From timber to tidewater

or, How the products are handled and loaded on the lumber railroads

By James W. Sabol

Sketches based on drawings by the author

THIS feature was presented as a clinic by Jim Sabol at the NMRA convention in Vancouver last August. The drawings were prepared from Jim's sketches; the text and captions from his notes. The photos are by Jim, and they show a 15" x 50" HO scale display used at the clinic. The smaller line-handling blocks were model ship fittings. The three large blocks and carriage were fashioned from wood and hook coupler parts. The line was Sears-Roebuck stranded copper leader. The donkey engines were modified and enlarged from Rollin's House materials. The tongs were filed from code 70 rail.

The glory days

Logging is an ancient practice, but in America the "glory days" of logging began when railroads were put to work in the woods. Previously much logging was done in winter and the logs were floated down rivers in the spring floods. Thus only timber close to manageable streams was available economically.

In the seventies railroads began to be used in Michigan, then in Wisconsin, then in all logging regions. Transcontinental railroads made it possible to ship lumber across the continent. Here are some significant dates:

1880: First Shay geared lokey, made by mounting engine and boiler on a flatcar.

1882: First steam donkey built by John Dolbeer.

1888: First Climax geared lokey.

1894: First Heisler geared lokey.

1911: First automatic log bunks.

1922: First Willamette Shay.

1927: First "Pacific Coast" Shay.

1930: Peak of lumber production — eight billion board feet annually.

The first Shay was built by Lima. The Willamette Shay was almost identical but was distinguishable because all three slide valves were on the outward side of their cylinders, while on the Lima Shay the forward two cylinders had valve chests facing forward and the rear cylinder's valve chest faced toward the rear. Willamette Iron & Steel Works built Shays under license from Lima.*

The "Pacific Coast" Shay was a 90-ton three-truck lokey designed and built by Lima expressly to meet west coast logging railroad requirements.

The logging locomotives

The Shay and other geared "lokeys," as they were called by loggers, were excellent for logging because they had good traction with all weight on drivers; they could operate on rail as light as 45-pound, and could not only negotiate curves of as little as 100-foot radius — even sharper on narrow-gauge track — but also undulating track. A 158,000-pound Shay could exert 13,920 pounds tractive effort on a 10 percent grade. By contrast, a 262,800-pound Mike could exert only 1850 pounds tractive effort on 10 percent.

Since all the mechanism was at the side of the Shay, it was the most popular geared type because of easy maintenance.

Besides the geared lokeys, many other types were used. One breed was the "false Mikado," a 2-8-2 but with either an old-type narrow firebox or the firebox ahead of the rear wheels. The trailing truck on this and other false types was there to aid the engine in running in reverse rather than to support the weight of a large firebox, as on a true Mikado.

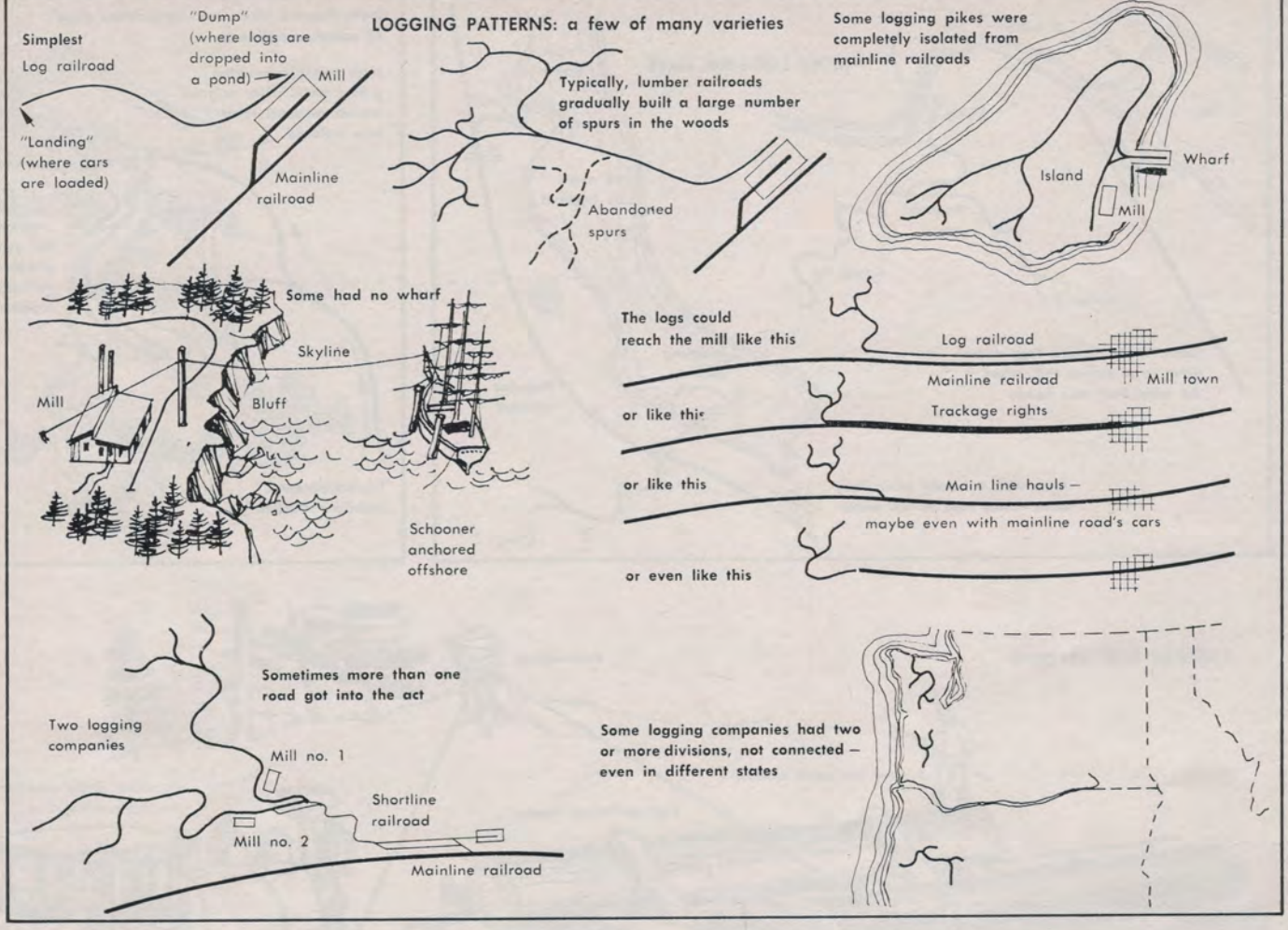
Articulated and tank locomotives were also used. Many of the steam dummies that were the predecessors of the electric interurban car were sold for use in the woods.

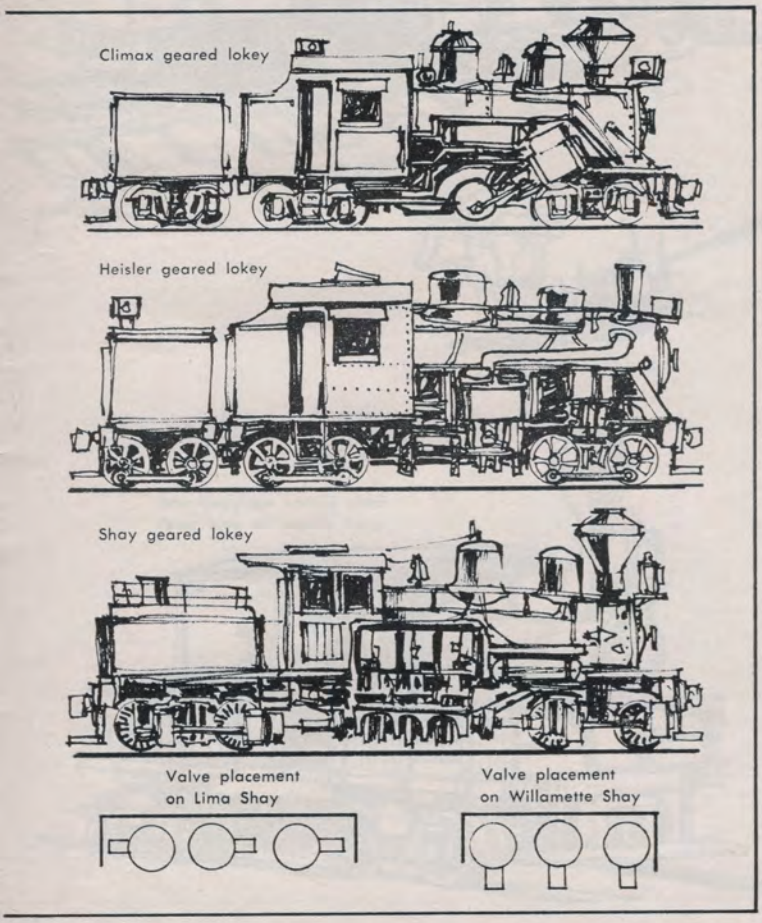
Western logging railroads commonly used oil — seldom wood, never coal — for lokey and donkey-engine fuel.

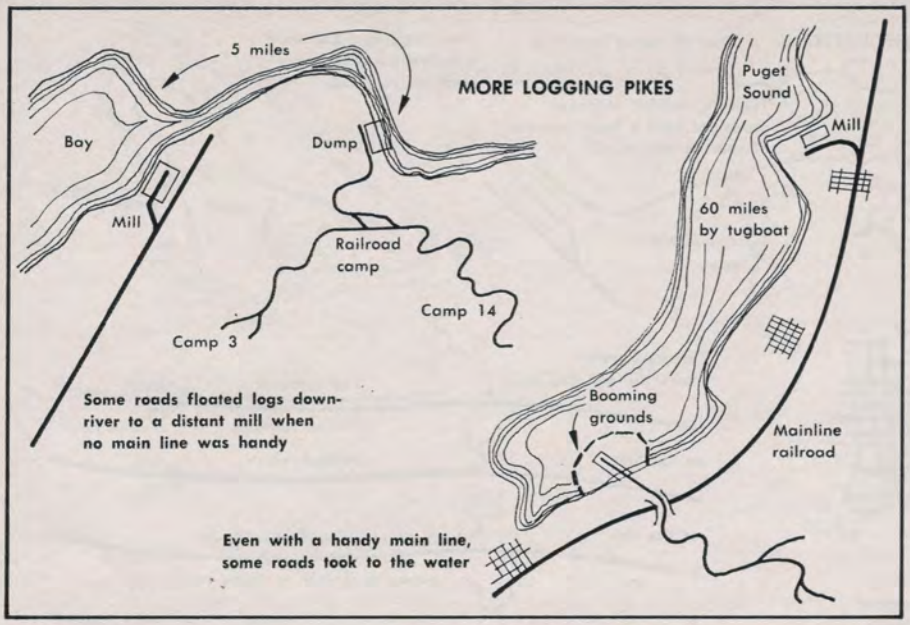
From about 1930, roads and trucks became more economical for most logging operations, and few new tracks were laid. Today only Rayonier and Weyerhauser, in Washington, have operations of any great size using rails. In California the McCloud River RR. and California Western are owned by lumber companies, and logging augments their operations.

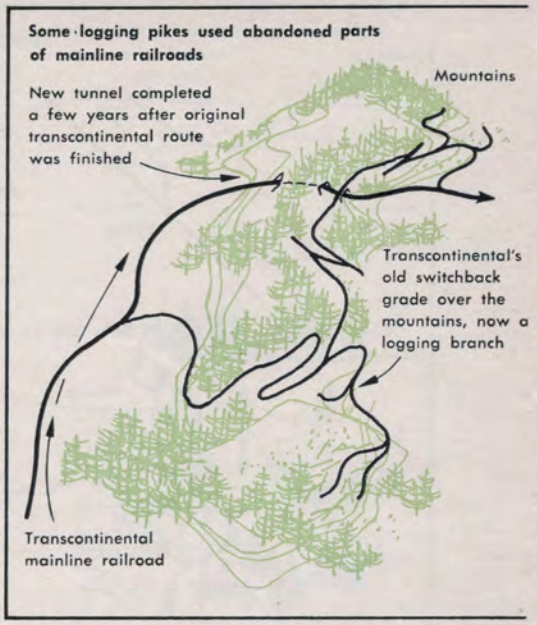
*Some sources state that Willamette Iron & Steel Works started to build Shays after the basic Shay patents ran out.

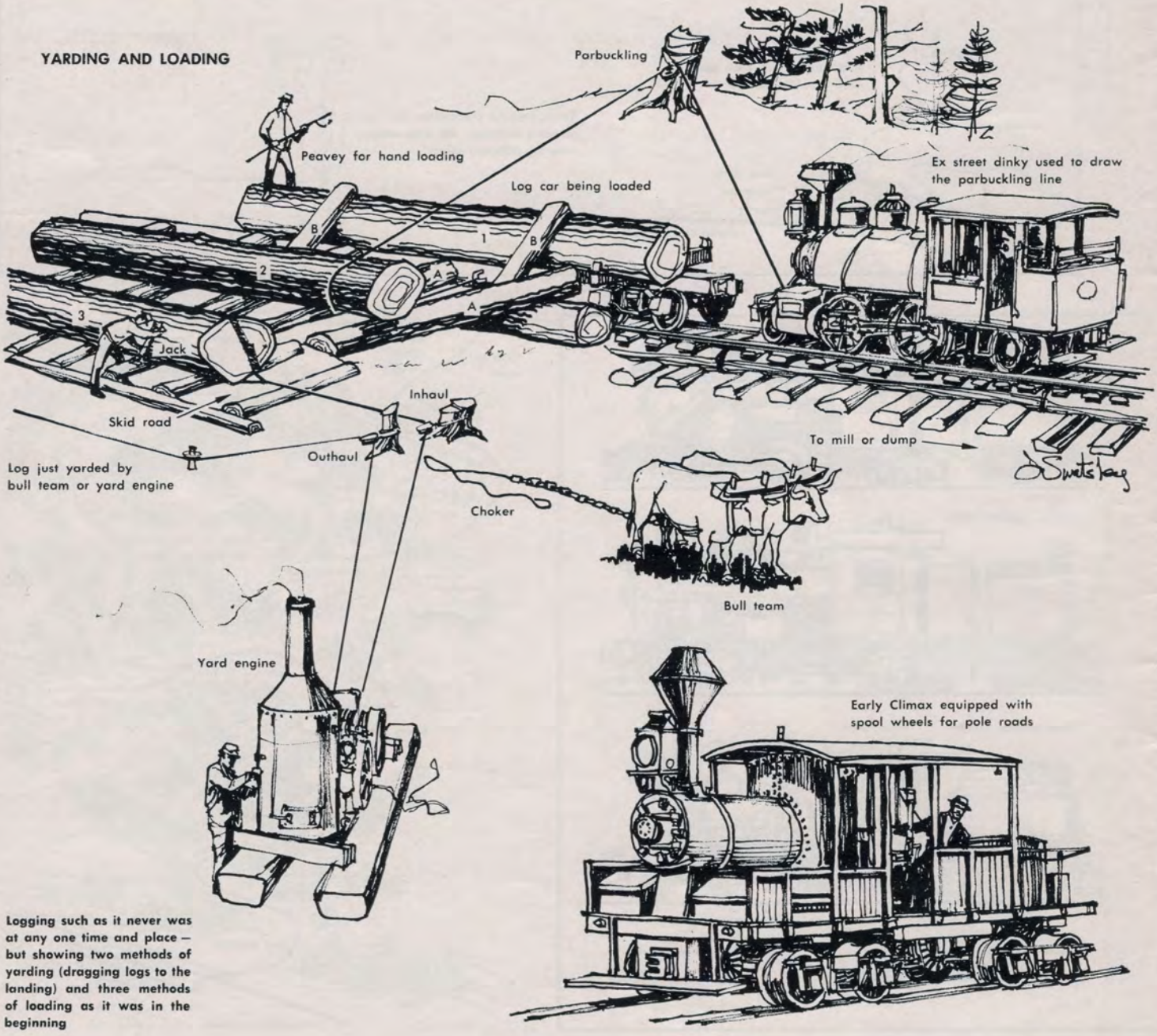
LOGGING PATTERNS: a few of many varieties



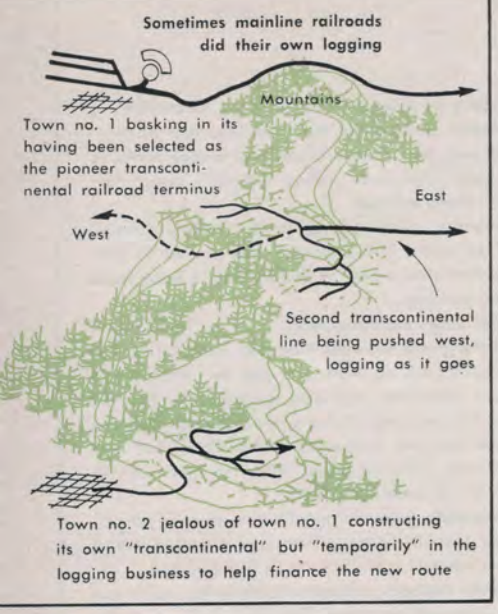


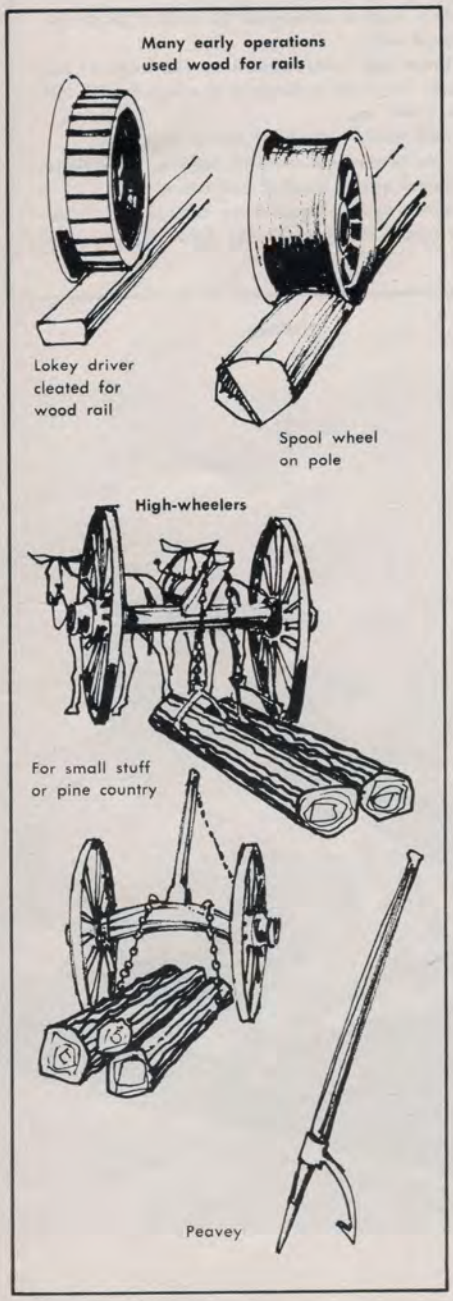






Logging such as it never was at any one time and place — but showing two methods of yarding (dragging logs to the landing) and three methods of loading as it was in the beginning





Lumber railroad operating practices

LOGGING lokeys in the woods seldom turn around. They remain headed uphill to ensure water over the crown sheet. The reason a lokey heads an up train, rather than pushing it (when track permits), is that log cars do not push well uphill. Commonly a piece of brush is stuck into the rear coupler of the last car of an up train to provide visual evidence that the train is intact.

The lokey, commonly running backward, heads a down train to provide an extra measure of safety against runaways. A runaway train will usually push the lokey off the rails: this is best because a wrecked train and lokey are cheaper than the cost of damage to lives and property that might be caused by a runaway log train roaring unchecked for a long distance down the pike.

The lighter the rail and the poorer the track, and the more switching required on steep grades, the more likely a road is to use geared power. If the grade is not over 7 to 8 percent in the woods, low-wheeled saddletank rod engines can go just about everywhere a geared lokey can go, and faster, provided the track is in reasonably good shape. A geared engine might still be preferred if there is a lot of switching to be done at the upper end. If the grade is reasonable on the entire line — not over 3 to 5 percent — a road might use rod engines exclusively: probably saddletank Mallets. If the logging pike is longer than a few miles and has reasonable grades on its lower end, geared lokeys and low-wheeled engines from the woods will commonly turn their trains over to faster rod engines for the run to the mill.

Loading is too time-consuming a process on which to waste expensive lokeys. Log cars are commonly moved to the landing by gravity, the lokey having shoved them up the grade past the spar tree. The loading crew drops the cars down one at a time by handbrake. Unloading can be accomplished more quickly, but it usually requires the services of a lokey at the dump: for certain with jill pokes, perhaps not with gin poles.

Some cars have a sill like the center sill of an ordinary car extending from one truck to the other. The couplers are mounted on the ends of this; and there are broad bolsters, called "bunks," to support the logs.

Another arrangement is the "disconnect." This is a single truck with couplers at each end and a bunk for holding one end of the logs. Another truck is placed under the other end of the logs, making a car without a center sill. Normally the weight of the logs is all that keeps these disconnects spaced. When empty, disconnects are coupled to each other, making a short train.

If a loaded log train is made of disconnects, the train crew must switch the loads at the landing, putting all light or weak loads at the rear of the train. A lightly loaded set of disconnects will pull apart under any heavy strain. Disconnects must ride the rails so that all brake wheels are on the same side of the train, and in pairs.

Mainline railroad freight trains must not pass under moving loaded log trains unless the logs are banded or chained. Mainline passenger trains must not pass under any moving loaded log trains under any circumstances.

Trains in the woods commonly operate with four-man crews. They have no conductor and no cabooses. Trains on logging railroad main lines do operate with cabooses.

Log trains usually double the hill when necessary, rather than doublehead.

The equipment, the line, and the camp

LOGGING railroads use more varieties of rolling stock than is commonly known. Second-hand passenger coaches or demotorized second-hand interurban cars are used to carry loggers into the woods from camp. These cars are parked on a spur near the landing during the working day. Heavy-duty steel-decked flatcars, often with six-wheel trucks, are used for moving machinery and other heavy equipment. Tank cars with pumps are used for fire protection. Boxcars carry tools and firefighting equipment. Topless boxcars are used to move sawdust and wood chips for pulp. Flatcars are used to carry fuel drums. Gondolas are used to carry track components. Wedge plows are used to clear snow.

Rolling equipment is commonly secondhand (or homemade from whatever parts are handy) and often is virtually unrecognizable as railroad equipment.

With an abundance of timber available and seldom any need for permanent roadbed, there is very little need for steel construction. Thus bridges are either timber trestles or timber trusses. Where ground is very rough, a roadbed of timber cribbing is frequently cheaper than to grade dirt in place. In short, if there's a roadbed problem in the woods, it's solved with timber. Where a tunnel might seem logical, a switchback is most often used.

A headquarters camp might contain these portable buildings mounted on railroad cars or trucks: bunk cars, commissary car, sawfiler's car; and these permanent buildings: dispatcher's office, engine shed (with complete toolshop for work from wheel-turning to retubing), blacksmith shop, water and fuel facilities.

A glossary of logging terms

In this list I have attempted to avoid terms that are merely part of the logging "color" used more by latter-day aficionados than by the loggers themselves. I have also concentrated on those terms most closely connected with logging railroads. The order of terms is in approximately the order of operation.

timber cruiser: one who determines where to log next and how many board feet of lumber to expect from a stand.

faller: one who makes vertical trees horizontal.

springboard: the board a faller inserts into a notch in the base of a tree, 4 to 10 feet off the ground, to stand upon when he swings his ax. It raises him above the brush and away from the thick bark and gummy butt wood.

bucker: one who saws fallen trees into manageable lengths.

misery whip or **swedish fiddle:** the bucker's long saw.

trailing: old method of dragging logs down the track.

snipe: to bevel a log which is to be trailed so it won't catch on obstructions.

landing: place where logs are hauled out of the woods and loaded onto cars.

spar tree: very tall tree left standing at the landing, but with branches removed and topped. It is rigged with lines (cables) to pull logs out of the woods.

high rigger: one who attaches the lines to spar trees.

main line: heavy line rigged from spar tree into the woods. A carriage rides on it.

tail tree: tree in woods anchoring the other end of the main line.

skidding line: line rigged from spar tree, through carriage on main line, to be lowered and attached to logs.

turn: a group of logs brought out of the woods as a unit.

block: a steel casing holding a sheave, with an eye for hanging from spar or tail tree.

sheave: pulley encased in a block.

donkey: steam-powered drum (winch) to provide muscle for pulling in the skidding line.

donkey puncher: donkey operator.

whistle punk: one who signals instructions from the woods to the donkey puncher by waving a line attached to the donkey's whistle cord.

engine: any logging machine, donkey, etc.

yard engine: a donkey used to bring logs to the landing by means of a spar and skidding line.

road engine: a donkey used to skid logs directly on the ground to the landing.

skidder: a combination yarder and loader mounted on trucks, equipped to work either with a spar tree or with its own built-on spar.

reload: place where log trucks transfer their loads to railroad cars.

scaler: government employee who measures board feet of timber in a loaded log train, often in transit.

lokey or **lokie** or **loky:** logging locomotive.

bunk: part of the car that logs rest on.

cheese block: retractable steel wedge on bunk to keep logs from rolling off car. Some cars use stakes instead.

rooster: piece of rail with flanges ground off its ends. It is inserted and pinned in coupler between a pair of disconnects to keep them from parting.

car frog: rerailing frog.

hole: place between two cars from which the brake wheel on each car can be reached. (If that's not clear, say you arrange the cars so that by standing on the end of one car you can reach not only that car's brake wheel, but also the next car's; it saves hopping from car to car to set brakes. Get it?)

booming grounds: subdivision near a jet airport; area in water where logs are dumped to be arranged into sections or log booms.

dog: eyebolt hammered into a log so it can be attached to other logs for trailing or for forming log booms.

bolt: section of log cut to correct length for shingle mill.

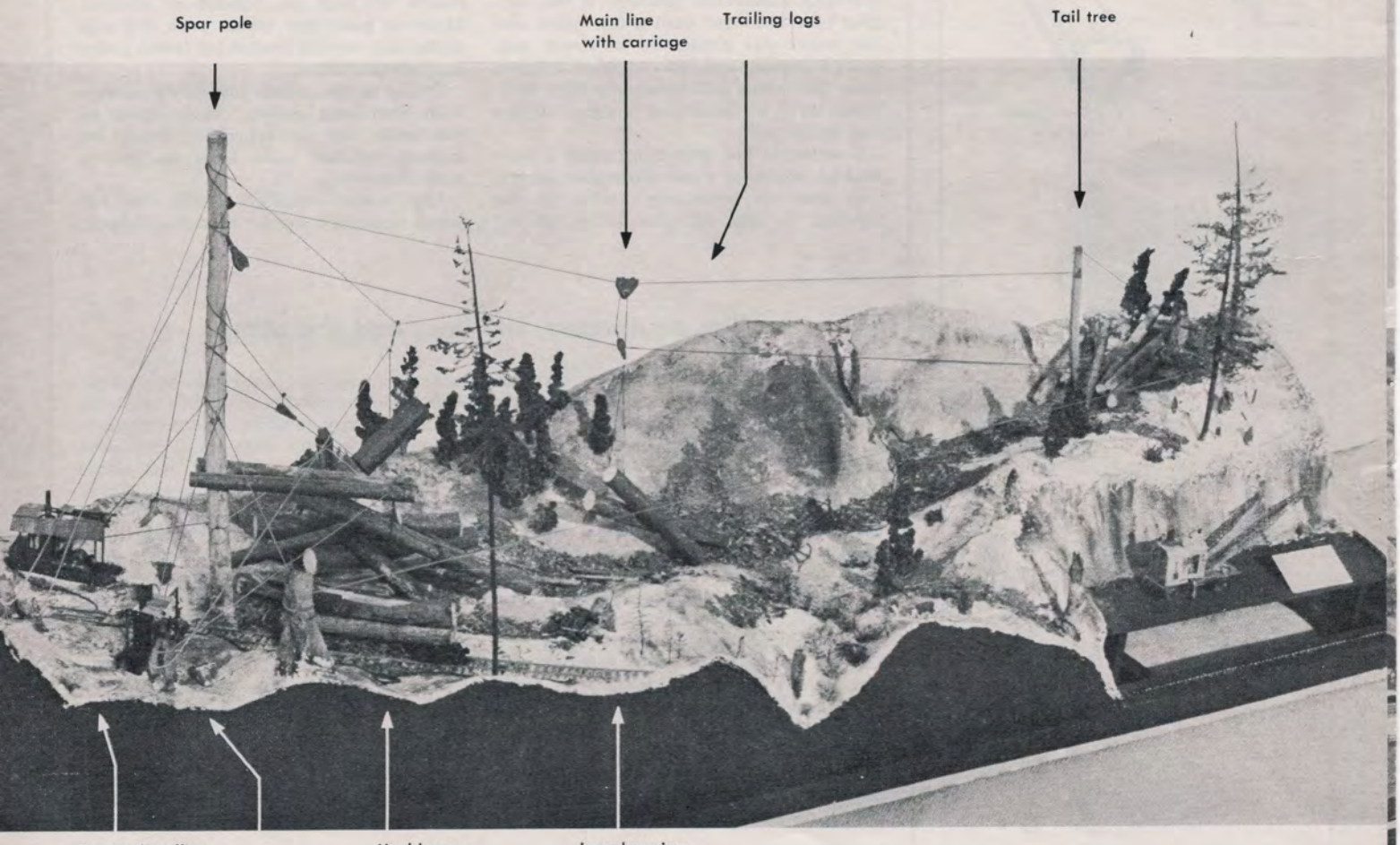
brow log: a log placed by the edge of the track. As a car is dumped, the logs bounce off the brow log.

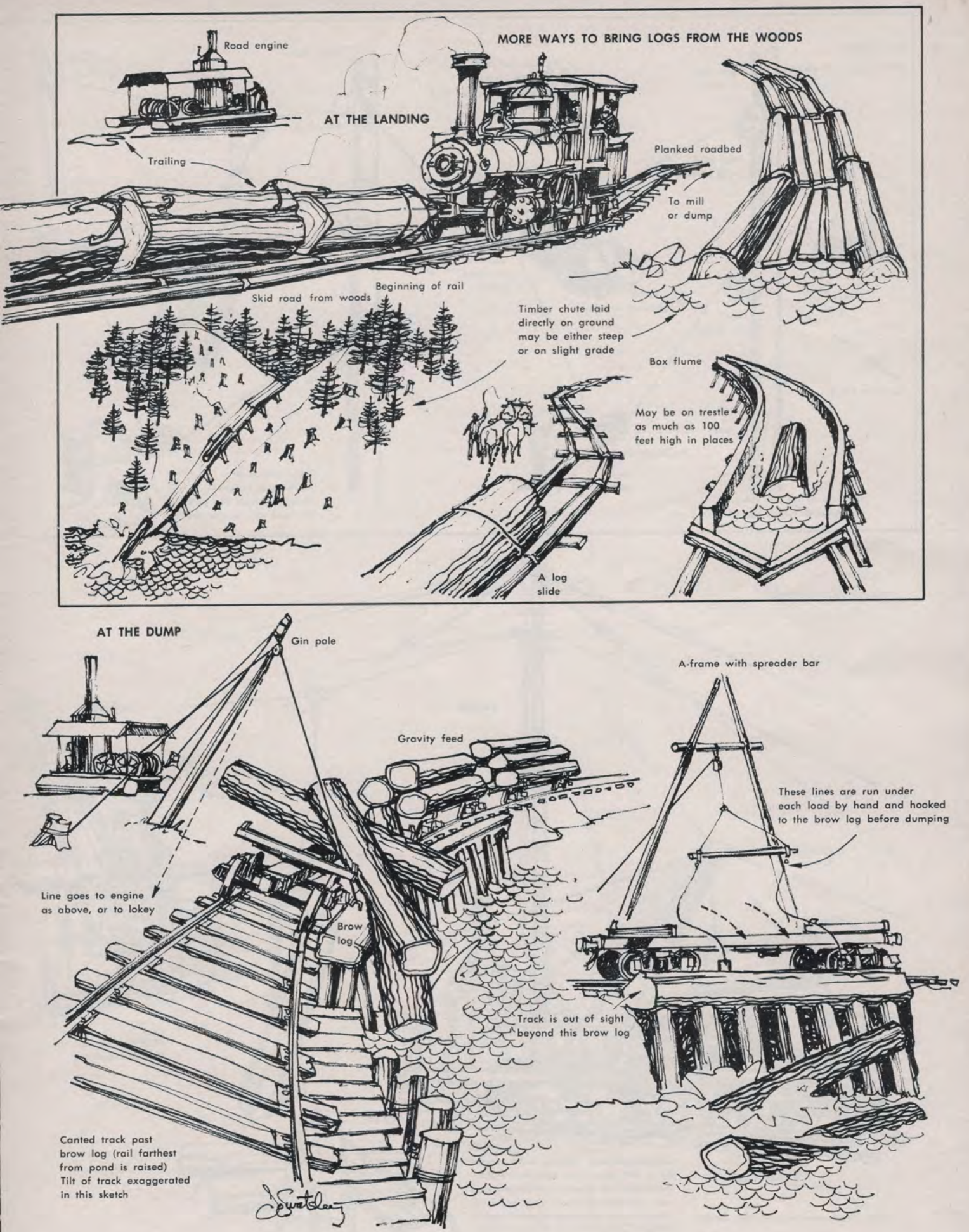
cold deck: a stack of stored logs.

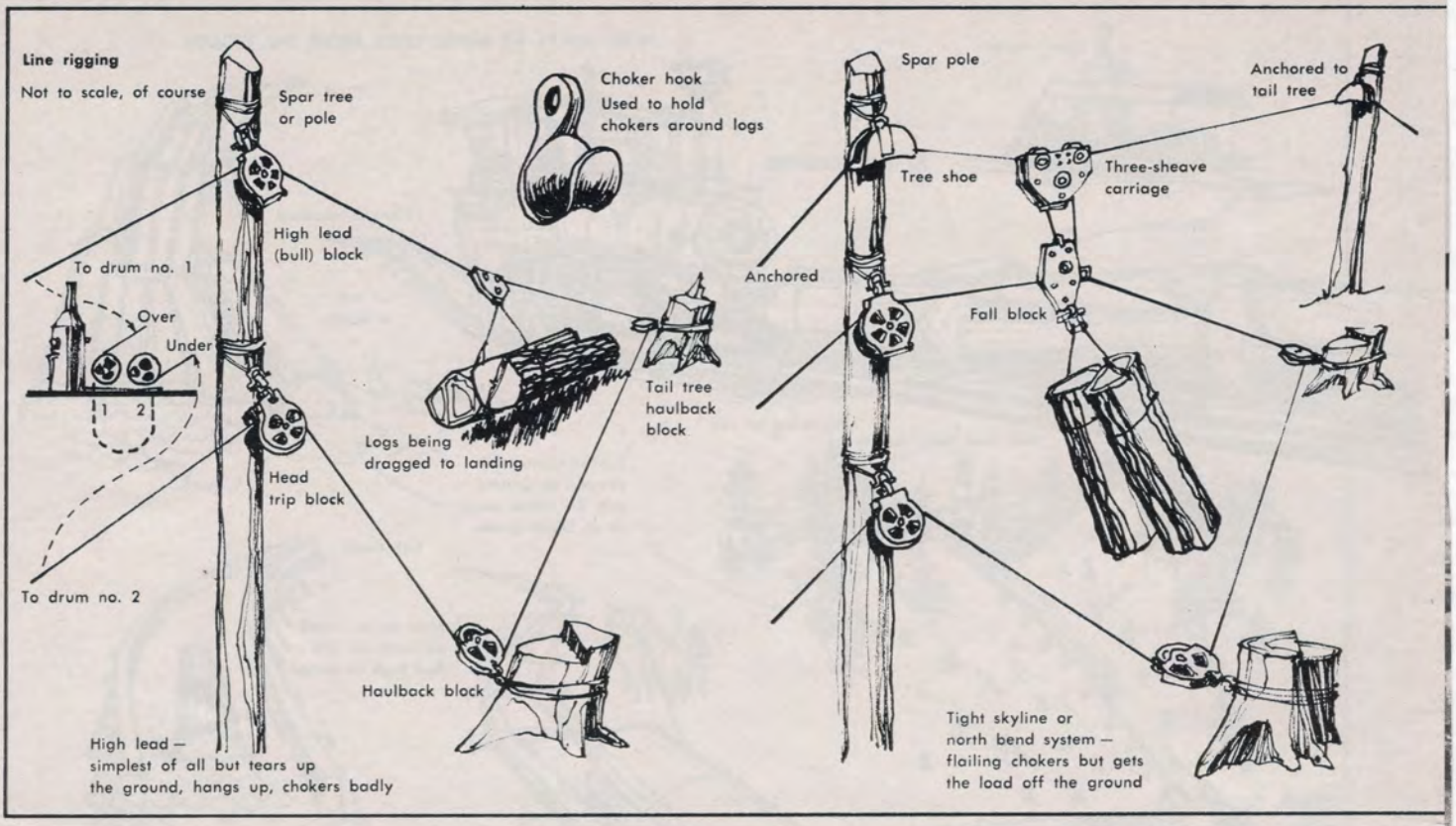
side: immediate area of logging operations.

show: entire logging operation.

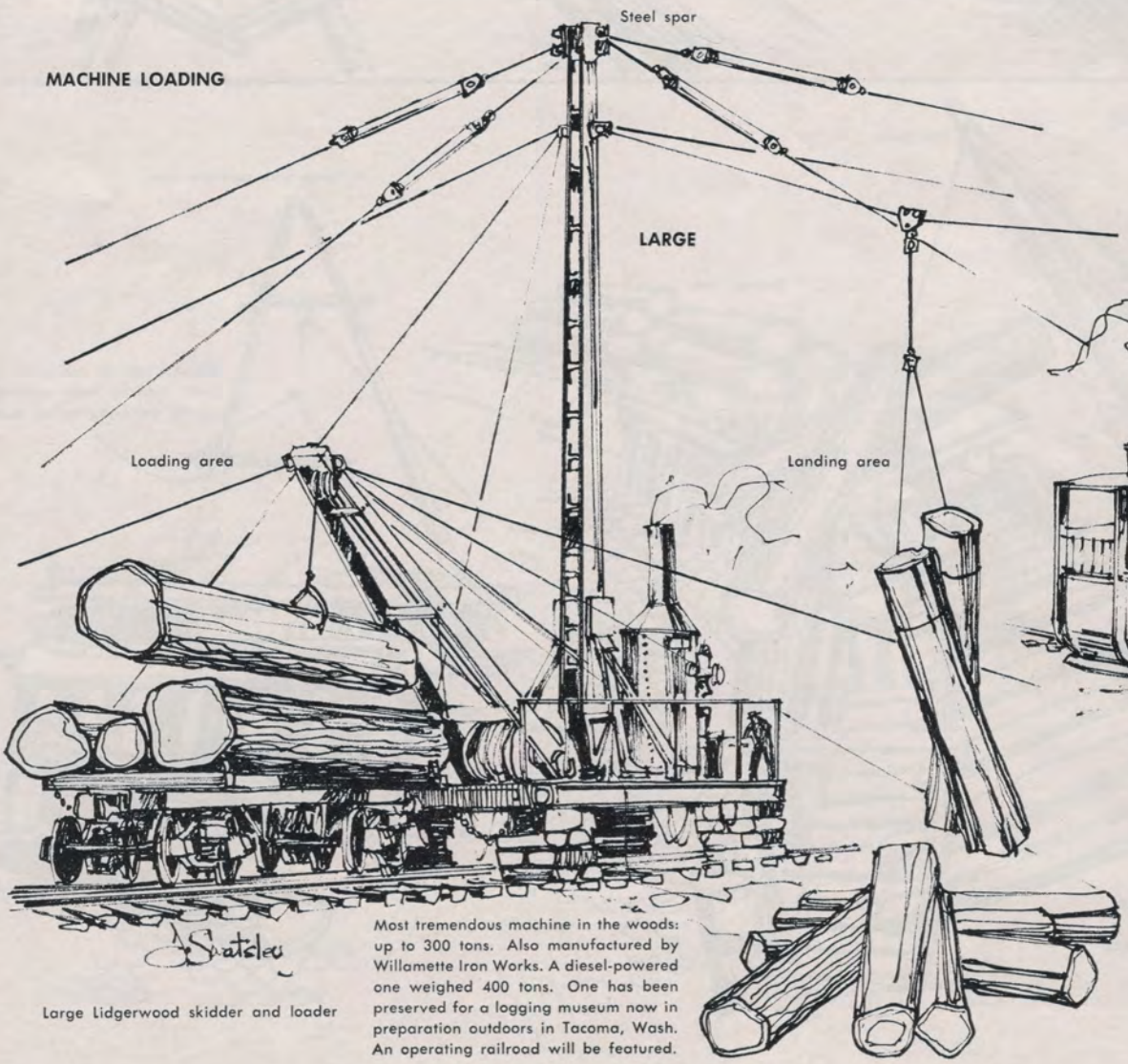
stump ranch: logged-over area sold to farmers before the days of tree farms.




MORE WAYS TO BRING LOGS FROM THE WOODS
Road engine
AT THE LANDING
Trailing
Planked roadbed
To mill
or dump
Beginning of rail
Skid road from woods
Timber chute laid
directly on ground
may be either steep
or on slight grade
Box flume
May be on trestle
as much as 100
feet high in places
A log
slide
AT THE DUMP
Gin pole
A-frame with spreader bar
Gravity feed
These lines are run under
each load by hand and hooked
to the brow log before dumping
Line goes to engine
as above, or to lokey
Brow
log
Track is out of sight
beyond this brow log
Canted track past
brow log (rail farthest
from pond is raised)
Tilt of track exaggerated
in this sketch

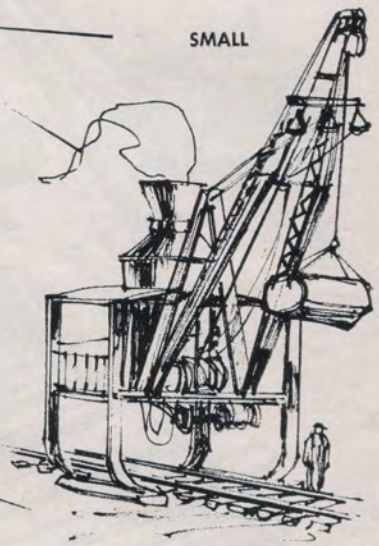


MACHINE LOADING



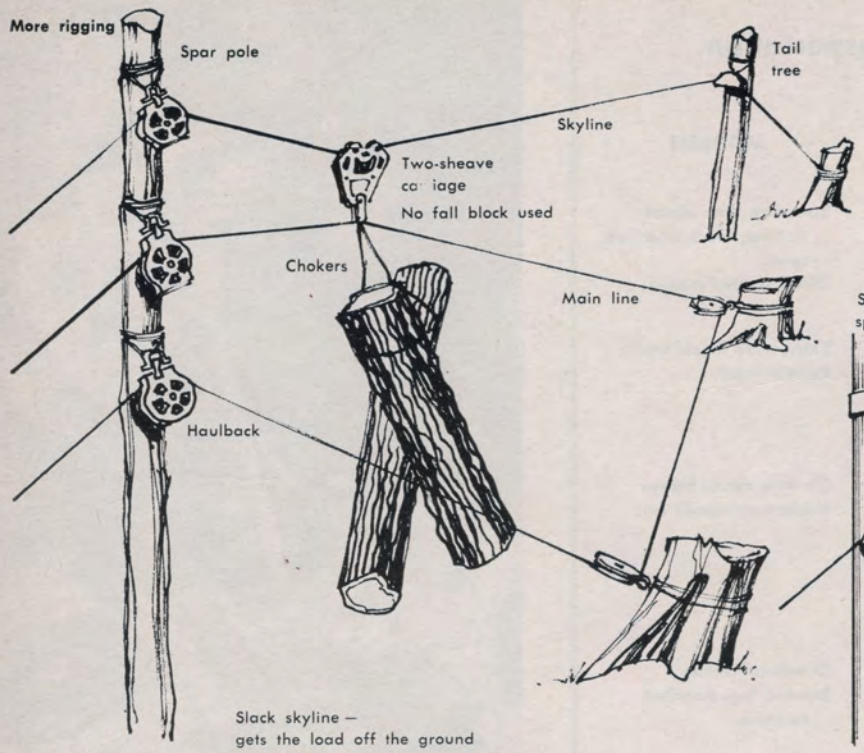
Large Lidgerwood skidder and loader

Most tremendous machine in the woods: up to 300 tons. Also manufactured by Willamette Iron Works. A diesel-powered one weighed 400 tons. One has been preserved for a logging museum now in preparation outdoors in Tacoma, Wash. An operating railroad will be featured.



McGiffert log jammer (for pine country)

More rigging



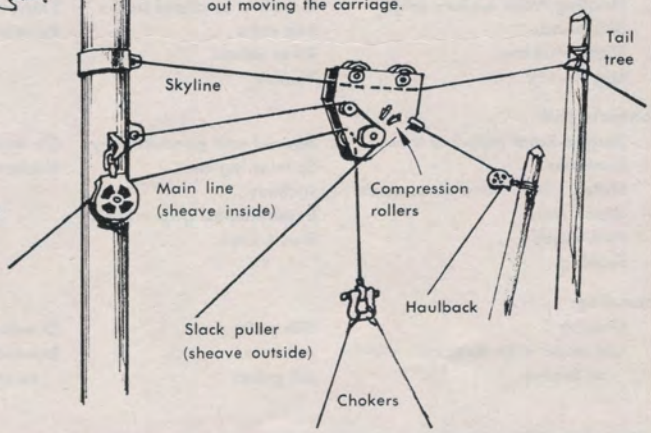
Slack skyline — gets the load off the ground and provides good control of chokers

Typical wire rope sizes

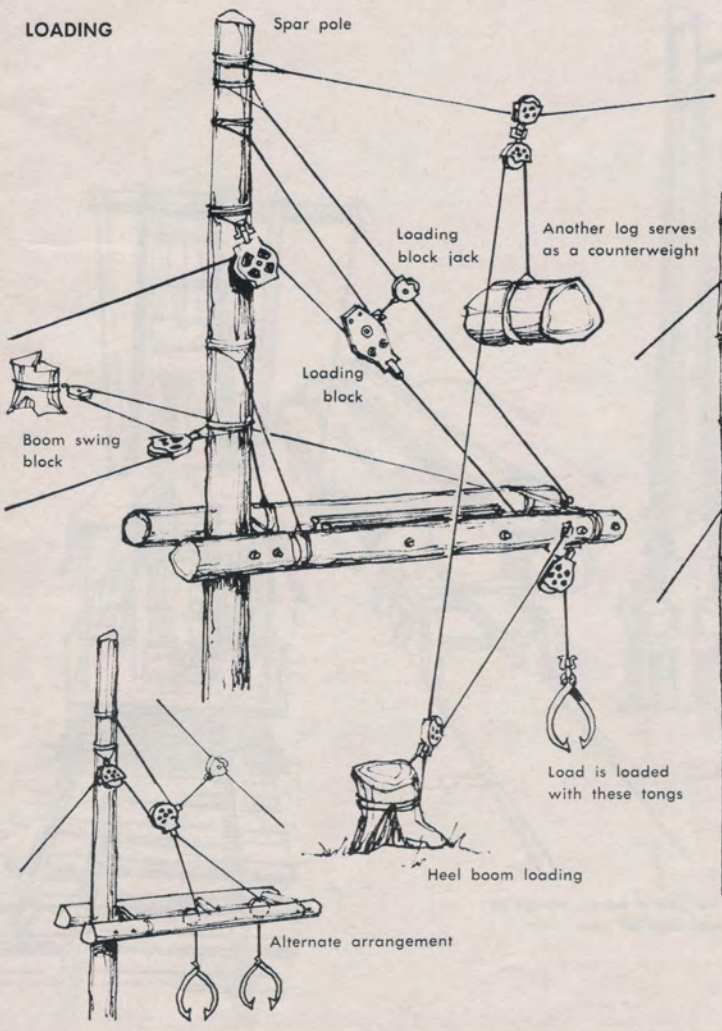
Skyline	1½" to 2"
Main line (skidder)	1⅛" to 1½"
Haulback	½" to ⅞"
Chokers	⅞" to 1¼"

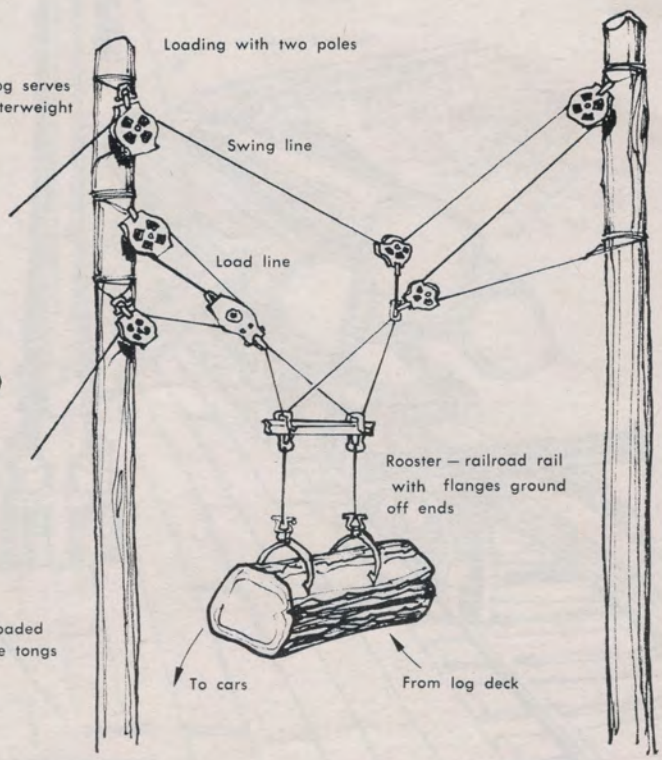
Lidgerwood carriage

Compression rollers hold main line to its sheave; any motion in slack puller line causes similar motion in main line and its chokers. Donkey engineer, by holding tension on haulback, can play slack puller to position carriage precisely on skyline to drop chokers accurately. Main line can also be raised or lowered without moving the carriage.



LOADING



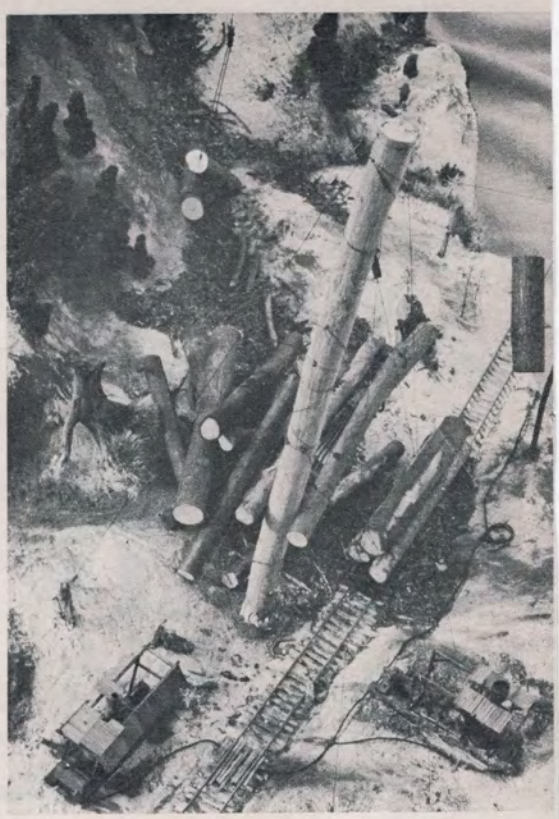


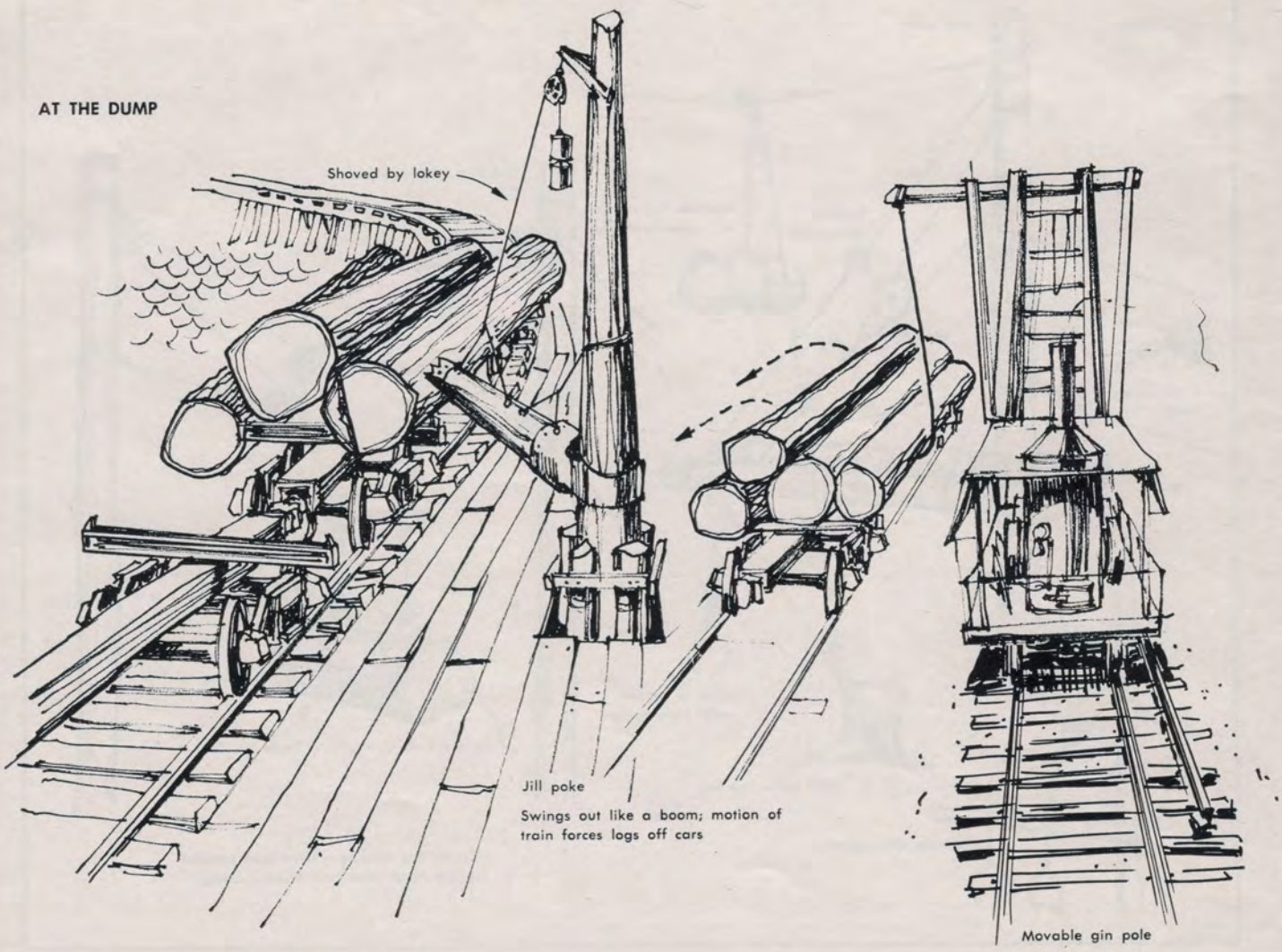
Crotch line loading — turns load parallel to car faster than heel boom loading

The three stages of timber transportation

[sketch illustrations follow]

	BEGINNING	GLORY DAYS	MODERN
Loading:			
	Rollway with peavey	Spar tree with steam donkey	Spar tree with diesel donkey; truck-mounted spar
	Rollway with jacks	Logjammer	
	Parbuckling with bulls or lokeys	Portable high-lead rigs	Diesel tractor cranes
Transport, nonrail:			
	Floating from water's edge	Gasoline or diesel trucks	Extra-wide diesel trucks
	Skid roads	Log rafts	Private roads
	High wheelers	River drives	
	Log flumes	Flumes	
Transport, rail:			
	Second-hand mainline lokeys	Special and geared lokeys	Six-axle diesel lokeys
	Dummies	Special log cars	Modern or rebuilt cars
	Flatcars and wood disconnects	Inclines	
	Wood rails	Experimental grip wheels	
	Pole roads	Gas lokeys	
	Trailing		
Unloading:			
	Gravity	Gin poles	Overhead cranes
	Gin poles with donkeys or lokeys	A-frames	Banded logs handled as units
		Jill pokes	





Some books for further study

The first three were used in preparing much of this feature

Logging Railroads of the West, Kramer adams; Superior Publishing Co., Seattle, Wash.; 1961.

Railroads in the Woods, Labbe and Goe; Howell-North Publishing Co., Berkeley, Calif.; 1961.

Logging and Lumbering Textbook, Schenk; L. C. Wittich, Darmstadt, Germany; 1932 or earlier.

Glory Days of Logging, Andrews; Superior Publishing Co.; 1956.

This Was Logging, Andrews; Superior Publishing Co.; 1954, reprinted 1965.

Rayonier, Inc., Gutohrlein; Railway Historical Quarterly vol. 1, no. 2, April 1964; Trans-Anglo Books, Los Angeles, Calif.

Last of the Three-Foot Loggers, Kreig; Pacific Railroad Publications, San Marino, Calif.; 1962.

Pacific Coast Shay, Dan Ranger Jr.; Pacific Railroad Publications; 1964.

Climax, an Unusual Steam Locomotive, Taber & Casler; Railroadians of America, Rahway, N. J., 1960.

Lima Locomotives, 1911 (reprint), vol. 2, no. 10, Pacific Railway Journal; Pacific Railroad Publications; 1960.

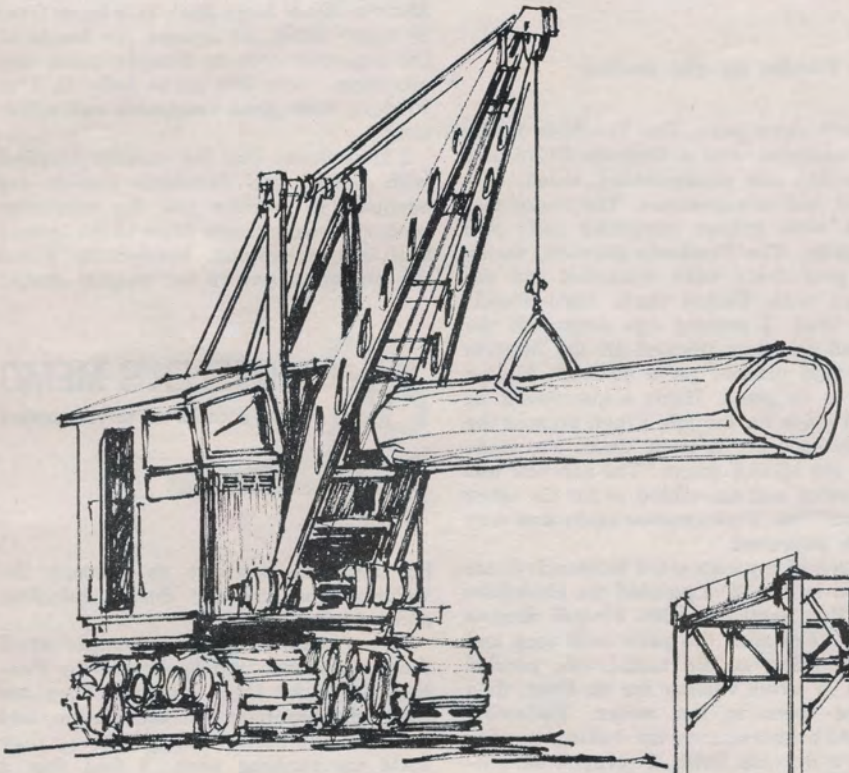
Lumber Railroads of the Weyerhauser Timber Co., 1935 (reprint), Pacific Railway Journal, vol. 2, no. 1; Pacific Railroad Publications; 1951.

Articles

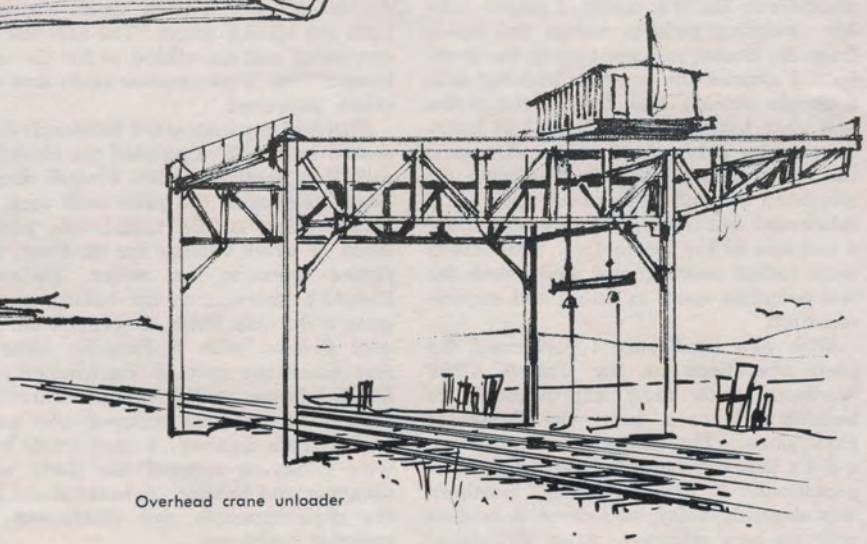
Building a Sawmill, Barrett Snyder; August 1956 MODEL RAILROADER.

Structures for a Logging Camp, Lyle Spears; July 1966 MR.

Modeler's Notes for Western Sawmill, C. W. Swanberg; November 1961 MR.



Tractor crane loader



Overhead crane unloader