

In this issue of *IS&WM*, our reviewer Joe Denig takes a look at a very different portable sawmill design. The Australian-made Lucas Mill is a swing-blade circular distributed in the US by Bailey's.

In our Oct/Nov issue we reviewed TimberKing's B-20 bandmill, and have another major manufacturer's portable lined up for review in the Feb/March issue.

Reviewed by Joe Denig

I had heard about one, seen pictures of one, but had never seen a swing blade circular sawmill in production. This was going to be a new experience for me as I drove to Chris Munson's yard in Mount Solon, Virginia. Chris operates an 8-inch Lucas swing blade mill and is in the custom sawing and fire-wood business.

The Lucas swing blade mill is a circular sawmill that cuts in the horizontal plane in the forward direction. In the reverse direction, the blade is swung 90 degrees to cut in the vertical plane. This accomplishes two things, it keeps the saw in the cut a high percentage of the time, and eliminates the need for an edger. Both of these factors contribute to a good production rate. How much lumber you recover from the log, and what the grain pattern will look like, really depends on the skill and creativity of the sawyer. The Lucas mill is designed and made in Australia and is distributed in North



Chris Munson pulls his Lucas Mill back through a hardwood log.

America by Bailey's. It is designed to be simple, portable, and trouble free. It can saw large logs—up to 5 or 6 feet in diameter—as well as normal sized logs.

The Lucas mill is extremely light and portable. It weighs 726 pounds complete. Chris said he usually transports his mill on top of a rack on his Toyota pickup. Once at the work site, it takes him approximately half an hour to assemble the mill and be ready to saw.

The mill consists of a frame that uses four vertical pipes to suspend the carriage tracks. The tracks then move up and down using a ratchet system on both ends that turns a sprocket, which feeds or takes up a roller chain, that in turn raises or lowers the saw. On each end, the sprocket is attached to a shaft with another sprocket

on the other side which duplicates the elevation changes. The two ratchet systems on either end of the tracks can be raised or lowered independently. This allows the operator to saw on a slight slope, or to taper saw. Near each ratchet system there is a gauge for the sawyer to set the amount of drop in the saw, which in effect sets the width or thickness of the piece of lumber to be sawn. The tracks are made from an aluminum extrusion and are approximately 3 inches wide by 8 inches deep, and weigh approximately 65 pounds each. The saw carriage is made up of a 20 HP Industrial Vanguard Briggs and Stratton gas engine, the drive system between the engine and the blade, the swing device allowing the blade to swing 90 degrees, and the 21.5-inch diameter blade. The entire

carriage is mounted on a 2-inch by 4-inch aluminum frame. The operator manually pushes or pulls the carriage forward and back during sawing.

A typical sawing sequence using the Lucas mill might go as follows:

First, a log is rolled onto two wooden blocks that support the log slightly off the ground and hold it in position. The operator checks the alignment of the log to the saw. This is done in two axis. The centerline of the log or one of the sides of the log should be parallel with the tracks, depending on how the taper will be handled in this plane. The elevation of the saw in the horizontal plane is set using the top surface of the log. This relationship is going to determine the depth of the first cut, how heavy of a slab is going to come off,

PORTABLE SAWMILL *Review*

and what type of taper will be used. The amount of taper can be adjusted by raising and lowering the ends of the tracks independently.

Next comes the first horizontal cut. This may be the total width of the slab, or you may have to take a vertical cut and then another horizontal cut to get to the first flat surface of the log. For example, if you want to mill a 1 inch board, the tracks are lowered 1 inch on each end using the ratchet system and depth gauge. The depth gauge accounts for the kerf. Then a horizontal cut is taken, followed by a vertical cut in the reverse direction. This process will produce an edging strip. Then a horizontal cut is taken for the width of the board, followed by another vertical cut which edges the board

and releases it. With a horizontal cut you can cut off the remaining edging strip. You have just produced a flat-sawn board.

Next you may wish to get some 4-inch wide by 1-inch thick quarter-sawn pieces. The Lucas mill really shines when producing quarter-sawn material because it cuts vertically and horizontally. To mill 4-inch lumber, the tracks are dropped four inches. The first horizontal and vertical cuts remove an edging strip. The next horizontal cut edges the quarter-sawn piece. The vertical cut is set to produce the thickness of the lumber. This process is continued until the layer of the log is sawn up.

All of the above sounds complicated, but it really isn't. Chris taught me how operate the ratchet set-

A grinder is attached to the saw carriage on the Lucas Mill, making blade sharpening quick work.



works on my end of the machine and we started sawing. He used his fingers to indicate the amount I should lower the tracks, say four fingers for four inches. After sawing two logs with him the alignment procedures and sawing patterns made sense.

Chris said the 18 feet between the uprights limits the length of the logs that can be rolled into the mill. You can saw longer logs, but you must first partially disassemble the uprights. Sawing long logs is still fair-

ly productive, despite the work getting them past the frame, Chris said. As most sawyers know, logs tend to move, bend, or bow when they are heavily sawn on one side due to the relief of growth stresses. To try to limit this, Chris leaves a vertical edging strip down one side of the log to give the remaining part of the log more support. Also, more horizontal log supports are needed the longer the log is. We used two horizontal supports, which proved to be inadequate on

LUCAS MILL MODEL 8 DATA SHEET

Stationary or portable: Portable

Options Included On Review Model: None

Cutting Capacity (diameter and length): Model 8 will cut up to 8 and 1/2 inch x 17 inch cant, by 20 feet long. With track extensions, any length long. Logs up to 8 or 9 feet in diameter can be cut.

Weight: 726 pounds

Length and width: Length w/extensions—27 feet 4 inches; width 9 feet 2 inches. Each track weighs 65 lbs.

FRAME AND CARRIAGE

Size and construction of the frame: Tracks, 27 feet 4 inches

Tracks are made of: Extruded aluminum

Are tracks replaceable: Yes

Wheels are made of: No wheels on mill, track rollers are high-impact plastic

Carriage support system (cantilever or box frame, etc.): box frame made from 2x4 inch aluminum.

SAWING HEAD

Circular Saw diameter: 8-inch model—545 mm/21.25 inches

Saw kerf: 5.5 mm/0.220 inch

Plate thickness: 3.2 mm/0.126 inches

Saw Arbor and bearing size: 1-1/4 inches

Saw Speed (RPM): 3600

Teeth per minute: Using the five carbide cutter—18,000 teeth per minute

Recommended Saw Blade (width, length, band thickness): five carbide cutters—tip to tip, 21.5 inches; kerf, 0.220 inches; depth of cut, 8.5 inches

SETWORKS

Method of Setwork Drive (chain, hydraulic, ect.): Chain and ratchet, manually operated

Set Display (electronic, scale boards): Horizontal and vertical dimension scale boards

Automatic sets: Repetitive dimension stop on horizontal scale

ALIGNMENT

How is alignment done at factory: Each machine is run and calibrated at the factory.

POWER PLANT

Engine: 20 HP Industrial Vanguard Biggs and Stratton engine

LOG TURNER

None

LOG DOGS

None

CARRIAGE FEED DRIVE

Type (hydraulic, electrical, mechanical, or manual): manual forward and reverse, speed dependent on dimension and species

TOWING

Towing weight/tongue weight: None

Transport: Usually in pickup truck with racks

GUARANTEE

15-day money back guarantee—two year warranty (engine and frame)

OPTIONS

Bevel siding attachment, slabbing attachment, extra tracks and extensions, super-long track kit, 9-inch model to cut railroad ties, dedicated slabbers

LIST PRICE AS SEEN

\$13,495, includes free shipping in Continental US, 3 blades, 12-volt sharpener with diamond wheel

The Lucas Mill really shines when it comes to quarter-sawing, evidence of which can be seen on the vertical edging strip.

MANUFACTURER & ADDRESS

G.W. Lucas and Sons, Pty. Ltd.
RMB 1090
Beechworth, Victoria 3747—Australia
001-61357-287-285

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MILL OVERVIEW

Band or Circle Mill:
Swing blade circle saw

long logs. The accuracy of the lumber suffered at the bottom of an 18-foot log. Chris was quick to point out that when he normally saws for a customer with long logs he uses more supports underneath the log.

Chris sharpened the saw while I was there. The saw consists of a circular saw blade—really a pentagonal blade—with five carbide teeth that are soldered onto the blade body. The Lucas mill comes with a simple and effective sharpener that attaches to the saw carriage. Including the grinder adjustment time, Chris had the saw sharpened in less than five minutes. The grinder uses a diamond wheel and runs off a truck battery. There is a water lubrication and cooling system for the blade mounted on the carriage. Chris said it cost him \$20 to get the saw reworked, including new carbide teeth, sharpening, leveling, and tensioning. Measuring the width of the teeth, I found them to have a kerf of 0.210 of an inch.

With the Lucas mill you are limited to the depth of cut you can take. On the 8-inch model, you are practically limited to an 8x8 inch cant. For wider boards you can add an optional slabber, which is basically a chain-saw attachment, or you can pick up the carriage and rotate it 180 degrees. Doing so will allow the mill to cut up to a 16-inch wide piece. To me either option did not sound great. Lucas has introduced a model to cut standard railroad ties.

How fast can the Lucas mill cut? The feed speed really depends on the

depth of cut and the species. The operator can hear the engine slow down and the saw frame starts to vibrate when the mill is being overfed. Using these indicators, the operator controls the feed speed and depth of cut. There is a third set of vertical supports for the track that help control the vibration, however, the use of them slows down log loading.

I asked Chris why he chose the Lucas mill. He feels that the Lucas swing blade mill is just more productive than what he could have gotten from a narrow blade bandmill. Chris said he can average 2,000 board feet a day custom sawing. He has several production tricks up his sleeve. If he is sawing small, similar-sized logs, he will batch saw them together, minimizing the loading and setting time.

We discussed maintenance and improvements that could be made to the mill. One problem Chris encountered was he let the gear box between the engine and the blade run dry of oil because he had lost the instruction manual. Bailey's, the US distributor of the mill, was kind enough to send him a new gearbox under warranty and another instruction manual.

The mill is fully adjustable for alignment. Chris would like to see more explicit instructions on how to check and adjust the alignment. Bailey's said they have a new, well-illustrated manual that shows how to do just that.

Overall, Chris is very pleased with his mill. I asked

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him what modifications he would like to make, and he replied he would like to somehow be able to tie both ratchet systems together on-demand. This would save him from having to ratchet both ends when setting to a new thickness, but would still allow him to independently adjust the height of each end.

Chris said his Lucas mill

has been relatively trouble free, and maintenance is minimal. He knocks off the accumulated sawdust on the pre-filter (a filter cover) every ten minutes or so; greases the bearings, checks the oil in the engine and gear box daily, cleans the air filter weekly and changes the oil in the engine every two weeks.

I talked to Chris a little about the business side of his operation and asked

him what words of wisdom he had for our readers. He said "advertise." He feels strongly that advertising in the local paper got him off to a quick start. Now most of his business is by word of mouth. He normally custom saws with his mill at a rate of \$200 a day, two or three times a week.

What has the Lucas mill done for him? It allows him to earn a comfortable living and be his own boss. He

said he had paid off the cost of the mill in his first nine months of operation. To quote him, "I'm making money with it and that was what I was after." ■

Joe Denig is a Wood Products Extension Specialist at North Carolina State University's College of Forest Resources. He is author of "The Small Sawmill Handbook-Doing It Right and Making Money."

MANUFACTURER'S COMMENTS:

Lucas Mills are revolutionizing the portable sawmill world today. It all started Down Under in Australia and New Zealand, and this new "swing blade" type mill is literally replacing the old "bandmill" concept the world over—in the South Pacific, Africa, South and Central America, Europe as well as other countries. Now sales in the United States are booming. Why? People always wanted an economical portable sawmill that produces—not wavy, but straight—dimensional lumber quickly, and people always wanted simplicity.

When you're milling in the mountains, there's no time for breakdowns of any kind—especially hydraulic and electronic. The Lucas has no hydraulics or electronics; it's efficient, unstoppable! When you come across a log that is 3

feet to 8 feet in diameter, you should be able to mill it and not have to quarter it. The Lucas Mill will cut any size log. When you hit a little dirt, you shouldn't need to always "sharpen up," and with the Lucas you won't because the (five) carbide cutters are tough and stay sharp longer. When you need to sharpen the blade, you can do it in about three minutes and you don't have to take the blade off. The Lucas Mill will cut about twice the lumber per hour that a comparably-priced bandmill will cut, and that's a fact!

Lucas Mills are shipped free of charge anywhere in the US., they have a two-year warranty on the mill and engine and there's a 15-day, money-back guarantee.

—Bill Bailey

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