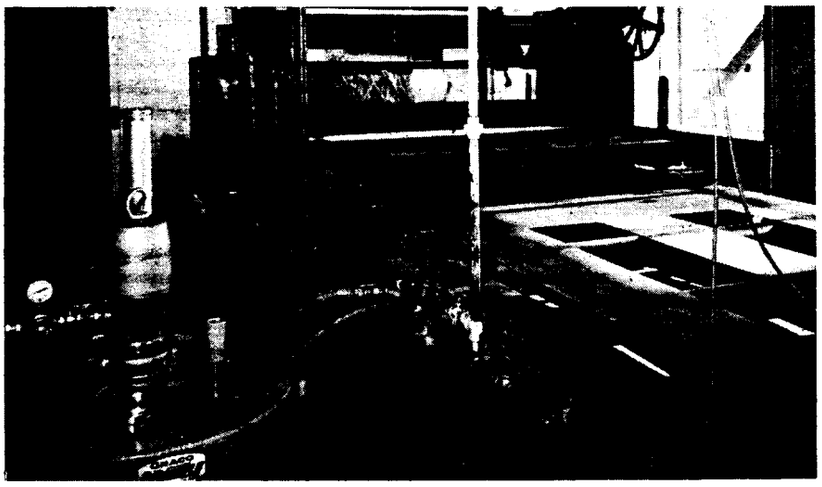


The Merrick Weightometer is the heart of the system. Note hook and turnbuckle arrangement supporting the framework.

Reverse Roll-Coater Improves Filling

By using a reverse roll-coater as the initial machine in the finishing line, Abitibi Corp., Alpena, Mich., gains both uniform surface and operational speed-up for their hardboard prefinish line.

The Black roll-coater first applies Arco Co., Fil-Coat filler-sealer to the surface of smooth 2-side hardboard, preliminary to the flow-coating of the top coat. According to R. E. Paul, control superintendent of the plant, the reverse-roll coating is the best method for their application of filler-sealer. No intermediate sanding operation is necessary between filling and final coating.



Outfeed side of back-roll filling machine. In left foreground is Graco PowerFlo direct-from-drum, air-powered pump. The pump keeps roll-crotch reservoir filled. Pump may be air-power lifted from drum for changing. Offbear belts convey panels through curtain coater and balance of system. Ingenious traveling spray nozzle on Black back-roll filler keeps material evenly spread when thick filler materials are used,

Immediately before being transferred to the surface of the stock being filled, the filler is held in a roll-crotch reservoir of the Black machine, between the top infeed doctor roll and the too coating roil where the filler is applied to the board.

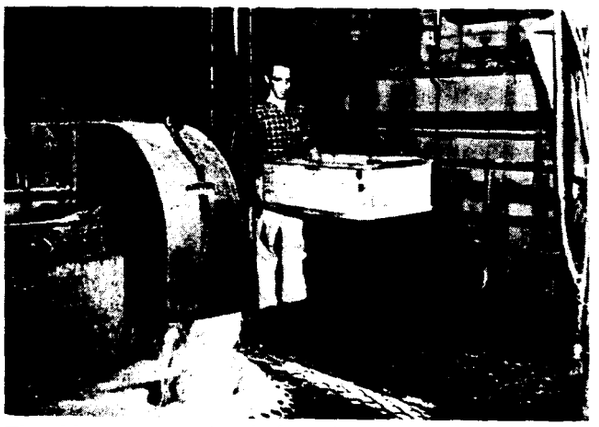
The method emuloyed for introducing the filler stock to this roil-crotch reservoir is a matter of choice with individual plants. In the Abitibi lay-out, however. this is accomplished with a direct-from-drum, air-powered Graco PowerFlo pump placed over the top of the paint drum. The pump is mounted on and supported by a sleeve tube which also permits lifting it by air pressure at drum-changing time.

Fil-Coat, applied by the Black roll-coater, provides a smooth surface, although it is a highly viscious material. It furnishes an excellent “hold-out?’ for decorative finishes applied later. Abitibi uses their reverse roll-coater on hardboards ranging from V’s” to 5/ 16” thick.

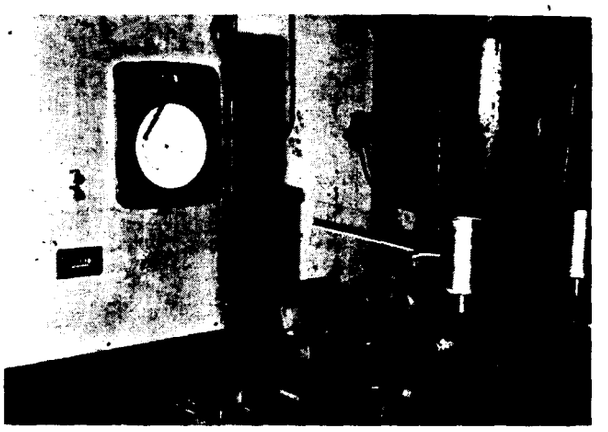
which the mix is made, and the physical characteristics of the end product are maintained with the greatest possible uniformity. The flow of resin now is constantly closer to the minimum established by the company for the glue content of the board.

The conveyor belt itself remains an endless one, but a section of the supporting rolls has been replaced. The new section is independent of the rest of the structure and registers variations in core material weight as the Ioad moves on its way. Variations are recorded instantly and automatic adjustments of resin flow are made just as quickly. The old system involved taking physical samples of the core material and of timing resin flow into a calibrated container. Readings were taken, computations made, and adjustments made in resin flow. The)ag inherent in this method has been eliminated. The extra margin of resin allowed for assurance that all tolerances would be met is now reduced. Weigh belt systems have been installed on both Novoply lines.

Old manual system is held only as standby emergency unit

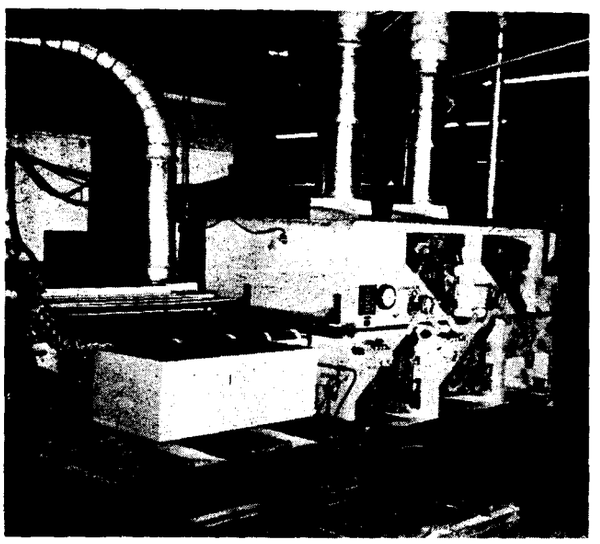


The old system consisted of putting the wood box into the core material flow (foreground) for a timed interval and then weighing the load on the scale where the box now sits

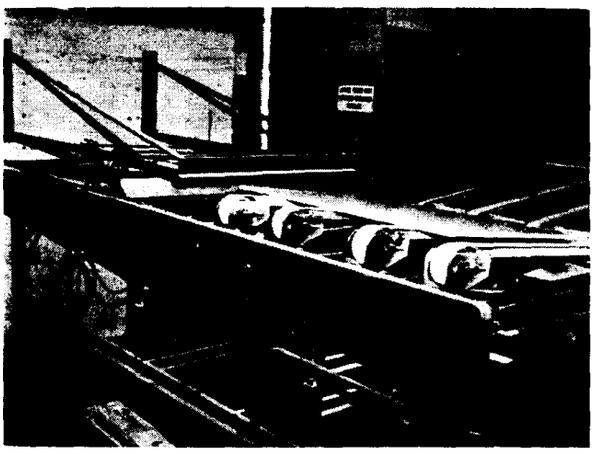


The second part of the former method was to open the valve on glue flow line at calibrated container (arrow) and. record fill-up time, Readings were correlated to proper mix.

Multi-Wide Belt sander Increases Manhour Footage



New 4-belt Smithway sander is in operation at the U. S. Plywood Novoply plant at Anderson, Calif. Prior to installation of this unit, four single deck, endless bed sanders were used. The changeover has meant an increased sander footage per man hour. Though capable of speeds up to 200 feet per minute, the wide belt sander is being run at from 80 to 120 feet per minute. Allows rapid change from various types of contact rolls to various types of platens.



Here's the outfeed end of the sander, with the rising and falling cross transfer belts in the up position. At left, attached to the sander housing is a twin-armed support for trip switches which actuate the cross transfer belts according to panel lengths. Many sizes of panels are put through the machine and the trip plates which "read" their lengths are adjustable, being slid back and forth along the tubular arms just above the outfeed table. The bracket supports for the trip plates and switches are held in position by simple tightening clamps,

Cylinder sections were formed in special jig from two thicknesses of ⅜" plywood. Sheets -were scarf jointed end-to-end before assembly and joints staggered when sheets were laid up. Right, plywood being fitted to Douglas fir timber frames in Wheelers Ltd., Sudbury shop.

English develop

Plywood Flour Hopper

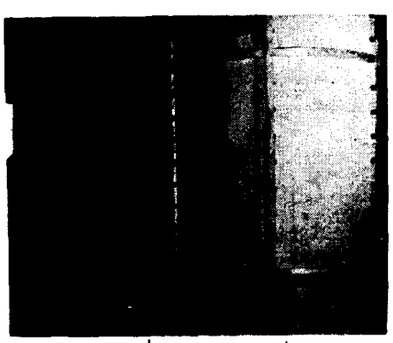
Two 15 ton capacity flour hoppers were recently developed by Timber Development Association, London, for Ladbrook & Son Ltd., Elmsett, Suffolk, England. Located on the upper floor of the flour mill, the lower portion projects through a 7' opening in the floor to deliver flour to trucks at ground level.

Each hopper consists of an upper cylinder assembled from six preformed curved sections and a lower cone fabricated in one unit. The cone consists of four layers of ⅓" plywood tailored to shape. Triangles were cut, two from each sheet. Joints between tapered sections were covered by the next layer. Externally, they are reinforced with timber splines glued spokewise to the fumel. Top rim of cone was glued to laminated timber ring. At the lower mouth end it fits into another -ring formed from plywood.

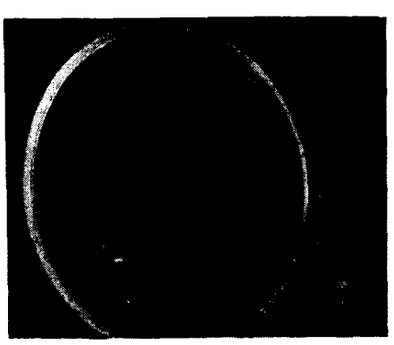
Lower curved members were screwed to the laminated top ring of the cone or funnel, while vertical flanges were pulled together by means of 3/8" bolts at 9" centers. At the top of the cylinder, an additional laminated ring was screwed to the curved upper framing members of the six sections.

Exterior Douglas fir plywood was used and framing lumber is also Douglas fir. Casein glue was used on plywood. Economy was achieved by designing so there was no waste from standard plywood sheets. Cost was less than metal. Structures are durable, light and strong.

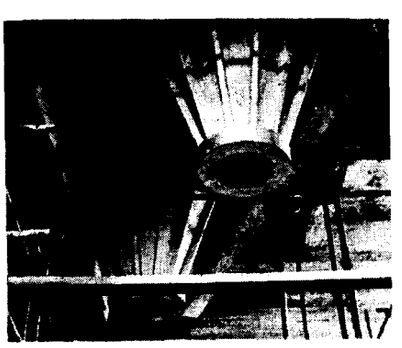
Clamping up clear Douglas fir laminated ring for the top supporting frame of the cone. Rings were screwed to the hoppers.



View of the twin hoppers at upper floor level during installation.



Cones of funnel end units were made in one piece from layers of plywood.



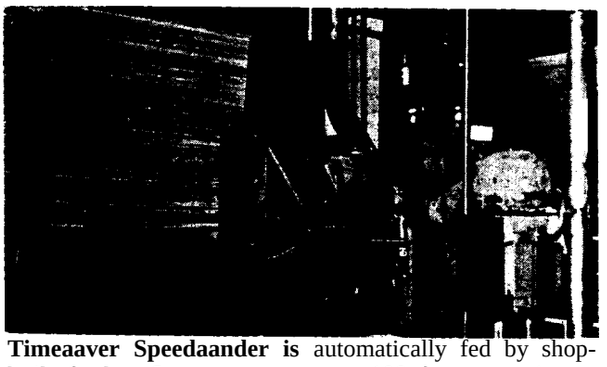
View of cones in place projecting through floor for truck loading.

Sander sorting line that upgrades plywood

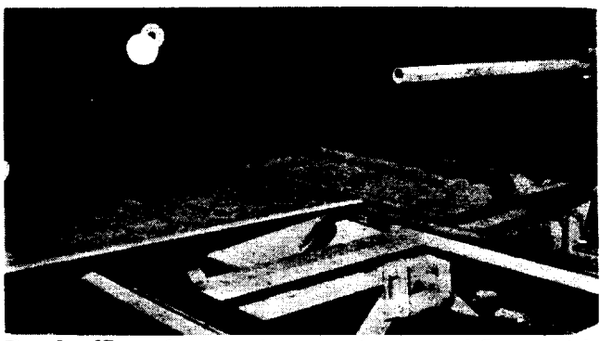
National Plywood, Inc., Roseburg, Ore., recently installed a shop-built sander sorting line. The result has been an appreciable increase in grade recovery.

Plant superintendent Gordon Ellison reported that the fii, "has saved a man in sorting, but the big advantage has been in upgrading. Every panel is properly inspected, automatically offbeared into the proper bin. We spot every panel just where we want it."

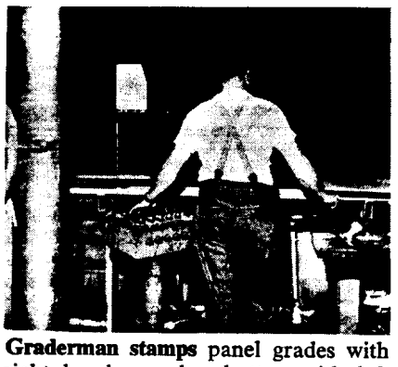
The system is operated electronically. The graderman punches a button to designate the proper sort bin. When a panel reaches the jump-belts serving the bin, the panel is rolled off. Both motor direction and belts are actuated by grader's control button.



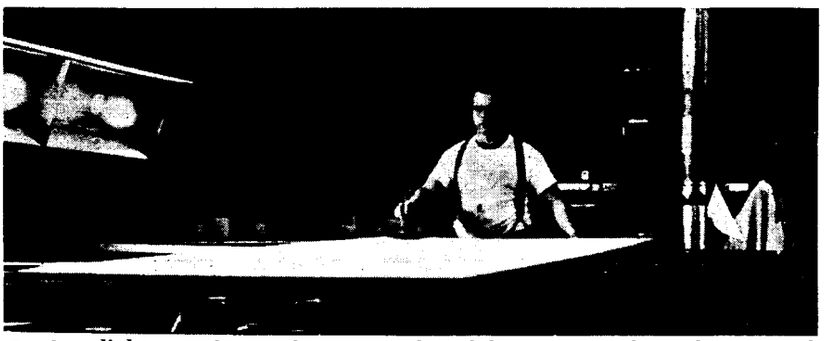
Timeaaver Speedaander is automatically fed by shop-built feeder. System operates at 100 feet per minute. Can sand and sort 4,000 panels in an eight hour shift.



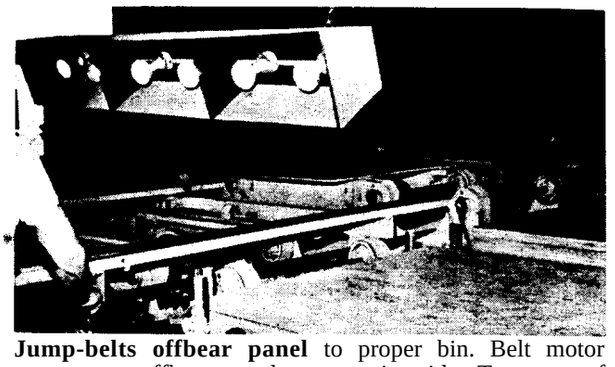
Panels offbear from sander onto air-operated flaps which drop to allow panel to be picked up by the transfer belts leading to the grader's operating station.



Graderman stamps panel grades with right hand, punches button with left hand to direct panel to proper bin.

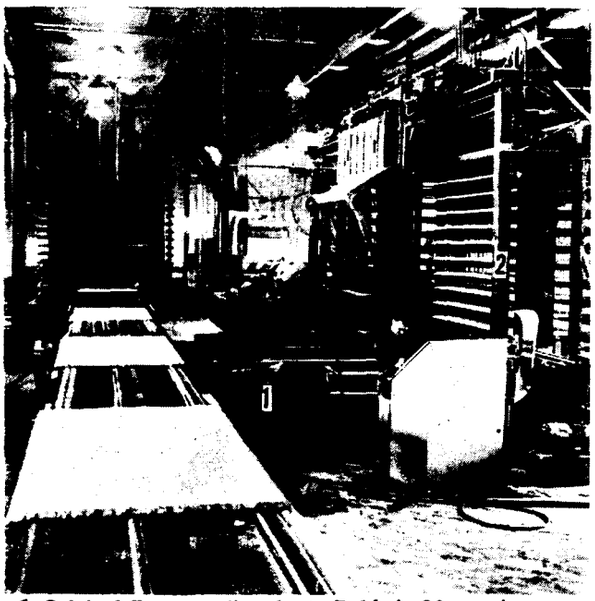


Grading **light** provides graderman good visibility to properly evaluate panel after sanding. He has jump-turntable to enable him to spin panel for comprehensive visual check of entire surface.



Jump-belts offbear panel to proper bin. Belt motor reverses to offbear panel to opposite side. Two sets of jump-belts serve four bins with fifth over the end. Pushes button controls jump-belts and motor direction.

Offbear bide shows end-bin for OK panels; repatch, belt-sand, upgrade and repatch are other four bins. Bin elevators lower automatically as loads build up. Roll-cases hold completed stacks at end of bins.



1 **Original flow was directly to Baldwin 20-opening press,** where these cauls are heading. New production line begins at side-shift position (l). Cauls go to side-loading elevator (2) and thence to Baldwin 10-opening press.

2 **The 10-opening press** has demanded cauls; the **side-**shift mechanism has responded. Feed belts on main conveyor drop, allowing rubber rolls to shift cauls obliquely and deliver them to feed belts serving elevator.

Unique side shift of cauls solves hardboard

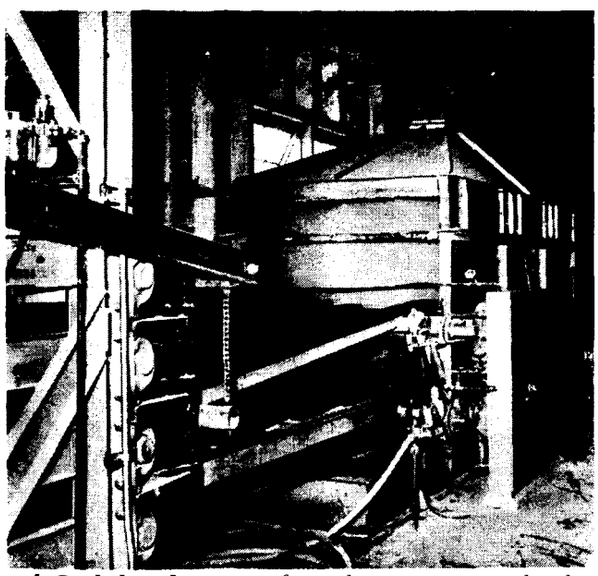
Cascades Plywood Corp., Lebanon, Ore., in the enviable position of being unable to supply the demand for its Lebanite, faced a decision: expand the plant or build a new one.

Production had to be increased. Building anew was the less desirable solution and so the management directed Cascade's technical director, J. R. Stillinger, to study the possibilities for expansion.

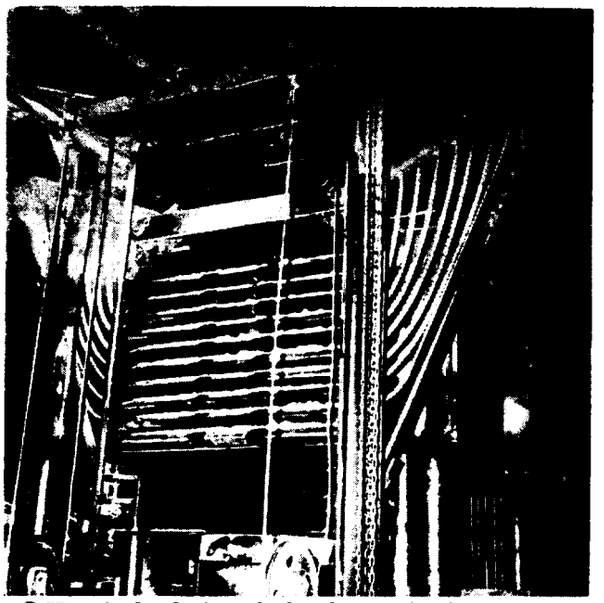
A key factor in the decision was availability of an unused press. Formerly a production unit, it had been retired when technical advances eliminated the need for it. If this could be integrated into the existing production line, a costly problem would be solved.

During the engineering studies of the basic problem, plant engineer John Pearl designed an ingenious side-shifting of cauls and an entirely new system of caul handling. This involved a tray and tipple system similar to

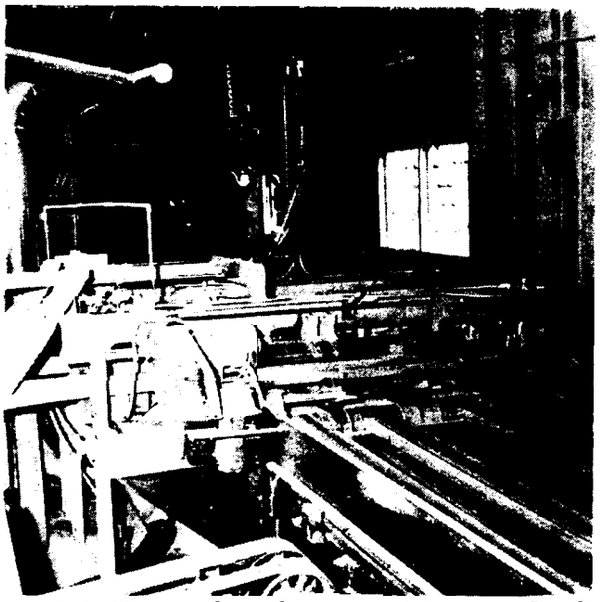
5 **Following press cycle,** cauls from new production line are cross-transferred and pass under revolving brushes and onto double-deck feed line. They then go into caul cooler. Upper deck handles cauls from big press.



6 **Cooled cauls** emerge from the water spray chamber and travel across one of two automatic tipples serving the tray system. Each tipple divides, between two of the four trays, the output of each of the two lines.



3 **Here is the device** which achieves **simultaneous platen** closing, preventing pre-curing in short press cycles. Action is cantilever. Large rod acts on chains of increasing length which match succeeding lower platens.



4 **Limited" space** dictated **compact** sizing saws. Panels pass through skinner saws, foreground, then stop while traveling head with two arbors, center, cuts one end. Panel advances, head passes back and cuts other end.

plant problem

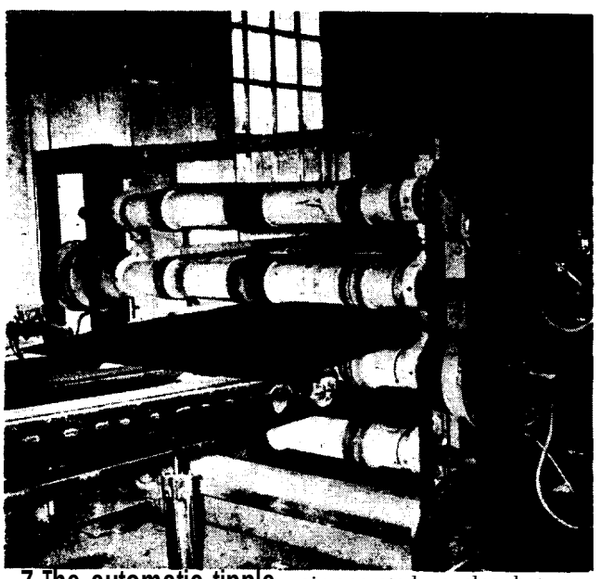
that in a veneer operation.

With the major engineering problem solved, management decided against new construction and gave the green light for a 50-percent increase in production in an expansion program. Production was raised from 5 million square feet monthly, Vii-inch basis, to 7% million square feet-on a 5-day, 3-shift schedule. Also, refining, drying and fiber-laying capacities were doubled to allow for future technological advances.

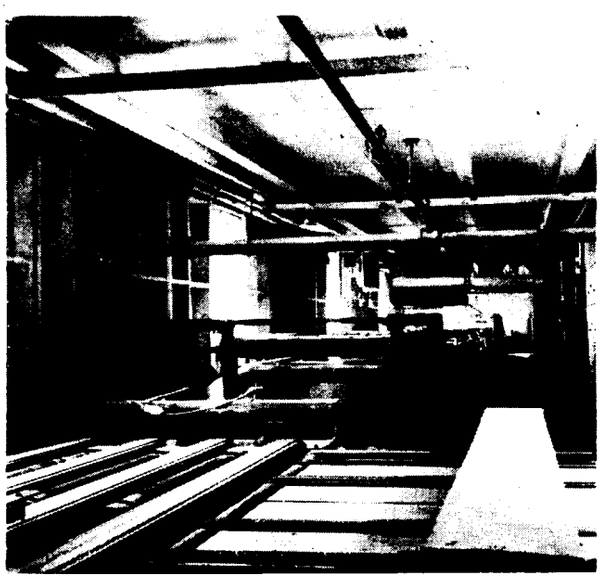
Among other pieces of equipment installed were two new Bauer refiners, with the same capacity as the three original units, a second Heil dryer, and a short-coupled sizing saw. A new caul handling system was built and the fiber-laying machine enlarged. Total investment was $350,000.

Mr. Pearl also designed a side-loading elevator to feed the added press and a simultaneous platen-closing installation. The latter was fabricated and installed by **MJM** Manufacturing, Albany, Ore.

Cascades personnel built the tray and tipples on the caul handling system. Sizing saws were designed by Mr. Pearl and fabricated by Sawyer Machine Works, Eugene, Ore.



7 **The automatic tipple,** air-operated, cycles between trays on the offbear side of the tray system. Automatic trays operate in the same manner as a conventional tray system. Drives engage, disengage automatically.



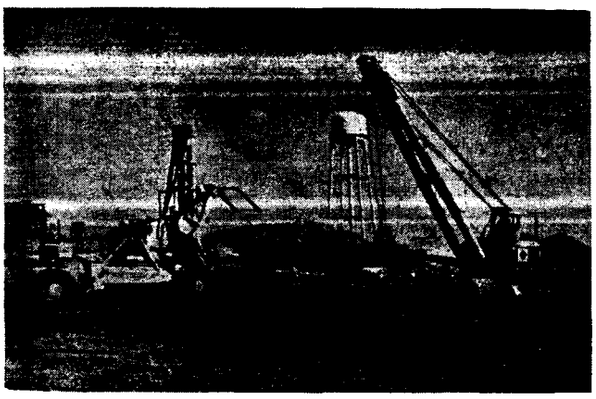
8 **A caul** is seen coming across tipple, in this view of the full length of tray system. It moves toward transfer, which will return it to the felter to receive a new mat and to start on another complete cycle.

Ideas at Work

to speed cut selection for sawyer, handle **cores off the lathe, and move logs and lumber at the sawmill.**

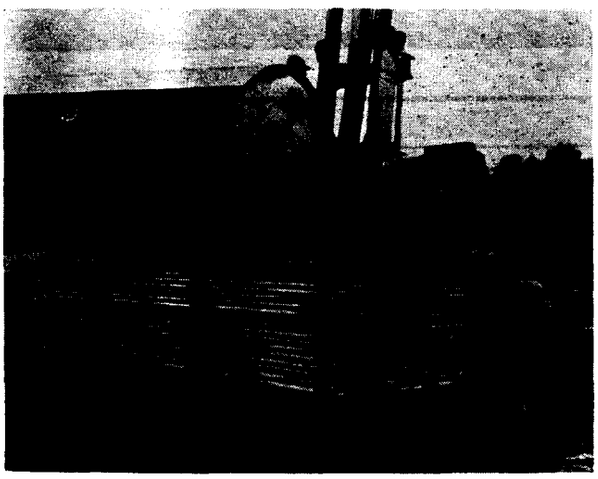
New guidance light in use at Algoma Lumber Co. sawmill in Algoma, Wis., helps the sawyer in making quick selection of setting so he can cut the minimum slab without additional cut line. The Carter Products light uses a Quartzline bulb that casts a brilliant white line the length of the log. The tube-type light is mounted on rafters above the carriage. Carriage is a Cleereman remote setworks unit, sawyer controlled. ■■

Machines, new systems simplify handling of logs and lumber at



Winton Lumber Co., Marten, Calif., recently began operation of a plywood plant and has shifted from pond to sprayed-deck log storage. The change necessitated a comparable change in log handling in the yard, and here are the three pieces of equipment the company is using: a LeTourneau log stacker, a Lima shovel and company built steel sorting racks.

Shovel is 2-yard model with Young grapples. Operator sorts as he unloads. Two racks on side of shovel take Douglas fir and white fir peelers, ponderosa and white fir sawlogs. On ground, adjacent to racks, go sugar pine floaters, ponderosa shorts for removal to pond, and sugar pine butts and Douglas fir sawlogs for removal to the deeking area.



Easy unstacking of stickered lumber is done with this rig developed by C. Arnold & Sons, Inc., Cullman, Ala. Regular arms are inserted into sleeves and steel tires hang down in front to hook into extra thin lower arms. Load hangs from upper arms. These lower arms permit inserting anywhere in stickered pile. ■■

End loading is accomplished simply at the Double A Lumber Co., Livingston, Mont. Conventional fork lift loading does not work on the trailers with sides. One end of lumber load is placed on back lip of trailer and a wooden shop-built standard is placed under the other end for temporary support (1), while the Gerlinger truck moves around to end of load and pushes it into trailer (2) on rollers on trailer floor. Loads are steel strapped. ■■

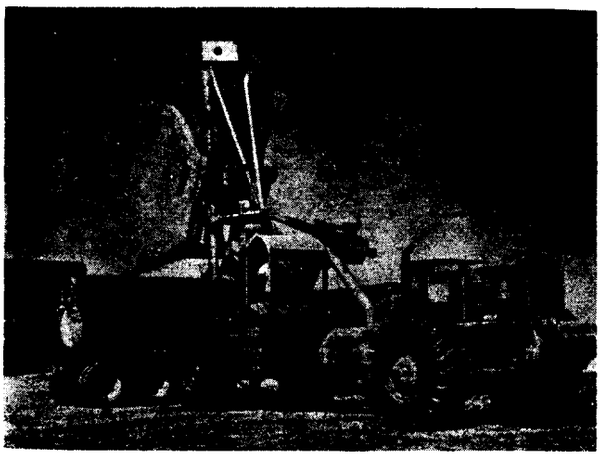
Turntable enables deckman to turn peeled core after it is kicked out of lathe, left, in Linnton Plywood Association plant in Portland, Ore. He transfers it to chain at lower left which conveys it away for sawing. Free rolls are

across The

■■

sawmills, plywood plants

While the Lima usually does most of the unloading, occasionally it needs help to keep the trucks moving. Then the LeTourneau pitches in and puts the whole load on the ground for subsequent sorting by the shovel. Two company sides send in 16 trucks each. A contractor side loads out 10 trucks and two more haul from a bug salvage operation.

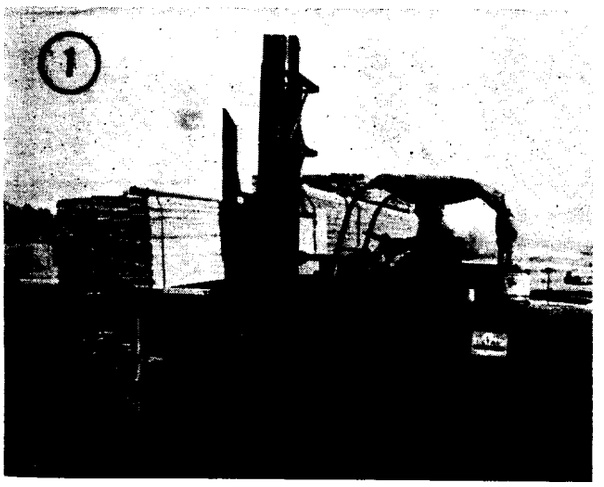


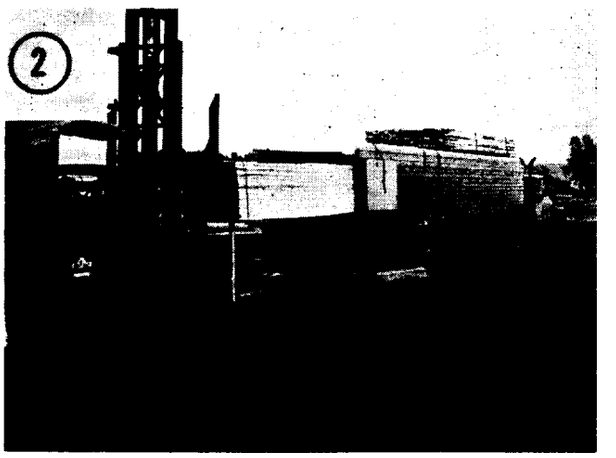
Le

Le pon

wood

od ■■



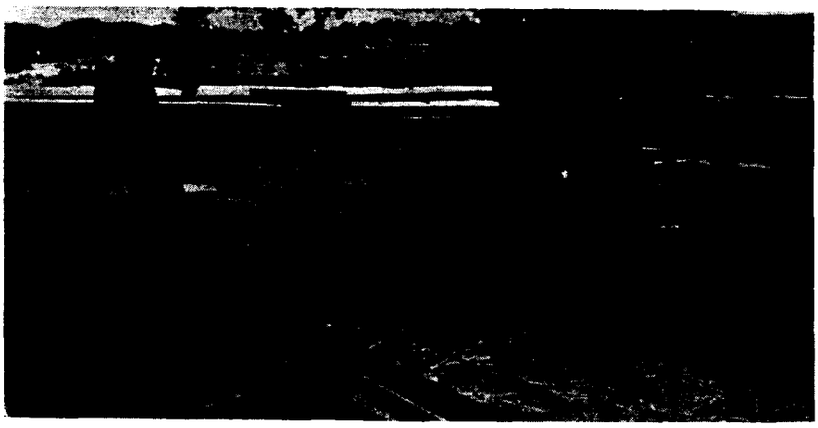


Ideas at Work . . . A small sawmill did these things to do a

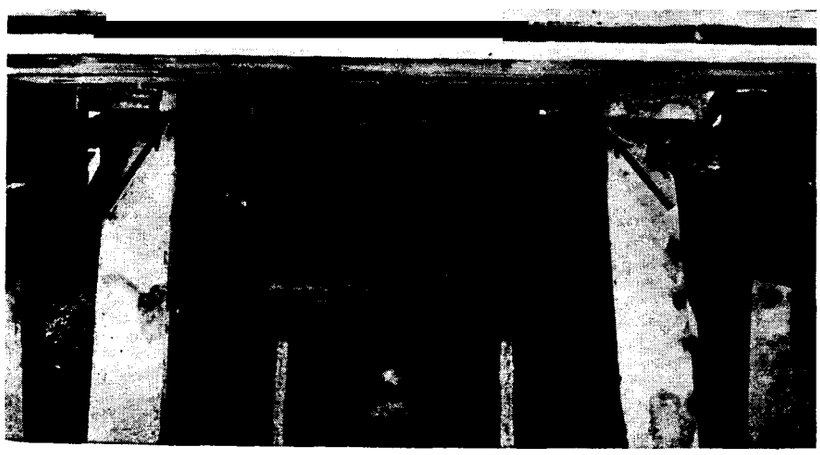
This edge sorter was built entirely from scrap steel that was around the mill. It is used part time, mainly when running red fir. It has six sorts, plus one over-the-end sort. Works well and saves considerable time.

Rasmussen Lumber Co. at San Andreas, Calif., is a small operation in the Sierra foothills, cutting about 60M bd. ft. daily. The job saver and cost cutting things shown here are not unique in the industry says owner manager M. E. Rasmussen, but are typical of the kinds of things being done in mills of similar size and they

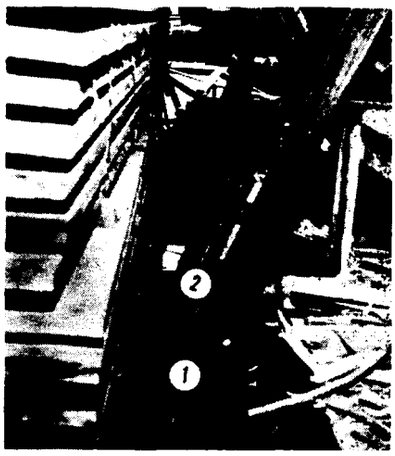
Built a breakdown hoist from a fork lift frame . . .



1 Load at dry sort chain, will be tilted on a former fork lift frame. Stickers will shale down wood-sided bin and move off to the right on the belt.



3 Hoist action is simple folding, knee action. Top irons are free moving. Front and inclined irons are firm. Arrows show pins at juncture holes.

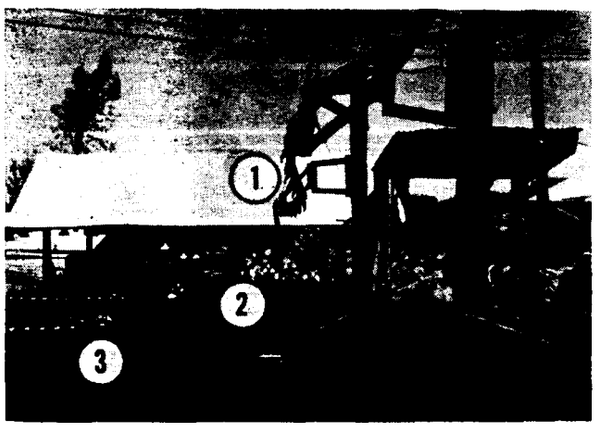


2 At (1-2) are channel iron arms which simply resting on cross supports and which will shortly rise and tilt against the stop rails on either side of the former Ross lift truck frame.

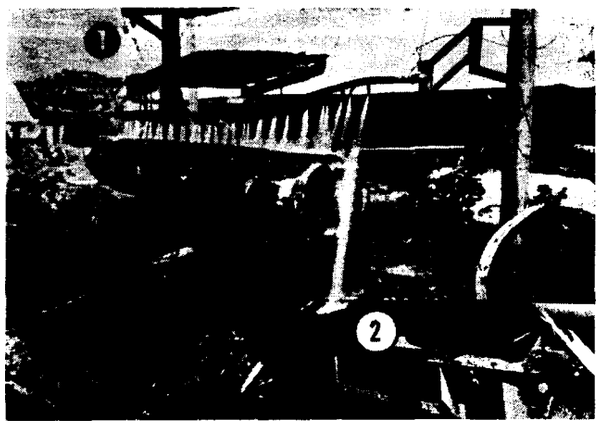
4 Forepossts, or irons, in photo **are anchored** to forks in this manner and further strengthened by addition of sections of angle iron on sides.

better job and cut operating costs

Rigged up this log spray device . . .



At (1) is a 2-inch pipe with brass nozzles. At (2) is a pair of log stops, holding the log while the transfer chain makes it turn. At (3) is pair of log stops to hold back the next log. Controls for all are under shed at right.

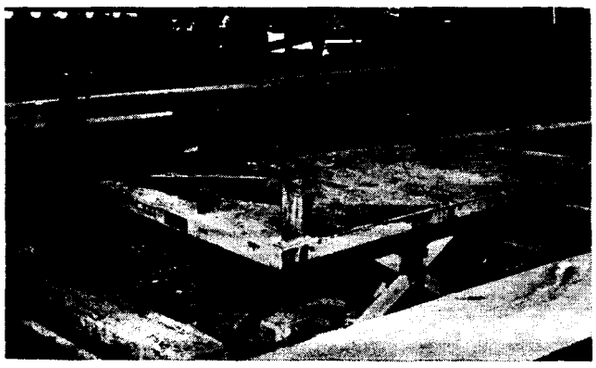


m pe

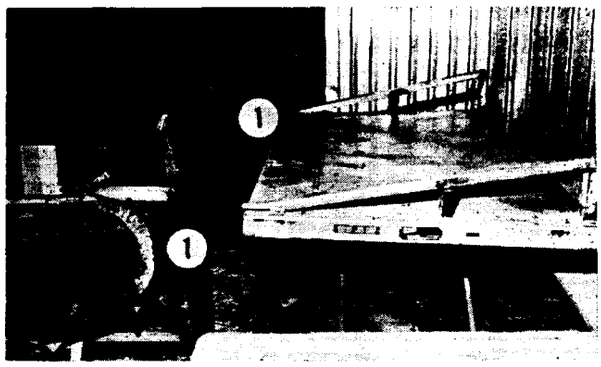
M

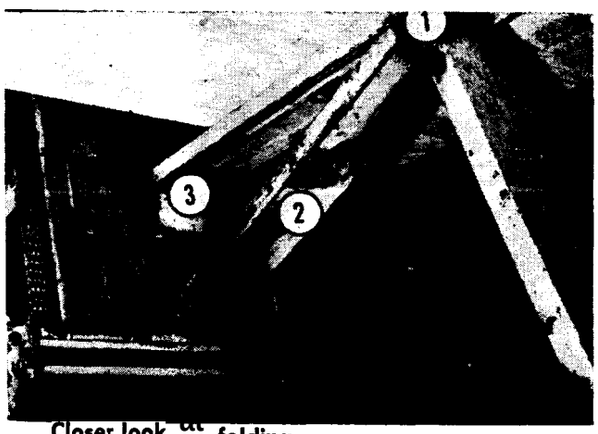
ogs

Modified this scissor lift table . . .

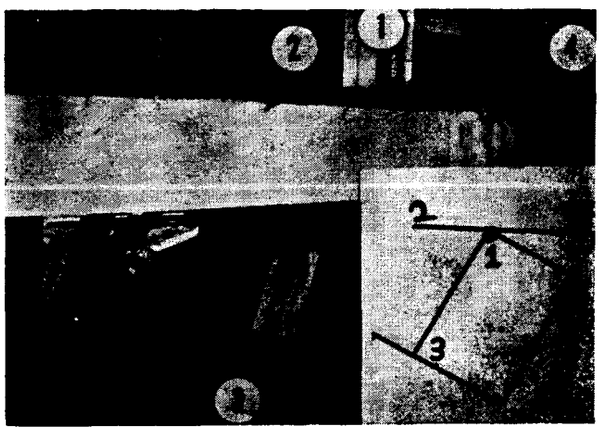


This is the company's new planer building and the lift serves the trimmer feed. Lift is American Mfg. Co. unit.





Closer look at folding action. Steel pin at (1) allows arm (2) to nest within arm (3) as hoist rises. Free moving arm (3) assumes angle of (2) and the load is then tilted against the back stops.

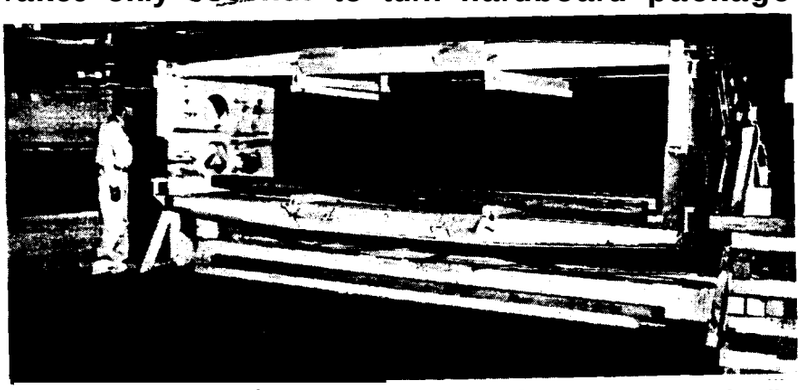


Other methods of modifying lift frame were considered. However this arrangement was deemed best and it was worked out quite satisfactorily. ■ ■

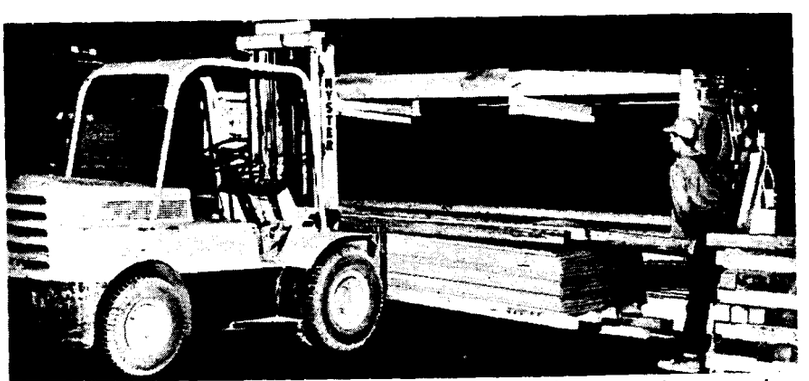
Ideas at Work

Production upgraded at Weyerhaeuser hardboard plant by board turner, airless spray prime-coating and modified feed system for punch press: Automatic deckle transfer system at U. S. Plywood's Novoply plant.

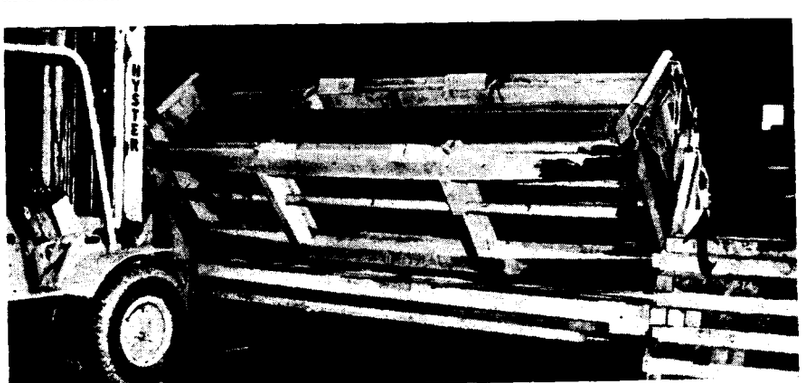
Takes only seconds to turn hardboard package at Weyerhaeuser Co.



Prior to installation of this load turner, built by Jeddeloh Bros., Sweed Mills, Inc., the boards were turned by hand for planing on the screened side and then turned again. The job now is done in a fraction of the time it formerly required. Size of the equipment may be appreciated by comparing it with the person at left. Operating mechanism is at right. The open and close action is by hydraulic power, acting through X-formed scissor arms at each end. Turning action is through chain drive. Weyerhaeuser plant at Klamath Falls, Ore.

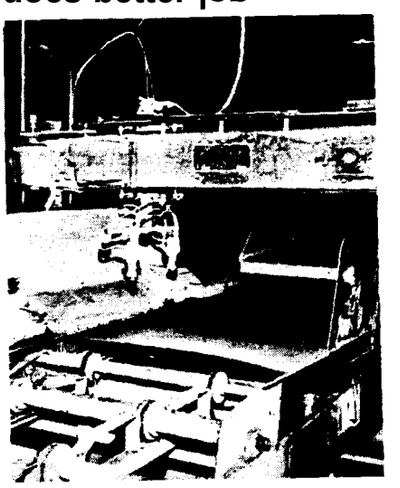


The lift truck operator delivers the loads and controls the turning operation. Here he has removed stringers left from the previous load (see above photo) and is placing them atop the new load to be turned. Stringers run full span, top and bottom.



Some details of construction are shown as the turner reaches mid-point in the revolving cycle. There are three stringers, top and bottom, matching the longitudinal members in the structure. Arrow points to push button control panel for the turner.

Airless spray coater does better job

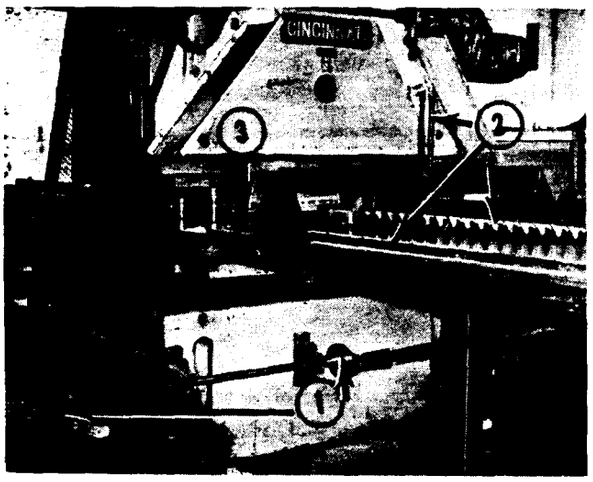


Prime-coated baurd now is being shipped from the plant, the coating being applied with this Nordson airless spray. The head, slightly blurred here as it moves back and forth across a board, travels on this over-head beam. Lead end of board has already entered drying oven at Weyerhaeuser Klamath Falls plant.

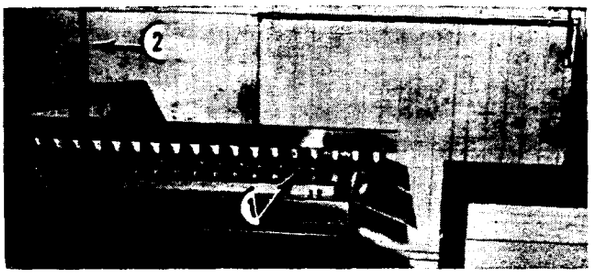
Bill Harrison demonstrating the mix and pressure chamber of the airless spray. The spray was installed to achieve a smoother and more uniform coating and one with improved adhesive and drying characteristics. Roller coating will not produce the desired results for prime coating, but does do the job on pre-sealed board. It is routinely used on the product.

Punch press feed ups efficiency

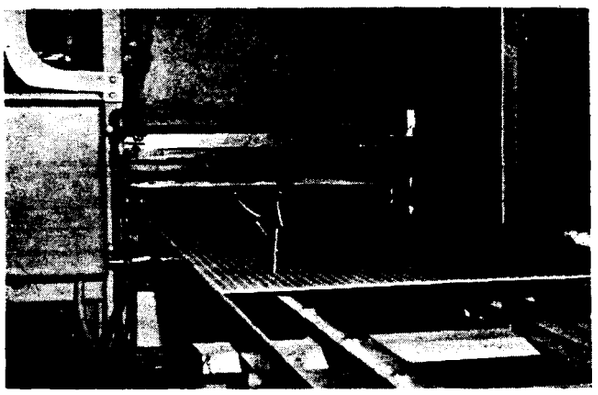
at Weyerhaeuser hardboard plant



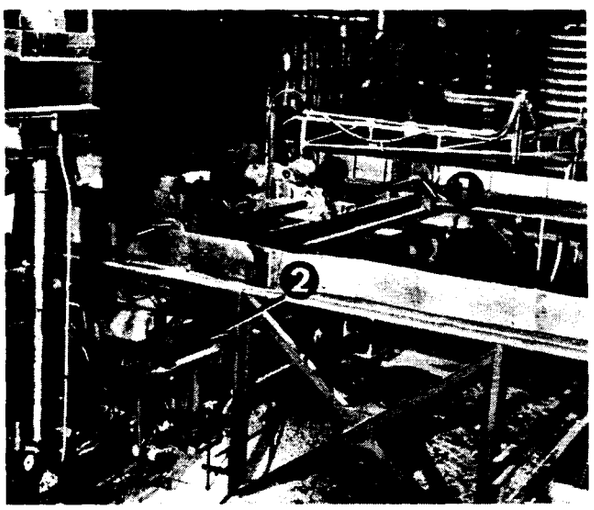
Production efficiency on the Cincinnati press, used to turn out perforated board, was improved by modification of the feed system and by addition of a stripper bar below the punches to separate the board from them as they withdraw on the up-stroke. Precision-spaced feed lugs are connected to the press cycle mechanism at (1) and through the drives behind the safety screens. Skate rolls, suspended from two cross beams (2) are adjustable and on each side of the rolls is a ski-shaped hold down and feed bar. The stripper bar is at (3) and resembles the bottom half of a sandwich, with the filling being a set of small, coiled steel springs, which pushes down on the board face as the punches withdraw from it. The bar, or plate, is suspended from the punch mount.



In this view of the feed end of the table, the feed lugs are partially visible as small triangles (1) rising from the feed table surface, directly beneath the skate rolls. Here **also** is seen the second of the two cross beams (2) which support the skate rofls and through which adjustment shaft passes.

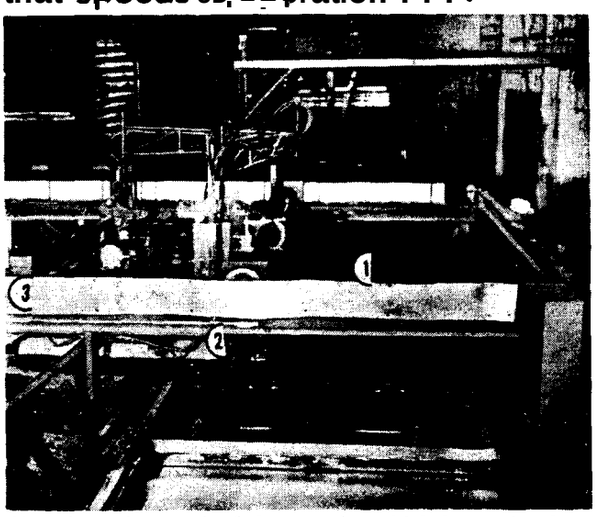


The final row of perforations has been punched on this board emerging from the press and the Ieading edge of the next board is visible as the thin line below the stripper bar (arrow). The two light dots in center are the tail ends of the ski-shaped hold down bars on the infeed side. The feed system was built by Pacific Tool & Die Co.



U. S. Plywood Corp. has recently installed an automatic deckle transfer in its Novoply plant and now both production lines for this board are similarly equipped. The transfer is air actuated and electrically operated. It. moves on geared wheels (1). Here, in the ready position, the deckle has just been moved into contact position and the transfer is about to lift it, holding at four points. One of these is at (2). An air actuated shaft, solenoid-like, engages an inverted U-bolt loop at each corner and locks into position.

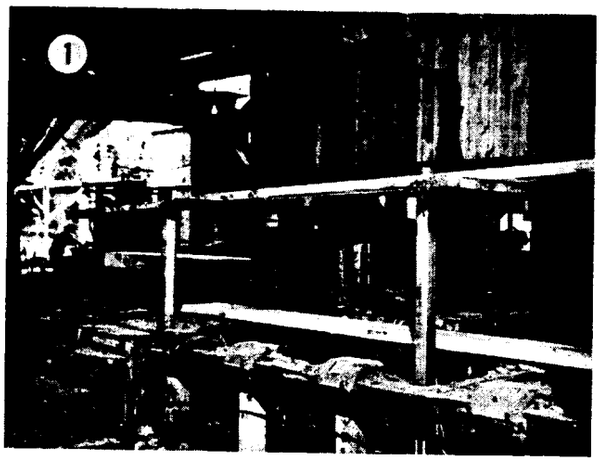
An automatic deckle transfer that speeds UD, operation . . . .



Nearing the end of the transfer which began in photo above, the machine is about to deposit the deckle onto the oncoming caul (1). The near point of support and suspension is at (2). Note guard fences alongside each track (3). U. S. Plywood Novoply plant, Anderson, Calif.

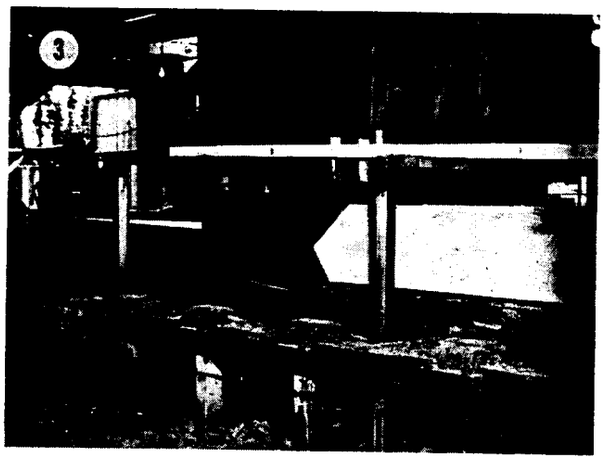
Ideas at Work

Lift arms opposite carriage help speed the final cut . . . "Scrap Buggy" quickly hauls scrap from mouldin, machine.

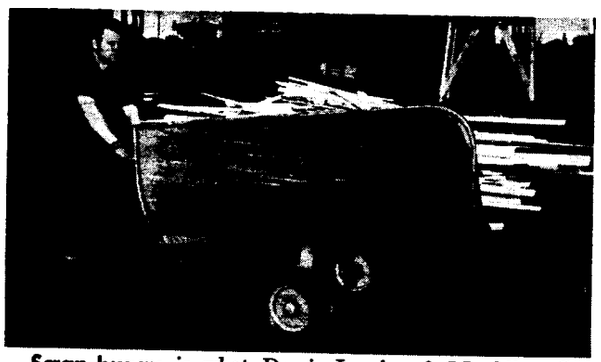


1 This pair of lift arms at Pine Logging Co., Dinkey Creek, Calif. is operated by the tail sawyer who controls an air cylinder. The arms form inverted L's and help speed final cut by lifting the second to last board up and out of the way so that the carriage may drop the last board and move away quickly for next log. Thus, the two final boards are fed separatel, to the edger feed table and there is a more uuiform flow of material. Action is brief, but provides a momentar, pause which helps avoid tie-up at the edger feed table.

2 In 'etracted position, arms rest just below the roll case level. Upright shaft on the near one is at (1), for the far one at (2). Edger feed table is just out of photo at left. Resaw and resaw transfer table are in left background.



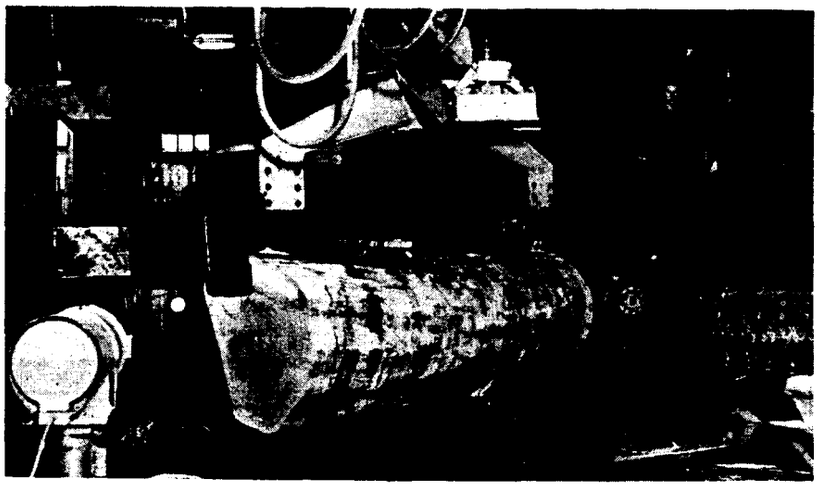
3 Upright arms also serve as backstops for cants being dropped from carriage, as shown here. In this photo, the final board cut from the cant was at once lifted out of the way and the cant moves at once onto the roll case. As the carriage is freed to pick up the next log, the tail sawyer then lowers the board and sends it to the feed table, trailing the cant. ■■



Scrap buggy is what Dorris Lumber & Moulding Co., Sacramento, Calif., calls this three-wheeled job-saver. It is one of two built and used at the plant. Placed beside the moulding machines, the buggy receives scrap steadil, until a load is built up. It then is wheeled to a burning pit, unloaded, wheeled back into position—ail in 1½ minutes. Formerly, refuse was collected in bins and then hauled out by lift truck, but there were delays when the truck was busy elsewhere. Now the system is speedier. Design resembles huge sugar scoop on wheels. The scoop is 33 inches wide and 6 feet long. At the center line it is 24 inches deep. The two longitudinal members on which the scoop is faatened are 2-inch channel irons. The scoop is sheet steel and framework is ¾-inch conduit, as is the handle. The conduit also serves aa a safety factor, covering the edges of the scoop, except at the lip. Air tires are mounted on a l-inch axle and the entire unit rolls easily. Small wheel at rear is swiveled. ■■

Ideas At Work

Block-turning charger that has upped recovery of veneer by 8000 ft. per shift-hold down for scarfer that gives 100% bonding surface. Devised for Fort Vancouver Plywood by mechanic Jim McGuire.



From the charger-operator% position is this view of the turner in action, turning log end-for-end. In use, however, block is turned and pre-set ready for the lathe at right, while the lathe is operating.

Master mechanic Jim McGuire believes his patented turner will replace old types of chargers due to recovery advantage.

Block-Turning Charger Ups Veneer Recovery

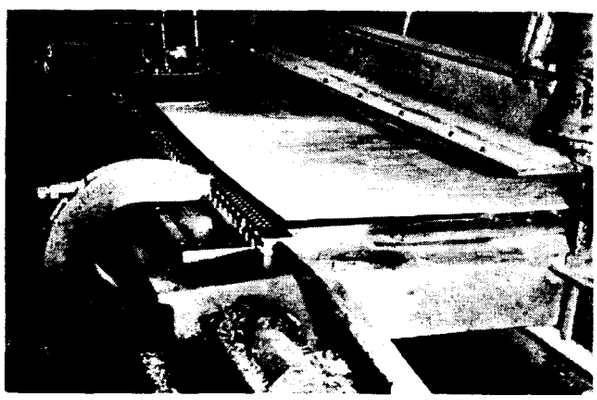
Added to Ederer overhead hydraulic charger is a new device permitting turning of block end-for-end in either direction. Eliminates necessity of changing chucks for bad ends; turning log to peel with grain instead of into splits; resulted in savings of time, gets better recovery for Fort Vancouver Plywood Co., Vancouver, Wash.

Devised by master mechanic Jim McGuire to increase recovery from old growth timber running to pitch, knots and splits. Lathe operator has gained up to 8000 ft. more recovery in one 8-hour shift. Speeds charging, reduces lathe delays for splits. Crew likes it — makes job easier.

Ederer Engineering Co., now builds on standard charger. Hydraulic turner works on 50-degree turn with valve on rack and pinion. Pre-spotted block turned for 10' lathe.

Also at Fort Vancouver Plywood, Jim McGuire has built an ingenious hold-down for scarfer that gives 100'ZO glue-bond surface. Works on warped or crooked panels.

A vacuum box with perforated metal plate 2" wide running table length on lead edge of feed table has vacuum pump pulling 200 psi. Suction holds panels tight, makes smooth running quiet cut and panel won't climb up on cutter head. Finger tip control with small set screws provides sectional control of vacuum for special sizes. Roller-tipped C-bar is panel stop guide.



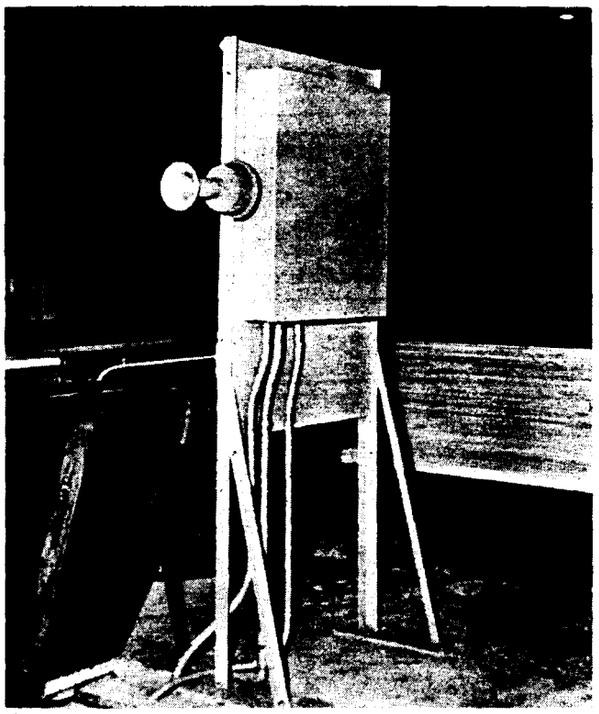
Hold Down for Scarfer

Operators side of the quiet running, accurate scarfer. Note the even and perfect edges of the scarfed panels.

Ideas at Work

Panels trip electric signal horn

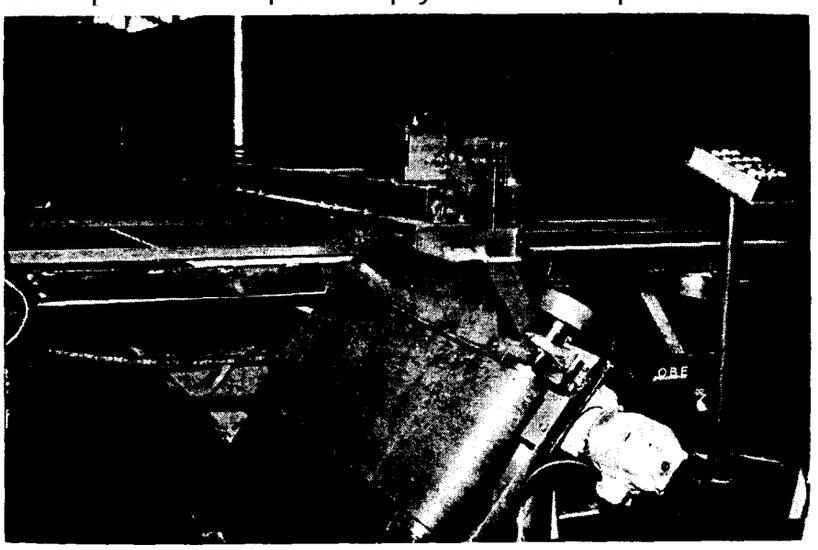
Tbis signaling device, at Bohemia Lumber Co., Culp Creek, Ore., notifies the lift truck operator that another stack of panels is ready to be moved. It's mounted on the control panel at the offbear side of the skinner and cut offsaws. A stack of panels ejected from the automatic panel stacker strikes a switch, sounding the horn. Lift truck operator does not have to keep returning for visual check; he has more time for other jobs.



Modified log flipper

Flipper was added to carriage system by means of a special shopmade headblock and air cylinder. It's at Idaho Pine Co., Meridan, Idaho. As sawyer raises the flipper, finger extends and flips the log. It was designed by Glenn Reed (above) and Edward Lemmon to speed small log sawing. Sawyer has pushbutton control.

Belt speeds dropoff of plywood trim pieces



Angle mounted belts, on each side of the outfeed end of the trim saws, receive leading ends of trim pieces as they begin to fall and move them quickly outward. The pieces are deflected onto the conveyor. Lost time from hangups is reduced to a minimum. Installed at U. S. Plywood Corporation's sheathing plant at Anderson, Calif.

Movable support on panel feeder

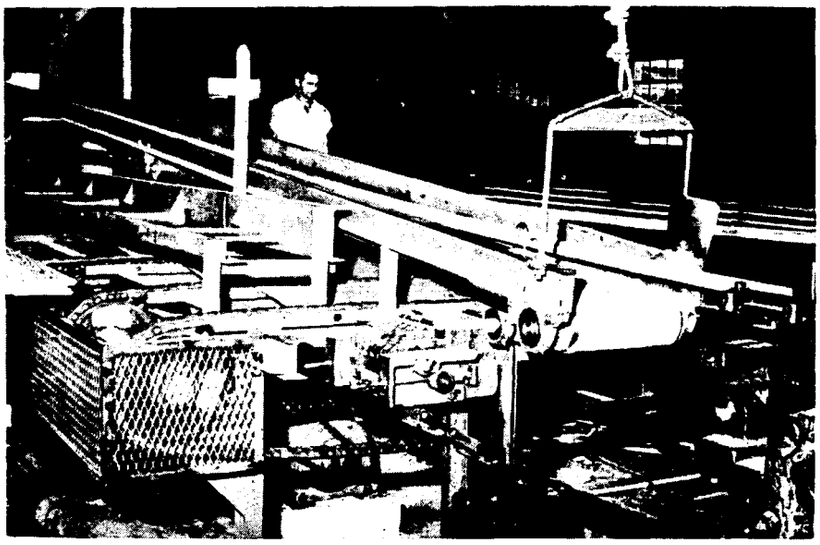
This center **support** on Cardwell panel feeder at Medford Veneer & Plywood Corp., White City, Ore., was modified in the shop by addition of rectangular steel plate and T-handled set screw. Support now can be slid to any spot and clamped firmly, providing optimum support and smooth feed of panels of varying thicknesses.

Ideas at Work

Convenient strapping

Strapping stand **used** at Welsh Panel Co., Longview, Washington, is made of steel tubing, with l-beams for the top members. Two Signode reels are suspended from fixed positions on cross members for easy feeding to both sides of a stack. Panels to be strapped are placed on gravity rolls by lift truck. Grooved 2x4 stickers are put on top and beneath the stacks to receive the steel straps. The strap sealer is suspended by cable from a self-winding reel, permitting it to be easily pulled down for use and just as easily rewound out of the way, The rewind hoist holding the strapping **tool moves back and forth on one I-beam.**

Planer and end-matchers share same transfer

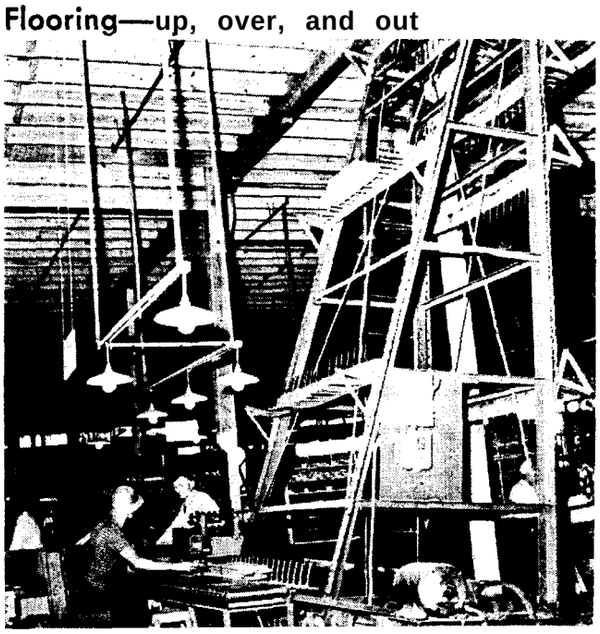


Space **and coats were saved at C)Zan** Lumber Co., Prescott, Arkansas, by installing a single transfer and grading table to serve both planer and end-matchers. One crew can run both pattern and end-match, in a quick changeover. A hinged transfer belt offbearing from the planer is the key. If S4S. is run, the transfer belt is lowered. Stock goes to the other side of the grading table. Running end-match, transfer is raised, allowing stock to go to the transfer table serving the Woods end-matchers.

Chipper knives rebuilt

Sawmill chipper knives are rebuilt at Crown Zellerbach Canada, Fraser Mills, British Columbia, by using the back section of worn out knives and welding onto them new cutting edges. Glen Lauck, left, won a $1,000 cash award for the idea, perfected after several tries at finding the right combination of heat and welding rod. With him here is plant manager Mort Heaps, who points **out** that chipper knives ground down in use and formerly thrown away are now given new life and save CZC money.

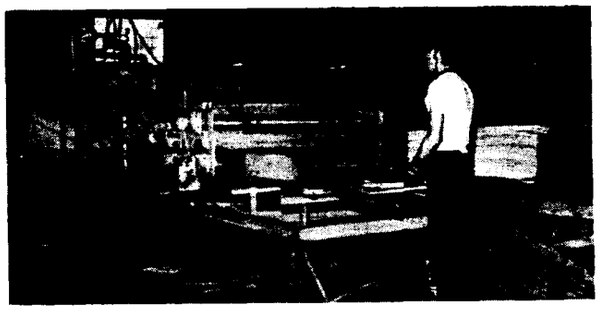
Flooring—up, over, and out



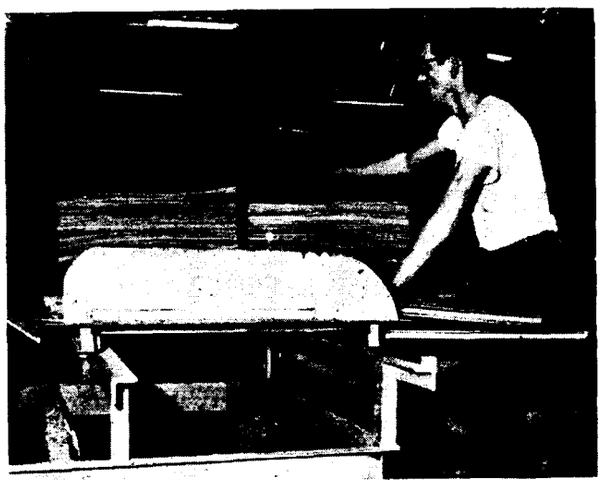
Converted lumber stacker is a lift conveyor for bundles of flooring at the Southern Pine Lumber Co., **Diboll,** Texas. Strapped bundles are lifted, borne over the top and deposited onto a conveyor belt. The belt moves the bundles the length of the plant, across an outside roadway and thence into the flooring storage and shipping area, located in a nearby building. Use of the device eliminated a step in loading and unloading.

Ideas at Work

Carriage feeder for spreader



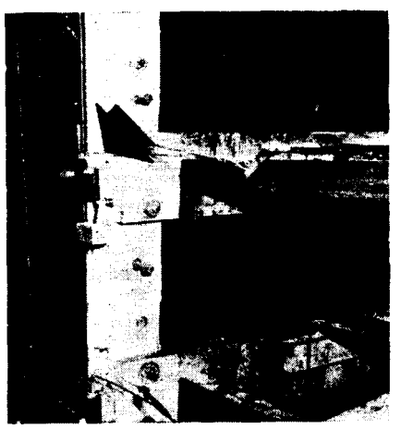
Core **carriage** on spreader **at** Martin Bros. Container & Timber Products Co., Oakland, Oregon, moves effortlessly and greatly reduces fatigue of spreader operator. He takes core material from the scissorlift and places it on the



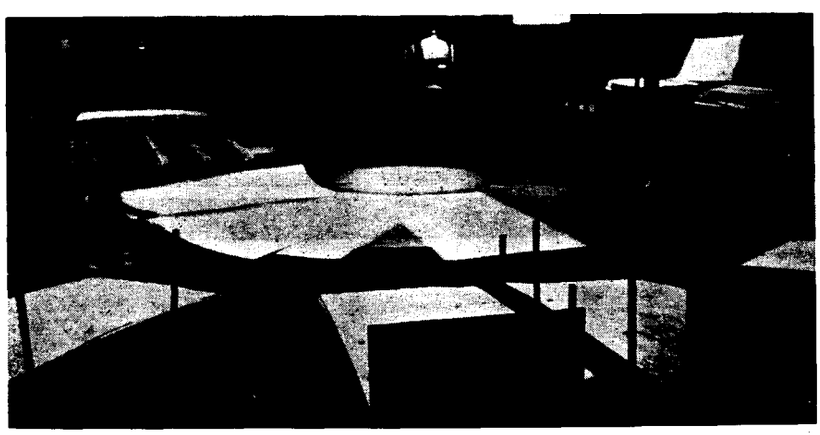
ress utri gers Carri ith hee

Automatic tray speedup

Top-speed clipper production is maintained at Evans Products Co., Gold Beach, Oregon, where superintendent **Delbert** DuvaU put in a tray speed-up to close gaps in veneer feeding to the clipper. Wands (arrows) sense gaps and cause speed-up. Control is by GE Limit switch, (arrow) **right** photo, linked **with** tray **drive** motor control. And when gaps are closed, wands are pulled down by veneer and the drive slows to normal.



Circular sorter saves $1,500 annually



Circular sorter at Coos Head Timber Co. plywood plant at Coos Bay, Oregor', saves money by reducing sorting work. The unit has a 24' diameter and is made of Y2" plywood on top, with 3_A" lower frame. The top is coated once a month with silicate to keep the surface smooth. Unit runs on hard rubber tires and is driven by a 2 hp Master electric motor through a Speed-ranger reducer. Veneer remains on the table until pulled and so there is less damage and increased recovery.

Heat speeds clipper

Infrared heat lamps are mounted on the air valves of clippers at Cascades Plywood Corp., Reedsport, Oregon. The lamps are mounted so that they not, only direct their rays to the valves but also affect the area. Lamps keep air warm, maintaining sharp, quick veneer clipper action.

Ideas at Work

The saw collar is directly mounted onto this precision, self-contained, ball bearing pulley, indicated here by Mr. Huntington. The timer mounting was designed for the new sheave and fits onto standard shingle machine. Saw collar was only slightly adapted.

Saw collar mounts directly here.

Boosts shingle saw recovery

Ed Huntington, of Huntington Shingle Co., Springfield, Ore., buys discarded saws at a fraction of the, cost of new onea, files them down for longer use,. geta 6 percent more recovery from blocks, and reduces breakage of shingles caused by saw wear-down.

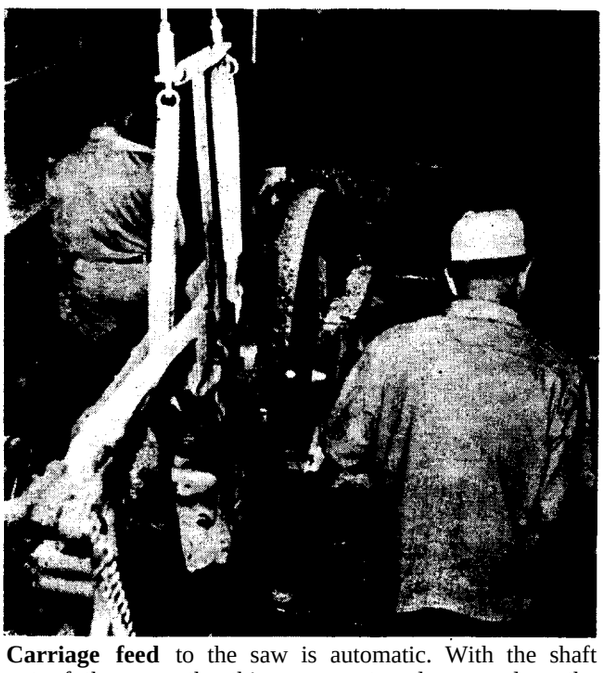
Huntington spent more than a year working out a special self-contained ball bearing pulley and a suitable saw mounting that would fit onto a standard shingle machine. The pulley and saw mounting enabled him to remove the long drive shaft normally extending across the machine, with motor on one end and saw on the other.

The new 'saw mounting permits both motor and saw to be mounted on the same side of the machine, using a close-coupled Poly-V drive.

Results have been highly noteworthy. Thinner saws are used, (17-gauge, with 14-gauge kerf). Recovery has jumped; breakage is nearly eliminated. Another plus factor is a smooth-running machine. With the long drive shaft gone, vibration has been eliminated and operator fatigue reduced.

Because of the direct Poly-V drive and tue free-rurming ball bearing pulley, the motor horsepower was reduced from 30 to 20 for each machine. The Huntington plant produces between 500 and 600 squares of cedar shingles daily.

The saw is shown here mounted on the machine. The motor is directly in the background, mounted on the same side of the machine. Through the opening, and indicated by the arrow, may be seen the poly-V drive sheave.



Carriage feed to the saw is automatic. With the shaft out of the way, the thinner mount and saw reduce the bend angle in a shingle, as it is cut from the block, thereby greatly reducing shingle breakage.

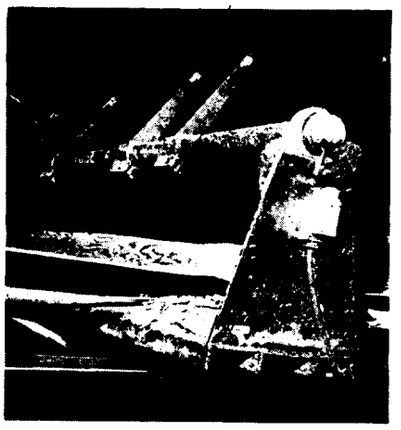
Ideas at Work

to provide extra veneer recovery, eliminate taping waste, easy saw handling, unload chips, guide trimmers.

Extra veneer recovery is made at the Edward Hines Lumber Co. plywood plant at Westfir, Ore., through use of a mechanical veneer breaker on the tipple. Master mechanic Emil Herman, reasoned that a breaker had to make a clean break without interrupting veneer flow, so he geared his breaker shaft to the tipple drive so it would travel at exactly the same speed as the veneer ribbon.

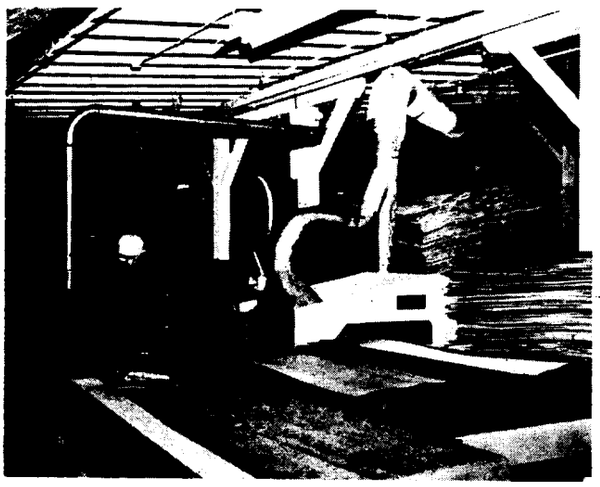
The breaker receives its operating signal from the first of two limit switches on the far end of each tray. The first switch actuates the breaker and tipple control and the second switch stops the tray. Since the breaker operates silently, a bell rings to notify the lathe operator.

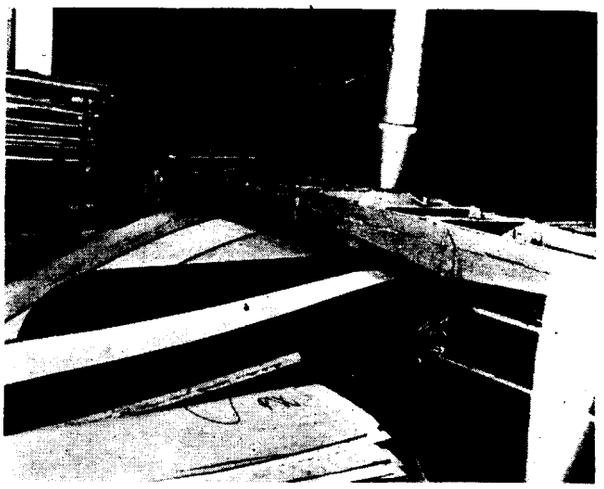
A previous breaker had thrown the veneer up, folding it over, causing splits. "We are losing three to four feet of material on every trayload," plant superintendent Clarence Herman said. He said time was saved at the clipper, also, in that the final veneer in each trayload did not have to be straightened and unfolded before clipping. It is now all face up, ready for clipping.

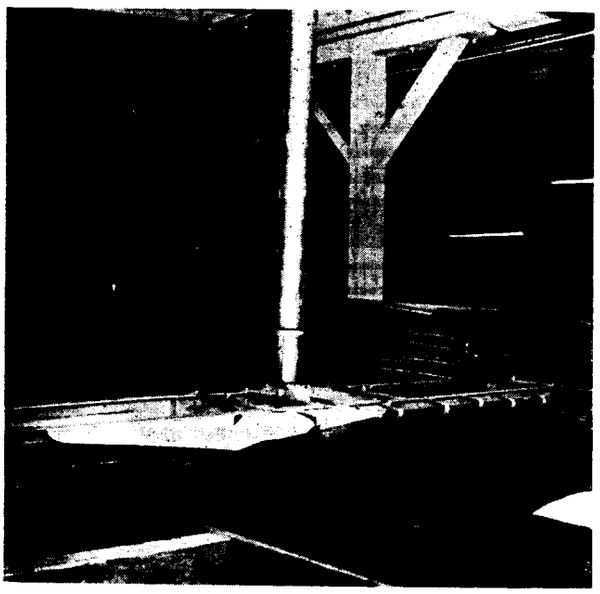


MicroSwitch stops breaker at "stakes-up" position following one revolution of shaft. Breaker travels at same speed as tipple.

Waste Eliminated at Veneer Tape Machine





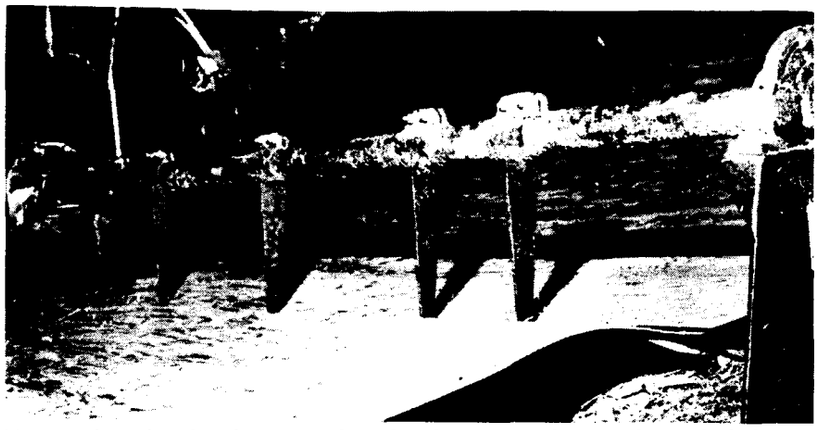


At the Weed, Calif., plant of the International Paper Co., all matching necessary in setting up random width veneer for taping into 54" sheets, and all waste from the operation have been eliminated. A shop-built pinch roll and ripsaw do the job.

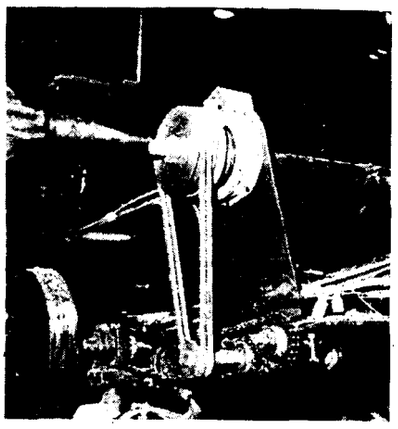
1. (Upper left). One-man feeds random widths to JoinTaper and second man feeds finished sheets to the ripsaw or passes sheets back for further taping.

2. (Left). When' sheet is taped to 54" or wider it is fed directly to pinch roll at right with bent strap steel fingers guiding it into rolls. Ripsaw set permanently at 54". Two bins are directly behind the saw.

3. (Above). Three section sheet is pulled through pinch roll to stack. A sheet metal divider separates the stack from excess pile where scrap pieces offbearing from ripsaw are accumulated and then fed back through JoinTaper until 54" or wider. Operation saves grading, is speedier.



Veneer breaker has five pointed steel stakes mounted on revolving shaft driven off lathe drive. Shaft makes one revolution, breaking sheet on downward thrust. Photo shows veneer at instant of breakage. Note veneer laying perfectly flat as it breaks.



Breaker driven by belts from tipple drive. Electric clutch actuates breaker shaft by automatic signal from tray. Belts run constantly.

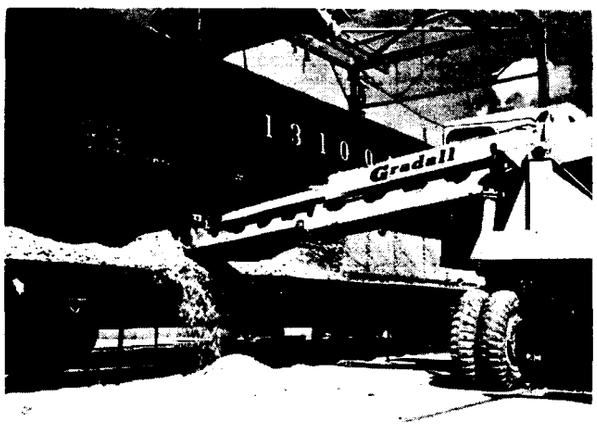
Other Ideas Include Trim Guides, Chip and Saw Handling

Lights are shown by arrows. Installation is made on both trimmers. Single light at the zero saw position is higher so as not to hamper the trimmer operator. Lights are easily accessible for bulb replacement.

Guide light installations are helping the Portland Iron Works and Sumner trimmer operators at Diamond Gardner Corp., Red Bluff, Calif., to speed and simplify trimming and reduce waste.

The shop-design installations are similar to the more-familiar edger guide lighta, only the guides are mounted at right angles to the lumber and the lines are shorter.

General Electric 200-A-25 200-watt incandescent bulbs are mounted in troughs. The special filaments are lined up with 6-inch wide slots in the troughs. Light falls on the boards at the 12, 14 and 16-foot positions. A single light puts a line on the zero saw position.

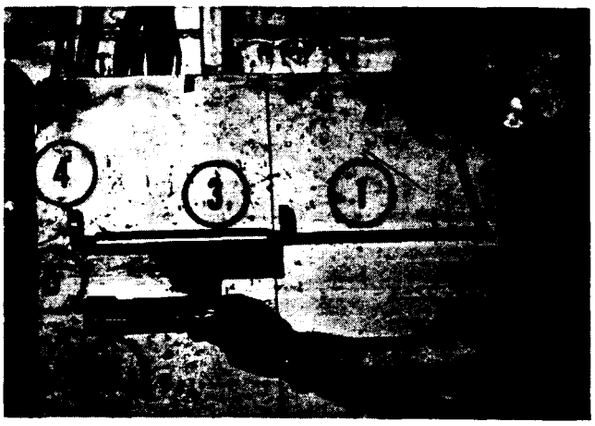


Full length side doors in chip cars built by the Southern Railway are easing chip unloading for Bowater Caroline Paper Corp. at Catawba, S.C. Doors are raised five feet to expose the chips and two Warner & Swasey Gradall machines unload them. Gradall uses pushing and swing motion to break a hole in the compacted cargo. This truck-mounted unit uses 36" bucket.

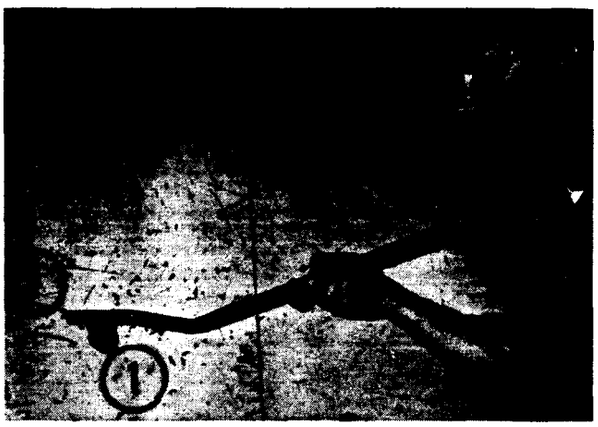
Circular saw cart uses 3 wheels at Arcata Redwood Co., Orick, Calif. Gives manueverability. Toe piece keeps saws from working forward. Saws separated by 2x4s. Cart made from plywood.

Filers' job savers

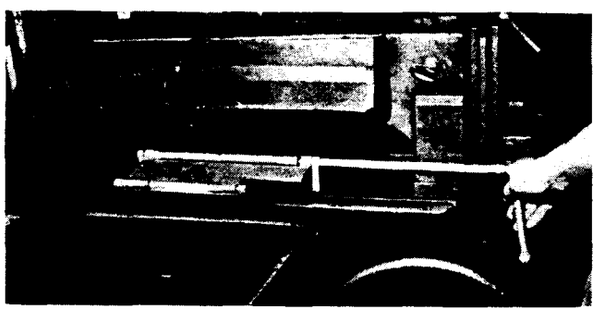
California filer uses two shop-made tools to do a better job



1 **Head filer I-L G. Phipps,** Rrdph L. Smith Lbr. Co., Anderson, **Calif.,** uses this to dish down saws. Steel shaft (1) is %x24"; swiveled handle (2) is 6" long; roller (3), where saw rides, is 1 %x IO"; two steel eccentric lugs (4) are **2⅜"** high, anchored to shaft by set screws; main plate (5) is **¼"** steel; foot (6) is 8" long.



3 **Th oo M**



2 **in p)**sition **for use,** the tool's handle is down. It was **used** to turn the main shaft and set lugs on their flat surfaces to keep the roller firmly raised. Hinge action connects foot and plate. Foot is in stretcher guide slot.

4 **Th ın ositi**

Swaging and tensionin$_g$ to get best performance

At the Urbana Lumber Co., Urbana, head filer H. L. Pritchett has found some sound principles that work for him in tensioning and swaging band saws to get continuous good performance. He lists them this way:

1. The first thing to remember in tensioning is to keep the saw level.
2. Keep a standard tension in the saw.
3. Get good corners on the swage for a 1/32" bite.
4. Keep the same amount of swage on both sides of the teeth.
5. In tensioning, use of stretcher rolls is preferable, though heat may be used at times.
6. On a new saw, use of heat is tine.
7. On saws needing tensioning in spots, use of stretcher rolls is preferable to heat because heat is more difficult to control properly.

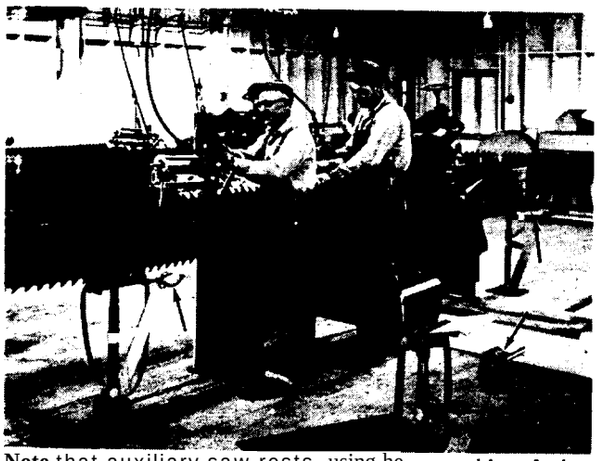
Mr. Pritchett uses a Simonds saw with C-H gullet with a 1%" spacing. The saw is .089 gauge, for a 7' Wheland band mill. He swages to 6 gauge for cutting pine and 5 gauge for hardwood, Rim speed is 10,000 fpm. Logs are generally 20' to 22' long. He applies the same practice for tensioning **and•** swaging saws for the resaw as for the band mill. The file room has an Armstrong grinder and a Hanchett No. 55 swage.

H Pritchett files saw

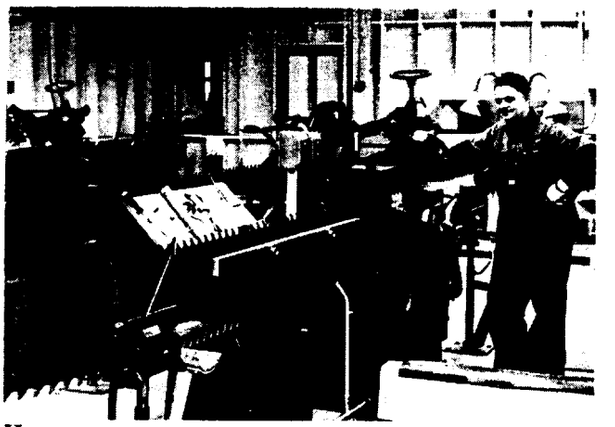
Saw Filers' Room

Here are some ingenious secrets of head filer Emil Johnson at Simpson Timber Co.'s new Mill 3, Shelton, Wash. Not of the old school, Mr. Johnson believes in sharing **his ideas with other filers. Photos are taken in Johnson's modern, Armstrong equipped filing room.**

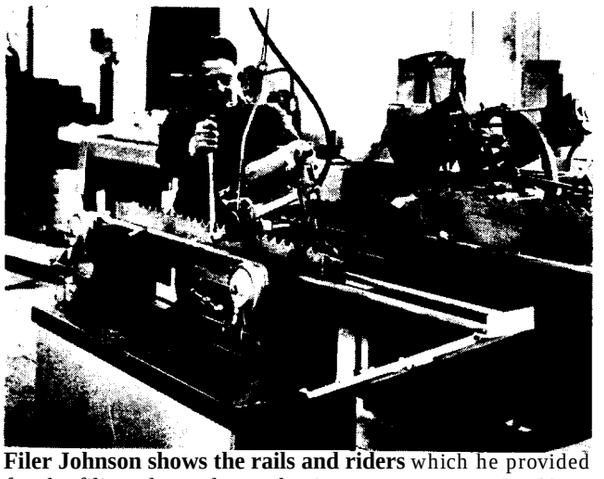
Good housekeeping evidenced in this photo is **normal** for this exceptionally **clean, well ordered** filing room. Provisions for prevention of accidents are excellent. Ingenuity shown in designing and laying out room is outstanding. One of features is an electrically powered lift for raising and lowering the saws in racks, (see arrows pointing at lift and rack).



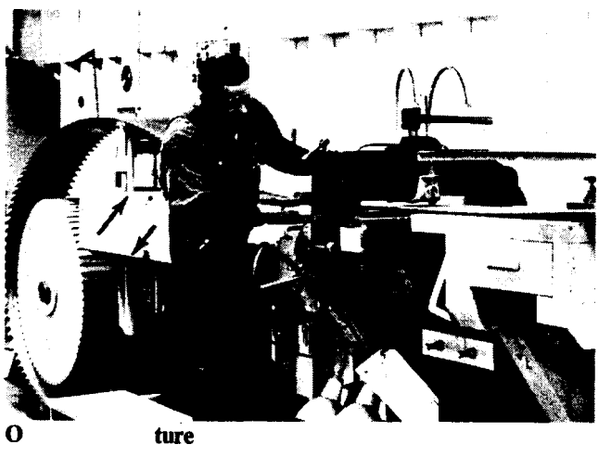
Note that auxiliary saw rests, using heavy rubber facing to protect the teeth, have been provided on the post brackets for use when loading and unloading the saw, See arrows. Filer Ray Densley, left and Alex Kuhr, right,



H **tu**



Filer Johnson shows the rails and riders which he provided for the filing clamp that make for convenience. The filing clam as well as the swage is air-powered. On the right is an abrasive cut-off wheel for trimming of tabs.

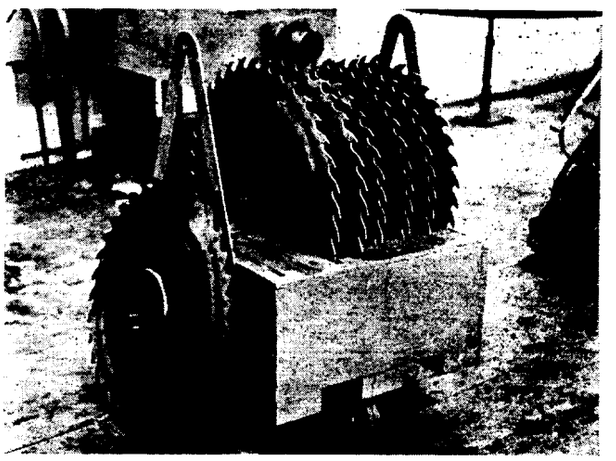


O **ture**

I saw Filer's Room

Saw handling methods at Simpson's new plant, make the filer's job easier, reduce damage, save time and money.

Armstrong stretcher roll setup is shown by head filer Ray Densley. He installed air-piston backlift with 13" lift. Also added swing-down wooden step to get him off floor to operating level. Roll is counterweighted.



Cart for handling edger saws was fabricated with arms so it could be lowered down onto mill floor. Saws are placed in slots for easy safe handling between filing room and machines. Casters allow easy rolling on floor.

One of the industry's mast modern filing rooms is a part of the new small log sawmill recently opened by Simpson Logging Co., Shelton, Wash.

The filing room, located on the mill's third floor, abounds with labor-saving devices to make the job of **handling** heavy saws easier. Head tiler Ray Densley and one assistant file the plant's 8-foot double cut band, 72" inserted tooth bucking saw, 6-foot band resaw, two edgers, trimmer, chipper and hog.

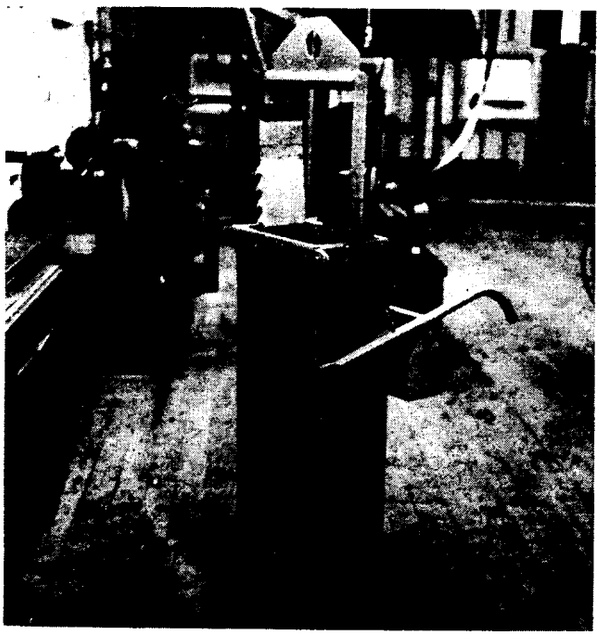
A shop-built overhead crane lowers sharpened saws to the operating floor and picks up saws for filing. All the special saw handling equipment was company-built.

The air shapers are counterweighted and hung overhead within reach of the filers.

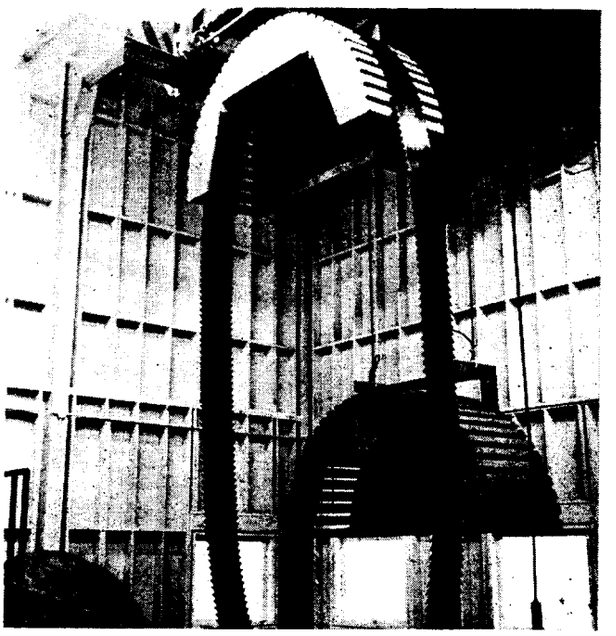
The **room's** location on top of the building provides abundant natural light, but fluorescent lights provide 100 foot candles of illumination at working level.

An elevator man-haul, similar to those used in pulp mills, is being installed. The vertical elevator will transport men from the ground floor up to the operating floor, and the filing room.

Another step-saver is a 10" pipe which will run from the filing room down to the ground with a refuse can placed underneath. Refuse will go down the chute.



Gangsaws are carried in hand-truck which also has superstructure for lowering down to floor. Bin between handles accommodates bolts and tools.

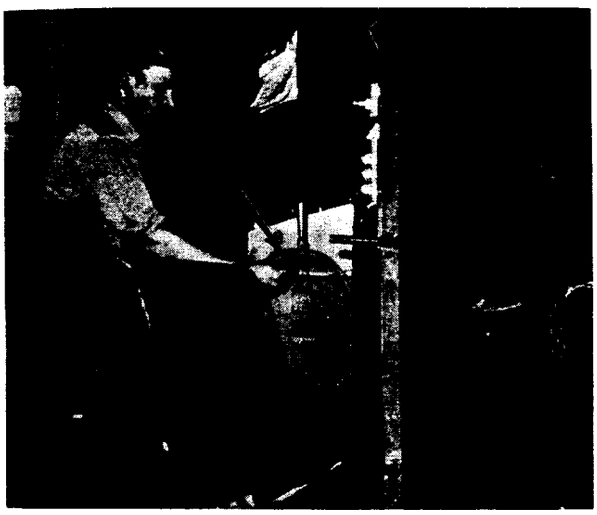


Bandsaws are lowered through hole in floor of filing room. The two cranes allow two saws to be handled at once. Crane has short travel to clear hole in floor.

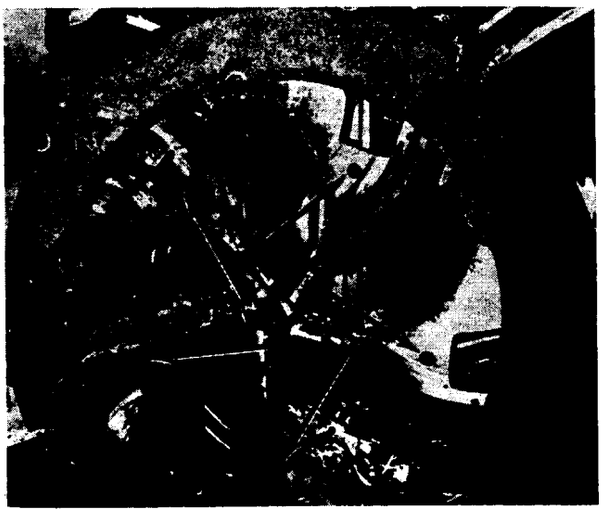
More Safety

. . . Special measures are taken at ring barker to prevent recurrence of freak accident.

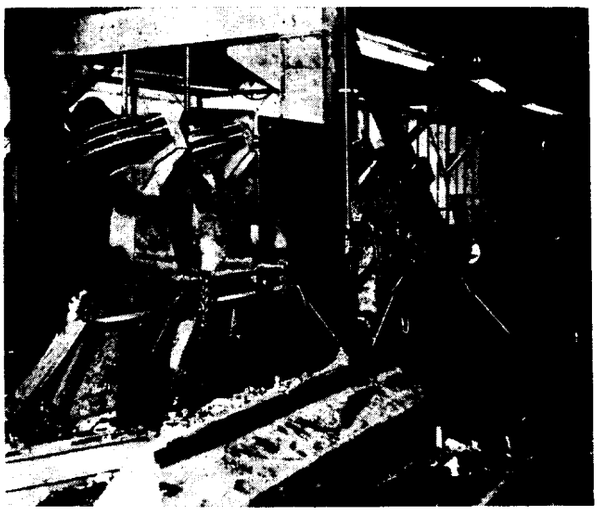
A freak accident, serious but not fatal, at the U.S. Plywood Corp. sawmill at Anderson, Calif., resulted in the development of these devices which function in conjunction with the Nicholson barker used there. A cant hook fell against the barker ring control lever, activating it, while the barker was being worked on. A man was injured.



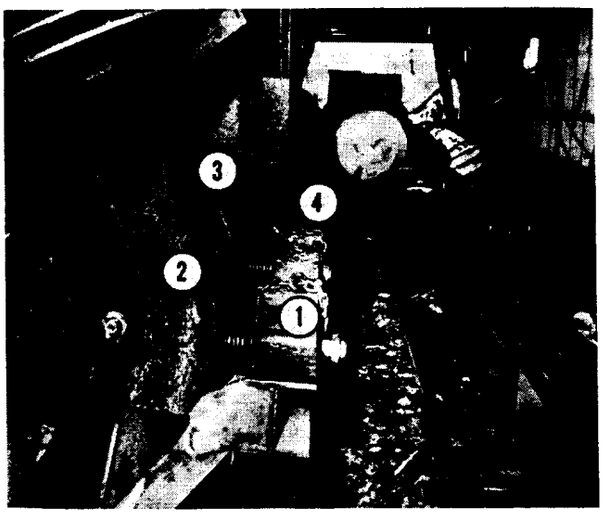
First, a hole was drilled through the barker control lever and the lever control housing. A steel pin waa then attached to a chain permanently mounted inside the operator's booth. Whenever he leaves the booth, he inserts the pin in the holes, locking out the controls and preventing action if, accidentally, the lever is struck. The same type device is used on the sawyer's control lever. Arrow points out pin.



A second control waS achieved by drilling holes through each of the barker knife arms, about 6" below the ring. Whenever it is necessary for a workman to stand on the ring, for any reason, he must first place a bar through the knife arm hole, locking the cylinder in place. The safety director found that a cylinder might drop at any given time, even though the ring is not in motion. Arrows show holes.



Further preventive action for a different kind of potential accident resulted in the chain tie down arrangement shown here for the barker hold-down rolls (arrows) . Actually, these might he termed tie up arrangements, for the system works by hooking the chains onto steel loops welded on the arm of each roll and thus holding it in the raised position, whenever there is work to be done on the barker.



Closer look at the manner of mounting chains and loops marked by riumbers in photo. From this point, loops on the hold-down wheel arms appear as bars welded onto the arms. They are, however, like large handles, with room for the chain to be put through and then the hook locked farther down on chain links. Controls are locked out at any time workmen are busy on equipment. ■ ■

Safety Check list

fly JACK E. BEDFORD
Prof. of Management
Armstrong College

Here are 50 questions to review to see if you are doing everything possible to keep your accident rate low.

Write "YES" to each statement which you can HONESTLY answer with an unqualified '"yes"". Multiply the **number** of "yes'" checks by two, when completed. This is your score.

If your score is 50 you are doing only a half hearted job—if 70, you are doing fair, need much improvement-if over 90, you have a first class safety program underway—if you check out at 100, you are exceptional—you are saving real money —your personnel is happy and you have a near Zero rating.

If you have one or the other, but not both a safety director and a safety committee. then 93 **is your** perfect score; 63 is fair **and 83 is excellent.**

SAFETY ORGANIZATION

1.....Has top management been completely sold on safety program value? '(Unless this question can be answered with a resounding "YES" the rest of the questions will have little value).

2. .....Have you complete cooperation of middle-management staff?

3. .....Have you integrated your safety **program as** definite part of production'?

4. .....Have you a safety director or selected a safety committee to handle details of the safety program?

5. .....1s your safety program set up for easy flow of communications through all organization channels?

6. . .... Are regular top level conferences scheduled to consider program progress?

IF YOU HAVE A SAFETY DIRECTOR

7.....Have you selected one person (full or part time) to handle work of safety director?

8. .....Have you given your safety director authority to direct and to coordinate the safety program?

'9. .....1s the safety director responsible for success of your entire program?

10.....Does safety director know the employees and have an understanding of their problems?

11.....1s the safety director able to delegate authority and responsibility for various phases of the program?

12.....1s your safety director able to contact and deal with the em**ployees in helpful** and satisfactory manner'?

13..... Do you take quick action on the recommendations made by your safety director'!

IF YOU HAVE A SAFETY **COMMITTEE**

14.....1s your safety committee composed of hoth workers and supervisors'?

15.....Do you have a plan for adding new people to your safety committee periodically? .

16.....Dws your safety committee determine standards for safeguarding equipment?

17.....**Does** the safety committee formulate and check on the observance of safety rules?

18.....Does the safety committee investigate all accidents and make recommendations for hazard elimination?

19.....Does the safety committee review safety suggestions and pass on their practical application?

20.....Do you take action on recommendations made by your safety committee?

SAFETY TRAINING

21.....Have all workers been informed of what accidents mean to them personally in both physical and financial sense?

22.....Do the employees understand cost of accidents to the company and know how they affect earnings and their own security?

23.....Have employees been in-, structed in safe ways to perform their work assignment?

24..... After the initial safety in**struction,** are the employees asked to perform the task in the safe way to check learning?

25..... While the employee is performing the task in training, does the trainer check to be sure it is completed safely?

26.....Have you set up some system of periodic checkup on the safety training on a departmental level?

27..... Are the workers encouraged to make suggestions for ways and means of preventing accidents in their departments?

28..... Are regular conferences on safety conducted on the departmental level?

SAFETY REPORTS

29.....Do you have a system of safety reports that keeps you up-to-date on your firm's safety status?

30.....Do you require a periodic report from each supervisor describing conditions in his department that need safeguarding to avoid future accidents?

31..... Do **you follow up safety reports with inspection (ours to** check on ail danger spots reported'?

32..... Do- you have the supervisor reporting these unsafe conditions ac**company** you on this tour?

33..... Do you correct the most **serious conditions reported on the safety reports first even though they require a larger expenditure?**

ACCIDENT REPORTS

34..... D0 you reccivc an accident report every time there is any type of accident in your plant?

35..... D0 your accident **reports** pin point the location where the accident took place?

36..... Do your accident reports indicate whether one **age** ,group or sex of employees has more accidents than another?

37.....Do your accident reports indicate which shift has the largest percentage of accidents?

38. . .. .**Do** you know the cause of the largest percentage of accidents?

39.....Have you made an accident report analysis for the past three or four years to determine the pattern of accidents?

SAFETY STIMULATION

40.....Have **you held a safety contest or a safety drawing within the past year?**

41.....Do you give some type of reward to employees with a good safety record?

42..... Do you use signs, posters and slogans to keep your employees conscious of safety all the time?

43.....Do you give local publicity to your firm's safety program and your safety record?

44.....Do you recognize individual safety performance on your bulletin boards or in your magazine?

45.....,....Have you considered a program of promoting home safety for its carry through value on the job?

46.....Have you considered a program of personal letters to your employees who have worked without an accident for certain periods of time?

SAFETY EQUIPMENT

47.....W h e n considering n e w equipment, do you always consider the safety factors before buying?

4 . 8. . .....When making any change in production, do you investigate the danger of accidents with this change?

49.....Do you provide (or require) your employees with the latest in personal safety equipment for their jobs?

50.....**Do** you check each issue of your business magazine for the latest ideas for safer equipment and supplies?