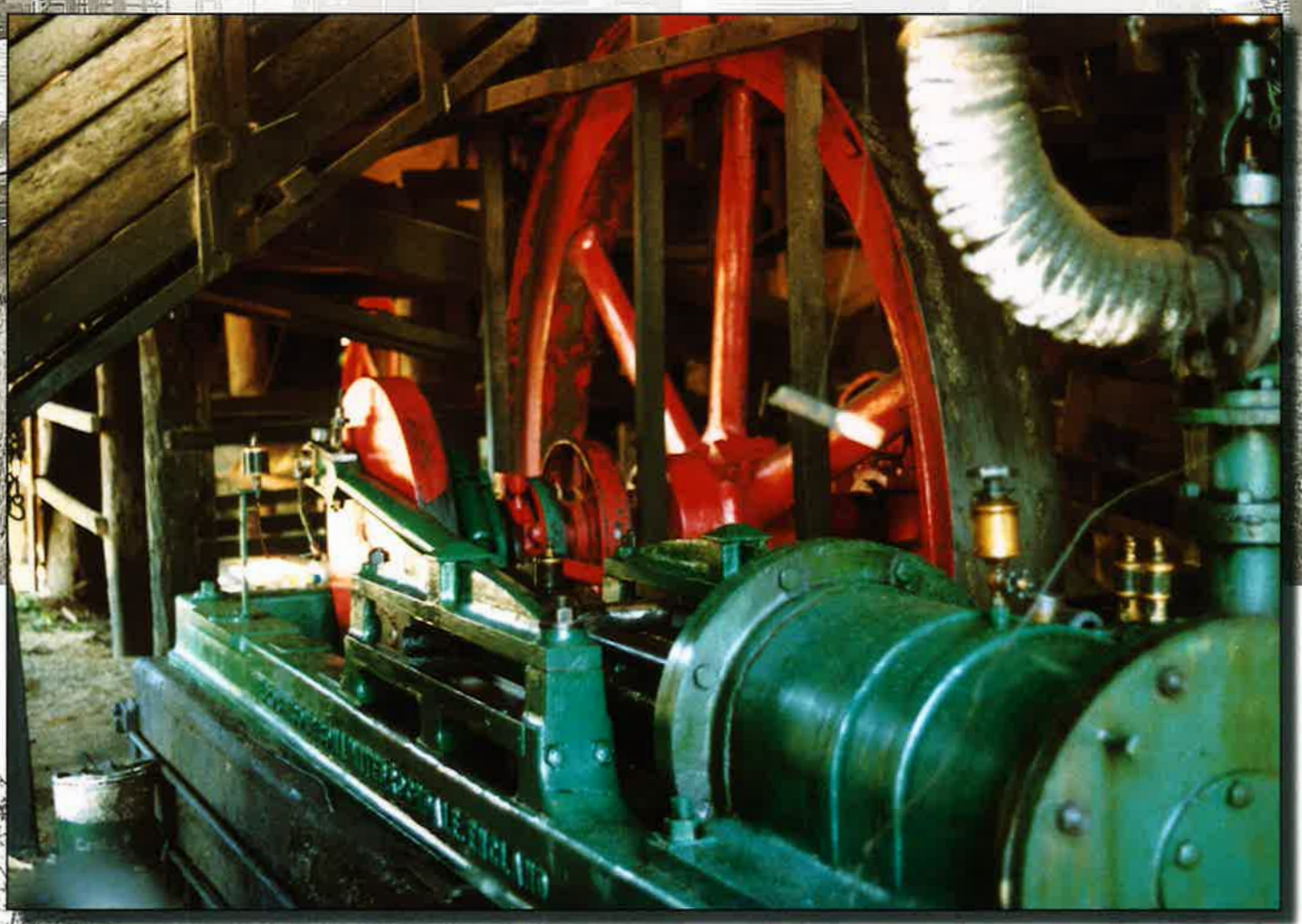
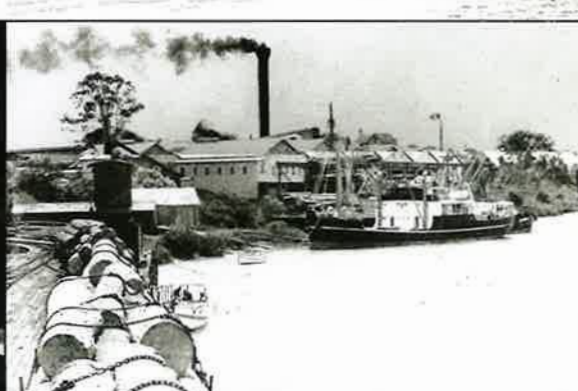
INTERLUDE AT ELGIN VALE

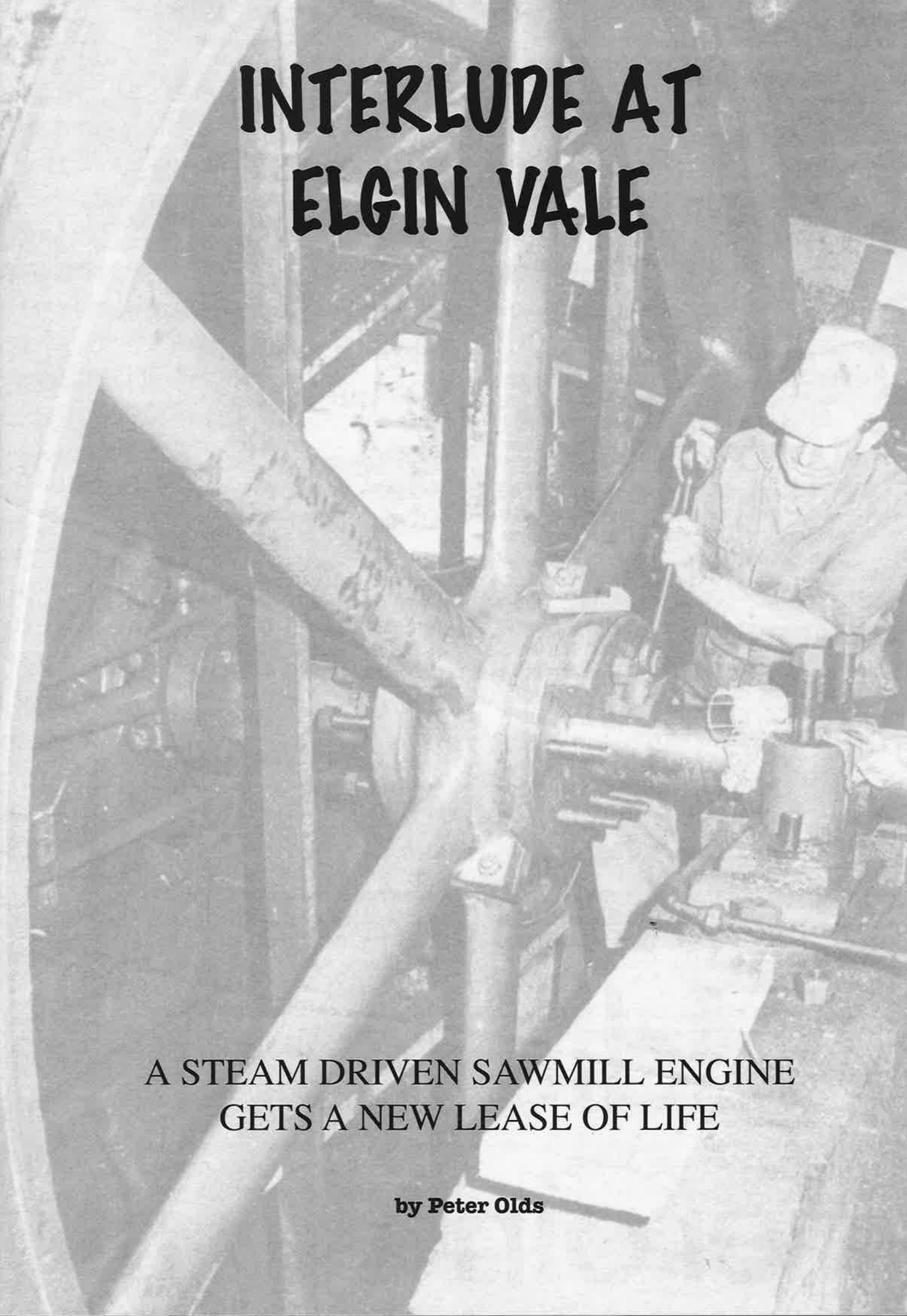
by Peter Olds

A STEAM DRIVEN SAWMILL ENGINE GETS A NEW LEASE OF LIFE



DURING THE INDUSTRIAL REVOLUTION, ALL OVER THE WORLD, STEAM ENGINES WERE THE MAIN SOURCE OF POWER TO DRIVE OUR MACHINES. THIS IS THE STORY OF AN OLD MILL ENGINE IN A SAWMILL IN COUNTRY QUEENSLAND





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GETS A NEW LEASE OF LIFE

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Interlude at Elgin Vale

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ABBREVIATIONS:

10'6"	10 Feet 6 Inches
PSI	Pounds per square inch
BHP	Brake horse power
RPM	Revolutions per minute

Unless otherwise stated, photographs in this publication were taken by Alan Johnston, Peter Olds and Robert Olds on occasions whilst working at Elgin Vale Mill.

INTRODUCTION

It was early in 1996 that I "set to" and wrote the story about giving the Elgin Vale engine a new lease of life. Dr. Dan Robinson had urged me to do so and then a letter from Dr. Tony Matthews was the final push needed to make me put something on paper.

I'm pleased that I did while I could still refer to notes that I had made and my memory regarding details was still fresh. Like many of our old friends, time passes on, and gone forever are the details of the enterprise and endeavours of our early residents.

It is now 2006 and many changes have taken place that we could never foresee. The great firm of Wilson Hart and Company is now only a memory and I cannot recall any detailed history ever being published.

Some years ago Stan Duffill called at our shop where we have a collection of artefacts on display. He was very interested in a large photo showing most of the staff of Walkers Ltd. taken in the mid 1930's and photos of the staff of the local Gas Works. Stan told me that he had a couple of shots of Wilson & Hart's staff which he thought were taken in the 1960's on the occasion of the firm's centenary. He offered to loan them to me for copying and I think it is fitting to include them within these pages.

I think it is also fitting to include an interesting photograph of the parent mill which was built on the high bank overlooking the town reach of the Mary River. The picture I chose was kindly provided by the Maryborough Wide Bay and Burnett Historical Society and was probably taken about 1940. At the left of the view, on the Government Wharf, a string of railway wagons loaded with logs can be seen. Immediately in line in the distance, over these, is the steam crane with its jib obscured on the other side. The cylindrical base still remains visible near the river bank below Queens Park.

Of particular interest, and possibly why this photo was taken, is a cargo ship tied up in front of the mill's wharf, outside of one of the timber barges whose stern can be seen just behind the stern of the freighter. The barge was probably the "Lass O' Gowrie", formerly a coastal steamer, which was stripped and used as an unpowered punt or lighter carrying logs from Fraser Island and towed by the motor vessel "Trade Winds".

I realised that it was a rare occurrence for a freighter to berth in front of the mill like this and so I called on Dave Neilson's memory.

He could not identify the vessel but suggested that it might have been loading turpentine timber piles from the "Lass O' Gowrie" that had been brought over from the Island.

To me the mystery ship looked like one of the five 170 foot "E Class" freighters which were being built just after the second World War by Walkers Ltd. while I was serving my apprenticeship there. Walkers not only built the ships but also the diesel engines that drove them.

It was wonderful to see the major components like the crankshafts, conrods, bed plates, cylinders and heads being forged and cast and machined, then finally assembled and test run all in the same works which we called the top shop.

While I was "doing my time" in the machine shop, one of my class mates right through from Primary School to High School started in the "bottom shop", sometimes called the "boiler shop" but mostly the "ship yards". Jack Concannon was there when the "EUGOWRA", "ENFIELD", "EDENHOPE", "ELMORE", AND "EUROA" were being built and he eventually became overall Manager of the yard.

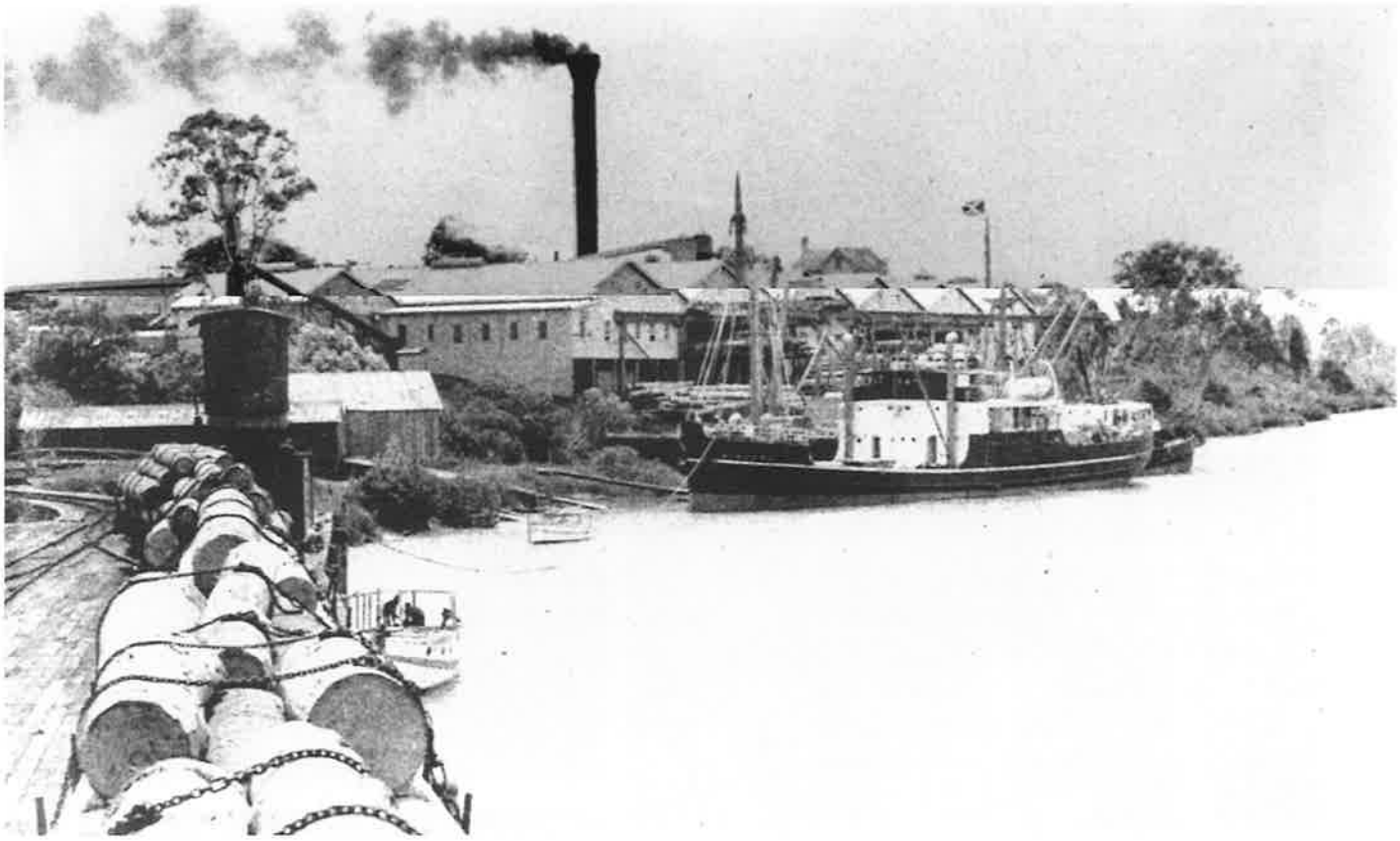
It was natural that I should ask Jack if the freighter tied up in front of the mill was one of the "E Class". With the aid of a magnifying glass he soon pronounced that it was the "BINGERA" and confessed how he used to admire her when she came into port here, usually tying up at the AUSN or Howard Smith Wharf upstream from the mill towards Walkers.

To add variety I am also including a photo of the "EUGOWRA" showing her in front of the yard from where she was launched, with the high cranes in the background. Like Wilson & Hart's mill these are also gone, not a sign of them remains.

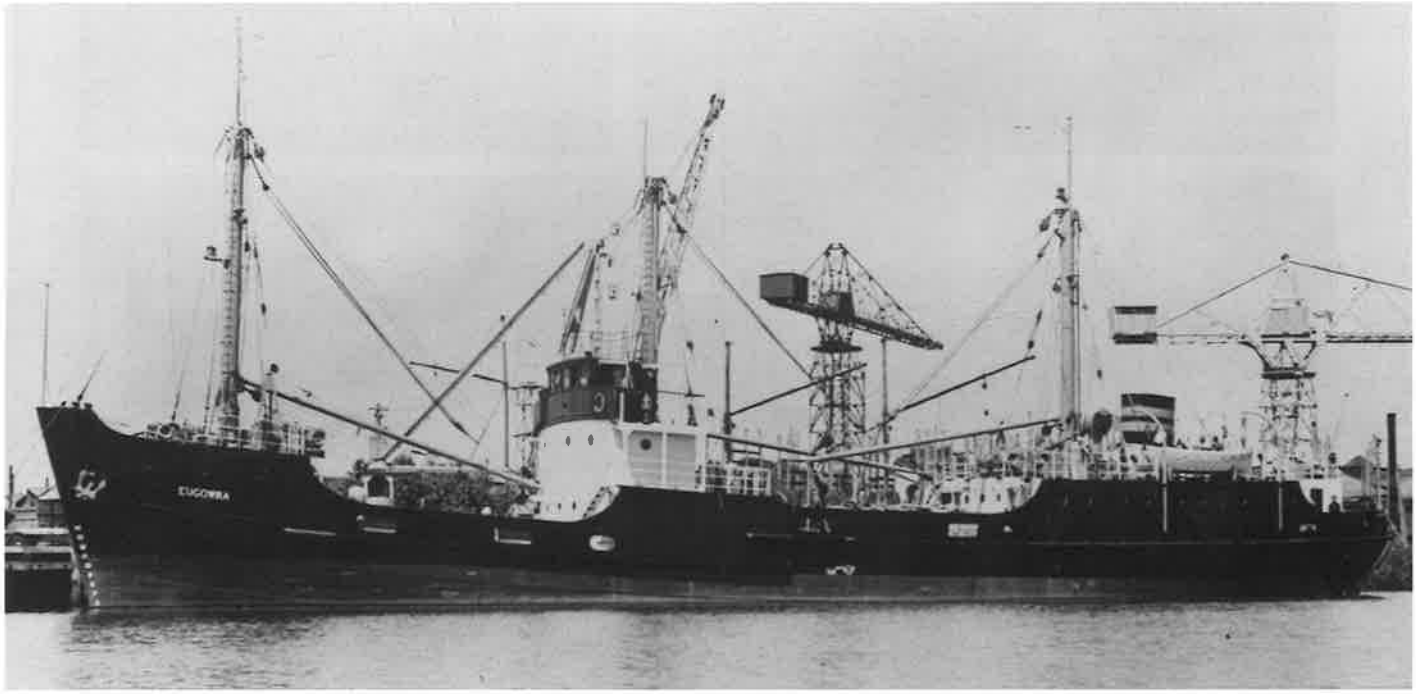
A nice touch to the Elgin Vale story is that the Kilkivan Shire Council has seen fit to preserve the little country mill. It has been made secure and under the control of a caretaker, and on occasions the boiler is fired up and the old Robinson with her new valve comes to life again.

Finally, as well as encouragement from Dan Robinson and Tony Matthews my wife Jan has urged me over and over to finish this story. When our grandson William introduced her to a new computer with one to one tuition, the heat was really on. Without Jan you certainly would not be reading this glimpse of our "Industries" past achievements.

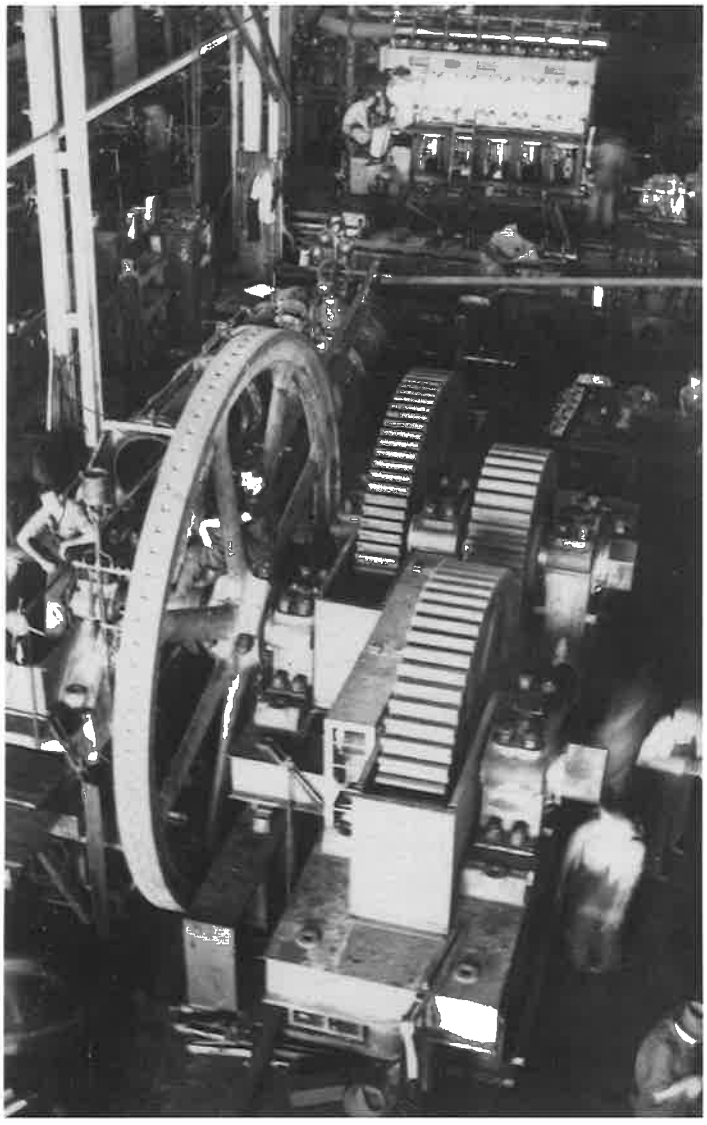
Peter Olds 2006.

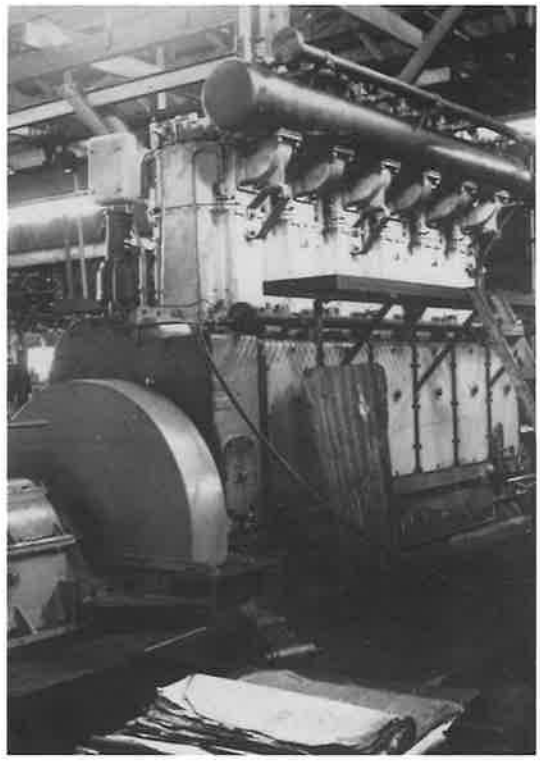


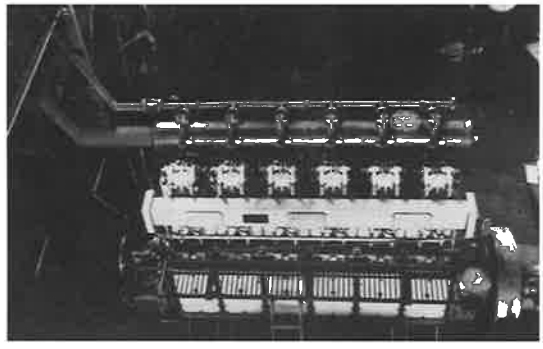
The busy bend in the Mary River with Wilson & Hart parent mill a hive of activity.
Photograph courtesy Maryborough Wide Bay and Burnett Historical Society.
Probably taken about 1940. Photographer unknown.

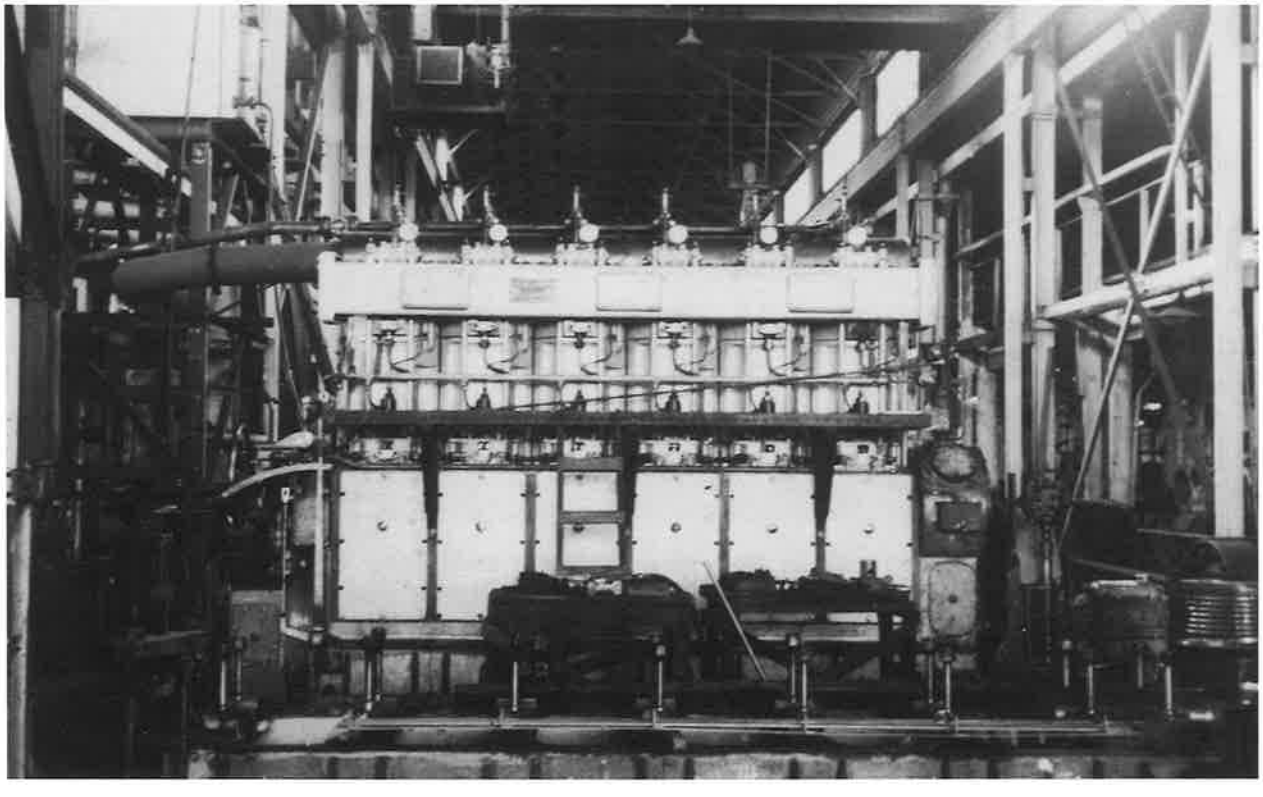


The "Eugowra" photographed in the Mary River with the Shipyards cranes in the background. She was one of five 584 T "E" Class Freighters built in the 1940's by Walkers Ltd. for the Australian government.
The firm also built the 6 cylinder Diesels that powered them. They were air start, direct coupled reversing engines, assembled and dynamometer tested in one of the erection bays in the "top shop".
The sister ships were named Enfield, Edenhope, Elmore and Euroa when launched, but all were renamed in later years when sold to various new owners.









Photos opposite depict a 550 HP "E Class" freighter engine on the test bed prior to being transported down to the Kent St. Shipyards and lowered into the new hull using the sheer legs crane.

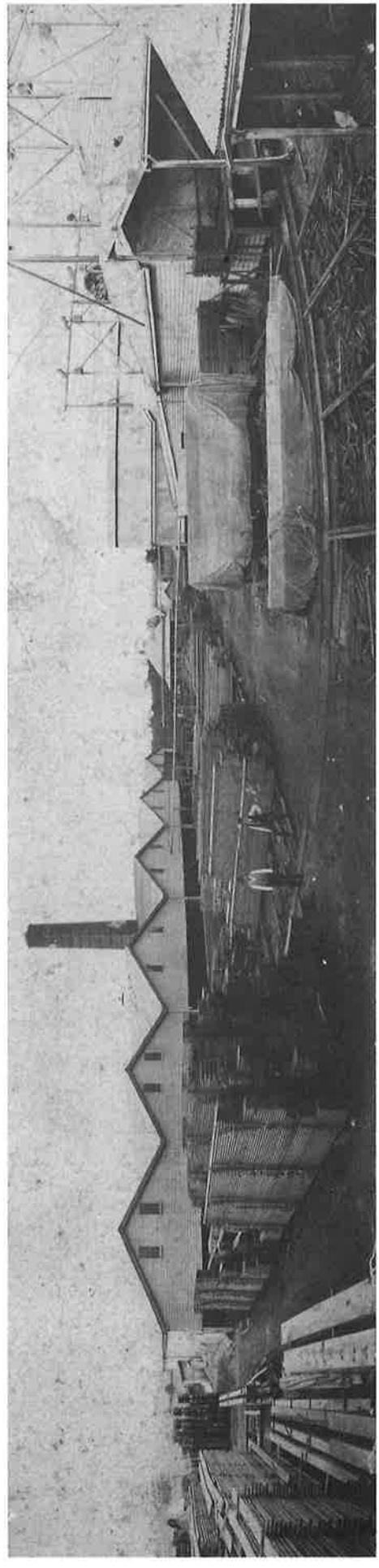
Top left hand shows a new 26" bore x 48" stroke sugar mill engine and gearing in the foreground. These engines were test run on compressed air on erection. Note the pile of well used blue prints on the bench in the foreground showing the flywheel end of the engine in the top right hand photo.

In the foreground of the lower photo, another engine bedplate can be seen with the main bearing studs standing up in position.

I don't recall getting up into the overhead crane to take the photos looking down on the subjects. Perhaps I trusted my new Box Brownie to Artie Saunders the crane driver to take them for me.

Forty C17 class steam locomotives were also being built at the same time in another erecting bay nearby. The great variety of parts, right down to the machined nuts and bolts, were all made on the premises.

Walkers was a wonderful place to serve an apprenticeship.



An early photograph of "Wilson Hart's" Sawmill on the site of the present Brolga Theatre. Their first sawmill was set up opposite, across the river on the Granville Bank. Three partners Wilson, Hart and Bartholomew operated that mill until the 1875 flood, when James Bartholomew tragically drowned. This mill was destroyed by fire in 1881 after which Wilson and Hart built the "new" mill shown on the new higher location. This mill was destroyed by fire in November 1934, was rebuilt and in full production in February, 1936. The steam heated drying kilns (a new concept) with their high overhead structures are to be seen at the right. Note the beautiful straight planks, probably pine, in the yard, neatly stripped up for drying.

The man standing up straight on the left is believed to be John Bartholomew, son of James who lost his life in the 1875 flood.

Source: MRS. MOYA BARTHOLOMEW.

Date of photograph believed to be about 1900.

A full page Magazine advertisement of 1957 by Wilson Hart & Co.

1960's Photo of Directors and Senior Staff of Wilson Hart & Co.

BACK ROW: L to R:

STAN DUFFILL (Sales Manager) A. BROOKMAN (Accountant) R. COLLARD (Manager Elgin Vale) TOM JONES (Electrical Superintendent) DAVE NEILSON (Maintenance Engineer) BILL BARTLEY (Manager Kandanga) BILL BARTSCH "Big Bill" (Maryborough Mill Superintendent) GORDON PONTING (Logging Manager) DON MONROE (Manager Theodore) CLAUDE IRELAND (Manager Rockhampton) L. BUGLER (Manager Miriam Vale)

FRONT ROW: L to R:

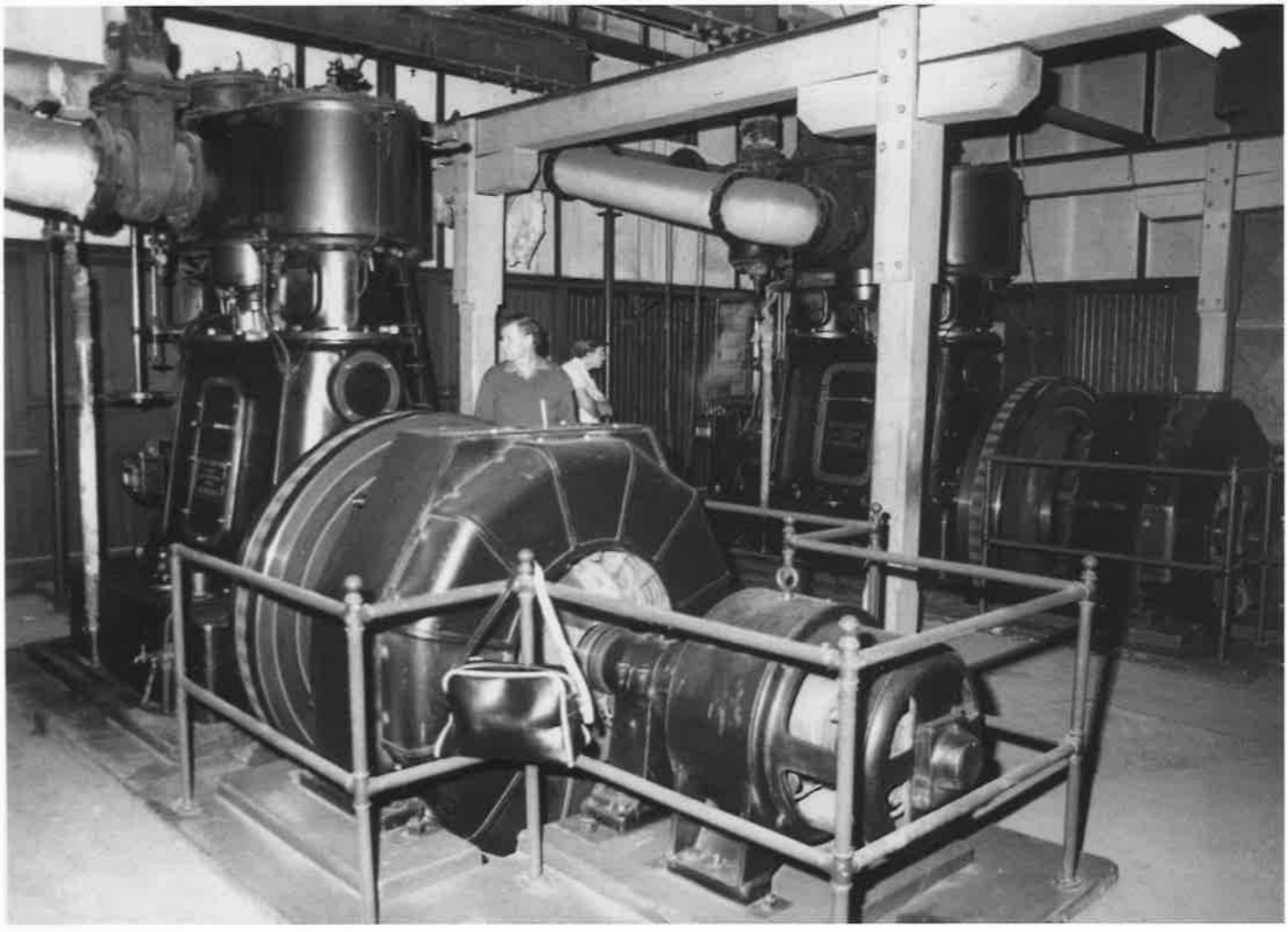
FRANK KEOGH (manager Mackay) GEORGE KUSKIE (Manager Townsville) JOCK McBRYDE (Secretary) JACK PATTERSON (Manager) GEOFF SHELDON (Chairman of Directors) ERIC MUNROE, ERNIE BIRD, STAN STAFFORD, (Directors) BRUCE BLACKLEY (Accountant)

Sawmills operated by the Company at the time were located at:

MARYBOROUGH (Mill and Head Office) MIRIAM VALE, ELGIN VALE, BIGGENDEN, CRACOW, THEODORE, BUILYAN, BILOELA, EIDSVOLD, KANDANGA, MOURA

Photographs courtesy: STAN DUFFILL

Most of the management and staff of Wilson Hart & Co. assembled in Queens Park with the Maryborough Sailing Club House as the backdrop. It is thought that the photograph was taken in 1965 to commemorate the centenary of the formation of the original partnership between Wilson, Hart and Bartholomew.



Wilson Hart & Co. Engine Room showing the two Belliss & Morcom Steam Generating Sets installed after the 1934 fire.

Photo taken by Robert Olds, July 1980.

The Author is standing looking at the smaller engine which is closest to the camera.

Leading particulars taken from handbook supplied by Dave Neilson as follows:

	ENGINE No. 8460	ENGINE No. 8879
CYLINDERS	19" and 27" x 12" stroke	16½" x 23" x 11" stroke
FULL LOAD RATING:	530 BHP	365 BHP
SPEED:	375 RPM	375 RPM
STEAM PRESSURE	120 PSI SATURATED	120 PSI SATURATED
EXHAUST	TO ATMOSPHERE	TO ATMOSPHERE

One of a number of photographs "commissioned" in 1957 by the late George Creed-Jacobs by well known Maryborough Photographer, Mr. R. G. Parry.

CAMERON (MACK) McKECHNIE is positioned at the switch board in the engine room which was his domain at the time. During the war years the Mill supplemented the power supply to Maryborough through this switch board.

George Creed-Jacobs, who was formerly a Q.R Locomotive Driver, worked as a fitter at the mill during this period. Not long after joining the firm he met with an accident, losing his left arm below the elbow when it was caught in a "V" belt drive.

He manufactured attachments for the "stump" himself and returned to work at the mill, where he served until his retirement.

George had been left handed before the accident. At the time a certain amount of compensation was paid for a right arm and a lesser amount for the left. It took a deal of effort to overturn the Compensation Board's ruling for him to receive the full amount.

George loved engines, which would have been the reason to have the Power House photos taken, a set of which he presented to Mack with the following note.

To Honoured Engineer Workmate
"MACK"
Whose bright companionship throughout
is ever a pleasant memory and Mental Tonic.
"Mack" may your shadow never grow less.

With a sweat rag on me shoulder,
(Scotch form) Och! There's no mon could be bolder, September 4th, 1957
"Cos, I'll be with "Bella" Morcom
In the morning!!!

To me there was always something nice sounding about the name "Elgin Vale".

It was the name given to the small country sawmill owned by Wilson Hart & Co of Maryborough, Queensland. The name would have been taken from the nearby long-established grazing property which had "Elgin Vale" carved in large letters in the headstock over the entrance. Although our engineering firm had been repairing and making replacement parts for the mill for years, it was not until July 1982 that I visited the site for the first time.

It was fairly early on a cold Sunday morning that I got out of a warm bed to answer a knock at the front door and was confronted by Dave Neilson, Maintenance Engineer of many years standing with Wilson Hart.

Dave told me that he had been called back from holidays because of a problem with the Elgin Vale Mill engine. He explained that the engine had developed a bad knock, causing the mill to be stopped and all but a couple of the hands stood down. When Dave visited the mill the previous Friday, he had arranged for the engine to be run with varying load conditions while trying to locate the cause of the problem, but without success.

The reason for his visit on that July morning was to ask if I would go out to the mill with him early on Monday to see if we could find the trouble.

On Sunday afternoon a variety of tools and equipment from our works were prepared and loaded into the utility for an early start the next day. Armed with cut lunches and a thermos or two of tea, we were well away before sun up for the two hours or so drive south west.

I remember enjoying the drive and seeing the wild life after we left the bitumen road on the other side of Goomeri. A mother brown duck with her family of babies crossed the road in front of us causing a sudden stop, and just as we were approaching the mill, a group of kangaroos were seen sitting upright on the top of a rise, soaking up the first warm rays of the winter sun.

Over a couple of cattle grids on the road and through some beautiful country and I had my first glimpse of the mill set up near a small creek. The creek supplied water for the boiler and caused trouble at times in cold weather by freezing over, as had happened the previous week. The water from the creek was particularly hard and not at all good for steam raising, playing havoc with the boiler.

Arriving at the mill, we were met by Bob Mercer the Manager and Warren Hockey the Engine Driver who had steam up so that we could run the engine. Bob and Warren would put a log through the No. 1 bench to give the engine a load while Dave and I looked for the offending knock.

After a cup of tea and warming ourselves near the boiler, we were into action.

Working together, it didn't take long to find that the "bump" was caused by the flywheel keys being slack, allowing the crankshaft to work in the flywheel boss.

Because of the amount of sawdust and grease about the engine it was difficult to see this at first but, once located, there was no doubt where the trouble was.

The Elgin Vale mill, which was established in the early 1900's, was cutting practically nothing else but virgin hoop pine of very good quality. Because of its value it was cut down to the smallest sections as well as planks, leaving virtually nothing but sawdust waste to fuel the boiler. It was necessary to bring in bush wood for extra fuel, an unusual thing for a country sawmill where there was usually plenty of waste timber.

A general examination of the engine showed that she'd had a pretty hard life. The main bed casting was cracked in the area of the crosshead guides, the back cylinder cover had evidently been smashed and had been replaced by a steel one, and the engine had been working on the foundation. Bob Mercer told us that the crank pin had come loose in the crank disc a short time back and now the flywheel was loose "or working" on the crankshaft.

At that particular time the old Maryborough firm of Wilson Hart & Co with its country sales outlets and smaller mills had been acquired by Carricks Pty. Ltd. of Brisbane.

Bob Mercer explained his fears about the situation to us, stating that he thought that if the engine couldn't be kept running, the mill would probably be closed. Single phase electricity only was coupled to the mill and nearby houses and the cost to install three phase, and equipment to electrify the plant would not be met by the new owners.

Bob, at retirement age, certainly had the good of the old mill and his crew at heart and wished the plant to continue operating.

As I got to know Bob Mercer better, I realised that he was as important to the old mill as the engine, and I doubted another man could be found to keep the old plant operating. I think these early country mill managers were a special breed, with sawdust in their blood, who could turn their hand to almost anything as well as "keep the books".

The mill was built on a gentle slope with the log pile on the top side where the logs could be easily loaded onto the No. 1 Canadian bench for breaking down into slabs. The machinery was all set up on a heavy timber floor which was well clear of the ground on the lower side of the mill. This gave clearance for the main drive 4" diameter countershaft under the floor with the flat belt drives coming up through the floor. Under the mill when it was running, the large, fast rotating pulleys with their flat belts disappearing up through the floor to the various machines were really something to see.

The noise of the various saws above, as they bit into the new timber, added to the experience. The drive to the countershaft was by a 14" wide heavy canvas-rubber composition belt fitted to the flywheel itself, which had a 12" wide face.

The engine and boiler were at ground level on the down side of the mill, closer to the creek.

Water was pumped by a "Worthington" duplex type steam pump from the creek to overhead tanks and then to a large rectangular brick or concrete

tank set in the ground near the engine. The top of this open tank was at ground level and around it was erected a rough barricade.

I was told that the men turned up for work one morning to find a lively steer in the tank with only its head sticking up out of the water. After breaking through the railings he was unable to get out.

Every time I visited the mill, this deep tank seemed to be full to the brim. There were also a couple of rainwater tanks for drinking purposes.

Very noticeable around the boiler and engine was the mixture of smells from the steam and hot oil and the burning pine in the boiler furnace. In the mill itself above the floor was the clean, sweet smell of the freshly cut hoop pine.

Viewed from a distance, the mill seemed to be part of the natural landscape. Some of the buildings looked as old as many of the surrounding trees. An even, light smoke drifted from the tall chimney, with a little cloud of steam coming from the engine exhaust. Sticking out over the boiler house roof was the "knock off" whistle which, when blown, echoed back through the bush.

At the far end of the mill were many stacks of timber neatly stripped for air drying. The sawn timber was taken from the mill to the yard on trucks running on steel tramways.

Particulars I recorded at the time regarding the main engine are:

MAKER:

T. Robinson & Son Limited
ROCHDALE - ENGLAND

Bore 16", Stroke 30"

Split Type Flywheel - 10' 6" diameter with 12" wide face carrying a 14" wide belt.

The year of manufacture was nowhere to be found, but it was thought that the engine was used elsewhere before the Elgin Vale mill was set up in 1926.

The rim of the flywheel was 10" deep, rather heavier than usual. The main drive to the mill was by the heavy 14" wide belt to the 4" diameter countershaft 33 feet from the engine crankshaft (or roughly 33 feet centres). The countershaft ran under the mill more or less on the same level as the engine. The flywheel ran in a pit deep enough to just give clearance for the belt which gradually tapered up to ground level toward the countershaft. In wet weather this pit sometimes filled with water from soakage, causing problems if not bailed out.

Close to the engine was a collection of small and large circular saw blades, some newly ground and others in need of sharpening. There were also blades for the vertical frame saw which was never in use during my visits. The saw sharpening machinery and various tools and spares were also nearby, the Engine Driver often doubling as the Saw Doctor. While he sharpened saws he was able to keep an eye on his charge.

Some information about the boiler might also be in order.

This was situated parallel with the engine bed and about eight feet away to give enough room for working. It also meant that the steam pipe was nice and short. The feed pump and injector were situated on the engine side of the boiler so as to be handy for the Engine Driver who was also the Boiler Attendant.

The boiler was of the under fired multi-tubular type. With this design, the furnace is situated directly under the boiler shell or "drum".

The hot gases from the fire pass towards the back and return through the many tubes to the smoke box at the front. The chimney, probably in the vicinity of 24" in diameter, rose from the top of the smoke box through the boiler house roof to a height of about 30 feet above it. The top of the chimney was covered by a flat disc of steel plate which could be tilted as desired, thus opening the top of the chimney to control the draught for the fire. The disc or "damper" was hinged at the top and to one side of the chimney and was controlled by a wire cable extending down through the roof. On the bottom end of the cable was fastened a short length of chain which afforded the operator a better grip and also enabled him to hook it on to a peg provided for that purpose and to give ease of adjustment.

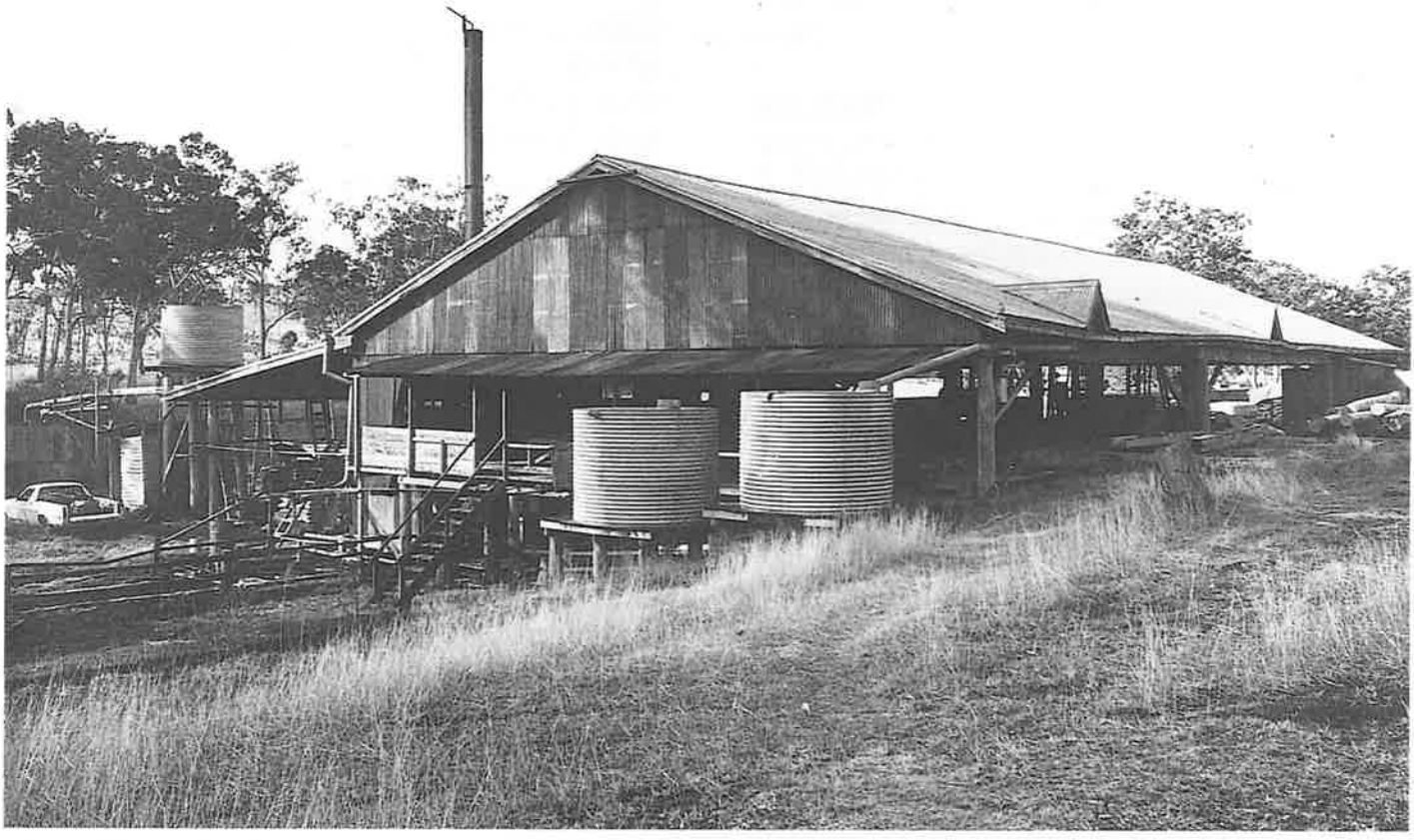
At a safe distance in front of the boiler was usually a pile of green sawdust and small scraps of wood for firing. The sawdust was fed through the twin fire doors with a wide, flat shovel or scoop and the scraps were picked up and thrown in by hand.

When firing with the damper well open, thus creating a "heavy" draught, a lot of the light sawdust was pulled straight off the shovel and burnt in suspension without landing on the grate.

The ash pit under the grate was slightly below the surrounding floor. This contained the hot remains of the fire that fell through the grate during the course of the day. As the ashes built up it was necessary to rake out the pit and remove the contents by wheelbarrow to a safe dumping area. Immediately in front of the boiler had to be swept clean and free of sawdust for safety reasons. The finest layer covering the floor and coming into contact with the heat of the ash pit could soon start to smoulder and spread slowly towards the heaped fuel supply.

Under the mill on the tops of all the beams and timbers, and indeed on anything that remained stationary for long, there was a build up of the finest bone dry sawdust that could easily ignite with the smallest spark. Fire in a sawmill is an ever present danger and there were a few charred timbers near the boiler at Elgin Vale that "told a tale" of near disaster.

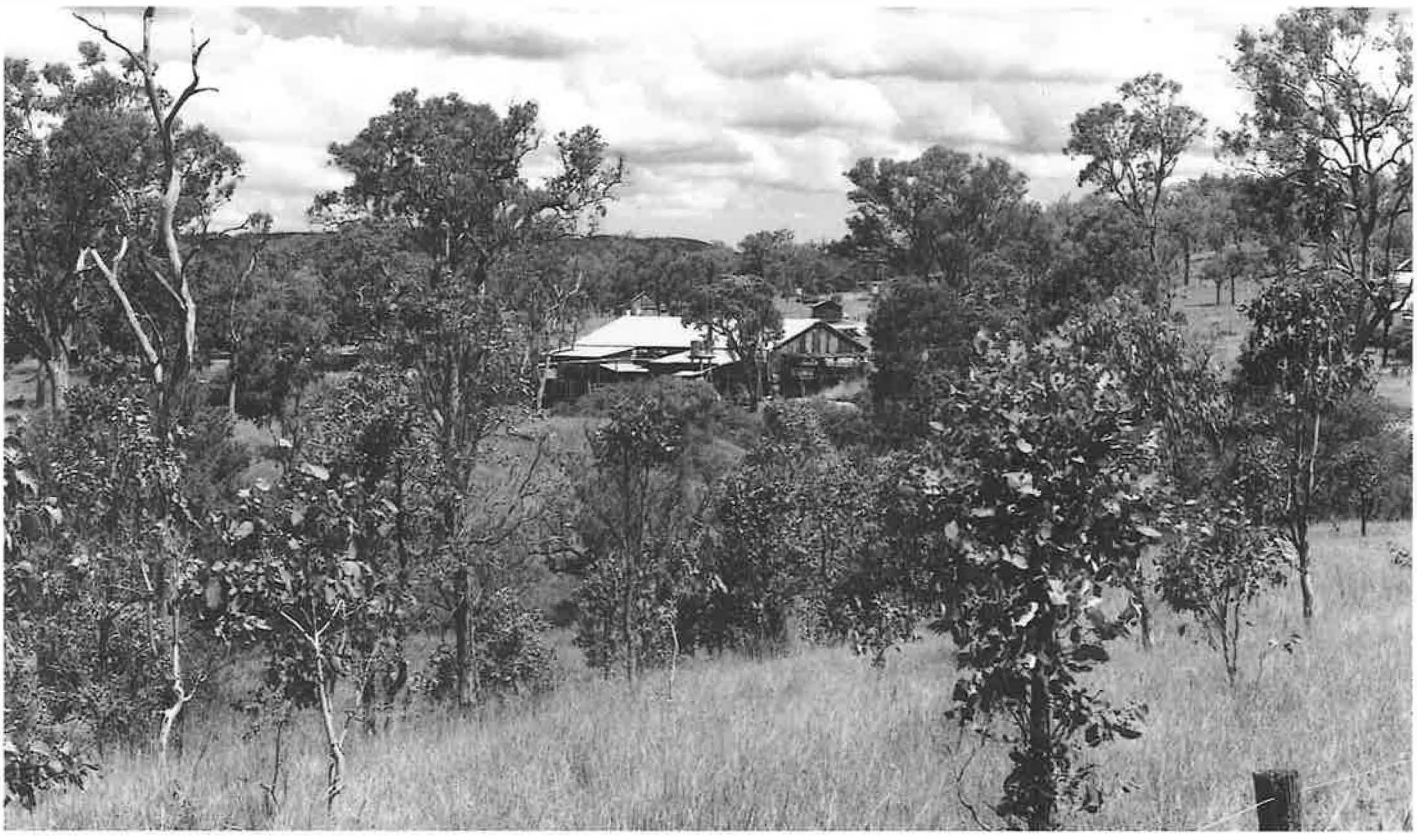
A small petrol engine-driven fire pump was kept handy to draw water from the creek in case of fire, and it also served to fill the boiler water supply tanks on occasion. When the boiler was cold (e.g. during the Christmas shut down) the mill was quite dead. When the fire was again lit and steam slowly raised, the little leaks here and there indicated she was coming alive again.



The mill was built on a slope running down to the creek which supplied the boiler feed water. This was pumped up into the high tank on the left. The two tanks on the right held rainwater caught off the roof.

Timber trucks dumped their log loads on the top side of the mill where they were easily loaded on to the moving carriage of the Canadian Bench for breaking down.

The large open spaces at the far end of the mill held many big stacks of pine planks carefully stripped up for natural air drying. All were cut with power supplied by the old Robinson engine.



A view of the Elgin Vale Sawmill in the distance across the creek, as seen from the road from Goomeri. Some of the buildings looked as old as some of the surrounding trees. Light smoke drifted from the chimney and a little cloud of steam vapour rose up from the engine exhaust.

A story related by Dave Neilson regarding the boiler is worth repeating. It occurred when Dick Collard was the Manager.

Dick was a very big man of about eighteen stone in weight. It was during the normal Christmas shut down period when, as well as work on the boiler and in the mill being carried out, the chimney was receiving a fresh coat of paint. This precarious operation was being performed by a steeplejack, Frank H....., who specialised in such work, travelling near and far in this unusual trade. Frank, who was a smallish, slightly built man was known as a bit of a a "hard case".

While up at the top of the chimney he thought he would "have a go" at the boys mostly out of sight down below. He was actually sitting on the damper, probably having a smoke, when he yelled out, "open the damper."

He apparently saw the wire being tugged by someone who must have wondered why it was stuck. He called out again, with the instruction, "give it a bloody good pull." The ensuing commotion and yells that were heard from aloft by the men in the boiler house took them by surprise. Frank hadn't reckoned on the might and muscle of the manager of Elgin Vale who managed to open the damper as commanded and nearly threw the steeplejack off his perch.

I make no apology for using our old Imperial measurements in my description. I believe it is correct to describe old equipment as it would have been when originally made. It is not through being unfamiliar with the metric system. Indeed for generations in our calling, we have had to use the metric system when dealing with Continental machinery long before the system was introduced in Australia as our standard. Likewise we will be required to continue to use our old Imperial measurements so long as the older machinery still in use continues to function.

"BACK TO THE PROBLEM."

After cleaning up around the split flywheel boss which was approximately 18" long, we managed to extract the two tapered gib head keys. These were driven one from each side of the boss into the same long keyway in the crankshaft. Wear in the keys and keyways was immediately evident.

The only remedy at the time was to refit the keys with shims. Before doing so all particulars were taken to make new oversize keys on our return to Maryborough, these to be fitted as soon as possible on another visit.

With the old keys fitted temporarily and the flywheel made as tight as possible, all was prepared for a test run with the engine being turned to the usual "starting position". With the cylinder drain cocks open, Warren the driver opened the throttle and the engine moved off but did not start. To my surprise the piston came to near the end of its first stroke and actually bounced back in reverse after having what I considered plenty of speed in the big flywheel to carry over the end of the stroke.

Warren cursed himself for not "giving her enough", and to my query said that she often did that.

After setting the engine in the start position again and giving her a bit more initial steam she was away. Bob Mercer and Warren proceeded up top and put a heavy log through the Canadian bench, while Dave and I watched and listened to the engine.

The knock was gone.

We packed up our tools and returned to Maryborough, promising to make new oversize keys and fit them in the near future. It was not until the next week that we returned to the mill as the engine continued to run well for a couple of days but the knock gradually returned. During this time I gave considerable thought to the past damage to the engine (already mentioned), as well as this latest problem of the flywheel coming loose. I also thought about the way the engine failed to start on that first attempt I witnessed.

This was the clue that made me think there was something really amiss.

When Dave and I made the next visit to Elgin Vale with the new keys and the tools to fit them, I also took a small sheet of thin plywood, some offcuts of handy sized dressed pine from our pattern shop and a few woodworking tools.

After arriving at the mill, we removed the main drive belt so that we could more easily turn the engine over. This was usually done by standing inside the flywheel or sitting on the spokes. While Dave started to fit the new flywheel keys, Warren and I removed the steam chest cover to expose the slide valve, also often referred to as a "D" valve. This one single casting controls the admission of high pressure steam from the steam chest to both ends of the cylinder as well as the exhausting of the same steam after its work has finished in the cylinder. This single component works by sliding against a flat face, from which ports or passages lead to each end of the cylinder and a third or central larger port leads to the engine exhaust pipe.

Slide valves are made with a recess or exhaust cavity in the face which slides over the ports in the cylinder steam chest. With the valve being driven by any one of the many types of drive mechanisms or "valve gears" across the port face a surprising number of events occur. The actual dimensions or lengths of the valve by which it controls the flow of the steam through the ports is most important. I had a hunch that this valve was at fault by closing off the exhaust events too early, causing undue compression at the ends of the stroke.

With a valve set up in its working position it is easy to witness the sequence of events in relation to steam being admitted to one or other end of the cylinder, but not to the exhaust. The exhaust events are controlled by the exhaust cavity, hidden from view in the back or underside of the valve and this cannot be seen under normal circumstances.

When the suspect valve was removed, a rough check with a rule confirmed my feelings that there was far too much exhaust "lap" which would cause undue compression of steam at both ends of the stroke. Explained simply, the flow of the exhaust steam from each end of the cylinder was cut off too early,

instead of being allowed to escape to atmosphere through the exhaust pipe. The steam thus trapped in the cylinder was compressed to a very high pressure as the piston came to the end of its stroke, thus giving great resistance for the engine to roll over dead centre.

At this point I produced the small sheet of ply etc. and proceeded to make a part dummy or skeleton valve that could be placed in position on the valve spindle, representing the actual valve. The piece of ply was cut exactly to the same length as the old valve and an opening, the same length and in the same position, was cut to represent the exhaust cavity. When this was set in position and the engine turned over, we could immediately see what was happening with both the admission as well as the exhausting of steam from the engine cylinder.

It was shown that the exhaust was cut off 5 inches before the end of the stroke on the crankshaft end of the cylinder and 6 inches before at the opposite or outer end. I was sure that here was the cause of the loose flywheel and the earlier troubles experienced.

On closer examination the piston rod showed signs of undue heat and Bob Mercer stated that the gland on the piston rod was difficult to keep steam tight. This was further proof.

The remedy I suggested was to make a new valve. This meant first making a pattern, then a casting and finally machining it. Such a job would mean a longer stoppage for the mill as well as the expense incurred.

My suggestion caused worried looks on the faces of my friends. After all the engine had been working since 1906 or thereabouts. There were suggestions that the engine was used elsewhere prior to being set up at Elgin Vale.

It is at times like this that one gets the feeling that others might think that one is trying to make work for himself.

After further discussion Bob Mercer phoned head office in Brisbane to explain the position and get instruction. He soon returned from his office with the words, "go ahead". I then phoned my brother Bill at our works in Maryborough and asked if it could be arranged for our pattern maker, Bill Baxter, to work on the new pattern that night.

After further work and adjustment to the plywood skeleton to give the dimensions desired, Dave and I packed up and headed for home as quickly as possible.

Bill Baxter completed the pattern for the valve to the new dimensions at a late hour that same night. It was cast in our foundry the next day. The casting was removed from its sand mould while still quite hot and when cool enough immediately machined on the working face ready to be fitted the following day.

It was an early morning start for Dave and I again as we headed off with the new valve, prepared for an overnight stay at Nanango.

On arrival at the mill we proceeded to clean up by hand the port face in the cylinder steam chest in order to get a good seating for the valve. We also fitted the new flywheel keys.

In the meantime Warren was gradually getting up steam in the boiler ready to run. Incidentally I recall that Warren himself was looking a bit the worse for wear that day. He was sporting a couple of cuts and bruises about the face as the result of a fight.

It appears he had come to the rescue of a young lady who was having trouble with a couple of young chaps at a dance over the weekend. Warren assured us that they would have looked and felt a lot worse than he did.

We believed him.

With everything completed and reassembled, the steam valve was cracked to warm the cylinder slowly, then she moved off and rolled over freely without load. Next, with no little effort, we refitted the 14" main drive belt to the flywheel and with a near full head of steam prepared for a load test.

The moment of truth had arrived.

After setting the engine in her normal starting position, all was ready.

With the throttle valve cracked open slightly again, the great flywheel moved off gently and evenly, gradually increasing in speed until the governor took control. Just outside the mill building there was heard the very even, soft puff of the exhaust from the 6" diameter exhaust pipe. With smiles all around, a few stops and starts were made. The engine seemed to run so much more smoothly and start so easily.

She ran like a steam engine should with no sign of stalling on starting up.

Bob and Warren soon had a big log on the carriage of the Canadian bench ready for a heavy cut to test the old engine again under load conditions.

I stood near the outlet of the exhaust pipe while Dave was nearby when we heard the twin saws biting into the pine log above. As the load was felt, the sensitive governor control valve opened up and the soft puff of the exhaust turned into almost a savage bark as the even beat indicated to me what the engine was doing. We heard the cut finish above and the gentle puff resumed. The new valve was doing its stuff. It was thrilling to hear the engine so responsive. We all felt very satisfied.

Bob told us that he had booked us into a motel in Nanango for the night and that he would arrange for his full crew to start work the next morning. We would then be able to further check and see the engine tested under greater loads.

It being mid afternoon, we packed up our tools and called it a day after making such an early start. The sky was clear and it was a pleasant drive to the nearby town. From the top of a hill on the gravel road, we caught a glimpse of the new giant Tarong Power Station construction rising in the distance.

With enough daylight left, after booking into the Motel, we drove over to get some closer views of Tarong which was the major point of interest in the area at that time.

The Motel where we stayed was enjoying a very busy period, with many overseas experts from the giant Japanese firm of Hitachi, who were involved with the Power Station, booked in.

The next morning, by the time we had booked out and got on the road back to the mill, the men would have been well and truly at work there. This was the scene we had expected to see when we drove over the last rise and the mill came into view below.

Dave and I were both silent as we got nearer and noticed that the damper cap on top of the chimney was closed right down and there was a cloud of steam coming out from under the boiler house roof, obviously from the safety valve being well and truly open.

This was an almost certain indication that the mill had stopped, the surplus build up of steam was escaping from the valve and the boiler fire was shut back.

Dave's first words were, "well mate, it looks as though we'll have to get our overalls on again." We both had the same thoughts.

However, to our surprise, when we got closer we could see the movement of men and machinery in full swing as normal.

Gradually winding our way in the ute to down near the boiler and engine, we spotted Bob Mercer with a grin from ear to ear. His greeting was, "this job will do me now, it's a real holiday firing the boiler."

In spite of his bruises and aches, Warren was up in the mill helping the other hands make up for lost time and Bob was acting as Engine Driver.

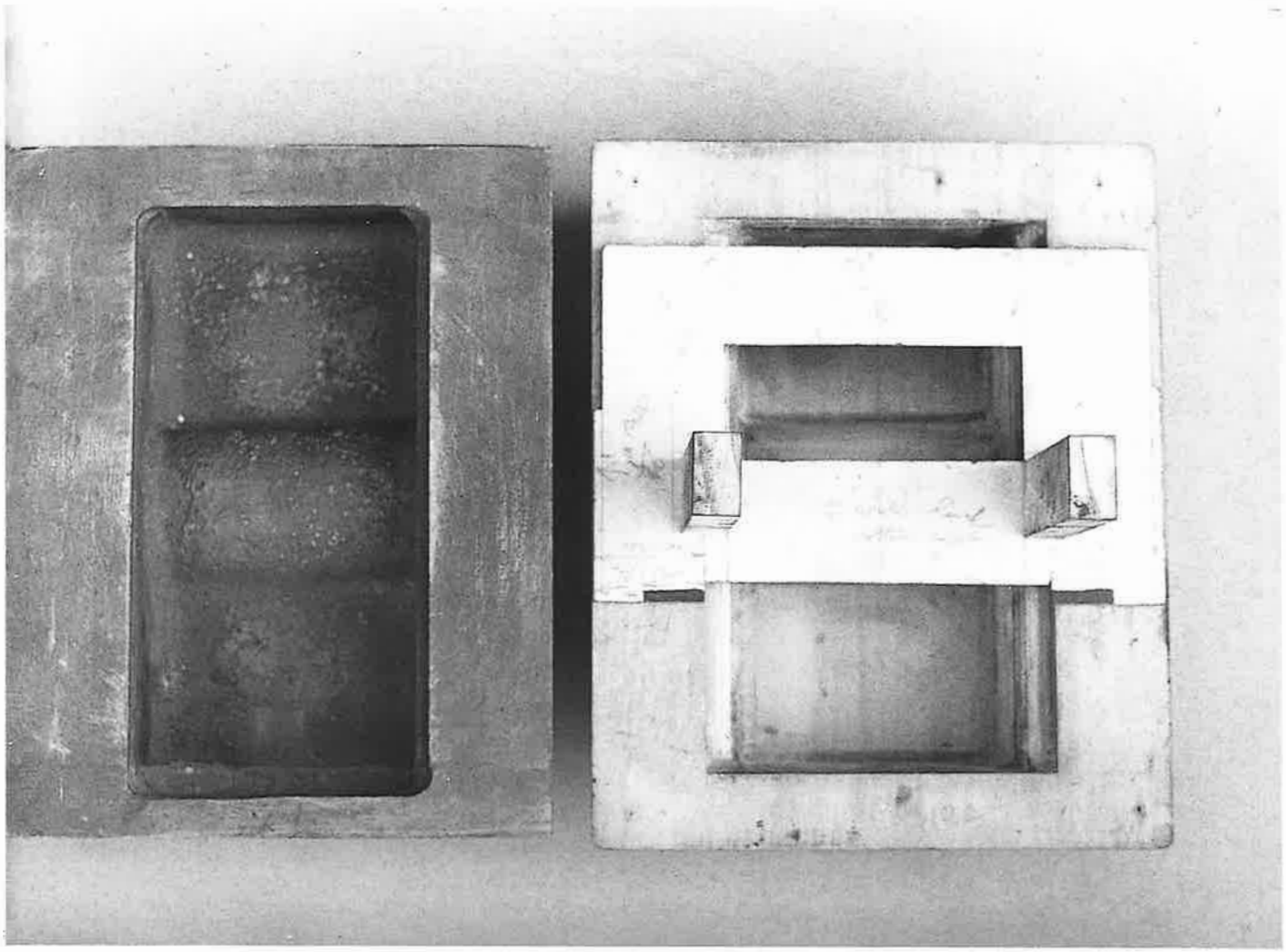
At the start of the day the fire in the boiler furnace had been well built up as had always been the practice, but now with the new valve fitted, the engine used far less steam than previously. This resulted in the damper having to be closed, but still the safety valve lifted. As the roar of the escaping steam from the valve subsided, the steady throb of the even exhaust from the engine could again be heard, the steady throb increasing as the governor opened up with load and then diminishing to the soft puff. The old engine was now running much more freely and sounded as though she enjoyed the work she was doing. The mill hands said they had much more power than before with plenty to spare even on a lower boiler pressure.

Dave and I stayed on for a couple of hours more and "boiled up" before heading back to Maryborough with that satisfied feeling of a job well done.

Thinking back on the problem, we remembered that we had made a new set of piston rings for the engine during the previous Christmas shut down period. These had been fitted by Dave's maintenance men as a routine job then. In the six months since they had been fitted they would have "bedded in" and begun sealing well in the old worn cylinder.

This fact would certainly have caused the higher compression event to be more acutely felt and contributed to the flywheel coming loose.

The original valve would probably have been quite satisfactory had the engine been working with a condenser and exhausting to a vacuum. It was probably designed for that arrangement originally.



Photograph of the original valve shown on the left, looking at the working face which slides over the "port face" in the steam chest.

On the right is the new pattern made to the corrected sizes taken off the "skeleton" which is seen lying on the pattern. These are to be seen at the very bottom edge, where the position and situation of the steam ports in the cylinder are shown in black infill.

It is very noticeable how much wider the exhaust cavity was made compared with the original, which is the length of the window opening in the top of the skeleton. The new valve has no "exhaust" lap but slightly increased "steam" lap.

The two small blocks attached to the back of the skeleton enabled it to be simply placed in position on the valve spindle, from where it could be lifted out and cut to the adjusted sizes and returned to its place for checking without moving the adjusting nuts.

The whole procedure was carried out by actually rolling the engine over and observing the "valve events". When it was decided the dimensions arrived at were satisfactory, the new pattern was made to these dimensions with the normal metal contraction allowance being taken into account.

NOTE: A pattern when being made to produce a casting must be made slightly larger than the actual job due to the contraction of the metal as it solidifies and cools. The contraction allowance varies with the type of metal from which the casting is poured.

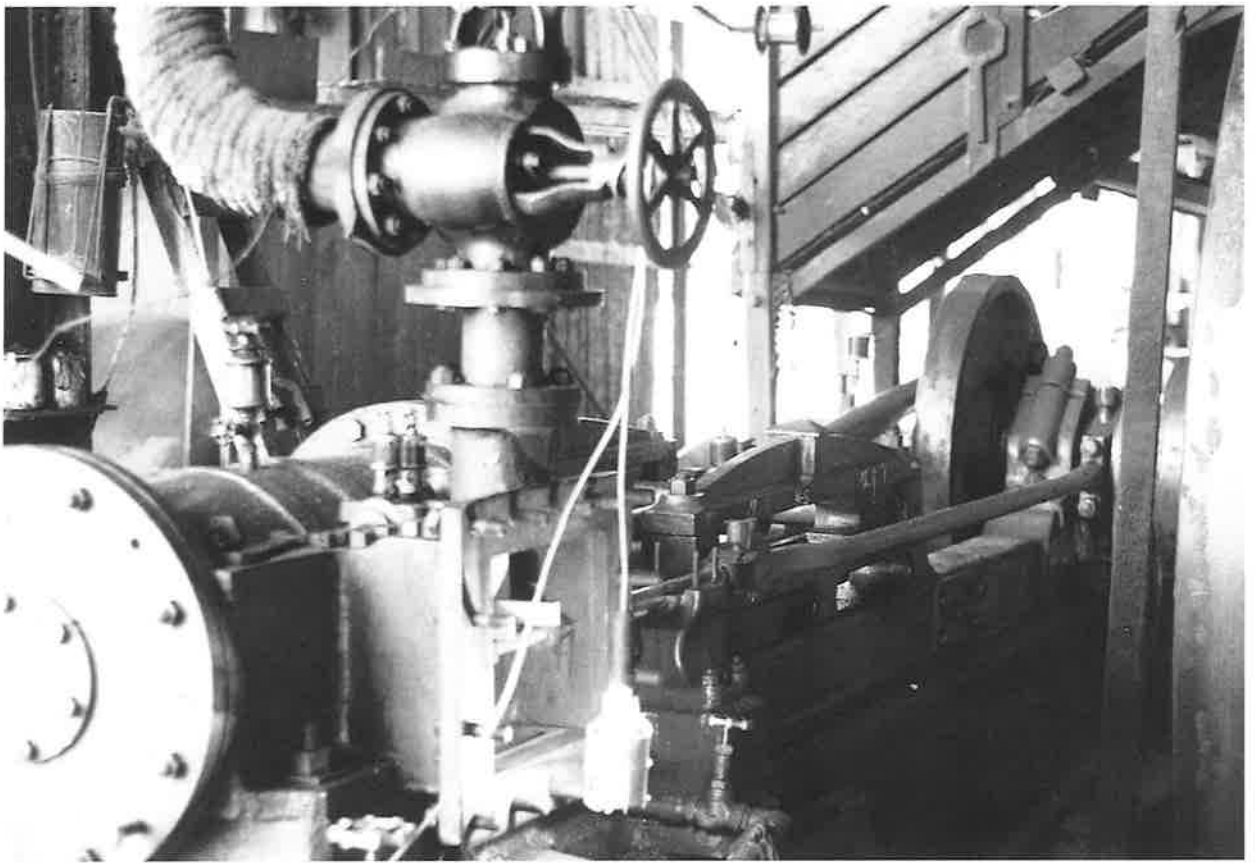


Photo shows the steam chest cover removed and the "skeleton valve" in position resting on the valve spindle. The lead light hanging down from the throttle valve spindle was plugged into a nearby power point, one of only a few in the mill. These together with a few lights were the only mains electricity supply available.

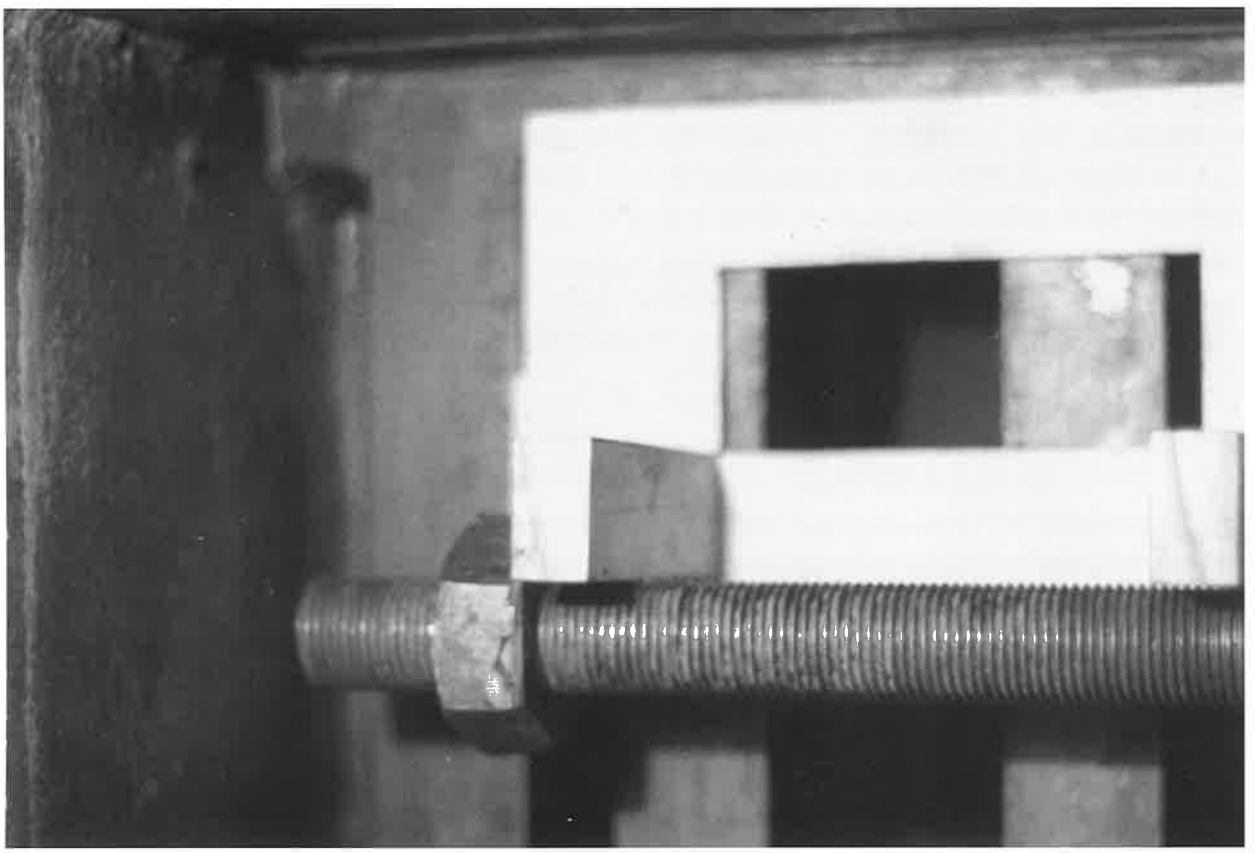
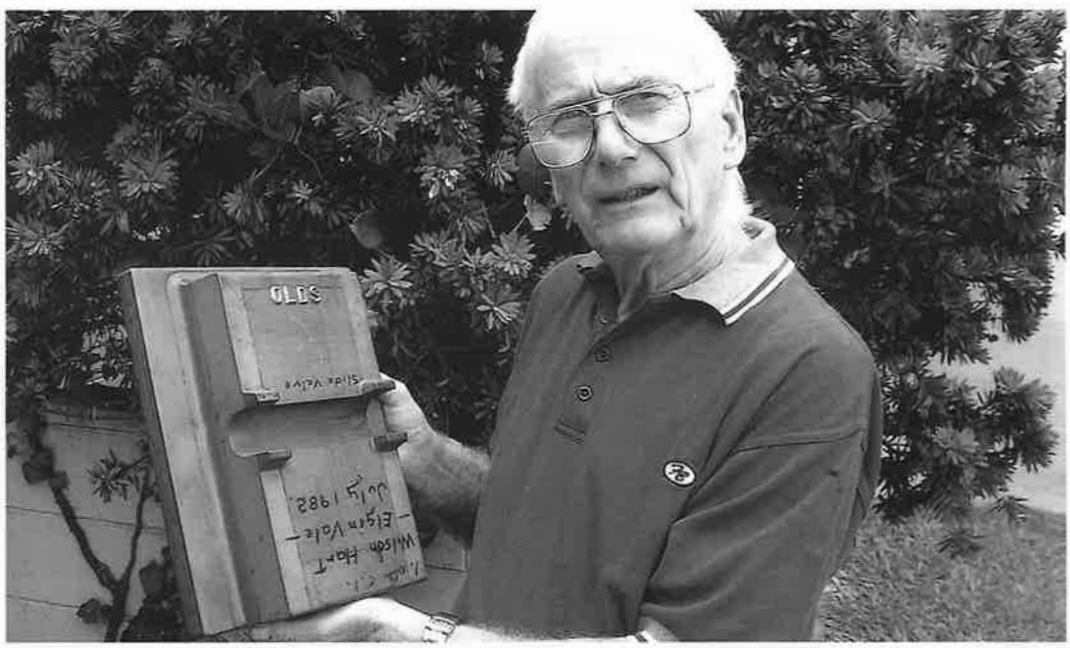


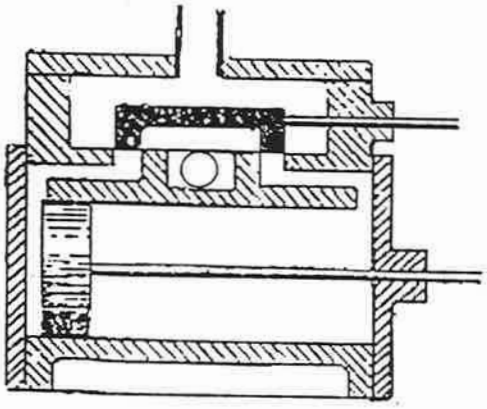
Photo showing close up of the "skeleton valve" in position on the valve spindle and against the port face.

Moulder Neil Anderson is shown about to "close up" the sand mould for the new slide valve ready for casting in molten iron. The pattern which was completed only the night before is shown on the left.

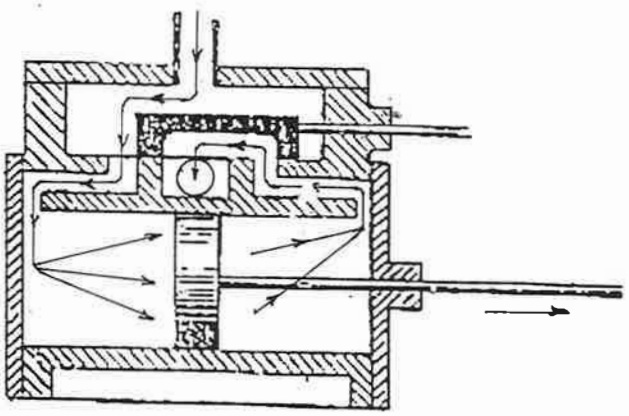


This photograph of the "back side" of the valve pattern shows the hollowed out area and lugs which engage on the valve spindle. The pattern is still as good as the "night" it was made nearly 24 years previously by a young looking Bill Baxter, seen here holding the pattern on 8/02/2006. Like all true craftsmen, Bill took great pride in his work, turning out thousands of accurate patterns many of which are most intricate.

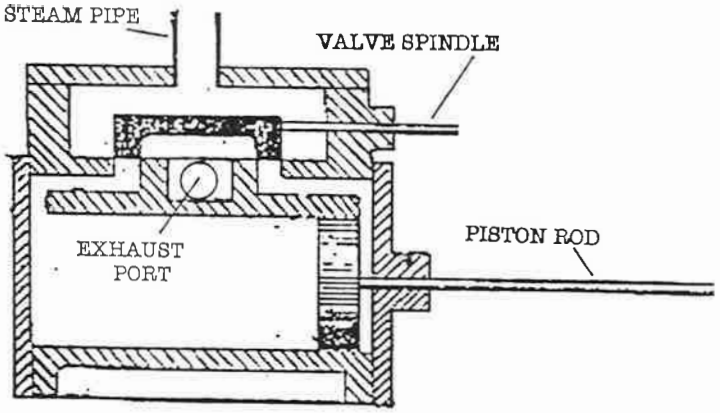
Bill and I were 1930 models, going through Primary and Secondary schools together. We finished school after sitting for our Junior Examination and started Apprenticeships at Walkers Ltd. during one of their busiest periods. Bill served his time in the pattern shop, while I was assigned to the machine shop.



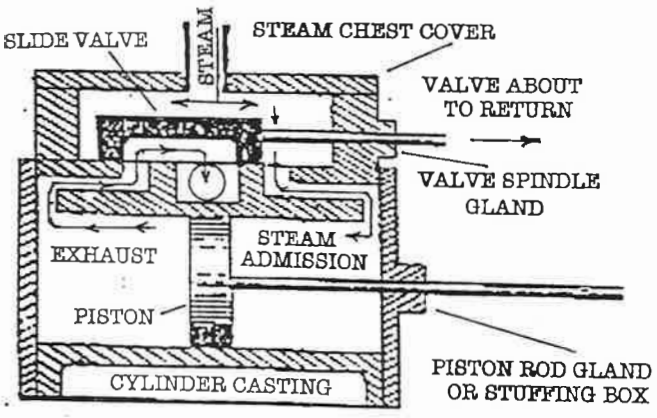
Valve in mid position & about to move to the right which will uncover the left hand port, allowing high pressure steam to enter the left hand end of the cylinder. With the same movement, the right hand port is opened by the exhaust cavity in the underside of the valve, which allows the escape of exhausting steam to the exhaust pipe as the piston moves to the right.



Showing valve at end of its travel and about to return while the piston is shown in mid stroke.



Valve in mid position and moving to the left, allowing high pressure steam to enter the right hand end of the cylinder, thus pushing the piston on its return stroke with the spent exhaust steam escaping through the left hand port.



The previous illustrations and explanations show the operation of the slide valve having no lap whatsoever. Although it is common to have no "exhaust lap" in valves used in engines exhausting to atmosphere, "steam lap" (or outside lap) is a definite requirement for the efficient working of all the common types of engines.

Were an engine to be built and used with a valve and no lap, as shown in the previous diagrams, it would be driven by an eccentric on the crankshaft, or a valve gear 90 degrees in advance of the main crank, in order to give the suitable timing of events. When steam lap is added to the valve, the eccentric must be advanced accordingly to cause it to still open the ports to steam near to dead centre of the piston strokes. All other events are then advanced at the same time to great advantage.

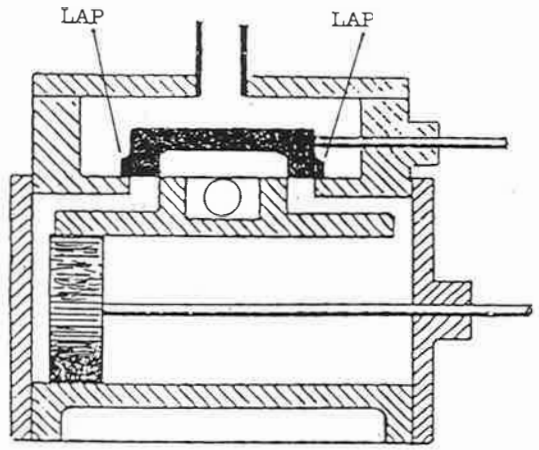
Firstly the steam is still admitted at the commencement of the stroke of the piston but its flow is then cut off well before the end of the stroke. This allows the expansion of the steam then trapped in the cylinder to effect the remainder of the stroke before the exhaust cavity opens the port and allows it to escape to atmosphere.

The advance of the eccentric also causes the exhaust events to happen earlier, which brings about desired results.

Exhausting now commences just before the piston reaches the end of its power stroke, thus releasing the pressure in readiness for the free return of the piston. The cutting off of the exhaust just before the end of the exhausting stroke traps some steam in the end of the cylinder and port, causing some compression or cushioning to occur. This effect results in less steam consumption, as that end of the cylinder is then already charged with steam under pressure for the commencement of the power stroke, when live steam is again admitted. The cushioning effect helps to halt the heavy reciprocating parts when slowing in movement at the end of each stroke.

Vertical engines often used slightly more exhaust lap for the underside working of the pistons, to help cushion the massive weight of pistons, piston rods, crossheads and connecting rods.

When arranging satisfactory valve timings, the angularity of the connecting rod and crank must be taken into account as well as the pillar action of the rod and crank at the ends of the stroke.

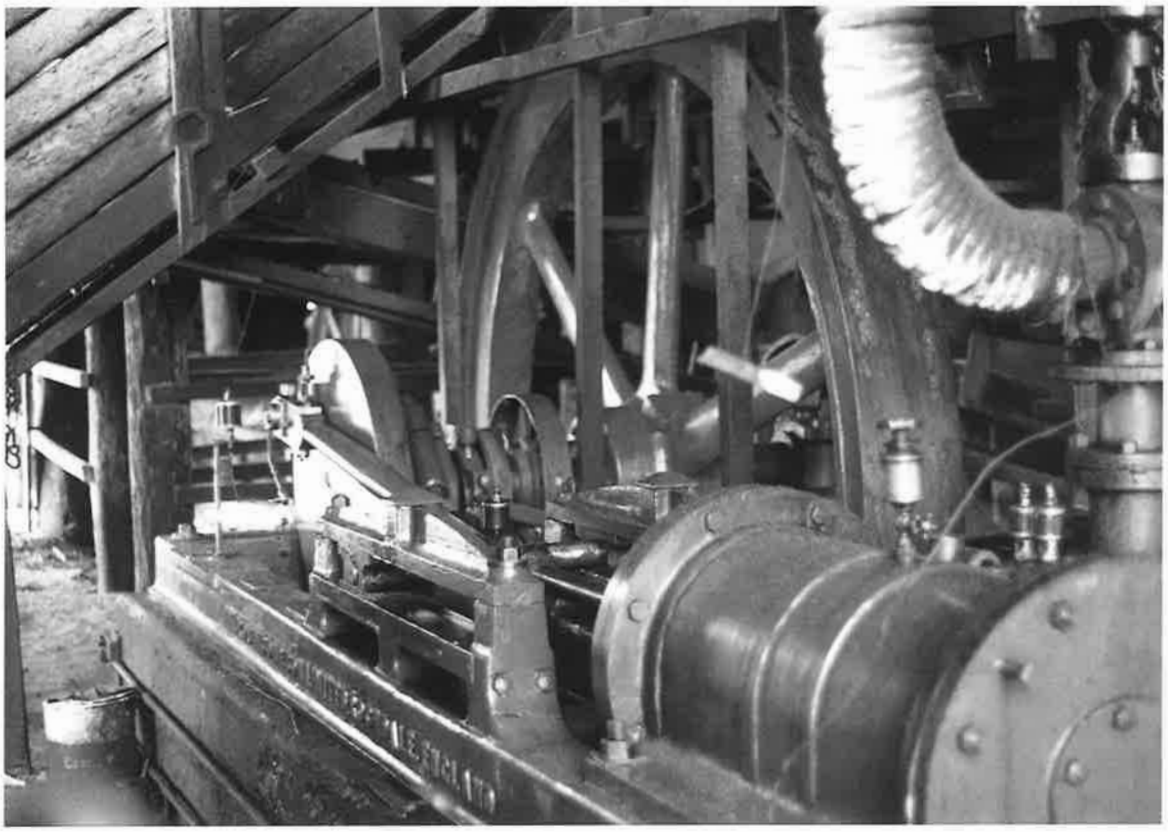


The illustration above shows the slide valve extended on both ends to provide "steam lap". Lap added to the valve causes earlier "cut off" of the admission of steam to the cylinder and effects more economical use of the steam through it being allowed to expand during the power stroke before being exhausted.

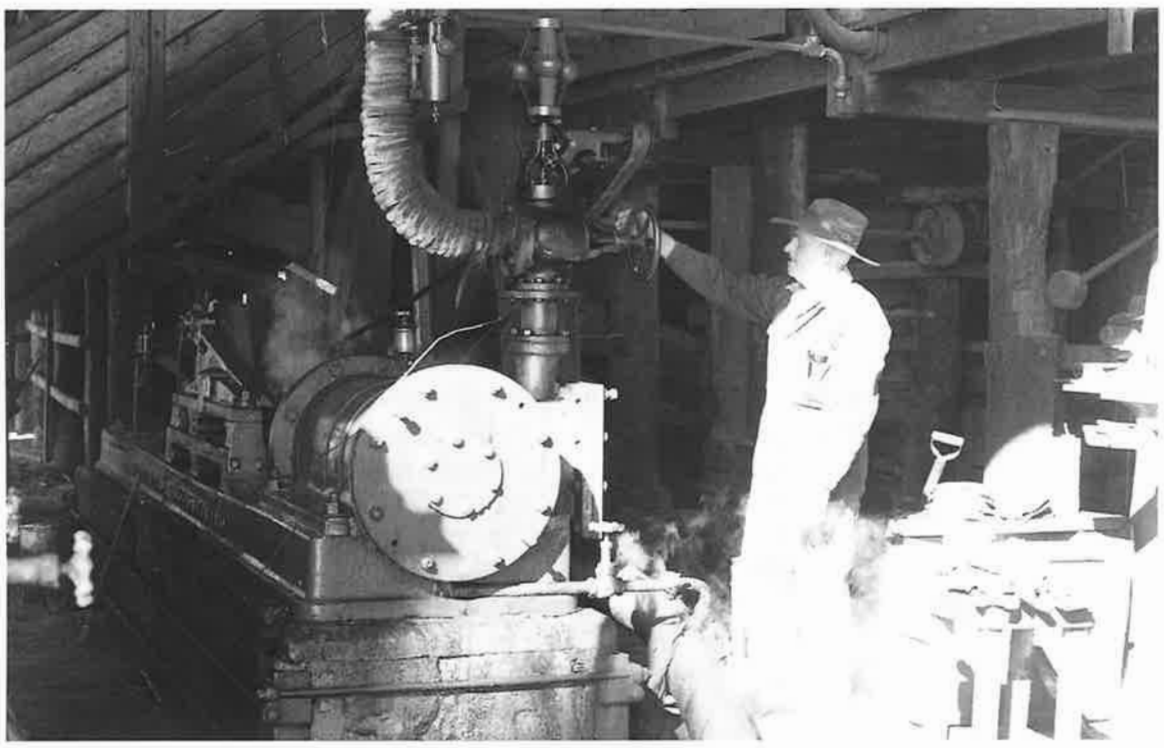
The greater the amount of lap provided, the more the valve driving mechanism must be advanced to maintain the correct admission timing.

With a simple "D" slide valve the steam pressure holds it firmly against the port face. Very high steam pressures can therefore exert a very heavy load on the valve driving mechanism, hence the use of "balanced valves".

Of more advanced design, in later years, is the popular piston valve which absorbs only a small amount of the engine power to activate it.



A view of the engine from the cylinder end. The wooden chute seen in the top left hand corner of the picture carried sawdust and wood scraps from the mill floor above to the front of the boiler furnace situated to the left.



This July 1982 Photo shows Mill Manager Bob Mercer with his right hand on the throttle valve hand wheel situated just below the governor, The asbestos lagged steam pipe can be seen in the middle of the picture coming down from above. The six inch diameter exhaust pipe is to be seen just in front of Bob's legs, with the "outside end" cylinder drain cock line connected in to it.

Checking back through our ledger, I found Invoice No. 17035 dated 20th July, 1982 covering all of the work associated with the new valve, attention to the flywheel etc. The total cost charged was $1734.10.

Thereafter I made a number of visits to Elgin Vale to carry out jobs in other areas of the mill as well as further work on the engine. When the mill ceased cutting for the year, Bob usually posted the key of his office to me. This gave us access to his telephone should we need it.

It was usually arranged for us to make a quick trip after the mill ceased, and dismantle the various parts requiring attention and return with them to Maryborough. We would go back to the mill and reassemble the gear the day before start up and stay overnight to make sure everything was satisfactorily in operation the next day.

I recall that we made and fitted a new crankpin and big end bearing to the engine and during the Christmas 1985 shut down, we made and fitted a new oversize piston and rings. During one of the maintenance trips we took the opportunity to more thoroughly fit and tighten the flywheel on the crankshaft.

On these visits I always tried to take different members of our staff with me to gain experience at the old mill.

Warren Hockey was always the first of the mill hands to show up.

He lived at Manumbar about 5 miles away. He used to ride his motor bike over in the afternoon to "light up" and get ready for work the next day. It wouldn't be long before one could hear the soft whistle of air through the grate and the gaps around the fire doors as the boiler and chimney warmed up and the draught increased.

These were the very first signs of the mill starting to wake up.

It was indeed pleasing to hear from Bob that the small scraps and sawdust were now all that was necessary to fire the boiler. He had no need to get in extra wood as the engine used so much less steam after the fitting of the new valve.

The cost of the new valve and fitting it up was very soon covered by the savings in the cost of outside firewood.

My last visit to the mill while it was still working was to make a template and get details to make a new multi "V" grooved fibre friction wheel for one of the bench feeds. At that time we had with us two visitors from Michigan, U.S.A., Bob Huxtable, who was nearly 90 years of age and Len Selden who was somewhat younger. Incidentally Len's Grandfather was the George Selden of the "Selden Patent" fame. George Selden had patented the motor car long before horseless carriages went into production. He brought an action against Henry Ford for infringement and after long drawn out battles in court Ford won the case.

A visit to Elgin Vale was the ideal opportunity to give our American friends a look at the real Australia outside of the big cities.

When we arrived the mill was working flat out and the scene which met our friends' eyes was almost unbelievable to them.

With saws screaming and sawdust flying, one log was being broken down on the Canadian, while the slabs from the previous log were being cut into planks on the next bench with its automatic feed.

The feed was powered by a radial three cylinder Smith steam engine. The control, forward and reverse, and actual speed of the feed were operated through a simple wooden lever near at hand, next to the heavy saw bench. It seemed that there were flitches of timber and trolleys moving in every direction. Over all, the clean smell of the freshly cut pine filled the air.

The men in the mill were working as a well trained team, each knowing exactly what his mates were doing and what they expected of him. Hardly a word was spoken.

Down below at ground level, the faithful old Robinson engine was supplying the power to make it all happen. You could hear her steady beat, rising and falling in volume as the load varied, but her revs remained constant with her effective governor keeping her under control.

During the lunchtime break, when the mill was stopped, the template was made and the required measurements taken. We then headed for home, towards some threatening storm clouds. It wasn't long before we were driving through teeming rain which slowed our progress to a crawl on the country road. Suddenly it was all over and the sun came out once more.

Our friends enjoyed the experience but expressed disappointment at not seeing a single kangaroo during the whole trip. As we approached the turn off to Miva Station there was water lying everywhere, on each side of the road and at times across it, but I decided to take the turn into the old property. We hadn't gone far on this quick detour when we came upon the greatest mixture of kangaroos and wallabies of all colours and sizes we could have imagined. Our visitors were delighted when we stopped and were able to watch the wildlife appearing to really enjoy the cool air and clean running water after the heat of the day.

Regarding native wildlife, I was always very wary of snakes when at the old mill, especially in the heat at Christmas time, during the quiet shut down period. When all was still, with all the timber and discarded machinery about, it looked like a haven for snakes. I saw only one large brown at the side of the road near where it crosses the creek approaching the mill. It quickly disappeared into the long grass.

When returning from Elgin Vale on our various visits we usually brought back as much of the beautiful pine as we could carry in the utility. Although Kauri pine is usually more favoured for pattern making, Bill Baxter found that the Hoop pine that was being cut there at the time was particularly stable and not prone to cracking. On the closure of the mill, Bill and I made a special trip to purchase a full load in short lengths for our pattern shop. Indeed we still have some. We also still have the new valve pattern as well as the old valve and a spare piston ring which was made in case one was broken when being fitted. These, together with photographs taken during the first couple of visits, are now a reminder of the whole episode.

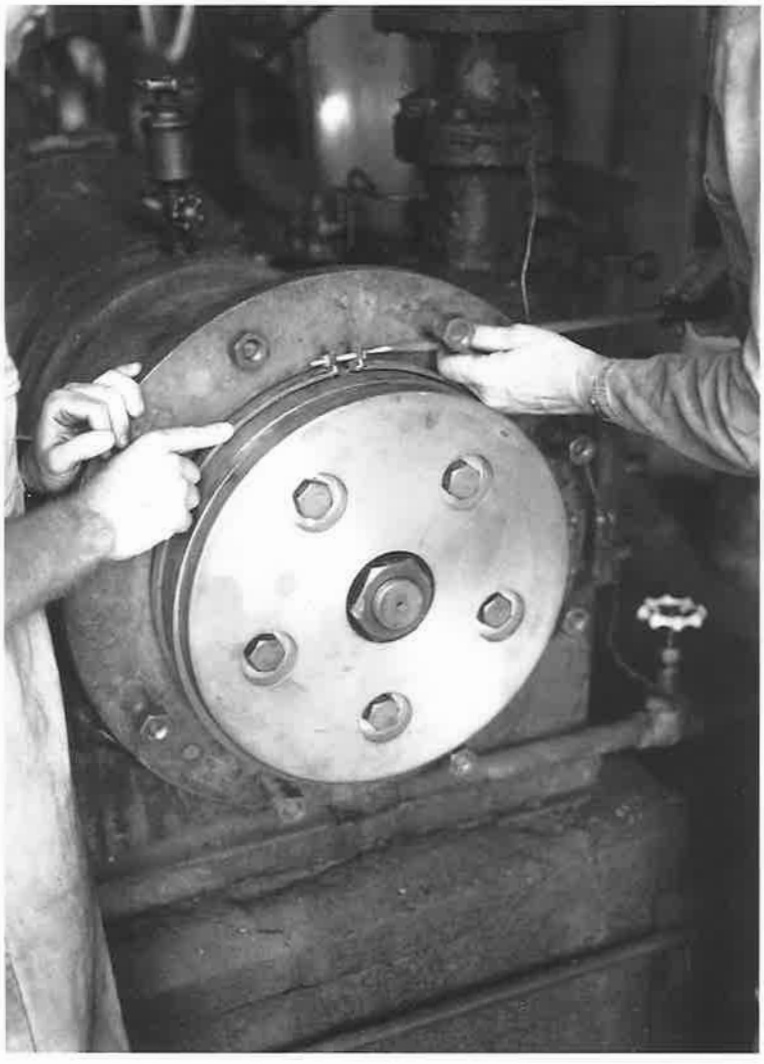
During the December 1985 "shutdown" the old Piston and Piston Rod assembly were removed and a new Piston and Rings were manufactured. The Piston Rod was ground undersize and the Stuffing Box was bushed to suit. In mid January 1986 the new parts were fitted to the engine just prior to the "start up" for the New Year.

The following photographs tell the story.

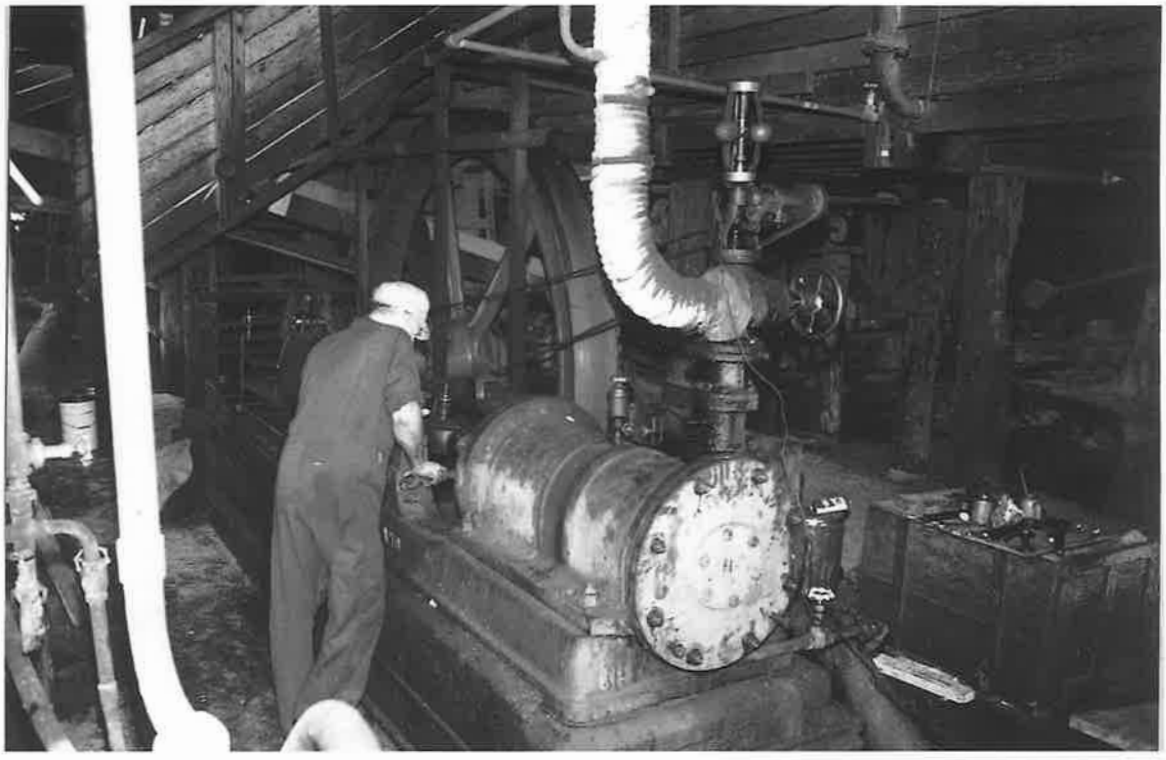
The cylinder bore was ground out and scraped to remove ridges or steps in the bore at the ends of the stroke of the old piston. Leading hand fitter machinist Alan Johnston is at the left, with third year apprentice fitter machinist John Petersen lying in the bore of the 16 3/8 inch diameter cylinder.

The bore, steam ports and steam chest are throughly cleaned out prior to assembly.

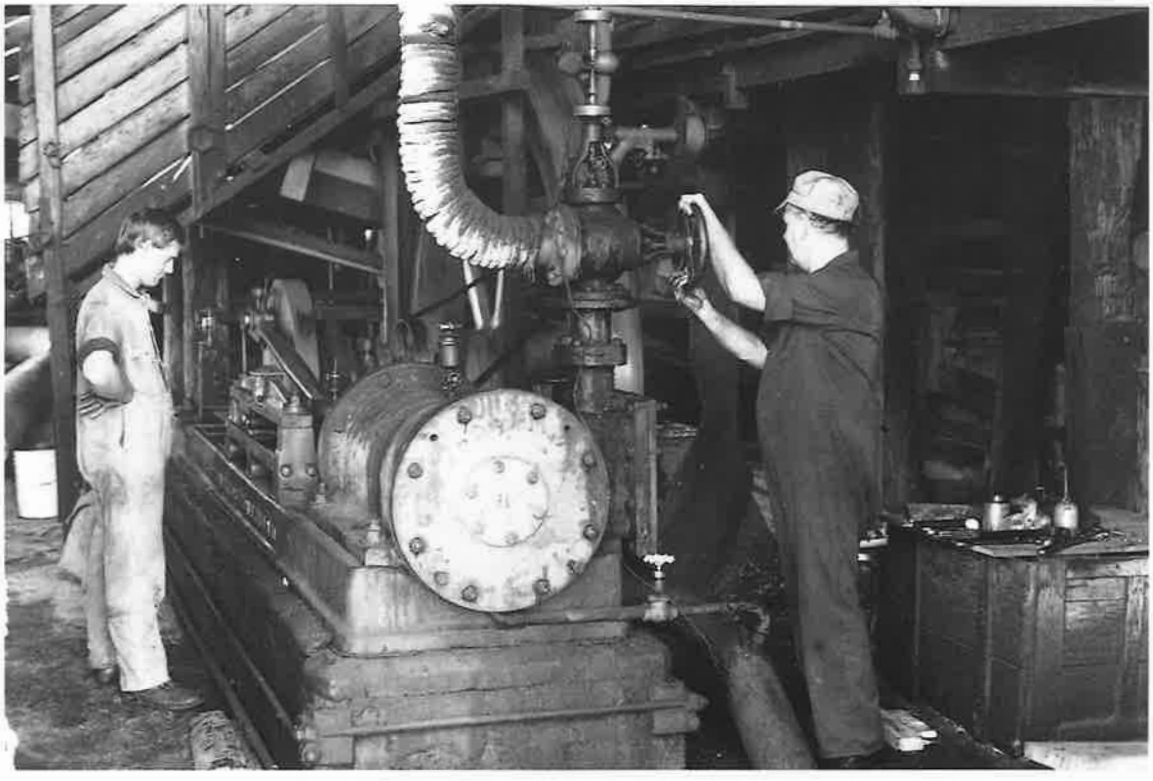
The new piston rings were first checked for "gap clearance" in the bore and then fitted to the piston. John Petersen at left with Alan Johnston.



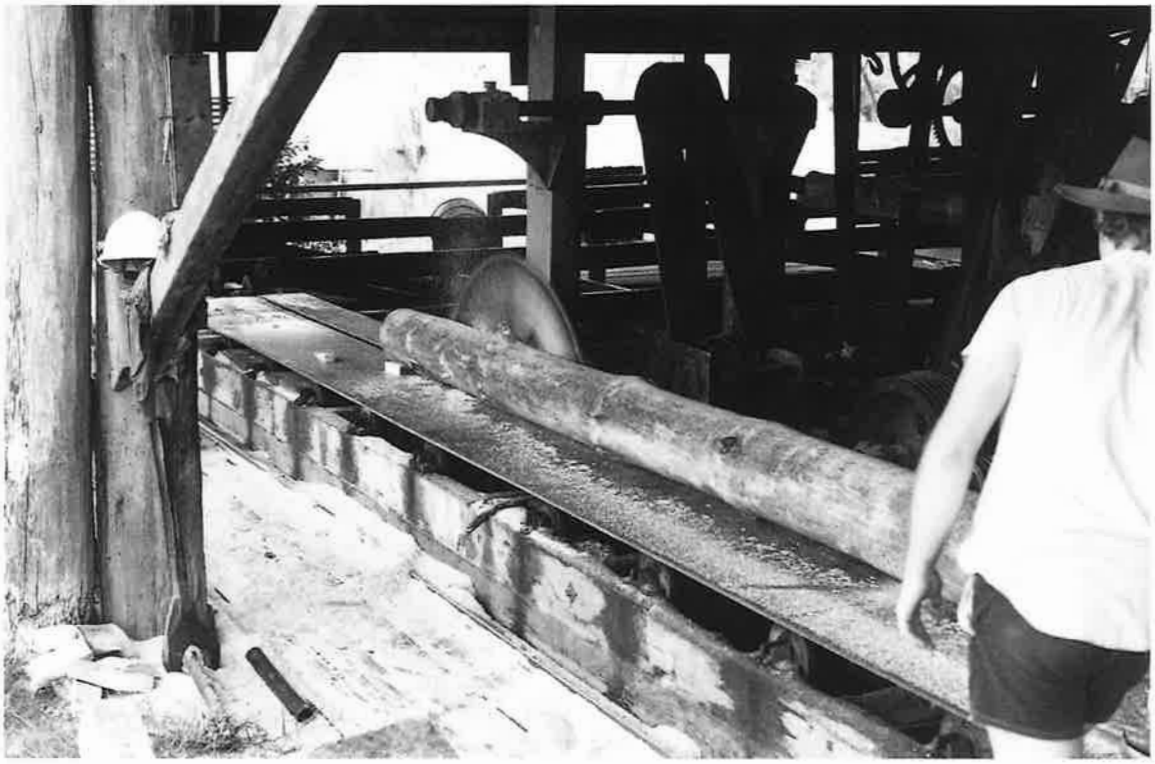
The piston has been entered into the bore and the piston rings are being compressed in order to get them started into the bore also.



Reassembly has been completed and the Piston Rod Gland is being repacked prior to a test run.



A "gentle" start up for a test run to make sure all is well for the next morning of the first working day of 1986. John Petersen witnesses the engine move off for the first time as Peter Olds slowly opens the throttle valve.



A small Hoop Pine log is fed into the single saw on the Canadian Bench with its long steel travelling table running on rollers. This photograph shows that the saw blade has been removed from the top spindle, it not being necessary when cutting small timber.

A large slab of pine is being handled by a man at each end of the heavy No. 1 saw bench, while a third man, nearly obscured by the man closest to the camera, controls the cut with the simple reversible three cylinder radial steam "feed" engine.

A light flitch can be seen on the skid rails in the centre of the photo, having just come across from the Canadian.

A skilled operator walks alongside the moving table or bench as the cut finishes and the flitch falls to the rails seen in the background, for transfer to the Number 1 bench. The Canadian was often referred to as a Rack bench, due to the fact that it is driven through a long gear rack fixed to the underside of the table.

The pinion gear meshing with the rack is driven through a friction drive, which is visible in the centre right of the picture, This device works as an effective friction clutch, which gives the operator smooth control over the heaviest of the logs being fed into the saws.

At times the operator actually sat on the moving table at the end of the log, sighting the cut with a trained eye. Usually, with one hand on the log and his leds dangling over the side just clear of the floor, he glided along watching nothing but the cut, finishing up very close indeed to the cruel saws.

"Making your blood run cold" is a fitting description of this operation when you first witness it.

(The small multi V grooved fibre friction roller had just been replaced when this photo was taken.)

As with some other machines, I can still picture and hear the old Elgin Vale engine working. I think of the men (and their wives who stood by them) who designed, built and installed them. Also the difficulties that must have been experienced in transporting such heavy equipment over the bush tracks in the early days. Without doubt, they too would have gained pleasure and satisfaction when all of their efforts came together and everything worked as intended.

The mechanism in some steam engines has often been described as "poetry in motion". I believe that this is very true. I also believe that the exhaust beat of healthy engines, both steam and internal combustion, is a form of music to the ears. At times they almost seem alive and their performance reflects the expertise of those responsible for their design, building and upkeep.

Well before the interlude at Elgin Vale, Dave Neilson pulled into the front of our works in North Street in his company utility with a greeting, "I've got a present for you".

In the back of his Ford was a sadly worn 5" bore x 6" stroke Tangye mill engine in a dismantled state. Dave explained that the little engine had just been pulled out of their Miriam Vale mill where it had been used for years to drive the sawdust blower. He had spoken to the management and it was a gift if I wanted it.

This little engine which was built in 1912 now drives some of the plant in our machine shop on special occasions. It shows basic steam power in action, gives training to apprentices, and is of great interest to visitors.

Some years ago I was invited to give an address, titled "The Age of Steam", at a Small Museums' Conference. I think that the 150 or so listeners were a little surprised when I opened with the statement that, "we are still in the age of steam. There is probably more steam generated now than ever before".

The bulk of steam generation today is in a small number of giant power stations where the enclosed cycle uses turbines and very high steam pressures. Few of us today stop to think that lights and appliances used in our homes are indirectly powered by steam. Machines of Industry of all types and even our electrified railways are mainly driven by the same source.

Years have passed since my first visit to Elgin Vale but during that period many changes have occurred. Where the once large and efficient timber mill of Wilson Hart & Co. stood in Maryborough we now have our wonderful Brolga Theatre and Convention Centre which attracts some high class performers. The exterior design is meant to reflect the shape of an industrial building, but inside it is something else.

Wilson Hart's big mill was regarded as one of the most stable industries in the area. In its heyday it generated all of its own electricity with two "Belliss & Morcom" sets powered by steam generated by burning offcuts and sawdust from its own production. During War time night shift, surplus power was fed into the Maryborough town supply grid to help the local power station, at the corner of Kent and Tooley Streets, carry the extra load.

With the passing of the steam-driven sawmills, so too has passed the valuable training ground for people in industry. Today, by the pressing of a button, operators have instant power at their command. Instead of being burnt, the wood waste is turned into chips to be used for other purposes. The power in this country of course comes mostly from the burning of coal, one of our non-renewable fossil fuels, in giant power station boilers.

The small steam-driven sawmill at the Forestry Complex on the Northern approach to Gympie is operated by volunteers under the management of the Queensland Museum. It has been set up to give visitors a glimpse of the past.

In 1992 we were called upon to remedy a fault that had developed in this engine. By coincidence it turned out to be a valve problem again. The engine was fitted with what is known as a balanced slide valve. Without going into detail, the valve on occasion came away from its seat on the port face. When this occurred high pressure steam was allowed to pass straight out through the exhaust. The exhaust pipe pointed directly out over the busy Bruce Highway, so when the Gympie Police started getting complaints from startled motorists, something had to be done.

An inexperienced fitter had removed the steam chest cover to examine the valve which had come apart due to its design. In attempting to force the two-piece valve back together by refitting the cover and tightening up the studs, the cover was broken completely in two.

The patented "balanced valve" was normally used in engines running higher steam pressures and I considered it was not necessary in the application for which the engine was now being used. We therefore made a new conventional valve similar to the one we had made for the Elgin Vale engine. We also made a new cast iron chest cover which measures about 18 inches x 14 inches x about 1 1/4 inches thick. On the outside face it carries the wording:

OLDS
REPLACEMENT
1992

thus recording the date of the repair.

Some two years later during a meeting with Dr. Dan Robertson and some of his Staff at the Queensland Museum, a comment was made that the Gympie Engine had given no more trouble and was working better than ever. I was then asked about the work and the modifications we effected.

After I related that episode, one of the party asked, "weren't you involved with the engine at Elgin Vale some years ago?" Then, after telling that story in some detail, I was urged by all present to "write it up".

Soon after, I received a note from noted Author and Historian, Dr. Tony Matthews, requesting information on the mill. This was the final spur needed. I was indeed very pleased to learn that the Kilkivan Shire Council had commissioned Tony to record the history of Elgin Vale in his book, "The Coffee Pot Mill".

Gone are those small country sawmills with the familiar smoke stack through the boiler house roof. Gone also are many of the opportunities where people could grasp the basic knowledge of the power source of steam and gain experience in a working environment.

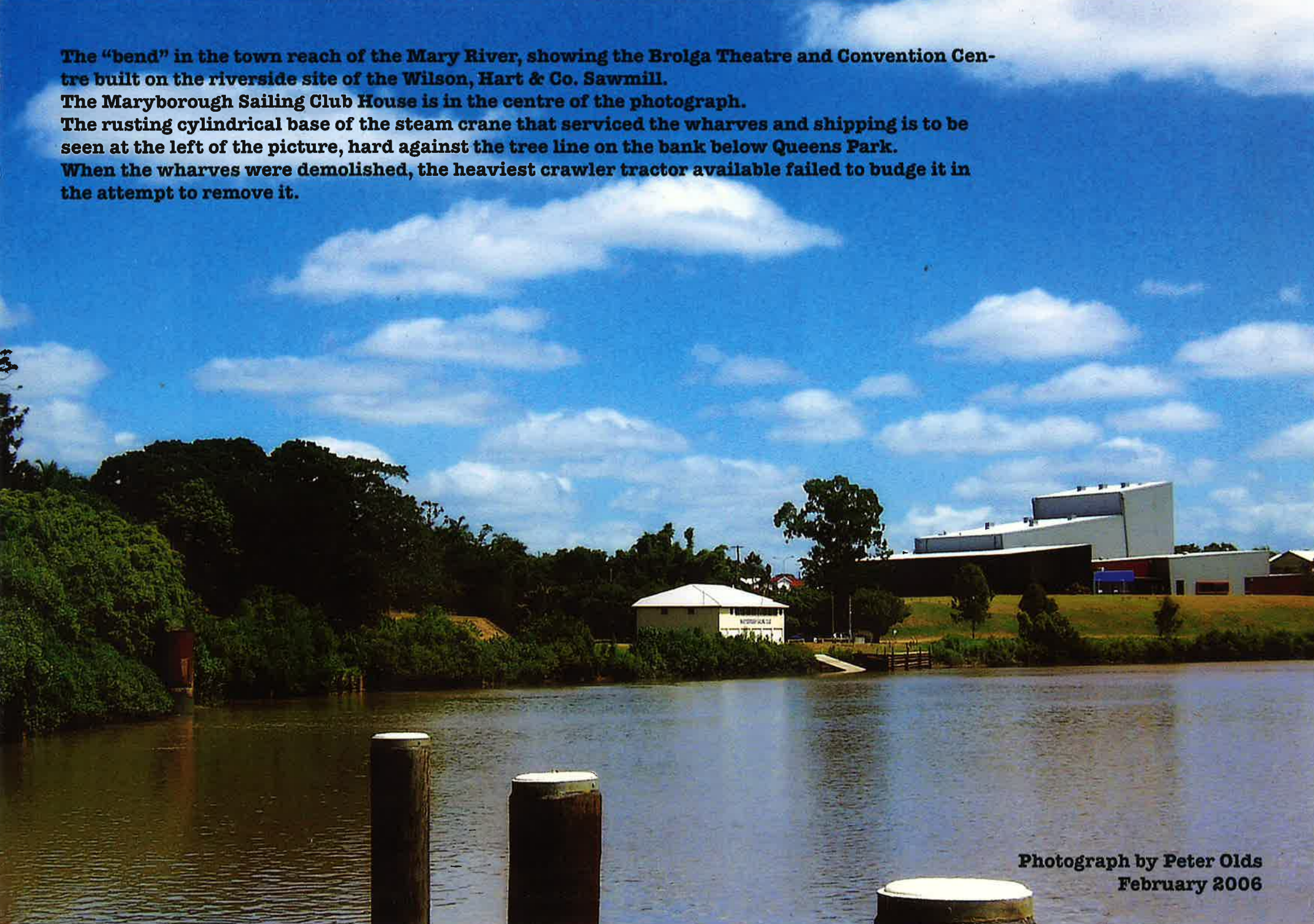
Tarong Power Station was in the early stages of construction when I first visited Elgin Vale. The day Dave Neilson and I fitted the new valve to the engine we completed the work in the early afternoon. Having nothing to do till the next morning we drove over and had a look at the giant project taking shape.

It now seems ironic that 12 operators and trainees from Tarong visited our works on Wednesday, 3rd January, 1996, the day after we returned from our Christmas break. They requested that , if possible, they would like to see the little Tangye steam engine operating. This was the third such group from Tarong Power Station to pay us a visit for training purposes.

In the quest for higher thermal efficiency, the modern trend is for boilers to be very much larger and designed to work with very high steam pressures and temperatures.

Each of the four giant boilers at Tarong can convert 290 kg of water per second (i.e. 250, 200 gallons of water per hour) into steam at 2,700 pounds per square inch pressure. Totally, they burn approximately 5 million tonnes of coal per year.

I often reflect on the amount of our fossil fuels we are consuming, especially in our so-called "developed countries". It leads me to think that in future we might be looked upon as the most wasteful generation to ever inhabit this earth, so far as energy is concerned. We seem to treat the use of coal and oil especially, as though there is a never-ending supply.



The "bend" in the town reach of the Mary River, showing the Brolga Theatre and Convention Centre built on the riverside site of the Wilson, Hart & Co. Sawmill.
The Maryborough Sailing Club House is in the centre of the photograph.
The rusting cylindrical base of the steam crane that serviced the wharves and shipping is to be seen at the left of the picture, hard against the tree line on the bank below Queens Park.
When the wharves were demolished, the heaviest crawler tractor available failed to budge it in the attempt to remove it.

Photograph by Peter Olds
February 2006